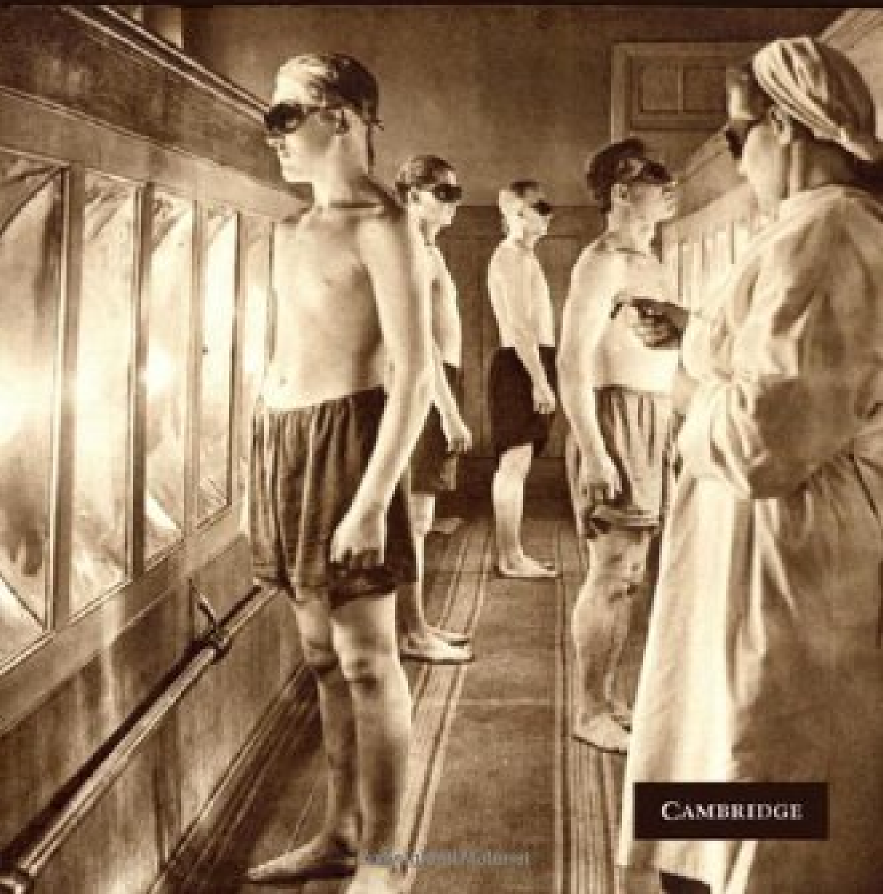
DONALD FILTZER

The Hazards of Urban Life in Late Stalinist Russia

Health, Hygiene, and Living Standards, 1943–1953



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The Hazards of Urban Life in Late Stalinist Russia

This is the first detailed study of the standard of living of ordinary Russians following World War II. It examines urban living conditions under the Stalinist regime with a focus on the key issues of sanitation, access to safe water supplies, personal hygiene and anti-epidemic controls, diet and nutrition, and infant mortality. Comparing five key industrial regions, it shows that living conditions lagged some fifty years behind Western European norms. The book reveals that, despite this, the years preceding Stalin's death saw dramatic improvements in mortality rates thanks to the application of rigorous public health controls and Western medical innovations. While tracing these changes, the book also analyzes the impact that the absence of an adequate urban infrastructure had on people's daily lives and on the relationship between the Stalinist regime and the Russian people, and, finally, how the Soviet experience compared to that of earlier industrializing societies.

Donald Filtzer is Professor of Russian History at the University of East London. His previous publications include *Soviet Workers and Late Stalinism: Labour and the Restoration of the Stalinist System After World War II* (2002), *Soviet Workers and the Collapse of Perestroika: The Soviet Labour Process and Gorbachev's Reforms, 1985–1991* (1994), and *The Khrushchev Era: De-Stalinization and the Limits of Reform in the USSR, 1953–1964* (1993).

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Contents

Figures

Maps

Tables

Preface and acknowledgements

Thomas Kuhn, in his pathbreaking book, *The Structure of Scientific Revolutions*, notes that prevailing scientific paradigms determine how, or even if, we observe specific phenomena. One of the examples he uses to illustrate this is that of the motion of a heavy object tethered to the end of a chain:

> Since remote antiquity most people have seen one or another heavy body swinging back and forth on a string or chain until it finally comes to rest. To the Aristotelians, who believed that a heavy body is moved by its own nature from a higher position to a state of natural rest at a lower one, the swinging body was simply falling with difficulty. Constrained by the chain, it could achieve rest at its low point only after a tortuous motion and a considerable time. Galileo, on the other hand, looking at the swinging body, saw a pendulum, a body that almost succeeded in repeating the same motion over and over again ad infinitum. And having seen that much, Galileo observed other properties of the pendulum as well and constructed many of the most significant and original parts of his dynamics around them.[1]

I was reminded of this a few years ago when I came across an article in the *Guardian* newspaper in Britain on the water crisis faced by the Chinese city of Shanghai. The city's rapid industrial expansion had brought with it almost irremediable pollution to its main river, the Huangpu. Although the people in charge of ensuring the safety and purity of the city's drinking water insisted that it was perfectly clean, the *Guardian*'s reporter noted that, "A glass of Shanghai water is tinted a faint yellow, smells of chlorine and tastes like something you'd rather not swallow – most people boil it, or buy bottled water." The city was seeking alternative sources, in the first instance from the Yangtze, but this was unlikely to solve the problem. "The trouble is," said the article, "that China's environment is being ruined so quickly that even a glass of water from the mighty Yangtze may soon not be much of an improvement."[2]

[1] Thomas Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1971), pp. 118–19.
[2] *Guardian*, November 11, 2004, G2 section, pp. 2–4.

Had I come across an article like this some years earlier I probably would have given it no more than a fleeting glance, and perhaps passed over it completely. What changed my perception was one of those archival accidents that periodically make historical research worthwhile. Chapter 3 of my book *Soviet Workers and Late Stalinism* contained a brief discussion of workers' housing conditions and health care, and I had been spending some time trying to find additional information in order to develop this work further. Quite by accident in the files of the USSR Ministry of Health I came upon a report by the city of Leningrad State Sanitary Inspectorate, in Russian the Gosudarstvennaya sanitarnaya inspektsiya, or GSI. Now, at that time I had never even heard of the State Sanitary Inspectorate and I have no memory at all of why I decided to order this report. When I opened it, however, it proved to be a revelation, for it contained the most detailed, even minute, descriptions of the state of Leningrad's urban environment: which streets and houses had sewerage and water supply and what kind of condition these were in; the state of hygiene in its hairdressing salons, hotels, markets, and public canteens; sanitary conditions in its hospitals; and the physical condition of its school children and teenage workers. In all the years I had been studying Soviet labor history, including a great deal of research into living conditions, I had never come across anything so rich in detail – nor anything that quite so forcefully drove home to me how little I actually knew about the real conditions in which workers and their families carried out their daily lives. Having had the privilege of living in the former Soviet Union during the Brezhnev and Gorbachev eras I had direct knowledge of just how bad Soviet toilets were, but I had no idea that for the better part of the twentieth century most Soviet citizens did not have a toilet, or running water either.

This was clearly a source of information that deserved following up. I soon realized that the state sanitary inspectors of every oblast' and city filed annual reports with the All-Union GSI in Moscow. Few of these from the late Stalin years have been preserved in the archives – just a handful of sample reports from a few cities for random years – but the archives for the Russian Soviet Federative Socialist Republic, or RSFSR, contain reports from a large range of Russian localities if not for every postwar year, then for enough years to make it possible to trace their progress longitudinally over time.

And so back to Thomas Kuhn and Shanghai's water supply. After reading several of the GSI reports and deciding that this was a research topic well worth pursuing I, too, had a "paradigm shift." I began to notice water, sewage, and urban sanitation in the news virtually everywhere. Much of the coverage focuses on China, whose environmental problems are particularly pertinent, because in some ways they reflect those experienced by the Soviet Union during the 1930s and after the war. But China is not alone. The need for proper sanitation and clean water affects almost half the world's population – and this when we are well into the twenty-first century. Oxfam and similar charities now sell Christmas gifts via which you donate a toilet or a water supply to a needy village on behalf of yourself or a friend. Nor is it as if the history of these problems has been underresearched. A little digging reveals a vast historical literature on the misery of life in Victorian cities in Britain, Germany, France, and the USA. From contemporary writers such as Mike Davis we learn that this history is constantly being recreated as capitalism forces millions of people the world over into shanty towns and slums, slums that are not holdovers from some previous phase of underdevelopment, but new accretions of a new and brutal form of capitalist urbanization.[3]

In terms of my own work, one of the things the GSI reports did was allow me to contextualize two other types of information I had been gathering, namely local data on postwar infant mortality and Central Statistical Administration (TsSU) household budget surveys on workers' consumption. It was from mining these three types of sources that I was able to compile the material for the present book.

This book as it eventually emerged serves as a sequel to my book on workers during late Stalinism, and ideally the two should be read together. Unlike *Soviet Workers and Late Stalinism*, it deals not with the situation across the entire USSR, but only with industrial regions in the RSFSR which had not suffered extensive damage during World War II. I explain the reasons for selecting these particular regions in the Introduction. As I elaborate there, *The Hazards of Urban Life* analyzes in great detail the conditions under which people lived, but the nature of the sources used has meant that it rarely deals with real human actors. Nor does it discuss in any great detail the political, economic, and social context of the late Stalin period. For these I refer the reader to the available social histories of late Stalinism by Elena Zubkova, V. F. Zima, Juliane Fürst, and my own *Soviet Workers and Late Stalinism*.

Like all research projects, this one would never have seen the light of day but for generous assistance from a long list of people and institutions. Most of the research was financed by the Arts and Humanities Research Council in the UK. The British Academy gave me an overseas conference grant in 2006 to allow me to attend that year's conference of the American Association for the Advancement of Slavic Studies, where I presented a

[3] Mike Davis, *Planet of Slums* (London: Verso, 2006).

preliminary research paper on infant mortality. The School of Social Sciences, Media and Cultural Studies at the University of East London funded further research visits to Russia during the summers of 2006 and 2008; for assistance with these I am particularly grateful to Gavin Poynter, Andrew Blake, and Haim Bresheeth.

In Russia itself I need to thank the archivists and reading room staff at the various archives at which I worked. Their professionalism, their knowledge of their craft, and their almost endless reserves of patience were, as always, indispensable to the successful completion of my work.

The list of friends and colleagues to whom I owe thanks is rather long.

Elizabeth Brainerd kindly shared with me references and anthropometric data she has collected on the postwar period. Thanks to the material she provided I realized that one of the central discussions in Chapter 4 was based on faulty data and I was able to excise it from the manuscript.

Dennis Brown was always there at the end of an e-mail connection, ready to provide instantaneous replies to questions on microbiology, biochemistry, and virtually any other branch of science with which I needed help.

Chris Burton introduced me to the field of the history of Soviet medicine and has effectively been my mentor in this area. He tutored me in how to locate and interpret the appropriate sources, was available to answer boundless questions, and read and commented on the book's manuscript, as well as most of the preliminary working papers that served as drafts of its various chapters.

Michael David, a person of unique talents as both a practicing physician and historian of Soviet medicine, patiently answered an endless list of medical questions and gave a careful reading of Chapters 4 and 5, together with a detailed set of corrections and advice on interpretation.

Bob Davies read a very early version of the second part of Chapter 4 and offered valuable guidance on how to develop the material and how to put it into its longer-term historical context.

Michael Ellman read several iterations of the same part of Chapter 4 and offered helpful suggestions at each stage of its development.

Juliane Fürst kindly invited me to contribute an article to her edited collection on late Stalinism, which gave me the chance to work up and think through the early results of my research.

Wendy Goldman read the manuscript with a fine-tooth comb and, with her usual perspicacity, laser-like analytical insight, and fair-mindedness, provided a lengthy and well-grounded agenda for corrections and revisions.

Mark Harrison, as he has done for many, many years, read a number of my early discussion papers and provided invaluable advice and instruction on how to present and interpret my data.

Dan Healey, together with Chris Burton and Fran Bernstein, invited me to present an early version of my work on water supply and river pollution, some of which I revised for part of Chapter 2, at a conference they organized in 2005 on "The Science, Culture and Practice of Soviet Medicine."

Karen Anderson Howes copy-edited my previous book, *Soviet Workers and Late Stalinism*, and was quite simply the best copy-editor I've ever worked with. I did not have the chance to acknowledge her then, but feel I have the right to do so now because she has also copy-edited this book – and has done an equally wonderful job.

Gijs Kessler gave helpful advice on the use and interpretation of the Central Statistical Administration household budget surveys. He also read and commented on an earlier version of what became the second half of Chapter 4. And if that were not enough, he shouldered the lion's share of the burden of co-organizing (together with Wendy Goldman, Simon Pirani, and me) a conference on recent approaches to Russian and Soviet labor history at the International Institute of Social History in Amsterdam in 2005, where I first presented this material. He then did the same when we produced a collection of articles from that conference.[4]

Natasha Kurashova has been putting up with the late Stalin period for rather a long time now. There is not a single part of my research that she has not discussed with me over and over again, and she has been a boundless source of encouragement and inspiration, not to mention a bottomless well of tolerance when the writing was not going very well.

Dave Leon gave me a crash course in epidemiology (together with a daunting reading list) and meticulously went through Chapters 4 and 5 of the manuscript, correcting mistakes, providing additional references, and making helpful suggestions on how to present the material accurately and more effectively.

Andrei Markevich shared with me his own research on the household budget surveys from the Khrushchev period and directed me to additional archive documents that helped me to develop my analysis.

Ethan Pollack read and commented on Chapter 3 of the manuscript.

Lionel Sims, always a thoughtful and compassionate colleague, immediately came up with the magic answer when I went to him for help on how to analyze the household budget data: he taught me how to use spreadsheets, from which point all things became possible. Without his help I would never have been able to process the material, and Chapter 4 simply would not exist.

[4] Donald Filtzer, Wendy Z. Goldman, Gijs Kessler, and Simon Pirani, eds., *A Dream Deferred: New Studies in Russian and Soviet Labour History* (Bern: Peter Lang, 2008).

Joel Tarr kindly read Chapters 1 and 2 and offered detailed comment on how best to revise them.

Stephen Wheatcroft, who probably knows more about the Central Statistical Administration household budget surveys than anyone, went through them with me in considerable detail, showed me how I could most effectively process the data, and pointed me in the direction of additional sources.

Some of the material in Chapter 2 appeared originally in the article, "Poisoning the Proletariat: Urban Water Supply and River Pollution in Russia's Industrial Regions During Late Stalinism, 1945–1953," *Acta Slavica Iaponica*, no. 26 (2009), pp. 85–108. An earlier version of the second half of Chapter 4 appeared as the article, "The 1947 Food Crisis and Its Aftermath: Worker and Peasant Consumption in Non-Famine Regions of the RSFSR," in Donald Filtzer, Wendy Goldman, Gijs Kessler, and Simon Pirani, eds., *A Dream Deferred: New Studies in Russian and Soviet Labour History* (Bern: Peter Lang, 2008), pp. 343–83. I am grateful to the editors of *Acta Slavica Iaponica* and to Peter Lang for their kind permission to use this material here.

And so to end with the usual caveat. Without the help of those listed here (and those whom I might have forgotten) what may be good about this book would not have been quite as good, or indeed not good at all, but for what is not so good I alone carry the can.

Terms and abbreviations

ASSR	Autonomous Soviet Socialist Republic
BGSO	"Be Ready for the Sanitary Defense of the USSR" ("Bud' gotov k sanitarnoi oborone SSSR"). Badge earned by school children after completing a course on sanitation, first aid, and disease control in case of war and enemy attack.
FZO (pl., FZO)	factory training school (*shkola fabrichno-zavodskogo obucheniya*), a three- or six-month training school for "mass" trades
garbage	used interchangeably with "rubbish" and "trash" to refer to solid, non-fecal waste
glavk (pl., *glavki*)	chief administration, a subdivision of a ministry
Gosplan	State Planning Commission (Gosudarstvennaya planovaya komissiya)
Gossaninspektsiya	State Sanitary Inspectorate (Gosudarstvennaya sanitarnaya inspektsiya), or GSI
GSI	*see* Gossaninspektsiya
GSO	"Ready for Sanitary Defense of the USSR" ("Gotov k sanitarnoi oborone SSSR"). Badge earned by civilians and older school children after completing a course similar to, but slightly more rigorous than, the BGSO.
Gulag	Chief Administration of Camps, more generally used as the name for the system of MVD labor camps
hinterland	As used in this book, those cities and regions that were not under German occupation during World War II and/or did not experience major battlefield damage.

	It is roughly equivalent to the Russian term *v tylu*, which means "home front" or "in the rear."
IMR	infant mortality rate, calculated as deaths of infants under one year of age per 1,000 live births
kolkhoz (pl., *kolkhozy*)	collective farm (*kollektivnoe khozyaistvo*)
Komsomol	Communist Youth League, formally known as the All-Union Leninist Communist Union of Youth
militia	police (*militsiya*); the regular police force, as distinct from the secret police
Minzdrav	Ministry of Public Health (Ministerstvo zdravookhraneniya)
MOH	Medical Officer of Health (England and Wales)
MVD	Ministry of Internal Affairs (Ministerstvo vnutrennikh del), in charge of the system of labor camps (Gulag) and police (militia)
norms	individual output quotas for workers on piece rates
oblast' (pl., oblasti)	region, roughly equivalent to a province
orgnabor	organized recruitment of workers
ORS (pl., ORSy)	Department of Workers' Supply (Otdel rabochego snabzheniya)
OSI (pl., OSI)	public sanitary inspector (*obshchestvennyi sanitarnyi inspektor*). During World War II, a lay sanitary inspector, usually appointed by a workplace collective, to assist sanitary physicians and sanitary inspectors with health education and the enforcement of hygiene and health measures.
Procuracy	Public Prosecutor's Office
procurator	public prosecutor
RSFSR	Russian Soviet Federative Socialist Republic (Rossiiskaya Sovetskaya Federativnaya Sotsialisticheskaya Respublika)
RU (pl., RU)	trade school (*remeslennoe uchilishche*) under the Ministry of Labor Reserves, a two-year training school in skilled trades
rubbish	*see* garbage

SES (pl., SES)	sanitary-epidemic center (*sanitarno-epidemicheskaya stantsiya*); took over many of the local inspection functions from the State Sanitary Inspectorate after 1951
skip	in British English, a large container used by multiple households to hold garbage until collected
slops	(Russian *pomoi*) liquid wastes other than sewage, such as common kitchen wastes
SSSR	Union of Soviet Socialist Republics (Soyuz Sovetskikh Sotsialisticheskikh Respublik)
SU RSFSR	Statistical Administration of the RSFSR (Statisticheskoe upravlenie RSFSR)
trash	*see* garbage
TsSU	Central Statistical Administration (Tsentral'noe statisticheskoe upravlenie)
VTsSPS	All-Union Central Council of Trade Unions (Vsesoyuznyi tsentral'nyi sovet professional'nykh soyuzov)
ZhU (pl., ZhU)	trade school (*zheleznodorozhnoe uchilishche*) to train skilled workers for the railways; equivalent to an RU

The notes use standard abbreviations for Russian archive references, which consist of five elements:

1. The abbreviation of the archive name (the full names of the archives are given in the bibliography).
2. f. = *fond*, or holding. These generally correspond to a particular institution or major subdivision of an institution, for example, the USSR Ministry of Health, an industrial ministry, or a specific trade union.
3. op. = *opis'*, or inventory. The *opisi* are the primary subdivisions of a *fond*. Sometimes the *opisi* represent subdivisions or departments within an organization; some *fondy* simply divide the *opisi* chronologically.
4. d. = *delo*, or file. These are the actual folders containing the documents.
5. l. = *list*(*y*), or sheet(s). Russian archives give files sheet numbers, rather than page numbers, since a file almost always contains many different documents, each of which had its own separate pagination when it was originally written.

Thus a typical reference will be something like this: GARF, f. 9226, op. 1, d. 636, l. 52, 53. The document will be in GARF (State Archive of the

Russian Federation), *fond* 9226 (State Sanitary Inspectorate of the USSR Ministry of Health), *opis'* 1, *delo* 636, *listy* 52, 53.

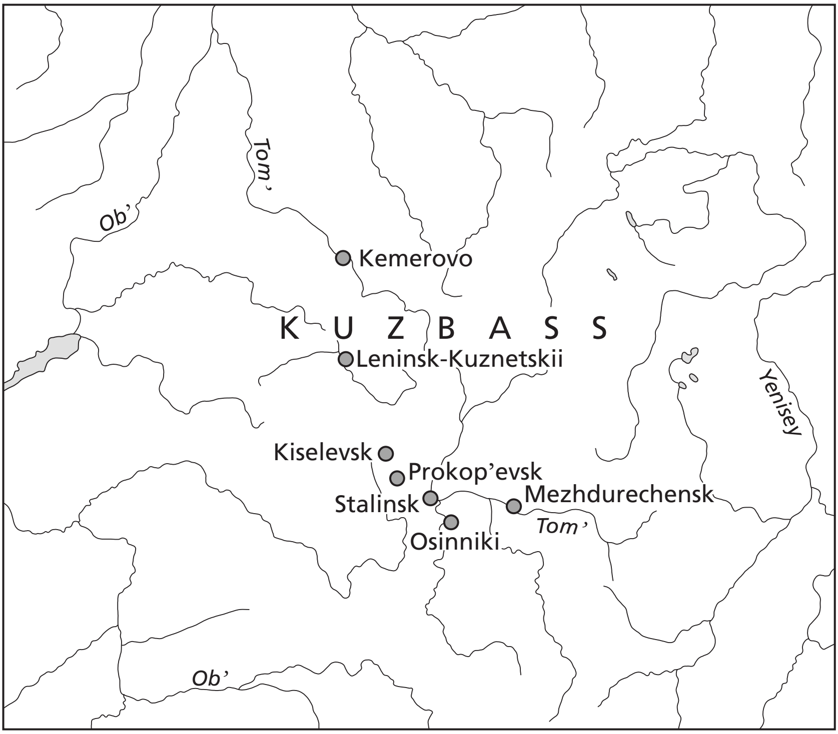
The State Archive of the Russian Federation (GARF) has two reading rooms. The central reading room, Reading Room 1, holds files from administrative divisions of the former USSR. Reading Room 2, in a different location, holds files for administrative divisions of the RSFSR. Documents from Reading Room 2 always have the letter “A” before the number of the *fond*. Thus: GARF, f. A-482, op. 47, d. 4941, l. 11, where *fond* A-482 is the Ministry of Health of the RSFSR. In the notes I have followed the practice used in most Russian books of giving the single letter “l” when referring to multiple sheets; thus, for example, “l. 10–14” indicates sheets 10 through 14.

1 Map of the regions covered in the book, from Moscow in the west to Kemerovo oblast' in Western Siberia

2 The Volga and Kama River networks

3 Moscow and Moscow oblast'

4 The Urals and its major rivers



5 The Kuzbass and the River Tom’

Introduction

Standard of living, "quality of life," and popular welfare

In 1947 the *American Review of Soviet Medicine* published an article by Peter Belikov, a Soviet public health physician, which gave a glowing account of the state of sanitation and disease control inside the USSR. Addressing the question of how the country was reducing the incidence of, and mortality from, intestinal infections, in particular among its young children, it attributed success in this area to two sets of factors. The first was the high quality of medical care that patients received. Doctors arrived quickly to attend the sick, made a rapid diagnosis, and referred patients almost immediately to hospital. At the same time living quarters were disinfected and contacts tracked down and isolated.[1] The second weapon in the battle against gastrointestinal disease was the country's extensive system of urban sanitation and public health controls. These Belikov described as follows:

> Sanitary measures to prevent spread of infection by water, milk and foodstuffs, are realized in the USSR on a very wide scale because no expense is spared and time taken to complete the construction and extension of water works, sewage systems, and garbage disposal stations. These works were uninterrupted during the war wherever possible. The water of all reservoir systems is subjected to regular bacteriologic control and is chlorinated daily. Wells which are still maintained in small cities are also chlorinated. In all industries closed tanks with water boiled and cooled have been set up. This has also been done in all ports and railroad stations where boiling water is always available for travellers in any desired quantity.
>
> At all populated points work is periodically undertaken to clean the territory. In connection with the hardships of the war period, the population itself is at present participating in this effort. Public dining rooms, markets and bazaars are under the vigilant supervision of sanitary inspectors. Similar control has been set up for slaughter houses, meat combines, dairy stores and milk collection centers. All these measures are realized in the Soviet Union since all industries in the USSR are state controlled and centralized.[2]

[1] Peter F. Belikov, "The Fight Against Intestinal Infections," *American Review of Soviet Medicine*, vol. 4, no. 3 (February 1947), pp. 240–1.
[2] *Ibid.*, pp. 241–2.

This passage requires more careful unpicking than it might seem. On the one hand, the measures elaborated here were genuine policy objectives of the Soviet state and its medical establishment, and they had far more than just a paper existence. It was certainly the aim to diagnose and treat those suffering from contagious diseases as rapidly as possible. The country really did have vast ranks of sanitary physicians and inspectors whose task it was to control water quality, food safety, and the efficiency of waste removal. On the other hand, most of the achievements Belikov claimed were not true. Soviet physicians were not well skilled in diagnostics, and frequently mistook dysentery – a highly contagious disease and major killer of both children and adults, which could nevertheless be treated and contained if properly identified – for simple gastroenteritis.[3] Sanitation in Soviet towns and cities was extremely primitive, and the safety of water supplies, although rarely catastrophic, was not secure, not least because water treatment plants were insufficient in quantity and capacity and could not always obtain the chemicals they needed. Milk was an extremely scarce foodstuff, and both its rarity and frequent contamination were major causes of high infant mortality during 1947, when the country experienced its last major famine. The one accurate claim in these paragraphs was itself a testimony to the dismal sanitary state of urban centers: because almost no towns or cities had extensive sewerage networks or well-functioning systems for the regular removal of human wastes, they relied on twice-yearly mobilizations of the general population in order to "clean the territory," that is, to remove the danger by carting off the huge accumulations of garbage and human excrement beyond town limits. Yet Belikov's article does point to a curious fact. Despite the reality of life in Soviet towns, during the late 1940s, and even more so during the early 1950s, the USSR made great strides in reducing both adult and infant mortality.

The present book deals with precisely the issues that Belikov raised. It investigates how people lived in Russia's towns and cities during the late Stalin period, in particular how the working class lived. The information comes from three main sources: medical reports on public sanitation and public health; demographic data; and data on diet and nutrition. Yet the book is not a study of demographics, epidemiology, or public sanitation *per se*. Some of the key questions it raises, such as how the USSR achieved its permanent decline in infant mortality in the face of appalling urban

3 L. G. Zhdanova, "Epidemiologiya dizenterii, obuslovlennoi zagryazneniem pit'evoi vody iz tekhnicheskogo vodoprovoda," in V. A. Krestovnikovaya, ed., *Voprosy epidemiologii, profilaktiki i kliniki kishechnykh infektsii* (Moscow, 1954), p. 31.

sanitation, it can answer only in part. Others, such as what were the long-term effects of these living conditions upon people's health in later decades, it cannot answer at all. A definitive treatment of these problems would require a separate study using different tools of analysis and possibly different sources, not to mention areas of expertise which this author does not possess. To this extent the book, while answering some major questions about working-class life in the postwar USSR, poses a number of others that will have to go on the agenda of future researchers. At the same time, the book also contains a methodological warning for these same researchers, for it shows the risks of engaging in demographic analyses without understanding the details and specifics of the conditions that produced these demographic results, especially at local level.

One of the central ideas behind this study is the need to broaden our understanding of workers' living standards so that it embraces more of the totality of living conditions, what I call the quality of life. Economic historians of Britain took up this issue nearly two decades ago with regard to longstanding debates over whether or not the standard of living of British industrial workers declined or increased during the early decades of the nineteenth century. If we look at movements of real wages, in particular those of male workers, we see that they very probably increased – an observation that prompted a number of historians to conclude that living standards actually improved at this time. I am not competent to judge whether this conclusion is correct. Rather I wish to make a broader point, that real wages alone – the spending power of workers' weekly pay packets – give a totally misleading picture of what working-class life was really like. In the same period that wages were increasing, infant mortality, life expectancy, and average child heights – key indicators of well-being or welfare – were all going down. Life expectancy at birth in provincial industrial cities with populations over 100,000 (that is, excluding London, which followed its own atypical demographic pattern) declined dramatically between 1820 and 1850, from 35 years in the 1820s, to 29 years in the 1830s, and 30 years in the 1840s. From 1850 onwards there was a gradual recovery, but British cities did not reach their 1820 average again until the 1870s, when life expectancy finally broke through the 35-year mark at 38 years, rising to 42 years during the 1890s. Life expectancy in the major industrial centers of Liverpool, Manchester, and Glasgow was even lower than this urban average: in 1841 it was 28 years in Liverpool and 27 years in both Manchester and Glasgow.[4] We see a

[4] Simon Szreter and Graham Mooney, "Urbanization, Mortality, and the Standard of Living Debate: New Estimates of the Expectation of Life at Birth in Nineteenth-Century British Cities," *Economic History Review*, new series, vol. 51, no. 1 (February 1998),

similar pattern if we look at other determinants of welfare: child heights, food consumption, and infant mortality.[5] All this, of course, conforms quite closely to the qualitative descriptions of the degradation of urban life during the industrial revolution by such observers as Friedrich Engels or the early pioneers of sanitary reform in Britain, Edwin Chadwick and William Farr.[6]

The postwar Soviet experience shows this exact same discrepancy between measurements of real wages and what was actually happening to the population. Following World War II the Soviet Union distributed food and basic consumer goods in three ways. Bread and other staple foods, together with essentials such as matches and kerosene, were sold in state shops at so-called ration prices. Rationed goods were not free. Rationing merely gave people the right to a coupon with which they could buy their allocated allowance provided they had the money. The prices were low, although the foods and goods were often unavailable. The state also ran a second network of so-called commercial shops, which were outside the rationing system. These were better supplied, but their prices were far higher. Finally, those citizens who had the cash could buy food and some consumer goods through private trade, primarily on the peasant collective farm, or *kolkhoz*, markets. These were bazaars where peasants could sell foods they had grown on their private plots, and they existed in every Soviet town. On September 16, 1946, in the wake of a harvest failure, the state dramatically raised prices on rationed goods.[7] The price of rye bread, the staple of the Soviet diet, more than tripled. The price of groats also tripled, while the prices of meat and milk more than doubled.[8] If we were to look solely at movements in wages and the cost of living following these price rises we could conclude that real wages

Tables 5 and 6. Throughout this entire period life expectancy in the large industrial cities lagged well behind the average for all of England and Wales, although after 1870 the gap did narrow. For purposes of comparison, life expectancy in England and Wales remained constant at around 41 years from the 1810s right through to the end of the 1860s, after which it rose steadily to 46 years by the end of the nineteenth century. What this means is that, during the 1830s, the life expectancy at birth in large cities was a full twelve years below the national average.

5 Paul Huck, "Infant Mortality and Living Standards of English Workers During the Industrial Revolution," *Journal of Economic History*, vol. 55, no. 3 (September 1995), pp. 546–7; Szreter and Mooney, "Urbanization," pp. 108–10.

6 For development of this argument, see Szreter, "Economic Growth, Disruption, Deprivation, Disease, and Death: On the Importance of the Politics of Public Health for Development," *Population and Development Review*, vol. 23, no. 4 (December 1997), pp. 693–728.

7 I discuss the state's response to the harvest failure in more detail in the opening section of Chapter 4.

8 Eugene Zaleski, *Stalinist Planning for Economic Growth, 1933–1953* (London: Macmillan, 1980), pp. 688–96.

actually rose during 1947 – a year when there was in fact a catastrophic famine that cost upward of a million lives – by a full 36 percent compared to 1946, the rise in ration prices notwithstanding. This is because calculations of the cost of living take into account not just the increases in ration prices, but the movements of all three components of Soviet prices in force at this time. Prior to September 1946, official ration prices had been relatively low, and it was these that the state had raised by draconian proportions. Officially, the state compensated the rise in ration prices with comparable reductions in the very expensive commercial prices. Moreover, prices on the private *kolkhoz* markets shadowed state commercial prices and, when the latter went down, so, too, did the price of privately traded food. Taken together, the decline in commercial and *kolkhoz* market prices was sufficient, on paper at least, not just to counterbalance the increase in ration prices, but to cause a fall in the overall cost of living, and with it an improvement in real wages.

The problem, however, is that these paper calculations had little bearing on reality. For the overwhelming bulk of workers the increase in real wages was no more than an illusion.[9] I say illusion for two reasons. The first and most obvious is that all this was happening at the start of a serious famine, and this famine affected not just rural living standards (to which the real wage calculations simply did not apply), but also those in the towns. Many tens of thousands of urban residents died prematurely because of this famine, while the rest suffered a near-cataclysmic fall in nutrition.[10] Secondly, the reality of Soviet life was that prices and wages, even under rationing, did not necessarily ensure access to food or any other good, be it clothing or housing. The main determinant of this was supply, and supply was blatantly inadequate. The vast majority of workers, but in particular the very low-paid who made up a substantial minority of the workforce, could now buy less rationed food at the new, higher prices, while prices on the private market, although lower, remained out of their reach. Higher-paid sections of the workforce in theory may have seen their purchasing power less affected, or even improved, but these people came up against a second obstacle: the food, although they might have been able to afford it, was simply not there for them to buy.[11] The larger issue here is that to determine whether or not people lived better or worse we need to look at what food they actually ate, at how many meters of cloth

[9] Donald Filtzer, "The Standard of Living of Soviet Industrial Workers in the Immediate Postwar Period, 1945–1948," *Europe–Asia Studies*, vol. 51, no. 6 (1999), pp. 1015–16.

[10] This I show in detail in Chapter 4.

[11] Thus the cities of Ivanovo and Kuibyshev both experienced very sharp rises in infant mortality during 1947, in large part because these cities had no milk. See Chapter 5, pp. 294–7.

they could acquire in a year, at how long it took to buy a pair of footwear, at how many pairs of underwear or socks they owned, or how many grams of soap they bought each month. Purchases of these non-food items were risibly, indeed dangerously, small – and not always because their prices were high (although in most cases they were), but because the country simply did not manufacture them. The generalized soap shortage, whose implications for public health and hygiene I discuss in Chapter 3, occurred not because soap was expensive, but because there was no soap to be had anywhere, despite the fact that in 1947 the country was battling a major outbreak of typhus.

Following the lead of historians of West European industrialization, what I do in this book is broaden this analysis to include other aspects of consumption, most importantly housing, access to sewerage and to safe water supply, whether or not streets were cleaned of rubbish and excrement, and the population's ability to bathe and maintain basic levels of personal hygiene. These were not just issues of personal comfort, although they played a very large role in whether or not urban life was tolerable. They were key determinants of whether or not people caught diseases such as tuberculosis, dysentery, or pneumonia, how long they lived, and whether or not their children survived their first year of life. They also affected the adequacy of the diet. A population living in squalid conditions, with poor access to water supply, and where the fulfillment of basic personal and domestic tasks requires a major investment of effort, will generally use up more energy in the course of a day than a population living in modern cities with sewerage, indoor running water, and indoor toilets and bathrooms. If the diet is low in calories, the energy required to carry out these personal and household chores can determine whether or not people suffer from under- or malnutrition, especially in a society such as the postwar USSR in which people tended to work long hours doing heavy physical labor.

My discussion of these topics will show that the postwar USSR did not look like what most Western observers, even specialists in Soviet history, probably imagined. Almost no Soviet cities had a modern sanitary infrastructure. Even the most advanced had only small, inadequate sewerage systems. Most people did not have indoor toilets, but relied on outhouses and primitive cesspits. If cities had central water supplies, these provided water only through outdoor street pumps; few people had indoor running water and, if they did, supplies suffered frequent interruptions. Almost no one had an indoor bathroom. To stay clean, people had to go to the bathhouse, but the capacity of these after the war was such that most people could bathe only once or twice a month. What we shall also see, however, is that the late Stalin period throws up a paradox. The regime took only halting steps to modernize its urban infrastructure. Conditions in cities, and especially in the industrial towns of the oblasti, remained hazardous if not outright squalid until Iosif Stalin died in 1953 and then for some years afterwards. Yet it was in this period that infant and adult mortality began to decline.

It is possible that in this regard the USSR was unique among industrializing societies. In Western Europe and the United States so-called sanitary reform – the laying of sewer mains and construction of sewage treatment plants; the provision of safe centralized water supplies; the relief of domestic overcrowding – was the *sine qua non* of improvements in adult and infant mortality during the late nineteenth and early twentieth centuries. There were other factors that also contributed to these trends, not least general improvements in diet and a fall in the birth rate, but without sanitary reform it is unthinkable that the vast improvements in public health could have occurred. The economist Werner Troesken, for example, has estimated that 20 percent of the overall fall in mortality in the United States between 1900 and 1940 was due to the construction of public water and sewerage systems.[12] The Soviet Union did not follow this trajectory. After World War II mortality declined without any appreciable improvements in urban sanitation, water supply, overcrowding, or facilities for maintaining personal cleanliness. We can express this seeming paradox in terms of time lags. The country's sanitary infrastructure resembled that of Western Europe some forty to eighty years earlier. Prior to World War II Soviet infant mortality figures showed a similar lag. Following the war, the time lag in construction of sanitary infrastructure altered very little, while the country drastically reduced the gap in infant mortality. To some extent this was due to the Soviet Union's ability to borrow from Western medical and public health practice but, as we shall see, this then raises a further political issue: the country attempted to achieve through public health measures what its leaders appear reluctant to have tried to achieve by investing in decent housing, sanitation, and water supply.

Sanitary reform in Western Europe occurred within a specific political context. As we have seen, the rapid growth of cities with industrial capitalism led to a clear increase in mortality, which observers linked to the all too obvious degradation of the urban environment in the form of slums, vast accumulations of uncollected human and animal waste, and foul water. All this occurred before the germ theory of disease was known or

[12] Werner Troesken, *Water, Race, and Disease* (Cambridge, MA: MIT Press, 2004), pp. 59–60, 63. I present a fuller discussion of the experiences of Britain and Western Europe in Chapters 1 and 2.

popularly accepted.[13] Much of the progress made in this area was due to the tireless efforts of a host of campaigning medical reformers, but there were other ideological roots to the movement for greater urban cleanliness in addition to the desire for social reform and better general welfare. Most prominent among these was the rising bourgeoisie's fear of the urban working class, whom it saw as a direct threat to its quest for greater political and social order. The middle class saw a direct correlation between dirt, disorder, and political unruliness. Richard Evans, in his classic work on the politics behind the cholera epidemic in the German city of Hamburg in 1892, devotes a lengthy discussion to the work of William Lindley, an English engineer who made his career in Hamburg promoting and building public baths and washhouses. In putting his plans before Hamburg's ruling elders, he used the following argument:

> Lack of bodily cleanliness soon leads to lack of self-respect, roughness, and vice. Experience demonstrates that those who have dirty clothing avoid respectable places and therefore have the lowest kind of public house as their haunts. If they can employ an hour or so of their leisure time in taking a bath, then in most cases this will put them off going to the pub ... An unclean population will suffer comparatively high rates of sickness and death, and since the poor inhabitants of the city will be thrown onto the state finances to cover the costs in all such cases, this tax burden will for the most correspond to the cleanliness of the population. A dirty population degenerates and so commits all the more offences against the laws of the state, thus contributing to the continued need and expansion of our costly prisons ... Lack of cleanliness makes the population all the more receptive to devastating epidemics such as cholera, smallpox, fever, etc., and encourages such diseases to become endemic or to return again. Experience shows that when these epidemics have reached a certain degree of severity they also reach the dwellings of the well-off.[14]

In other words, building bathhouses had nothing to do with public health (which did not enter into Lindley's argument at all, except insofar as

[13] Hypotheses about a germ theory of disease had been around since ancient times, and it was the general acceptance of contagion theory that allowed European and Middle Eastern physicians of the middle ages to advocate quarantine as a means to combat plague. The theory itself became provable only with the advent of microbiology. Even so, it was only in the 1870s that Robert Koch scientifically demonstrated that the theory was correct. Yet even then it still took some time before Koch's work was generally accepted. In Europe in the middle of the nineteenth century the dominant theory was that diseases were spread not by contagion, but by "miasmas," or foul air, and it was this misconception that fortuitously led most sanitary reformers in the nineteenth century to push for better urban sanitation, the development of sewers, and the provision of clean water.

[14] Richard J. Evans, *Death in Hamburg: Society and Politics in the Cholera Years* (London: Penguin, 2005), pp. 118–19, citing W. Lindley, *Oeffentliche Wasch- un Bade-Haüser* (Hamburg, 1851), pp. 16–17.

workers might spread their diseases to the bourgeoisie) and everything to do with maintaining public order and saving the Hamburg bourgeoisie money. Evans saw it as no accident that Lindley developed these views in the wake of the 1848 revolutionary upheavals all over Europe. "The issue was not," as Evans concluded, "that lack of cleanliness would lead to revolution; rather, lack of cleanliness was merely the outward expression of an inner rejection of bourgeois norms and so of bourgeois society."[15]

Historians have observed similar motivations at work in nineteenth-century France. "Bourgeois observers," wrote the historian Ann-Louise Shapiro in her study of Paris housing reform during the second half of the nineteenth century,

> understood the miserable conditions in which workers lived as the source of moral laxness and political sedition as well as of poor health and disease. Underlying all discussion of the concrete problems associated with rapid, unplanned urban growth lay an intense, and often explicit, fear of the consequences of the geographic separation of the classes. Commentators warned of the danger of allowing Paris to be surrounded by impoverished enclaves hostile to the social order. Equally unsettling was the prospect that workers, deprived of the example of bourgeois *moeurs*, would slip into patterns of vicious or criminal behavior. The hygienist Du Mesnil voiced the chronic anxiety of his contemporaries that in the hovels of the poor "heroism was necessary in order not to succumb to hate for society."[16]

Yet the bourgeoisie's fear of the mob and the unwashed masses came into conflict with its unwillingness to pay for the huge investments needed to clean up Europe's cities. This in part explained the faster development of municipal water supplies compared with sewerage. In both Britain and Germany investors realized that there was profit to be made from municipal water works, despite the huge sums that had to be invested. Moreover,

15 Evans, *Death in Hamburg*, p. 178.

16 Ann-Louise Shapiro, *Housing the Poor of Paris, 1850–1902* (Madison: University of Wisconsin Press, 1985), p. xiv. Later she notes, "Bourgeois observers defined an urban syndrome: dark, humid, exiguous lodgings drove the worker to the cabaret; family life crumbled; the wife turned to prostitution, and the children to the streets; the city spawned a generation of vagabonds – pariahs living outside of social norms whose lodgings were sites of infection and sedition" (*ibid.*, p. 15). It was not just fear of revolution that motivated the French sanitary reformers. They were equally worried that urbanization had produced a population in such poor physical condition that the army would not be able to recruit enough soldiers adequately to defend the nation (*ibid.*, p. xiv). France was not alone in this problem. During the Boer War the British army had to reject 38 percent of volunteers because of various physical disabilities. When Britain introduced conscription toward the end of World War I, the army rejected over 40 percent of potential draftees as physically unfit to serve: John Burnett, *Plenty and Want: A Social History of Food in England from 1815 to the Present Day*, 3rd edition (London: Routledge, 1989), pp. 243, 254.

industrialists had learned that polluted rivers were costly, since pollution had reached a point where it was doing serious damage to their machinery and finished goods. Industrialists were having to pay large sums to cart in clean water from afar. Sewerage, on the other hand, offered no such financial rewards. The widespread installation of sewerage systems essentially depended on arguments of public health.[17]

In the Soviet Union both of these factors – ideological and financial – were either absent or functioned in a different way. Perhaps because of their own working-class and peasant origins, the Stalinist elite did not have the same qualms about working-class hygiene and public disorder as their capitalist counterparts. Stalin's contempt for the working class and peasantry had roots quite different from worries about hygiene. As for investment, here, too, financial considerations came to play a significant role. Through the course of this book we shall see example after example of how Soviet sanitary inspectors beseeched central planners and ordered local soviets or specific industrial enterprises to install essential sanitary infrastructure, ranging from sewerage lines to treatment plants, but the central authorities in Moscow, in the form of either Gosplan (the State Planning Commission) or the industrial ministries, refused to release the funds. The same was true of housing. What little house building took place under Stalin could not keep pace with the growth of urban populations. Medical authorities knew full well that overcrowded housing was a serious health menace, but it had to wait until Nikita Khrushchev came to power in 1953 before the Soviet Union made any serious investment in housing construction.

The economic logic of Stalinism appears to have been that it was cheaper to stop disease by preventing and controlling outbreaks of epidemics than by diverting significant investment resources into sanitary reform. Therefore the postwar period saw the launch of vast public health programs to immunize against infectious diseases, to carry out regular disinfection of certain targeted groups within the population, to identify and isolate carriers of disease or of disease-bearing organisms (most importantly lice), to inspect food handlers and market traders for bacterial contamination, and to educate the population about hygiene. These were all sensible and essential public health measures, but they occurred at a time when cities remained breeding grounds of the very diseases that health officials sought to prevent, and when hospitals themselves did not have sewerage or methods for the safe disposal of infectious human wastes.

[17] Jörg Vögele, *Urban Mortality Change in England and Germany, 1870–1913* (Liverpool: Liverpool University Press, 1998), pp. 159–64; Anthony S. Wohl, *Endangered Lives: Public Health in Victorian Britain* (London: J. M. Dent & Sons, 1983), p. 237.

How I have carried out this study

My survey of the urban environment is based on detailed comparative local studies of a series of what I call hinterland industrial regions within the RSFSR. By "hinterland regions" I mean those areas of Russia that did not experience major fighting or battle damage during World War II. The one partial exception here is Moscow oblast', which for a brief period was under German occupation. There is reasonably good archive documentation on the reconstruction efforts of Soviet cities such as Leningrad and Stalingrad, and of Ukraine, and we now have three very thorough studies in English about the reconstruction of Rostov-on-Don, Sevastopol', and Kiev.[18] Their problems of physical reconstruction were very different both physically and politically from the problems that the hinterland regions faced. As we shall see, infrastructure in the latter also suffered during the war, and suffered greatly, but this was mainly due to enforced neglect owing to the lack of funds and skilled personnel needed to carry out proper maintenance and upkeep. It was not due to battle damage or willful sabotage by retreating Nazi armies. Essentially, by focusing on the hinterland we are coming as close as we methodologically can to analyzing the specific attributes of urban life that were endemic to the Stalinist system *as a system*, features that are masked by the vast physical destruction suffered by the occupied territories during the war.

The regions in the study, moving roughly from west to east, are these: Moscow and Moscow oblast'; Yaroslavl' and Ivanovo oblasti and Gor'kii city and Gor'kii oblast' in Central Russia; Kazan' and Kuibyshev in the Volga region; Sverdlovsk city and Sverdlovsk oblast', Molotov city and Molotov oblast', and Chelyabinsk city and Chelyabinsk oblast' in the Urals; and Kemerovo oblast' in the Kuznetsk Basin (Kuzbass) in Siberia. In Chapters 4 and 5 I will have occasion to include some additional data series from Leningrad and Bashkiriya (southern Urals) where relevant to the discussion. The documentation I use (which I explain in a moment) allows us to study these regions longitudinally, from the final years of the war until the first years after Stalin died. Although this is a relatively brief period, we are still able to assess changes over time. We also study our

[18] On Rostov-on-Don, see Jeffrey W. Jones, *Everyday Life and the "Reconstruction" of Soviet Russia During and After the Great Patriotic War, 1943–1948* (Bloomington, IN: Slavica, 2008); on Sevastopol', see Karl D. Qualls, *From Ruins to Reconstruction: Urban Identity in Soviet Sevastopol After World War II* (Ithaca, NY: Cornell University Press, 2009); on Kiev, see Martin J. Blackwell, "'Regime City of the First Category': The Experience of the Return of Soviet Power to Kyiv, Ukraine, 1943–1946" (Ph.D. Dissertation, Indiana University, 2005). What each of them shows is that, aside from making good the vast physical destruction of these cities, the regime also had to reconstruct a local political elite, a process that was not without conflicts and contradictions.

regions across two different axes. We are able to compare the experiences of the different regions, one with another; and we are able to compare the situation within a region between its major industrial center (for example, Moscow, Sverdlovsk, or Chelyabinsk) and the small industrial towns in its surrounding oblast'.

The importance of the latter approach will become clear when we look at the regions I have selected and the characteristics of their small towns. Historians of Soviet labor and industry like myself have tended to pay insufficient attention to the particularities of life in the USSR's smaller industrial centers. Yet the country was littered with hundreds of towns and small cities with populations of around 30,000 or 40,000 people, many of them dominated by a single industry or even a single enterprise. Taken together, the populations of these towns could be equal to, or even several times greater than, the large industrial metropolises that dominated each region's economy. This is a point worth reflecting upon, because it reminds us that a very large proportion of Russian workers and their families lived in towns like these, and their experiences were just as typical of working-class life as were those of workers in the major cities. Precise local population figures are difficult to come by for the early postwar years, but estimates by the RSFSR Statistical Administration for 1948–1955 in Table I.1 show the breakdown in some of the industrial regions in this study (for purposes of comparison, the Statistical Administration also included data from the 1939 census).

Thus in the Gor'kii region, nearly as many people lived in the oblast' towns as in Gor'kii itself. An even more radical picture emerges in the Urals. The oblast' urban population was over twice the size of the regional metropolis in Molotov oblast', slightly less than three times the size in Sverdlovsk oblast', and approximately two and one-half times in Chelyabinsk oblast'. Even in the Greater Moscow region, where the population of Moscow dwarfed that of the urban centers in Moscow oblast', the latter nonetheless counted more people than the combined population (that is, metropolis plus its surrounding oblast' towns) of any other hinterland region. Moreover, these ratios remained fairly constant through the entire late Stalin period. In virtually every region in our table the rate of population growth between 1949 and 1953 is more or less identical in both oblast' and metropolis. In social terms, what this means is that as the urban workforce expanded during the process of postwar reconstruction – and much of this expansion was due to centrally decreed forced or semi-enforced labor mobilization – the small industrial towns received the same, and in some cases greater, priority from the central authorities in Moscow.

These data, as revealing as they are, still do not show the full extent of the disparities here, because they do not separately enumerate the

Table I.1 *Population estimates, selected RSFSR industrial regions, 1939–1955 (in thousands)*

	1939	1949	1951	1953	1955
Moscow oblast' towns	2,270.9	2,543.7	2,741.5	2,977.8	3,432.7
Moscow city	4,243.8	3,964.4	4,128.5	4,298.7	4,817.3
Gor'kii oblast' towns	559.0	577.4	632.3	681.7	616.2*
Gor'kii city	644.7	656.2	710.5	764.0	867.7
Kuibyshev oblast' towns	213.7	261.7	304.9	374.1	468.2
Kuibyshev city	398.0	515.0	553.3	602.3	731.0
Sverdlovsk oblast' towns	1,207.1	1,460.3	1,639.1	1,779.0	1,965.6
Sverdlovsk city	425.3	510.3	559.7	614.0	699.1
Molotov oblast' towns	558.5	757.3	867.1	958.3	1,005.6
Molotov city	312.2	355.0	394.9	439.2	528.8
Chelyabinsk oblast' towns	827.0	999.0	1,124.9	1,245.4	1,390.3
Chelyabinsk city	284.2	385.2	428.3	487.0	599.6

Notes: Data for 1939 are from the 1939 census. Data for other years are for the population on January 1 of that year.
*In 1954 the borders of Gor'kii oblast' changed, as the town of Arzamas was removed to become a separate oblast'. The two oblasti were later reamalgamated.
Source: GARF, f. A-374, op. 34, d. 1540, l. 81, 81ob., 82, 83, 83ob., 84.

populations of individual oblast' towns. The Central Statistical Administration (TsSU) did include these, however, in preliminary and probably not very precise population estimates carried out in early 1948. While the data themselves may not be wholly accurate (they understate the populations of the three Urals industrial centers), they at least capture the relative sizes of cities and towns within each oblast'. Table I.2 presents these. We see a fairly common pattern here. Aside from the regional metropolis, there might be one other medium-sized city (Dzerzhinsk in Gor'kii oblast', Nizhnii Tagil in Sverdlovsk oblast', and Magnitogorsk in Chelyabinsk oblast'), together with a large number of much smaller industrial towns with populations of just a few tens of thousands.

What we shall see in this book is that there were significant disparities in living conditions and life chances not just between different industrial regions when compared to one another (to take the extreme case, Moscow versus Molotov), but also between the industrial metropolises as a group and the smaller towns in their geographic peripheries.

What sources have I used? I rely on three main types of documentation. The first are the annual reports of the local offices of the State Sanitary Inspectorate (Gosudarstvennaya sanitarnaya inspektsiya, or GSI). The GSI inspectors were roughly akin to the Medical Officers of Health in

Table I.2 *Populations of regional metropolises and major oblast' towns of Gor'kii region, January 1949, and Molotov, Sverdlovsk, and Chelyabinsk regions, January 1948*

City or town	Population	City or town	Population
Gor'kii region		**Chelyabinsk region**	
Gor'kii city	656,000	Chelyabinsk city	364,953
Dzerzhinsk	139,000	Magnitogorsk	189,154
Balakhna	52,487	Zlatoust	99,412
Vyksa	32,267	Kopeisk	92,830
Kulebaki	31,289	Korkino	62,588
Pavlovo	26,124		
Arzamas	24,850	**Sverdlovsk region**	
Bor	24,514	Sverdlovsk city	444,952
Bogorodsk	19,852	Nizhnii Tagil	177,364
		Kamensk-Ural'skii	81,314
Molotov region		Serov	59,724
Molotov city	326,548	Pervoural'sk	48,829
Chusovoi	99,881	Revda	43,450
Kizel	81,727	Alapaevsk	35,298
Berezniki	53,005	Berezovskii	34,818
Solikamsk	47,781	Krasnoturynsk	34,714
Gubakha	47,132	Irbit	31,014
Lys'va	46,707	Asbest	28,969
Kungur	36,077	Karpinsk	28,249
Krasnokamsk	34,682	Polevskoi	27,033
Polovinka	31,537	Kirovgrad	26,951
		Krasnoural'sk	23,145
		Krasnoufimsk	22,751
		Verkhnyaya Salda	18,426

Sources: Gor'kii city, RGAE, f. 1562, op. 329, d. 4464, l. 19; Gor'kii oblast', GARF, f. A-482, op. 47, d. 7656, l. 75–81 (1948 GSI report from Gor'kii oblast'); Molotov, Chelyabinsk, and Sverdlovsk regions, RGAE, f. 1562, op. 329, d. 3152, l. 47–8, 65–7, 75–6.

Britain. They inspected the state of the publicly owned housing stock (but not private housing or housing owned by industrial enterprises other than dormitories); the condition of sewerage systems, waste removal, and water supply; schools and school hygiene; public catering; private food markets; food processing enterprises; cemeteries; barbers and hairdressers; hotels; and railway stations and river boat depots. Nationally, there was an All-Union GSI which came under the authority of the USSR Ministry of Public Health (Ministerstvo zdravookhraneniya, or Minzdrav), although it has its own separate document repository in the Russian State Archive; there was also a GSI within each Soviet republic.

The local inspectors filed their annual reports to both of these, and it is thanks to this that we have access to them. Most of what we know about the state of urban sanitation comes from this source.[19]

A second source base is the files of the RSFSR Ministry of Health, and to a lesser extent the Ministry of Health of the USSR.[20] These cover a wide variety of different areas, but the ones I have used for this study mainly focus on sanitation, public health, measures for control of epidemics, infant mortality, conditions in hospitals, workplace safety, the nutritional status of the population, and the health of school children and young workers. A related source comprises medical dissertations, articles, and monographs held at the Central Scientific Medical Library in Moscow – a very rich source of information that social historians have not yet adequately utilized.

Our third main source is the USSR Central Statistical Administration, or TsSU, and its RSFSR affiliate, the Statistical Administration (SU) of the RSFSR, from which I have drawn two types of data. The first are demographic data on births, deaths, causes of death, and infant mortality. The second are nutritional data derived from the TsSU's annual household budget surveys, which I discuss in the second part of Chapter 4.

I have said the GSI inspectors were similar to Britain's Medical Officers of Health, but there are some important differences. The detail of the MOH reports and the data that they collected have proven a rich source for historians of British public health and population. The GSI reports cannot pretend to such consistency, richness of detail, frankness of discussion and analysis, or reliability of statistical data. This is certainly understandable given the nature of censorship and political control in the Soviet Union, especially under Stalin, in the light of which the candor of much of what the inspectors wrote is both admirable and striking. Still, the reports vary enormously in quality, a fact that seems to depend very much on the locality within which the inspectors were working and the internal ethos of the local inspectorate.

Who were the state sanitary inspectors? By training they were physicians, but before the war their status, pay, and conditions of work were extremely poor. Medical graduates who opted to become sanitary

[19] From 1951 the detailed local reports became the responsibility of the sanitary-epidemic centers (*sanitarno-epidemicheskie stantsii*, or SES) after the latter were made organizationally independent of the GSI. With few exceptions, the oblast' GSI reports then concern themselves mainly with internal organizational matters.

[20] Many of the files of the USSR Ministry of Health are still secret, especially those covering the years after 1950. The archives of the RSFSR Ministry of Health have for the most part been declassified. I believe that Christopher Burton was the first Western scholar to make extensive use of the RSFSR files, and I am deeply grateful to him for first pointing me in their direction.

inspectors could expect a starting salary of around 60 percent of what they could receive in other branches of medicine. For this money they had to put up with awful housing (usually provided reluctantly, if at all, by the locality in which they were working); a refusal to grant them any means of transport, making it difficult to travel to the factories, markets, or dormitories they had to inspect; and a near-total absence of equipment – not just basic laboratory equipment or instruments, but things as simple as pencils. But the greatest obstacle they faced was the sheer hostility of the institutions over which they were supposed to exercise sanitary oversight. They had almost no enforcement powers and, to make matters worse, they effectively had to perform the tasks that other agencies should have but would not. The inspectors' job was to inspect, to uncover problems, and to recommend solutions. Responsibility for enforcing the USSR's rather weak and haphazard laws on environmental health and safety did not belong to them, but to local soviets and the police. Since both of the latter abdicated any responsibility for this work, the inspectors had to fill the gap. This was eloquently captured by the testimony of the senior sanitary inspector in the city of Sverdlovsk sometime in either late 1940 or early 1941:

> At present the State Sanitary Inspectorate answers for all the filth in the city, for every aspect of life and work in the city. The State Sanitary Inspectorate's staff are run from pillar to post chasing after petty details, inspecting courtyards and flats on orders of the district soviet, dealing with the most diverse range of complaints by workers – complaints which really come under the competence of housing administrations, and so on. Because we have no strict or precise sanitary legislation, local officials take a poor attitude toward specialist sanitary physicians: they don't fulfill our legal demands; orders to close down installations for sanitary violations need the approval of the local authorities, but instead, as with fines, they often rescind them. All this when taken together creates lack of trust in the work of sanitary physicians.[21]

After the war it appears that their status and pay improved, but not necessarily their ability to compel observance of health regulations, something that I shall have cause to note in several places in the book. One problem was their relative youth and inexperience. As in other areas of postwar medicine, the numbers of sanitary physicians grew, and this of necessity could come only from training new doctors. This, however, left them at a tremendous disadvantage when trying to deal with factory managers who were older, more savvy, and very likely to be able to bully them.[22]

[21] GARF, f. A-482, op. 47, d. 157, l. 111–28. The quotation is from l. 114.

[22] GARF, f. 9226, op. 1, d. 897, the third non-numerated page at the beginning of the volume. The file covers the proceedings of the First Plenum of the Sanitary-Epidemiological Council of Molotov Oblast', September 2, 1948. Of the 161 public health professionals at the conference – 90 of whom were either sanitary inspectors or

The picture of the inspectors that emerges from the files is mixed. In most localities the reports convey the impression of knowledgeable, conscientious officials often battling against the odds to do their jobs and to enforce regulations and orders. If nothing else, they were also the eyes and ears of the All-Union and RSFSR Sanitary Inspectorates, which depended on the information provided in the local reports to press Gosplan, the Ministry of Health, or the USSR Council of Ministers to take action on issues they deemed important. Yet their All-Union and republican superiors were not always as impressed with their work as the local inspectors were themselves, and on occasion berated them for buckling under the pressure of local enterprise managers.

As one might expect from such a source base, this book has at least one overriding peculiarity. It is a book about the way that people lived, but there are no people in it. Individuals, their accounts of their daily experiences, or the actions they took in response to them are totally absent. This is in the nature of the documentation. For this reason the book needs to be read alongside other social histories of the late Stalin period, histories in which people and their experiences loom very large indeed.[23]

I also need to say something about the quality of the data available to us, something I shall have cause to comment on further in the context of the specific discussions taken up in each chapter. The difficulties of working with Soviet data are well known. Prior to access to archives, published data were always suspect because of strict censorship over which figures could be put in the public domain and which should remain secret. Almost all the data I use here come from archive sources, and virtually all of these were marked top secret. Most important to keep in mind is that they were prepared and processed so that economic and political officials could use them. To this extent the issue was not always one of overt censorship, but of other, in some cases more difficult, problems that affected their accuracy. As we shall see in Chapters 4 and 5, which deal with questions of mortality, deaths and births were not always accurately registered, and there were discrepancies between the figures recorded by

sanitary physicians employed directly by industrial enterprises – the report gave age and professional experience data for 144 of them. Of these, 42 percent had less than three years' experience.

23 Besides my own *Soviet Workers and Late Stalinism* (Cambridge: Cambridge University Press, 2002), of which this is a companion volume, see the various works by Elena Zubkova listed in the bibliography; V. F. Zima, *Golod v SSSR 1946–1947 godov: proiskhozhdenie i posledstviya* (Moscow: Institut rossiiskoi istorii RAN, 1996); Juliane Fürst, ed., *Late Stalinist Russia: Society Between Reconstruction and Reinvention* (London: Routledge, 2006); Juliane Fürst, "Stalin's Last Generation: Youth, State and Komsomol 1945–1953" (Ph.D. Dissertation, University of London, 2003); Qualls, *From Ruins to Reconstruction*; Jones, *Everyday Life*; and Blackwell, "'Regime City.'"

different data-gathering bodies. As I note in Chapter 5, which deals with infant mortality, there was a significant discrepancy, for example, between the number of births, stillbirths, and neonatal deaths registered by maternity homes and other medical establishments, and by official birth and death registration offices (the medical institutions and personnel tended to capture a larger share of actual events). In fact, secrecy went far beyond what could and could not be published. It plagued all branches of the medical establishment and directly impeded their work, much to the detriment of the health of the country, as practitioners themselves made clear. As one sanitary physician complained in 1946, "We garner more information from the journals of England or the United States than we have concerning Ivanovo oblast'. I cannot even pass [statistical] materials to my own assistant to work up. The only thing I can do is go to the Special Sector and process the figures myself, but in doing this I wind up being no more than a simple technical assistant." The result of such mindless, excessive secrecy was to make it harder to fight against the spread of diseases. Information on the number and identity of tuberculosis sufferers was held only by tuberculosis dispensaries, but the latter did not pass it to the sanitary physicians, the people whose job it was to locate sufferers and stop the disease from spreading. Nor was this just a question of not sharing information between different branches of public medicine. It extended to colleagues working in one and the same building.[24] These were not the only drawbacks of medical data. In parts of this book I attempt to use not official data, but those collected from research studies. These confront us with additional problems, over and above possible self-censorship by researchers worried about what they could and could not report. Their methodologies were often faulty, and even where these were sound they might be hampered by shortages of instruments and proper facilities, making the accuracy of their findings uncertain.

If these were the difficulties facing doctors and researchers, what do they mean for us trying to piece together the historical record using these kinds of data? Does it mean that all data are unreliable and that we cannot learn anything about this aspect of Soviet history? Probably not. On the one hand, it is clear that we cannot treat the information in the GSI reports or the files of the Central Statistical Administration as having the same kind of precision that historians working with similar data in Western countries can assume. On the other hand, we most definitely can try to unravel some of the mysteries the data contain and, more importantly,

[24] Speech by a Prof. Mazel' to the Congress of Oblast' and City Sanitary Physicians, Epidemiologists, and Bacteriologists, held in Gor'kii, October 5–7, 1946. The conference proceedings are in GARF, f. A-482, op. 47, d. 4914, here citing l. 217–19.

attempt to discern general trends and movements. It is therefore on these larger movements, these discernable trends, that I have concentrated here.

It remains now to give a brief summary of each of the book's chapters. Chapter 1 examines the problem of keeping cities and towns clean. As already mentioned, almost no Russian cities had extensive sewerage systems; most oblast' towns had either highly limited ones or none at all. Aside from the degradation this caused to courtyards and streets, it created a massive problem of how to remove human wastes from cities. This had always been a difficult task, but in the wake of the war town authorities suffered shortages of vehicles, petrol, and horses. Towns relied on twice-yearly mass cleanup campaigns to haul away winter and summer accumulations of refuse and excrement, but for most of the year urban residents were living almost permanently surrounded by filth.

Chapter 2 examines the problem of water supply. There are, in fact, two related but distinct threads to the analysis. The first surveys the provision of water supply to urban residents and the difficulties that people had ensuring sufficient access to water that was safe for drinking and other domestic needs. The second investigates the growing problem of river pollution and why government laws and regulations to contain it went largely unenforced.

Chapter 3 concludes the examination of urban sanitation *per se* by looking at the system of public baths and the systems in place for preventing the outbreak and spread of typhus, a potentially deadly disease carried by lice. Few people had indoor showers or baths; they therefore relied on the public baths or workplace showers to maintain personal hygiene. The capacity of these was very low. This, combined with the chronic shortage of soap, severely limited the frequency with which people could bathe. More interesting is the attitude of public health officials to this situation. Their concern was not personal comfort, but public safety. So long as people could bathe often enough to contain the spread of lice, the sanitary physicians were relatively unconcerned. There was a further problem here, however, in that the spread of lice and with them also typhus was directly related to mass population movements. Here the regime's extensive reliance on prison and indentured labor, where tens of thousands of people were carted across the breadth of the USSR every year, created a serious risk to public health. The regime responded with strict control measures, which by and large were successful in preventing or containing mass outbreaks of typhus and other communicable diseases.

Chapter 4 analyzes diet and nutrition during the late Stalin years. It begins with a brief overview of rationing on the home front during the war and makes some preliminary estimates of wartime mortality in home front cities. It then examines the impact of the 1947 famine on hinterland regions, together with the slow, but basically inadequate, improvement in nutrition once the famine had abated. Although the demographic data are not firm enough to be conclusive, when taken together with other reports on the famine, they show that casualties among urban workers and their families were very high. What we also find here is that, in Russian hinterland regions at least, peasant households had better food resources than families of workers and were better able to ameliorate the famine's destructive impact.

Chapter 5 looks at infant mortality, a good indicator of a society's general state of health and well-being. Infant mortality began to decline during the later stages of the war, but surged upwards again during the famine. Although it began to drop from 1948 onwards, we find marked regional differences in the extent of the fall. Essentially, those regions where sanitary reform was slowest were also the ones where the decline in infant mortality was smallest. Equally noticeable was a growing gap between infant mortality in Moscow, the one Soviet city in our study where sanitary reform was fairly advanced, and that in the rest of the country. The chapter also highlights one of the great paradoxes of the late Stalin years. Infant mortality fell, despite the fact that the factors that had allowed West European countries to reduce infant mortality earlier in the nineteenth and twentieth centuries were absent in late Stalinist Russia. Although it is not possible to demonstrate this conclusively, the answer to this conundrum probably lies in better public education concerning personal hygiene and improved medical care (including the use of antibiotics) in the large industrial cities. To this extent the regime relied on public health measures as a substitute for the more expensive and more drawn-out process of modernizing urban infrastructures.

Finally, the Conclusion examines the relationship between the book's findings and the larger political economy of the Stalinist system. If the Stalinist regime systematically failed to develop its urban infrastructure, was this because of malice on the part of the political leadership? Was it because the need to make good the massive damage of the war forced the regime to invest a disproportionate share of national wealth in the restoration and expansion of heavy industry at the expense of individual and collective consumption? Or was it consistent with deeper features specific to the Stalinist system, in particular its tendency toward what I call self-consuming growth, which made any shift of resources away from heavy industry extremely difficult? The answer, I shall argue, lies in the interaction of all of these factors. Stalin's personal distrust of, and indeed contempt for, the ordinary producers of Soviet society meant that in questions over the allocation of resources he naturally gravitated toward solutions that involved the suppression of consumption and the intensification of the exploitation of labor. Nor is there any doubt that the severity of the postwar economic situation would have presented any leadership with difficult choices over resource allocation. Yet all such choices were constrained by the dynamics of the economic and social system that Stalinism had created, which produced a natural tendency toward a hypertrophy of heavy industry and underinvestment in those goods and services that would have improved the welfare of the population. Thus it was that subsequent leaders, with a better grasp of the economic realities than Stalin possessed and a less malevolent, if not less elitist, attitude toward the people over whom they ruled, found it equally difficult to solve these problems.

1 The impossible task: keeping cities clean

Sanitation in European cities in the nineteenth and early twentieth centuries

Soviet cities after the war were filthy places, covered for most of the year in piles of garbage, mounds of human excrement, and torrents of raw sewage flowing through open gutters or simply spilling out onto streets and sidewalks. There was nothing novel about this, nor historically unique. If today those who live in the industrialized world take flush toilets and closed sewerage systems for granted, it is a staggering fact that nearly half the world's population, some 2.6 billion people according to the United Nations, still live without adequate sewerage, and 1.8 million children die every year from diarrhea and other sanitation-related diseases[1] – and this at the end of the first decade of the twenty-first century. It is equally easy to forget that clean water and modern drainage are relatively recent innovations, even in the "West." The great waves of sanitary reform in the cities of Britain, Germany, and France began in the middle of the nineteenth century, but neared completion only during the first decades of the twentieth. Europe's rapid industrialization during the nineteenth century caused an equally rapid surge in urban populations, more specifically, in the urban working class, who crowded into towns and

[1] United Nations Development Programme, *Human Development Report 2006. Beyond Scarcity: Power, Poverty and the Global Water Crisis* (New York: Palgrave Macmillan, 2006), p. v. "Access to water for life is a basic human need and a fundamental human right. Yet in our increasingly prosperous world, more than 1 billion people are denied the right to clean water and 2.6 billion people lack access to adequate sanitation. These headline numbers capture only one dimension of the problem. Every year some 1.8 million children die as a result of diarrhea and other diseases caused by unclean water and poor sanitation. At the start of the 21st century unclean water is the world's second biggest killer of children. Every day millions of women and young girls collect water for their families – a ritual that reinforces gender inequalities in employment and education. Meanwhile, the ill health associated with deficits in water and sanitation undermines productivity and economic growth, reinforcing the deep inequalities that characterize current patterns of globalization and trapping vulnerable households in cycles of poverty."

cities and lived in cramped, ill-lit, poorly ventilated, and inadequately heated homes with few if any sanitary facilities. With the people and the slums came problems of how to collect and remove their waste. It took decades to solve this problem – compounded by the huge amounts of animal dung that also had to be cleared from urban streets – and in the meantime all but the wealthiest urban residents had to put up with truly wretched conditions. Without sewerage the only way to deal with human waste was to deposit it somewhere – a cesspit or a privy midden – and then have it carted away, usually to the outskirts of a town, where it might be treated in some way or allowed to degrade to fertilizer on a sewage farm. Uncollected waste might wash away with the rains, running along open channels to the nearest body of water, often a river from which people took their drinking water. This meant that homes, courtyards, and streets were more or less permanently contaminated with filth, with all the dangers to health this implied.

Anthony Wohl, in his magnificent study of sanitation and disease in Victorian Britain, notes that in Darlington in 1850 one privy might have to serve forty, sixty, or more people, the privies were undrained and sited right up against the houses, and excrement oozed into the walls. Later in the century you could find mining villages with as many as 600 families and no privy at all.[2] In Stockport in 1876, the homes of railway workers were "surrounded with swamps (not merely pools) of sludge, sloops, and other offensive matters, resulting from a want of drainage and privy accommodation," so that "the women and children were obliged to navigate their way on planks, blocks of wood, and old doors."[3] And Wohl continues:

> In Ipswich the MOH literally and metaphorically uncovered immense cesspools in the centre of town which had not been cleared out and were bursting with the accumulated filth of twenty or thirty years' use. Perhaps this state of affairs was not surprising, for although it had a population of 45,000 inhabitants, Ipswich employed only four men to remove all of its cesspool filth. Even when these cesspools were cleaned, only the solid matter was removed, leaving the liquid matter to saturate the sub-soil and seep into the water table. The Ipswich MOH, like so many other MOH, considered that the first priority was to cleanse the cesspools and only then to move on to alternative forms of excrement removal. In his first three years he had improved almost 2500 open middens, roofing them over and making them water-tight. Yet in 1893 the Local Government Board could still complain that the Ipswich authorities were lax in their system of excrement removal and that they cleansed the cesspools only at very irregular intervals and then only "when full."[4]

[2] Wohl, *Endangered Lives*, pp. 87, 93.
[3] *Ibid.*, p. 90, quoting from *Sanitary Record*, January 8, 1876. [4] *Ibid.*, p. 90.

Even in a city the size of Birmingham, the local Medical Officer of Health could give this description of the state of the city's privy middens in the mid-1880s:

> The pit is unnecessarily deep and large, it is open to the rain, it is not watertight, sometimes not drained, or, if drained, the outlet becomes obstructed, a volume of liquid filth, stagnant and horribly offensive from decomposition, accumulates, poisoning the air for a considerable distance, while soakage goes on into the ground, polluting it to an extraordinary degree, and finding its way to the surface wells from which the tenants draw their domestic [water] supply ... The pollution is not, however, limited to air, soil, and water, but owing to the improper situation of the pit, the interior[s] of houses are invaded by the liquid contents.[5]

Still worse was the city of Bradford, where the state of sanitation must have rivalled any in the United Kingdom. A visitor attending the Congress of the Sanitary Institute held in Bradford in 1903 remarked:

> In walking through a few of the many slum districts of Bradford during the week we spent there, I was at first disgusted to observe that children, even of respectable parents, were encouraged to make a convenience of the open street, if not of the kitchen floor. On closer observation of the sanitary accommodation provided, I felt there was much excuse ... I have seen without enthusiasm, both earth closets and middens where pails were used but this was my first acquaintance with the truly primitive arrangement in vogue in Bradford, and the flies that bred in and swarmed about these filthy places also settled thickly about the eyes of the babies in the wretched little houses, whose front doors opened within a few feet of these insanitary conveniences. It was remarked once or twice during the Congress that it is of no use to give people a good house until you have taught them to be clean. May I say that I think it is at least as doubtful whether a people can be civilized while they are housed worse than savages.[6]

It would be possible to give similar descriptions of France or Germany. Remarking on Paris in the last two decades of the nineteenth century, after Baron Georges Haussmann had imposed his grand plan for refashioning the city, including laying an extensive sewer system and decanting the more rowdy and hygienically less desirable sections of the Paris proletariat to the city's outskirts, Ann-Louise Shapiro presents a picture that could equally apply to postwar Kuibyshev or the industrial towns of the Urals:

> Investigators produced accounts of working-class districts on the periphery of the city which were truly horrific. Du Mesnil described the *terrains vagues* on which clusters of housing were erected as veritable sewers. Private roadways without any

[5] *Ibid.*, p. 98.

[6] Cited in Barbara Thompson, "Infant Mortality in Nineteenth-Century Bradford," in Robert Woods and John Woodward, eds., *Urban Disease and Mortality in Nineteenth-Century England* (London: Batsford Academic and Educational, 1984), p. 141.

form of drainage turned streets into foul swamps in which the ruts and potholes were filled with decaying matter. Frequently liquid and solid wastes from clogged cesspits seeped into the first-floor living quarters of adjoining properties, while privies without covers overflowed into courtyards, and open gutters intersected walkways.[7]

In the rest of this chapter we shall see that the Soviet Union differed from the West European experience not so much in the actual state of its cities, but in the time lag with which it eventually implemented comprehensive sanitary reform. The conditions just described in Stockport in 1876, Birmingham in the 1880s, or Bradford in 1903 became the exception by World War I, and insofar as they persisted, applied to specific neighborhoods of certain towns, but no longer to entire cities.[8] By 1913 Germany had extended sewerage to over 90 percent of its urban residents.[9] In the Soviet Union, by contrast, the lack of basic sanitation persisted well into the 1950s, and indeed beyond. Even Moscow, the only industrial center in this study to provide a majority of its population with sewerage, by the late 1940s was in the same position as Paris, a relative latecomer compared to Britain or Germany, had achieved in 1903.[10] Even as late as 1975, only two-thirds of the state-owned urban housing stock in European Russia had water supply and sewerage, and if we take account of private dwellings, which tended to have few amenities beyond electricity, that figure would fall even farther.[11]

[7] Shapiro, *Housing the Poor of Paris*, p. 72. Shapiro is an American scholar. The first floor in US buildings is the ground floor.

[8] Even here we need to be cautious. The evacuation of British slum children during the early days of World War II produced some graphic, and well-publicized, accounts of how some of the children would defecate in the middle of the living or dining rooms of their rural middle-class or upper-class hosts. Only Angus Calder had the perspicacity to note that this had something to do with the fact that there were still parts of Britain – the specific example he cites is from Glasgow, but it could equally have come from East London, Liverpool, or any large British city of the 1930s – where one toilet had to serve several dozen people, and these were in such a disgusting state that parents forbade their children to use them. It was those families who stressed cleanliness who had their children relieve themselves in the corner of a room (where it could be cleaned up) or on a newspaper, which could then be burned in the fire: Angus Calder, *The People's War: Britain 1939–1945* (London: Cape, 1969), p. 43.

[9] Vögele, *Urban Mortality*, p. 157.

[10] David S. Barnes, *The Great Stink of Paris and the Nineteenth-Century Struggle Against Filth and Germs* (Baltimore: Johns Hopkins University Press, 2006), p. 55. It was 1903 before Paris finally had a majority of its houses connected to the sewerage system. As I note below, in 1949 over 57 percent of houses in Moscow still had no sewerage, and 54 percent had no running water. These were older, smaller homes, however, and between them housed only 31 percent of the city's population.

[11] James H. Bater, *The Soviet City: Ideal and Reality* (London: Edward Arnold, 1980), p. 150. Bater noted that, even in the late 1970s, what was preventing major outbreaks of disease in Soviet towns was stringent public health measures, rather than elimination of the threats

Sewerage

The task of keeping cities clean depends on four interrelated elements: water, sewers, waste treatment, and removal of all those wastes that could not go into the sewers. Water was to prove a double-edged sword. Effective sewerage – which means flush toilets emptying into sewer collectors, which then pump the sewage to discharge points along waterways and (ideally) to treatment plants – requires adequate water supply. It was the bane of some early Victorian systems that water shortages and irregular supply meant that toilets could not be flushed, making them little better, or sometimes worse, than privies or cesspits.[12] The main difficulty, however, was usually the reverse: towns laid on water supply long before they installed or expanded their networks of sewers. The volume of waste water with which the sewers had to cope exceeded their capacity, both in terms of length of pipe and the pipe's diameter. Either sewers overflowed, with sewage backing up onto the streets and sidewalks, or the excess went as untreated emergency discharges directly into local waterways. According to Jörg Vögele, in 1849 London's sewers spewed more than 9 million cubic feet of "muck" into the Thames. Since it was the wealthier parts of London (and other major cities) that first had piped water, the upper and middle classes' newfound luxury created enormous sanitary problems for the poor, who still had to take their water directly from the increasingly polluted river.[13] Therefore, a third stage was essential: proper treatment of sewage to render it harmless. Here, too, the growth of water supply created problems, since treatment plants, just like the sewer pipes themselves, were less and less able to deal with the mounting volume of waste water. We need to bear in mind that industrialization created new sources of contamination besides houses. Factories had to dispose of the human wastes of their workers and the toxic byproducts of production. Equally dangerous were wastes from public buildings, such as railway stations, schools, and, most hazardous of all, hospitals. These all had to go somewhere, and if they did not go into the sewers they tended to flow directly into local canals, ponds, and rivers. Larger British cities therefore began to build treatment works in the 1880s, putting the sewage through sedimentation and filter beds.[14] If, as in Hamburg, the volume of

themselves. Considering the huge difficulty in obtaining all but the most basic and highly censored information on health issues during the Brezhnev period, this was a very perceptive observation.

12 Wohl, *Endangered Lives*, pp. 102, 111–12; Thompson, "Infant Mortality," p. 142.

13 Vögele, *Urban Mortality*, p. 177.

14 Wohl, *Endangered Lives*, p. 110. Sedimentation acted to precipitate out solid particles, usually via a chemical reaction, so that they would sink to the bottom of the tank. What did not sink could be skimmed off the surface. The sludge could then be removed and

waste water overwhelmed the capacity of the sedimentation tanks, the authorities tried to compensate by reducing the amount of sedimentation time. In Hamburg they reduced it so much that the drinking water after sedimentation was biologically no different from the water in the contaminated local river, the Elbe. The general point here is that unless sewage could be decontaminated before discharge, and unless water supply systems could treat the water taken from polluted rivers to kill off pathogens, water supply and sewerage became not agents for sanitary improvement, but perfect conduits for spreading diseases such as typhoid and cholera, a fact Hamburg was to discover during the infamous cholera outbreak there in 1892.[15]

What of the wastes that did not go into sewers? These ranged from food and other solid wastes (garbage), excrement from the houses and neighborhoods that still used cesspits and privies, to the animal droppings that were ubiquitous in all towns before motor cars and trucks displaced horse-drawn transport and local health regulations restricted urban residents' rights to keep farm animals inside town limits. These required organized waste removal. Cleaning teams had to sweep up the animal dung, empty the cesspits, and collect the garbage. What could not be flushed away into the sewers had to be carted away to a dump, a treatment plant, or a sewage farm. As we shall see in this chapter, Russian towns' ability or inability to remain tolerable places of habitation and to minimize the risk of epidemics hinged overwhelmingly on the success or failure of these operations.

Most large Russian cities had small sewerage systems in their central districts, some dating back to before the 1917 Revolution, to carry away some of the human waste and rain water, but the rest would have had to be carted away either by the town authorities or by private citizens themselves. The first strains on these systems came from Stalinist industrialization of the 1930s, which saw a massive migration of peasants from the village to the town in search of work. The populations of older cities swelled almost overnight, but there was little investment in housing stock or infrastructure to accommodate them or to cope with the wastes that they generated. New industrial regions sprang up but, again, with no planning of housing and infrastructure to deal with the sudden increase in population. People lived in "temporary" barracks and makeshift dormitories, or crowded into communal flats or basements, and generated a sanitary nightmare. Prior to 1931 the USSR did not even manufacture any

disposed of, either on sewage farms or by incineration. Filtration removed pathogen-bearing particles by running the water over a porous medium, usually sand, and in modern times also over manmade filters.

15 Vögele, *Urban Mortality*, pp. 170–1. For the Hamburg cholera epidemic, see Richard J. Evans's *tour de force* of historical writing, *Death in Hamburg*.

specialized equipment for waste removal or cleaning streets. Everything was done by horse-drawn carts, aided in a few places by the odd piece of imported machinery. By 1939 there were thirteen factories making vehicles and devices for carting away trash, human excrement, and snow, but by 1940 they had produced a grand total of 3,682 pieces of equipment of various sorts for the whole of the USSR – to be shared out among more than 2,500 municipal authorities. The immediate prewar period did, however, bring the first attempts to organize regular, planned cleaning of a small handful of cities, only two of which – Moscow and Leningrad – were in the RSFSR.[16] The large, or soon-to-burgeon, industrial centers of the Russian heartland, including Sverdlovsk, Chelyabinsk, Molotov, and Gor'kii, were left to fend for themselves.

If this was the situation on the eve of war, the war itself turned a sanitary nightmare into a sanitary catastrophe. Worst affected were the large hinterland industrial centers, which saw their populations increase by anywhere from 50 to 100 percent due to the influx of evacuees and new workers mobilized to work in war industries. The limited, and already inadequate, local sewerage and treatment facilities came under enormous pressure. Towns and factories had little choice but to discharge their wastes directly into local water courses, polluting them to the point where the water became unsafe to use even for industrial purposes, much less as drinking water. Since only a small proportion of each local population actually had access to sewerage, most of the waste piled up in cesspits and makeshift middens. Towns, however, now had even fewer resources to cope with the filth. As we shall see, the number of horses for pulling dust carts and cisterns fell to near-zero levels, partly because they were commandeered for the military, partly because there was no fodder to feed them. Wartime mobilization had reduced the amount of available labor power (drivers, cleaners, mechanics), and fuel shortages and lack of spare parts immobilized the few motorized vehicles not yet requisitioned. The result was a crisis that required emergency measures. Since only a small part of the mounting refuse and excrement could be removed to a safe place beyond town boundaries, the local GSI authorized other expedients: burning garbage, burying excrement in domestic courtyards,[17] and flushing what they could into the sewers. None of these

[16] GARF, f. 9226, op. 1, d. 636, l. 52, 53. The USSR listed 2,534 towns with municipal utilities as of December 31, 1940 (Timothy Sosnovy, *The Housing Problem in the Soviet Union* [New York: Research Program on the USSR, 1954], p. 136).

[17] As in much of Europe, most multiple-occupancy residential buildings in Soviet towns and cities were built around a central courtyard. Before indoor plumbing and toilets became the norm, it was in these that outhouses and cesspits were located. Most private dwellings also had land around them, and if the house had an outhouse or pit it would have been in

were satisfactory solutions. Burning created serious pollution. Burial soon ran out of land and risked polluting subsoils and groundwater – an important issue given that people were also using courtyards and any other spare ground to grow food. Decanting waste into sewers increased river pollution and compromised the safety of drinking water. The war also saw another expedient that became a permanent part of postwar urban life: mass mobilizations of local people in spring and fall to collect and dispose of the huge accumulations that built up over the winter and summer months. The fact was, however, that at war's end none of these measures, including the seasonal cleanup campaigns, had managed to keep pace with the accumulation of garbage and excrement. The uncollected residues grew with each passing year and posed a major health threat not just from the waste itself, but also because it proved a fertile breeding ground for flies and rodents.[18]

This, then, was the situation in Russia's cities in May 1945. It is a general picture, but we shall see that, with the exception of Moscow, it is one that fits most large cities and the smaller industrial towns of their surrounding oblasti. Until at least the early 1950s, and in some cases even later, the majority of their populations lived in buildings with no sewerage. Although a number of cities extended the length of their systems, this tended merely to keep pace with rapid population growth, and began to outstrip it only after Stalin died. The other important feature was that few cities treated their sewage before discharging it into open waterways.

Table 1.1 shows the type and extent of sewerage systems in those major industrial metropolises for which we have information; in three cases – Moscow, Kuibyshev, and Molotov – we have data for both the early and late postwar periods, and so can measure the amount of change.

Among hinterland cities, only in Moscow did a majority of the population live in buildings connected to sewers. No other city could claim much more than a third, and in many the number was close to none. Let us be clear what this meant. Ivanovo in 1947 had a population of nearly a quarter of a million people. Prokop'evsk and Kemerovo in the Kuzbass

the surrounding yard. The Russian word *dvor* covers both cases – courtyards and yards – and from this comes the term *nadvornaya ubornaya* (literally, courtyard toilet), or outhouse.

18 GARF, f. 9226, op. 1, d. 636, l. 51–2, 54–6. The mass cleanup campaigns were not an innovation of the war, but dated back to the early years after the revolution. A Soviet poster from 1920, entitled "How to Carry Out the Week-Long Cleanup Campaign," depicts a man with long hair (perceived as a breeding ground for lice) receiving a haircut, while at the same time making his own contribution to the campaign by scrubbing the back of another man having a thorough wash. In front of them is a soldier collecting rubbish. I do not know what happened to the large-scale cleanups during the 1930s, but the documentation cited here implies that the mass mobilizations of wartime were extraordinary, emergency measures.

Table 1.1 *Sewerage systems in selected industrial centers, 1945–1954*

City	% of population with sewerage				Citywide system?	Treatment?
	Early postwar		Late postwar			
	Year	%	Year	%		
Moscow	1946	69	1953	71	Yes	Yes
Central Russia and Volga region						
Yaroslavl'	1948*	26.8			Central districts	No
Ivanovo	1946*	4.2			Partial	No
Gor'kii	1947	29.9			Yes, but incomplete	No
	1948	30.5				
Kazan'	1947	20.0			Central districts	No
Kuibyshev	1947	30.0	1951	30.0	Central districts	No
Urals and Western Siberia (Kemerovo oblast')						
Molotov	1945	15	1951; 1954	15.0; 30.0	Yes	No
Chelyabinsk	n/a		n/a		Local factory systems only	No
Stalinsk	1947	35.0			Local factory systems only	Partial – often out of order
Prokop'evsk	1948	0.0			No	No
Kemerovo	1948	0.0			No	No

Notes: Percentages of the population with sewerage are sometimes given directly in the GSI reports; in other cases I have calculated them by estimating the size of the local population from indirect data, such as disease rates or volumes of refuse. In the latter case, the GSI used a standard formula of how much waste each urban resident generated per year; knowing their estimates of the total annual volume of refuse and waste each city produced, we can make a rough calculation of the population.
(*) Yaroslavl' and Ivanovo data show the percentage of residential buildings with sewerage, not the percentage of the population. The percentage of the population would have been higher, because more modern buildings with sewerage connections had a higher population density.
Sources: Moscow: GARF, f. A-482, op. 47, d. 4941, l. 11, 120 (1946); op. 49, d. 7373, l. 136, 147, 147ob. (1953).
Yaroslavl': GARF, f. A-482, op. 47, d. 7685, l. 105.
Ivanovo: GARF, f. A-482, op. 47, d. 4925, l. 181, 221.
Gor'kii: GARF, f. 9226, op. 1, d. 798, l. 45ob. (1947); d. 895, l. 94–5, and GARF, f. A-374, op. 34, d. 1540, l. 81ob. (1948).
Kazan': GARF, f. A-482, op. 47, d. 6178, l. 7.
Kuibyshev: GARF, f. A-482, op. 52s, d. 224, l. 84 (1947); op. 49, d. 3243, l. 13 (1951).
Molotov: GARF, f. A-482, op. 47, d. 3431, l. 19 (1945); op. 49, d. 3250, l. 21 (1951); op. 49, d. 8862, l. 39. (1954).
Chelyabinsk: GARF, f. A-482, op. 47, d. 4960, l. 39–40, 43–4 (1946); op. 49, d. 3261, l. 15 (1951).
Stalinsk, Prokop'evsk, Kemerovo: GARF, f. 9226, op. 1, d. 932, l. 41–5 (1947); GARF, f. A-482, op. 47, d. 7659, l. 46–9 (1948).

region of Western Siberia had populations of 170,000 and 160,000 respectively.[19]

The limited nature of urban sewerage systems had an impact upon two quite separate problems. The first was the comfort, safety, and public health of the population. Those living in buildings with sewerage, especially if they had indoor flush toilets instead of outhouses, enjoyed a far less unpleasant quality of living than people residing in buildings with outhouses and cesspits. The second was water pollution. The discharge of untreated sewage, both domestic and industrial wastes, into rivers, lakes, and ponds, created massive pollution problems that compromised domestic water supplies and in many cases turned large sections of the country's waterways into biologically dead or dying bodies of water. I address this problem in detail in Chapter 2.

The other feature of sewerage is that it was closely tied to the overall quality of the urban housing stock. In virtually every city, including Moscow, a large share of the housing stock consisted of small, mainly wooden, private dwellings with few or no amenities. In Ivanovo the vast majority of the housing was of this nature, and it further complicated the task of extending that city's very limited sewerage system.[20] What we shall also see, however, is that cities and towns proceeded to erect new housing without sewerage, often over the protests of the public health authorities.

I can illustrate these processes better by examining a few case studies. First, I look at some of the large industrial cities across different regions: Moscow; Yaroslavl' and Gor'kii in Central Russia; and Chelyabinsk in the Urals. Then I contrast their experiences with those of small industrial towns in the surrounding oblasti.

The large cities

Moscow Of the cities in this study Moscow, the capital, was clearly the most privileged. With the possible exception of Leningrad it had the most developed infrastructure prior to June 1941, and received the most attention during reconstruction. In short, its problems were in many ways unique to itself, and not typical of those facing the other industrial centers. For all that, Moscow shows that even in the capital it is not possible to understand the state of urban sanitation without first looking at the structure and condition of the housing stock.

[19] RGAE, f. 1562, op. 329, d. 3152, l. 25, 35. These are crude estimates made by the TsSU in January 1948, based on registrations of children under the age of eighteen and voter registration rolls for adults.

[20] GARF, f. A-482, op. 47, d. 4925, l. 221–3.

Much of Moscow's water supply and sewerage had fallen into disrepair during the war and, despite an apparently concerted effort to restore it, its general condition was so bad that in large parts of the city center this proved impossible. There were around 6,000 buildings in the city center with no sewerage, and official plans projected it would take five years to connect them. In fact, early results were desultory. Of 200 buildings scheduled for connection in 1946, the city completed work on only 14.[21]

Over the longer term, new housing construction barely kept up with the rise in population. If in 1946 Moscow's 3.8 million inhabitants had an average of 4.4 square meters of living space, by 1953, when the population was roughly 4.8 million, average living space was more or less exactly the same.[22] Nor did the contours of the housing stock change very much. In December 1949, the percentage of low-lying wooden buildings without amenities was exactly the same as it had been in December 1946. Between 1946 and 1953 the number of residents without sewerage actually rose, from 1.2 million to 1.5 million, although their percentage of the overall population gradually declined, from roughly 31 percent to around 29 percent. One reason for the stubbornness of this figure, despite new house building and a steady increase in the number of houses connected to the central system, was that, as in other industrial towns, new housing tended to be situated in outer districts, away from the center, where they had not yet laid sewer lines.[23] Another obstacle, at least in the early postwar years, was that many of the buildings designated for connection to the sewerage system had no available space to install toilets. But behind these structural difficulties lay yet a third: housing authorities considered sewerage installation and connection a low priority.[24]

Although less affected than other cities, Moscow had all the ingredients necessary for an outbreak of a major epidemic: a substantial minority of the population without proper sanitation; dilapidated and badly overcrowded housing; a sewerage system in a very poor state of repair; and difficulties treating its wastes. Immediately after the war some of its sewer collectors were in a state of virtual ruin. Others suffered frequent blockages because the systems – both collectors and pumping stations – were

[21] GARF, f. A-482, op. 47, d. 4941, l. 142–6.

[22] GARF, f. A-482, op. 47, d. 4941, l. 142ob. (1946), and op. 49, d. 7373, l. 147 (1953); GARF, f. A-374, op. 34, d. 1540, l. 81. The 1953 SES report claims that average living space had actually declined to 4 meters per person. However, according to the SU RSFSR, Moscow's population stood at 4,762,800 on January 1, 1954; the SES gives a total housing stock of 20,890,600 square meters for the same data, implying average living space of 4.39 meters per resident.

[23] GARF, f. A-482, op. 47, d. 4941, l. 142ob. (1946); op. 49, d. 111, l. 64–65ob. (1949); and d. 7373, l. 136 (1953).

[24] GARF, f. A-482, op. 47, d. 6351, l. 110.

overloaded and working beyond their capacity. The in-house construction organization belonging to the city's Water Supply and Sewerage Department, which was responsible for repairs, was very small and could deal with damages and breakdowns only after long delays. Unlike many of the other cities we shall investigate, Moscow did put almost all of its liquid wastes – over 90 percent – through treatment, but here, too, capacity was too small to deal with the phenomenal volume of sewage (291 million cubic meters per year) these plants had to process. As a result, treatment was partial and inadequate. In 1946 the city suffered a surge in dysentery cases compared to 1945, although the rate per 10,000 population remained half that of 1940.[25] These are crude disease rates, and may be misleading. Because dysentery mainly affected very small children (the infection rate per 10,000 population among toddlers aged one to two years was nine times the citywide average for the population as a whole[26]), this apparent increase may have been due to a simple rise in the size of the infant population, rather than a deterioration in sanitary conditions. There are reasons to doubt this, however. Infant mortality from dysentery, which measures the impact of the disease only among children up to the age of one year, doubled in Moscow from 1945 to 1946, and was to double again during the famine of 1947.[27] What is less open to question is the correlation between dysentery and access to sewerage. The GSI produced an epidemiological "map" for 1946, comparing dysentery rates per 10,000 population in each district in houses with sewerage and in houses without (Table 1.2).

Within one and the same district people living without sewerage were from one and one-half to three times more likely to contract dysentery than people who had access to it. Although the connection between sewerage and the risk of contracting dysentery is unambiguous, this relationship may have been more complex than these data show. Other factors also contributed to the spread of dysentery, most notably poor knowledge of personal hygiene and the large pool of chronic sufferers who could easily pass it to others. Certainly absence of sewerage made maintenance of

25 GARF, f. A-482, op. 47, d. 4941, l. 119ob., 120, 120ob., 123ob.
26 GARF, f. A-482, op. 47, d. 4941, l. 25, 27, 27ob.
27 Moscow's infant mortality rate specifically from dysentery, expressed as deaths of infants up to one year of age per 1,000 live births, was 5.6 in 1945, 11.1 in 1946, and 23.9 in 1947. It is probable, however, that the 1945 figure significantly understates the true incidence of the disease, a fact partially attributable to its frequent misdiagnosis, especially during the very early postwar years when laboratory facilities needed to make a correct diagnosis were badly inadequate. See Chapter 5, pp. 293, 295. These figures are calculated from births data in RGAE, f. 1562, op. 329, d. 1883, l. 6 (1945); d. 2229, l. 7 (1946); d. 2648, l. 210 (1947); and from data on infant deaths in GARF, f. A-374, op. 30, d. 6856, l. 7, 7ob., 8, 8ob.

Table 1.2 *Dysentery cases per 10,000 inhabitants in houses with and without sewerage, major Moscow districts, 1946*

District	With sewerage	Without sewerage	Ratio
Krasnaya Presnya	35	107	3.1
Pervomaiskii	34	98	2.9
Oktyabr'	25	70	2.8
Kiev	39	99	2.5
Sokol'nicheskii	30	70	2.3
Shcherbakov	31	63	2.0
Dzerzhinskii	43	80	1.9
Sverdlov	38	73	1.9
Leningrad	32	59	1.8
Komintern	48	80	1.7

Source: GARF, f. A-482, op. 47, d. 4941, l. 25.

personal cleanliness difficult and left courtyards and streets permanently exposed to uncollected infected excrement. Although the data do not exist to allow us to test this hypothesis, it is very likely that this complex of factors was directly associated with class: the families of workers very probably had the worst knowledge of basic rules of hygiene but also had the worst housing, where the risk of exposure to dysentery was the greatest.

From 1948 the gap between the amount of sewage being generated and the processing capacity of the sewage treatment plants grew at an alarming rate. In 1948 the system was handling around 50 percent more sewage than it could safely cope with. The city dealt with the problem by increasing the volume of emergency discharges of untreated waste, and by curtailing the treatment regime of the remaining wastes. So overwhelmed were the drying beds at the city's main treatment works in Lyublino that the undigested sewage was spilling over into, and thereby recontaminating, the channels carrying away already treated waste, causing significant pollution to the Moscow River.[28] This situation persisted at least up until 1953. Table 1.3 shows the increase in the combined *daily* total of untreated discharges of domestic waste and the untreated wastes released by Moscow's industrial enterprises between 1949 and 1953.

Not a single treatment plant was able to carry out a full cycle of treatment, including sedimentation, filtering, and final treatment with chlorine. In practical terms this meant they were unable to remove from the

[28] GARF, f. A-482, op. 47, d. 7669, l. 184.

Table 1.3 *Discharges of untreated sewage, Moscow, 1949–1953 (cubic meters released per day)*

1949	1951	1952	1953	% increase, 1949–1953
100,000	108,000	120,000	170,000	70

Sources: GARF, f. A-482, op. 49, d. 111, l. 49 (1949); d. 3249, l. 28 (1951); d. 7373, l. 136ob.–137, 140 (1952 and 1953).

sewage all potentially harmful bacteria or all worm eggs before discharging it into the Moscow River or other local bodies of water. At the point where the Moscow River entered the city boundaries it was labeled a "conditionally clean river," that is, the water quality was borderline. Yet once inside the city there was not a single place where it was safe to swim.[29]

Central Russia: Yaroslavl' and Gor'kii Central Russia contained a number of old cities and towns, some dating back to Russia's middle ages, which underwent further accelerated growth during Stalinist industrialization. The problems of urban sanitation reflected the legacies of these two phases of development: a housing stock and housing location patterns that made provision of infrastructure very difficult, and the Stalinist regime's near-total disregard for the welfare of its citizens.

Yaroslavl' was held up as a model of bad city planning. The city, which entered the postwar period with a population of just over 300,000 people, lay at the junction of two rivers, the Volga and the Kotorosl'. The Volga ran through the city from northwest to southeast, dividing it into a small eastern part along the Volga's eastern bank and a larger western part along the Volga's west bank. The Kotorosl' flowed into the Volga from the west, running perpendicular to it, effectively cutting the western part into northern and southern sections. The central districts were located in the wedge formed by the north bank of the Kotorosl' and the western bank of the Volga. The geography is significant insofar as it defined the city's housing patterns.

Overall, the city was poorly provided with amenities. Only a third of all streets and roads were paved, the rest merely cobbled. There were almost no parks or green space, nor was there enough land for the city's cemeteries – a potentially serious health risk. The housing stock in the central district (Kirov district) was reasonably sound, and consisted almost entirely of brick or stone two- or two-and-one-half-story buildings;

[29] GARF, f. A-482, op. 49, d. 7373, l. 139–139ob.

80 percent of residential buildings in the district had sewerage. The area just north of the center housed much of the city's large-scale industry: a tire factory, a motor vehicle plant, a paint and dye factory, a blacking factory, and a factory that made soles for footwear. Housing here had two negative features. First, the quality of the construction was less solid, as wooden and mixed-material homes began to dominate, 55 percent of which were without sewerage. Secondly, residential buildings were interspersed among the factory buildings, creating significant health hazards for the population. Still further to the north and to the west the situation deteriorated even more. The very north was dominated by the Krasnyi Pereval textile factory. It was swampy and a breeding ground for anopheles mosquitoes, which carry malaria. Housing was poor, and much of the district resembled a rural village, with few amenities. Perhaps because of the swampy terrain it was not until 1948 that the district was integrated into the city's sewerage system. The west of the city along the right (southern) bank of the Kotorosl' contained more heavy industry: the Krasnyi Perekop textile plant, a brake factory, a leather factory, the railway station, and, most menacing of all, the city's oil refinery, whose impact on the region's public and environmental health I discuss in Chapter 2, which deals with water supply. Most housing here was made of wood. Finally, furthest west, on the left (northern) bank of the Kotorosl', was again swamp land dominated by individual dwellings "of a rural character," and plagued by mosquitoes. Taking the city as a whole, just under 27 percent of all residential buildings had sewerage. Given that 80 percent of dwellings in the center, and 45 percent in the area just north of the center had sewerage, almost all the housing in the rest of the city would have been without it. Significantly, even when the area around Krasnyi Pereval was hooked into the city system in 1948, the overall percentage of housing with sewerage remained unchanged. The other feature of the sewerage system, besides its limited coverage, was the fact that it collected sewage but did not treat it. Everything went untreated into the Volga and Kotorosl'. For this reason, although this brief account gives some idea of the hardships most residents confronted, the real significance of Yaroslavl' really lies elsewhere, in the immense damage it did to these rivers and to the populations that lived along them, including inside Yaroslavl' itself.[30]

Yaroslavl' was representative of older industrial centers with historic roots in light industry (mainly textiles), although – like nearby Ivanovo, the country's most important textile center – it had seen considerable

[30] GARF, f. 9226, op. 1, d. 745, l. 50–2, 91; GARF, f. A-482, op. 47, d. 7685, l. 93, 105. For the effect on rivers and water supply, see pp. 83–5.

expansion and some diversification during industrialization. Gor'kii, in contrast, was a center of heavy industry. It was home to a number of large engineering factories (Krasnoe Sormovo, an old enterprise dating back over 100 years; a machine tool factory; a diesel engine factory), several iron and steel works, the giant Molotov motor vehicle works (constructed during the 1930s), and a number of large defense plants erected during the war. Lying at the junction of two major rivers, the Oka and the Volga, it also had a shipyard and was a major river port. Its housing stock reflected these different phases of development. In the early postwar years some two-thirds of the housing stock was privately owned. Over 80 percent of dwellings were made of wood, almost none of which had running water or sewerage. The new factories from the 1930s and 1940s had put up a number of more modern, high-density buildings, so that the overall provision of amenities was slightly better than this portrait might suggest. Probably only around 10 percent of all dwellings had sewerage, but by 1948 they accounted for over a third of all living space and housed around 30 percent of the city's population.[31]

This still left 70 percent of people living in extremely primitive conditions. Fewer than half the city's courtyards had outhouses, and only one in eight had a cesspit. Only a quarter had garbage receptacles. Everywhere else rubbish and excrement went into "primitive pits" which did not meet even the most basic sanitary requirements. Making matters worse was the fact that 90 percent of outhouses were made of wood, and nearly half of these were in an advanced state of disrepair. As in most Russian cities, there were few public toilets which people could use as an alternative, and two of Gor'kii's largest working-class districts had no public toilets at all.[32]

31 The housing data are from GARF, f. A-482, op. 47, d. 4923, l. 60 (1946); op. 49, d. 8857, l. 9 (1954). The general portrait of the city's industrial mix is from GARF, f. 9226, op. 1, d. 798, l. 1–17. The percentage of the population with access to sewerage is calculated from different sources. The 1947 GSI report gives a figure of 29.7 percent living in buildings with sewerage – 192,421 of a population of 648,000; the 1948 report lists around 200,000 people with sewerage, but with a population of around 754,000 (estimated from a formula used to calculate the amount of garbage and waste the city generated in that year), or 26.5 percent with sewerage: GARF, f. 9226, op. 1, d. 798, l. 34 (1947); d. 895, l. 94–5 (1948). Both these population estimates are considerably larger than the figures listed in the files of the RSFSR Statistical Administration prepared in the mid-1950s, which are probably the most accurate. These give the city's population at 642,700 on January 1, 1948 (that is, at the end of 1947), and 656,200 on January 1, 1949 (that is, at the end of 1948): GARF, f. A-374, op. 34, d. 1540, l. 81ob. If we use these figures we arrive at 29.9 percent of the population with sewerage at the end of 1947, and 30.5 percent with sewerage at the end of 1948.

32 GARF, f. 9226, op. 1, d. 798, l. 35ob., 38ob.

The city's sewerage system was inadequate on every count. Although it covered a much larger percentage of the population than nearby Yaroslavl' or Ivanovo, the system was incomplete: it had collectors and pumping stations to take the sewage to various discharge points, but as late as 1954 it still had no treatment facilities, and had not even begun to commission any designs for their construction. In the early postwar years these problems were exacerbated by the poor physical condition of the system, which was in urgent need of repair. The city was trapped in a vicious circle. The limited scope of the system meant that the city's factories continued to pour huge quantities of untreated industrial and fecal wastes into the Oka and Volga Rivers. The Krasnoe Sormovo factory alone discharged more waste per day than the larger of the city's two sewerage networks could accommodate. The health authorities considered it a matter of urgency to connect industrial enterprises to the city system, but this required the construction of waste treatment plants. Gor'kii, like almost every other city and oblast' in this period, had fallen victim to central budgetary priorities, and could not obtain funding even for the design work, much less for the task of building the facilities.[33]

Gor'kii displayed one other trait common to this period. Perhaps because of the slow progress expanding and improving the sewerage network, perhaps because of negligence on the part of enterprises and construction organizations, or perhaps a combination of both, roughly half of all *new* housing built after the war had no sewerage. Between 1946 and 1954 there was a net increase to the housing stock of 6,322 residential buildings; the net increase in dwellings with sewerage was only 2,742, or 43.4 percent. If we consider that during this eight-year period some of the very oldest and most decrepit housing stock without running water or sewerage would have been demolished, this suggests that the amount of new housing built without sanitation probably exceeded 60 percent.[34]

The Urals: Molotov and Chelyabinsk Of the three Urals industrial centers in this comparative study, Chelyabinsk stands somewhere in the middle between Sverdlovsk, an old, well-established hub of heavy industry with an above-average level of infrastructure, and Molotov, which underwent extremely rapid growth in the 1930s and again during the war, and whose infrastructure was, as we shall have cause to note throughout this book, totally inadequate. Because of its importance Sverdlovsk would have been a better choice to illustrate the arguments in this section,

[33] GARF, f. 9226, op. 1, d. 798, l. 34–34ob.; d. 895, l. 94; GARF, f. A-482, op. 49, d. 8857, l. 7.
[34] GARF, f. A-482, op. 49, d. 8857, l. 9.

but the GSI reports contain surprisingly little information about the city's sewerage system.

Let us deal first with Molotov. Perm' (the city's original name to which it would return under Khrushchev) and a number of disparate, far-flung districts to its west had originally been part of Sverdlovsk oblast'. In 1938 these were hived off to create a new oblast', with Perm' as its principal center. In March 1940, Perm' and Perm' oblast' were renamed after Stalin's henchman, Vyacheslav Molotov. According to Oleg Leibovich, author of a recent political and social history of the city during late Stalinism, the motivating factor for creating the new oblast' was very probably the desire on the part of the Sverdlovsk oblast' Party leadership to rid themselves of responsibility for the poorly performing Kizel coal fields, which together with the towns of Lys'va, Berezniki, Kizel, and Chusovoi, formed the industrial heart of the new region. In the mid-1930s the political authorities in Sverdlovsk had considered Perm' to be such a backwater that they found it almost impossible to find a reasonably honest, capable, and non-alcoholic Party worker to go there to take over the Perm' city Party Committee (according to Leibovich, they had to bribe the man they wanted with the offer of a new Buick).

While part of Sverdlovsk oblast' Perm' had been badly neglected, and was devoid of virtually all amenities. Conditions there were recognized as being sufficiently unpleasant for the MVD to consider it (as well as its oblast' towns) a prime site to receive various waves of prisoners, exiles, and special settlers. Most streets and roads were unpaved and without sidewalks. As the city industrialized during the 1930s and even more rapidly during the war, little was done to improve its infrastructure. By war's end Molotov had indeed become a major industrial center, home to forty large-scale enterprises, many of which were of primary importance to the defense industry. Yet provision of housing and infrastructure never kept pace with the growth of its industry. The city grew up as a "massive agglomeration of workers' settlements" clustered around its major industrial enterprises, with only a weak network of roads and public transport linking them together. Plans to turn these workers' settlements into model "socialist cities" never materialized. Most people lived either in their own primitive wooden homes, where they at least had a private plot on which to grow their own food, or in barracks devoid of almost all services, and with little else to do other than drink. As we saw in Table 1.1, only a small percentage of the population had access to sewerage. The sewerage system dated from World War I, and by 1946 – just thirty years after its construction – was deemed to be totally dilapidated, with the volume of sewage going into it being some 2.5 times its capacity. Breakdowns were frequent and it was not uncommon for the city's central thoroughfares to be flooded with human excrement. The horror of this situation must have been made far worse by the poor state of Molotov's transport system, which was so inadequate that many of those waiting for a tram would simply give up and walk, the condition of the streets notwithstanding.[35]

Chelyabinsk, like Molotov, was a child of Stalinist industrialization, but in terms of its history and development probably had more in common with Sverdlovsk. Its most famous factory, the Chelyabinsk Tractor Factory (renamed the Kirov Tractor Factory during the war), dated from that time, as did a number of large-scale industrial enterprises, most notably a zinc factory, a ferroalloy works, and an electric power station. As a result of its rapid growth it was removed from what had been known as Urals oblast' and made the seat of a new oblast' bearing its name. Chelyabinsk oblast', which we shall have cause to discuss in different contexts throughout this book, was home to some of the USSR's most important metallurgical towns, most notably Magnitogorsk and Zlatoust. The oblast' was also a coal mining region, and its most important mining town, Kopeisk, was just 14 kilometers from Chelyabinsk itself.

From its very beginnings the city suffered from an almost total lack of planning. As almost everywhere else in the 1930s, the stress was on putting up factories and staffing them with workers; minimal attention was paid to housing, and almost none to infrastructure or intangibles such as parks, squares, and landscaping. On the eve of the war the city was already badly overcrowded and suffered from serious air pollution. With World War II, the city underwent an even more radical wave of expansion. In addition to the "several tens" of factories evacuated there from the western USSR, the city also saw the construction of new engineering, metallurgical, and pipe rolling works, and a second electric power station. These enterprises needed workers, of course, and the city's population grew by several hundred thousand – all of whom had to be accommodated within the existing, already overcrowded housing stock and serviced by the old, equally inadequate transport system and sanitary infrastructure. Factories quickly threw up new residential buildings, some of which were solid and reasonably well fitted out, but most consisting of poor-quality, supposedly temporary barracks (which in most cases became permanent), interspersed with small private homes highly variable in quality. Planning was also poor. Many buildings were built without any thought to

[35] Oleg Leibovich, *V gorode M: ocherki sotsial'noi posvednevnosti sovetskoi provintsii* (Moscow: Rosspen, 2008), pp. 14–25, 30–4. In 1946 the city had no trolleybuses and only forty-two buses. It had a tram system, but even in 1953 this had only eighty cars to service the entire population. In that year forty-two people suffered injuries (ten of whom died) from riding on (and falling off) the footboards because they could not squeeze into the cars: *ibid.*, pp. 32–3.

positioning. Some received no natural light and were exposed to arctic winds. Others were built cheek by jowl with factories, and in one district the air pollution was said to be so bad that it blocked out all sunlight.[36]

After the war the housing situation remained critical: new workers kept pouring in but little new housing had been added to accommodate them. In one case, at the end of 1946, 3,000 workers and their families arrived to work at the Kirov Tractor Factory, even though the factory had nowhere for them to live. It crammed them into dormitories for single workers, with four to six *families* occupying a single room. The exact same scenario occurred again at the end of 1947, only this time some had to be "housed" in the factory's bathhouse without either beds or bedding.[37] From the point of view of the present discussion, the most important thing to note is that in virtually every district of Chelyabinsk housing had little or no sanitation. The city had had plans to build two separate sewerage systems, one for domestic wastes and one for factories, but little work was done on them during the whole of the late 1940s. The domestic system had rudimentary elements in place, but it served few buildings and the small amounts of sewage it handled it discharged into the local river, the Miass, without any treatment. More to the point, almost no work was done to extend the system during the great population influxes of 1946 and 1947. In 1947 the city added a mere twenty-seven buildings to it. Not a single enterprise had sewerage, either for factory buildings or for workers' settlements, whose residents continued to depend on the limited city system. Moreover, what coverage there was was very uneven: the bulk of those in workers' settlements who lived in buildings with sewerage worked at the tractor factory, whose housing stock was otherwise in very poor condition. With no industrial sewerage systems, all factory effluents went straight into the Miass, which even in 1946 was so polluted that people living along its banks could not even bathe in it, much less draw drinking water. In every district factories carried on putting up new housing units without sewerage.[38] Thus, although we do not know the precise percentage of Chelyabinsk's population with sewerage, it is certain to have been small and was probably declining.

Over the next few years the city did expand its sewerage system, but its extension did not keep pace with increases in new housing. Thus more units were built without sewerage. By then the system had run into other difficulties. The original pipework was now very old, was too narrow in diameter, and could not handle even the limited volume of sewage going

36 GARF, f. A-482, op. 47, d. 4960, l. 8–11, 17–28.
37 GARF, f. A-482, op. 47, d. 4960, l. 24–5; d. 6363, l. 14.
38 GARF, f. A-482, op. 47, d. 4960, l. 39–41, 43–4; d. 6363, l. 23–5.

into it. Breakdowns, therefore, were becoming frequent. The city system continued to spew untreated sewage into the Miass. This posed special problems for the iron and steel works, which lay downstream from the discharge point. By 1951 some factories had begun to construct their own sewage systems, but only one – at the iron and steel works – was close to completion as of January 1952.[39]

The oblast' towns

However difficult housing and urban sanitation may have been in the major cities, in the smaller industrial towns it was far, far worse. Only by examining conditions there can we appreciate just how badly large sections of the Russian working class lived after the war.

Not surprisingly, probably the best infrastructure was in Moscow oblast'. Yet even here we see a yawning disparity between infrastructure there and in Moscow city. Moscow oblast' is also instructive, because it illustrates many of the basic structural problems that hindered the development of sewerage and other sanitary infrastructure in the country as a whole. The oblast' was heavily industrial, with major engineering factories in Kolomna, Mytishchi, and Podol'sk, just outside Moscow; the Elektrostal' iron and steel works in the town of the same name; large chemical plants in Stalinogorsk, Voskresensk, Shchelkovo, and Klin; a long-established textile industry in Orekhovo-Zuevo, Serpukhov, Egor'evsk, Noginsk, and Ramenskoe; and part of one of the country's major coal fields.

The early postwar years saw feverish growth of the urban population, both in towns and in the workers' settlements attached to factories located outside town boundaries. This greatly exacerbated an already critical housing shortage, since the housing stock had badly deteriorated during the war. In 1947, roughly half of all urban residents lived in private dwellings, none of which had running water and thus also no sewerage.[40] Those living in factory-owned premises fared little better. Textile plants were housing people in production shops, store rooms, cellars, and kitchens. Others they placed in hastily knocked up "pygmy" dormitories with few or no sanitary facilities. Worst off, however, were the workers farmed out to "dormitories" set up in private flats. Even in 1949 there were factory-owned dorms where up to 120 people, including those with families, might be living in just one large room. So serious had the situation become that in 1949 the GSI tried (unsuccessfully) to stop the influx of

39 GARF, f. A-482, op. 49, d. 3261, l. 15–18.
40 RGAE, f. 1562, op. 329, d. 4591, l. 32.

new workers into Orekhovo-Zuevo. Similar conditions obtained in chemical and iron and steel towns.[41] As bad as conditions were in factory-based industries, most deprived of all were coal miners. In 1947, miners with families had 3.7 square meters of living space per person, single miners just 2.7 square meters. Many lived in rickety, poorly heated barracks, most of which had no kitchens, storage rooms for personal belongings, laundries, or isolation rooms for those who came down with contagious diseases.[42]

In terms of sewerage, 80 percent of towns had limited systems, but nearly two-thirds (73 out of 117) of workers' settlements attached to factories did not. In all, around 40 percent of housing units had sewerage. These figures remained virtually unchanged between 1945 and 1949, the last year for which we have information.[43] Prior to the war Moscow oblast' had embarked on a large-scale project to install systems where none existed, and to join up and centralize the myriad small-scale and piecemeal local systems. The war, of course, stopped all this work dead in its tracks. Some systems remained only half-built; others never progressed past the design stage. Once the war was over the oblast' could not simply go back and pick up where it had left off. The half-finished construction would have deteriorated. More to the point, as with the rest of the country, working systems had been neglected. Buildings that had had sewerage before the war now effectively did not, because the systems had fallen into disrepair, in many cases to such an extent that they could not be restored; in some instances it was not even possible to install outhouses in the courtyards. Some towns had fewer than half their prewar number of toilets, or even cesspits. There was also the massive task of cleaning up water courses of all the wastes that had been dumped into them during this period.[44]

[41] GARF, f. A-482, op. 47, d. 6347, l. 106, 115–16; op. 49, d. 103, l. 68–9, 70–4.

[42] GARF, f. A-482, op. 47, d. 6347, l. 113–15. Only in 1949 did average living space begin to approach the sanitary minimum of 4.5 square meters for dormitory residents. Those with the most cramped conditions were in fact construction workers attached to mining organizations; miners themselves lived slightly better, but only just: GARF, f. A-482, op. 49, d. 103, l. 75. Most pathetic of all were the indentured laborers forcibly dispatched to work in the mines right after the war. These were mainly Soviet citizens repatriated from the Third Reich, where they had been used as slave laborers. The Stalinist regime sent them to the mines without taking any account whatsoever of whether or not the mining trusts had anywhere to house them. In reality, they did not. Some indentured workers had as little as 0.85 square meters; none had more than 2.5 square meters, with almost no sanitary facilities at all: virtually no baths, showers, laundries, or even adequate supplies of drinking water (GARF, f. 9226, op. 1, d. 691, l. 73–4).

[43] GARF, f. 9226, op. 1, d. 691, l. 123–4 (1945); GARF, f. A-482, op. 49, d. 103, l. 19–20 (1949).

[44] GARF, f. 9226, op. 1, d. 691, l. 124–6, 155.

In the postwar years sewerage systems in Moscow oblast' showed three dominant characteristics. First (and this was a problem inherited from the prewar period), installation of sewerage lines significantly outstripped the construction of treatment facilities. In 1947, the GSI estimated that only 10 percent of domestic and industrial wastes went through any kind of treatment, and most of this was inadequate – only a handful of oblast' towns were able to put their wastes through a full treatment cycle, and in 1949 the majority of towns still had no treatment works whatsoever. This meant that most wastes went untreated directly into rivers, many of which became unfit for either domestic or industrial use.[45]

The second feature, which helps explain the total lack of progress, was that even where enterprises drew up plans to invest in new sewerage systems and/or treatment plants the central authorities refused to fund them. Thirdly, by the end of the 1940s it was proving impossible to obtain any cooperation and coordination between the different industrial ministries and the local soviets of the towns in which their factories were located. This was an especially Soviet problem which affected the entire country right up until the USSR's collapse. As already noted, many factories were not hooked directly into municipal sewerage systems, but had their own local networks for their sole use and perhaps also their associated workers' settlements. To provide a centralized, town- or city-wide system required collaboration between all the separate ministries with factories in that given town, and between each of these and the town authorities, not least over the issue of who was going to stump up the investment and carry out the work. It was a problem that the GSI, which had overall responsibility for achieving this coordination, found beyond its power and ability to solve.[46]

Despite the huge contrast with neighboring Moscow, Moscow oblast' was probably not typical of other hinterland regions. To appreciate this we need to look at two different types of region, Gor'kii oblast' and the Urals. Gor'kii oblast' was largely agricultural, but as we have seen contained one city, Dzerzhinsk, which was a major industrial center, plus a number of small industrial towns, most notably Balakhna, the home of a large paper mill whose contribution to the pollution of the Volga I discuss in Chapter 2. Both housing stock and infrastructure in the oblast' had suffered badly during the war. The one partial exception was Dzerzhinsk, which had a new "socialist city" with brick, multistory housing blocks alongside its older districts. Everywhere else the housing stock was primarily wooden or of "mixed materials," and over 90 percent of

[45] GARF, f. A-482, op. 47, d. 6347, l. 69–70 (1947); op. 49, d. 103, l. 20, 27 (1949).
[46] GARF, f. A-482, op. 47, d. 4937, l. 36–7; op. 49, d. 103, l. 28–30.

dwellings were just one or two stories. Even factory-owned housing fit this pattern. The combination of age and wartime neglect meant that much of the housing needed major repair. Yet the pace of building work in 1947 was so slow that it would take at least six or seven years simply to bring the housing stock back to its prewar position; new construction was barely measurable. The same was true of sanitary infrastructure. Not a single city or town, including Dzerzhinsk, had a proper sewerage system. There were "elements" of systems in Dzerzhinsk, Pavlovo, Bogorodsk, Vyksa, and Kulebaki, but nothing anywhere else.[47] Kulebaki was probably typical in that before the war it had channeled its wastes through enclosed gutters to their final discharge points, but by war's end these had decayed to the point where they were now open gullies and the waste – including the untreated wastes from the local hospital and polyclinic – leaked out onto the ground, turning it into a polluted swamp. The GSI meant this literally: much of the town had been built on swampland, and the seepage from its gutters, plus the wastes spewed out by its main factory, further degraded the land and the landscape. To make life even more miserable for the town's residents, the town had no paved sidewalks. To go anywhere people had to trudge through the muck. Significantly, this situation changed little between 1944 and the end of 1948; wastes still traveled along open gutters, although in 1948 the local authorities did begin a land reclamation scheme to try to dry out the swampland.[48]

This gives us some idea of what the lack of sewerage meant for the people who lived in these towns. The other problem, of course, was that nowhere, not even Dzerzhinsk, had any treatment plants. Given that the major industry in Dzerzhinsk was chemicals, this was to cause serious ecological problems. All wastes went untreated into local bodies of water. Dzerzhinsk had a small and ineffective chlorination unit, but it did little to reduce the level of bacterial contamination flowing into the Oka. Attempts to improve the situation in one district or factory settlement came at the expense of worsening sanitary conditions in the area as a whole. The Sverdlov factory began work in 1947 to join up the small local sewerage system of its residential settlement to the citywide system; this would indeed have made life better for the people living around the factory but, because Dzerzhinsk had no treatment facility and no plans to build one, the extra sewage merely increased the amount of pollution going into the Oka – and from there downstream to Gor'kii city. Other factories in Dzerzhinsk did, in fact, start work on a waste treatment plant, but

47 GARF, f. A-482, op. 47, d. 6335, l. 102–4.

48 GARF, f. A-482, op. 47, d. 2338, l. 132–132ob., 133, 135–135ob. (1944); d. 7656, l. 61 (1948).

construction was halted in 1947 and then mothballed.[49] The following year, 1948, saw oblast' towns, including Dzerzhinsk, come up against a familiar obstacle. Promises made in 1947 to allocate funds to a number of large polluters (the paper combine in Balakhna, the iron and steel works in Vyksa) came to nothing when parent ministries refused to release the funds.[50] Only limited progress was made between then and 1954. By then several large factories had at least entered the design stage of building treatment plants but, significantly, not a single one had actually begun construction. Perhaps more telling was the state of the oblast' hospitals. Of its sixty-seven urban hospitals, only sixteen had sewerage, and not a single hospital or medical institution anywhere in the oblast' – including those treating tuberculosis patients – treated or chlorinated its wastes before discharging them.[51]

An even starker situation existed in the Urals. Even in the larger cities provision was very poor. Nizhnii Tagil, the largest town in Sverdlovsk oblast', had begun to build a citywide sewerage system in 1937, but construction stalled during the war. At war's end the city had a number of small and inadequate local systems that served only a very small proportion of the population. It was only in 1953 that the city acquired a comprehensive citywide sewerage system but, because it had taken so long to build, by the time it opened it was already outmoded and under capacity and could not handle the full volume of wastes the town's population was generating. Perhaps more important is that during the entire intervening period its population had almost no access to sanitation, while the sewage system itself became a major source of pollution of the Tagil River.[52] Magnitogorsk, the largest city in Chelyabinsk oblast', presented an even grimmer picture. The city's sewerage system belonged to the iron and steel combine. Its construction during the 1930s had been a tortuous process, but by the outbreak of World War II coverage extended to around 25 percent of the population. Between 1942 and the beginning of 1951 (the last year for which I have information) virtually nothing changed. Most of the city remained without sanitation – not even designs of a citywide system had been approved. Some districts had local systems, but these did little more than divert the sewage into open gullies which carried it untreated down into the local river, the Ural.[53]

[49] GARF, f. A-482, op. 47, d. 6335, l. 62–3; d. 7656, l. 60.
[50] GARF, f. A-482, op. 47, d. 7656, l. 64–5.
[51] GARF, f. A-482, op. 49, d. 8835, l. 6–8, 20–1.
[52] GARF, f. 9226, op. 1, d. 693, l. 60–1; d. 763, l. 68–70; d. 1429, l. 46.
[53] Steven Kotkin, *Magnetic Mountain: Stalinism as a Civilization* (Berkeley: University of California Press, 1995), pp. 136–9; GARF, f. A-482, op. 49, d. 1628, l. 67–8.

The real horror, however, was in the small towns, most of which had no provision whatsoever. In Sverdlovsk oblast', only six towns besides Nizhnii Tagil had any kind of sewerage system, and of these only Kamensk-Ural'skii could claim to cover a reasonable proportion – around 50 percent – of its population. Even where systems existed they carried out little if any treatment, and to this extent the sewerage systems, such as they were, became major contributors to pollution of the Urals' rivers. A few towns, such as Revda, managed eventually to install systems by 1953, but in most cases plans for sewerage construction did not make it to the construction stage.[54] Molotov oblast' presented a similar picture. The only town with a proper sewerage system was Berezniki. A few other towns (notably, Krasnokamsk, Lys'va, and Chusovoi) had limited, enterprise-run systems, but almost everywhere else had nothing. Such limited systems could cause the local population more misery than they prevented. In places such as Revda or the mining towns of Molotov oblast', the systems had been constructed in such an unplanned and helter-skelter way that more often than not the pipes clogged up and raw, feces-laden sewage poured out into the streets. Bear in mind that these mining towns, even one the size of Kizel, with over 80,000 inhabitants, had no paved streets and no sidewalks. People had to wend their way through dirt and mud, which much of the time was also mixed with human excrement.[55]

Waste removal

With such a small proportion of urban residents having access to sewerage, towns had to dispose of rubbish and excrement as best they could. In normal times this meant collecting it from courtyard rubbish containers or open pits or emptying cesspits, and then carting it to dumps and/or sewage farms. This was by no means a straightforward task. Many buildings did not even have outhouses or cesspits; people simply tossed their wastes on the ground near their homes or carried them to a nearby – and often illegal – dumping area. The main problem, however, was simply lack of resources. Municipal authorities and industrial enterprises did not have enough vehicles, enough horses, or adequate supplies of gasoline to keep their towns or workers' settlements clean. Nowhere carried out regular refuse and waste removal until the early 1950s, and even then it proved a

[54] GARF, f. 9226, op. 1, d. 693, l. 59–63; d. 763, l. 64–72; d. 1429, l. 45–53.

[55] GARF, f. A-482, op. 47, d. 6345, l. 310–12; GARF, f. 9226, op. 1, d. 899, l. 153, 284–5. For Revda, see GARF, f. 9226, op. 1, d. 693, l. 61–2. See also Leibovich, *V gorode M*, p. 25.

rarity. Instead, towns and cities relied on twice-yearly mass cleanup campaigns in the spring and fall. Even where such campaigns were successful and managed to clear out the huge backlogs of accumulated muck, the achievements were short-lived. Within a few months the cities looked and smelled pretty much as they had done before. They were filthy and breeding grounds for disease.

The legacy of the war

It is no understatement to note that the war created a major crisis in waste removal from which it took years to recover. I have already stressed the reasons why, at least in the hinterland regions. Urban populations swelled and vastly increased the amount of waste that had to be removed, while towns had infinitely fewer resources to do the job.

The city of Kazan', on the Volga, provides a particularly well-documented example. Historically the city had always had poor sanitation: doctors in the late nineteenth century described mounds of waste piled 1.5 meters high, and in 1889 and 1890 the rate of deaths per 1,000 inhabitants actually exceeded the rate of births. Whatever progress may have been made in the period after the 1917 Revolution was quickly undone by the war. In 1943 and 1944 the city proved able to remove no more than 10 percent of its accumulated rubbish and human excrement. Its small number of waste removal trucks had no fuel; its horses had no fodder; there were no skilled workers to maintain the fleets of vehicles. The only alternative was to bury it, although the GSI tried, largely unsuccessfully, to promote other methods, such as burning rubbish and slurrying the excrement. After three years there was simply no more land available for burying. Rubbish piled up in building courtyards, and excrement ran out onto the streets. The city organized mass cleanup campaigns, but these barely made a dent in the problem. By 1944 the city had around 1,000,000 cubic meters of uncollected wastes, 70 percent of it excrement. The city removed around 100,000 cubic meters, and a spring mobilization of citizens another 100,000 cubic meters – all told barely 20 percent of the total. This still left a staggering 800,000 cubic meters (roughly 800,000 tons) contaminating every part of the city. The risks to public health this posed were obvious. Of particular concern were the city's food markets. With no sewage removal vehicles available, it was impossible to keep the toilets at the markets – and thus also the hands of the stallholders – clean. This was a disaster just waiting to happen.[56]

[56] GARF, f. A-482, op. 47, d. 1418, l. 8ob., 9, 19ob.; d. 2328, l. 108–9, 111–13.

This story was repeated in almost every city and town. In Kuibyshev, they also ran out of land for burying waste; and, while the city was reasonably successful in carting away its garbage, it managed to remove barely 11 percent of its sewage, not least because the horses and vehicles intended for waste removal were commandeered for even more urgent tasks, such as carting fuel to hospitals, schools, and bathhouses.[57] In Chelyabinsk, the Kirov Tractor Factory alone generated 100 tons of waste a day, of which it could remove only half. According to the GSI, "With each passing month the accumulation of filth builds up in the settlement, the soil of the Kirov factory settlement is saturated with excrement, and at the end of the year, in winter time, in the settlement ice mounds form out of slops and feces."[58] Even in Sverdlovsk and Moscow, both of which coped much better than the other cities mentioned here, it was still a case of the dog chasing its tail. In Sverdlovsk all efforts up until 1944 went to containing the amount of waste around public buildings, and even this relied on the springtime mass mobilizations. Once these were finished, the waste built up all over again. Moreover, lack of resources meant that prior to 1944 there had been no collections at all from private dwellings, whose rubbish and muck had simply been allowed to grow.[59] Nor was Moscow spared the effects of gasoline shortages and the shortage of vehicles and horses, although by comparison with everywhere else it was a relatively "clean" city. In the summer of 1943, following an only partially successful spring cleanup, a "mere" 25 percent of its courtyards were fouled with excrement; and, although a further campaign in October removed most of this, the situation worsened again in the winter of 1943–1944.[60]

The difficulties caused by the war were not solely due to the lack of transport. The toilets and cesspits in the outhouses that most people had to use also fell into disrepair. These needed not just regular cleaning, but also ongoing maintenance, which proved impossible. Many simply collapsed, and the local population scavenged the wood for fuel. The towns of Moscow oblast', by no means the worst oblast' in terms of sanitation, emerged from the war with fewer than half the toilets and cesspits that they had had in 1941.[61]

This lack of transport and the essential primitiveness of toilet facilities persisted into the postwar period, and indeed until after Stalin died. The

[57] GARF, f. A-482, op. 47, d. 1415, l. 46ob., 47.
[58] GARF, f. A-482, op. 47, d. 2313, l. 154. [59] GARF, f. A-482, op. 47, d. 2326, l. 11–13.
[60] GARF, f. A-482, op. 47, d. 1420, l. 8, 8ob., 9, 16ob.
[61] GARF, f. 9226, op. 1, d. 691, l. 155.

two factors combined to create conditions that must have been intolerable to live through. To point out that the majority of the population relied on outhouses and cesspits gives an insufficient picture of what these were like. First of all, not every building, even multistory buildings, had an outhouse. In Gor'kii, as I have noted, fewer than half of all the city's courtyards had an outhouse and fewer than one in eight had a cesspit; only around one-third had a container for garbage.[62] As late as 1954 there were still streets in the center of Molotov with only two cesspits for every three residential buildings, and one garbage skip might serve anywhere between seven and thirty. Nearly a third of all Molotov's dwellings were still privately owned, and they did not even have toilets, much less cesspits.[63] Yet Molotov was in a luxurious state compared to some of the coal mining towns surrounding it. Polovinka in the Kizel coal fields, a town of well over 31,000 inhabitants, had not a single cesspit anywhere; people defecated into removable drawers that they emptied wherever they could – a subject to which I shall return later.[64]

The state of the cesspits also left much to be desired. In fact, they very much resembled the early Victorian cesspits described at the beginning of this chapter: they were unlined and permeable, creating a constant threat of seepage into groundwater. In Gor'kii, Chelyabinsk, and Molotov most cesspits were like this at least until the early to mid-1950s. In Molotov many were simply wooden shells with no bottoms; whatever went into them absorbed into the ground. And if in Moscow in the early 1950s they finally made a concerted effort to make the outhouses less hazardous by asphalting the area around them and installing screens to keep flies from getting to the waste, in Molotov "major repairs" meant laying a few planks of timber around the toilets.[65]

Regular cleaning might have minimized the inconvenience and the risks of these kinds of toilets. Yet this is exactly what towns could not do. Here we need to see just how badly their resource base – which had never been adequate even before 1941 – had collapsed during the war. The most complete data are from Moscow, presented in Table 1.4. They show both the extent of the crisis and how privileged the capital was in the speed of its recovery.

[62] GARF, f. 9226, op. 1, d. 798, l. 35ob. This is the 1947 GSI report, which claimed that just 11,600 outhouses served some 25,800 courtyards. The 1948 report claimed an improvement of just 100 outhouses for 19,860 courtyards. I cannot explain this discrepancy but, even if we take the lower figure, the percentage of courtyards with some sort of sanitary facility was still less than 60 percent: GARF, f. 9226, op. 1, d. 895, l. 96.

[63] GARF, f. A-482, op. 49, d. 8862, l. 42. [64] GARF, f. 9226, op. 1, d. 900, l. 116.

[65] GARF, f. A-482, op. 49, d. 8857, l. 9–10 (Gor'kii, 1954); d. 3261, l. 19–21 (Chelyabinsk, 1951); d. 3250, l. 22 (Molotov, 1954); d. 7373, l. 141ob.–142 (Moscow, 1953).

Table 1.4 *Waste removal resources, Moscow, 1941–1949*

		Motorized vehicles			Horses and horse-drawn vehicles	
Year	All vehicles	Trucks	Sewage removal trucks	Garbage trucks	General cleaning carts	Horses
1941	1,003	664	265	–	74	201
1942	576	293	238	–	45	120
1943	376	182	154	–	40	70
1944	379	194	145	–	40	98
1945	439	284	130	–	25	97
1946	723	505	176	–	42	95
1946 operational*	500	350	122	0	28	–
1947	1,113	522	297	147	147	–
1947 operational*	777	363	244	127	43	–
1948	1,055	439	319	297	–	–
1949	1,017	458	325	294	–	–
1949 operational*	912	350	292	270	–	–

Note: *The rows labeled "operational" refer to the average number of vehicles out of the total fleet that the city was able to put on the road. Although not listed here, the war years are also an overestimate, because real utilization was only around 75 percent – the same as in the postwar period.

Sources: GARF, f. A-482, op. 47, d. 1420, l. 16ob. (1942–1944); d. 4941, l. 124ob., 126 (1941, 1945–1946); d. 6351, l. 90 (1947); d. 7669, l. 90 (1948); op. 49, d. 111, l. 50ob. (1949).

Moscow's fleet of vehicles did not reach prewar levels until 1947 or 1948. Moreover, unlike most other cities and towns, Moscow's factories made little contribution to general cleaning. Thus the resources in Table 1.4 were all that the city had to work with. In 1947, however, the fleet underwent modernization, as the city stopped using horse-drawn carts altogether and went over to purpose-built mechanized garbage trucks (*musorovozy*). In doing this Moscow set itself off from every other hinterland city in this study: the move was part of a general campaign for sanitary reform that would produce visible results in Moscow's rapid reduction in infant mortality.[66] Yet for all this there was a period of a few years when

[66] See Chapter 5. The introduction of new technology did not come without its problems. In 1947 the city installed large metal rubbish containers (skips) in its courtyards to improve general cleanliness and to speed up rubbish collection, since these skips could be tipped up into the new modern-style garbage trucks. The problem was that the garbage froze to

Moscow simply did not have enough trucks, carts, or draft animals to keep the city clean.

This shortage of equipment and animals was universal. The nine major towns of Moscow oblast', for example, entered the war with a combined total of 49 waste removal vehicles and 170 horses – not a great deal given the size of its urban population, but a veritable bounty compared to the mere 19 vehicles and 80 horses they had in 1945.[67] Dzerzhinsk in Gor'kii oblast' in 1947 needed 348 horses to keep its streets, courtyards, and cesspits clean, but had just 8. The nine towns and cities of the oblast' as a whole (including Dzerzhinsk) between them needed 802 horses – but possessed only 30. Remarkably, by 1954 the urban areas of the oblast' were still making do with a mere thirty-five horses (an increase of five since 1947) and thirteen waste removal vehicles.[68] The same was true of Kazan', which in 1954 had only twenty-three trucks and horse-drawn vehicles and thirty-five horses.[69] Yet these regions were privileged compared to some parts of the Urals and Western Siberia. In the Kuzbass only the three large cities of Stalinsk, Prokop'evsk, and Kemerovo had any kind of waste removal transport, almost all of it horse-drawn (there were only four trucks regularly assigned to cleaning in the whole oblast'). No other town had a permanent fleet. They were totally reliant on the occasional lending of vehicles by local industrial enterprises.[70] In Chelyabinsk oblast' in 1950, Zlatoust, the second-largest city after Magnitogorsk, had half the number of horses and one-third the trucks it needed, but smaller towns like Ufalei still had none at all.[71]

The situation in Molotov oblast' was even more dire. The local soviets of fourteen towns and cities, with a combined population of nearly three-quarters of a million people, had between them a grand total of thirty-six horses to draw their sewage removal carts. Ten of these towns could rely on assistance from local enterprises, but they, too, were not well endowed: together they could muster just two trucks and fifty horses.[72] Even these figures overestimate what cleaning trusts (the equivalent of a municipal

the sides in winter and had to be chiseled out with crowbars, so that collection actually took longer than before. The chiseling also damaged the containers. Nor did the new garbage trucks work properly – their hoisting mechanisms were faulty. The city managed to solve this latter problem, but as of 1953 it still had not found a solution to the freezing. On the other hand, this did mean that outside the winter months most areas of the city, embracing a majority of its population, now had their skips emptied on a regular basis: GARF, f. A-482, op. 47, d. 6351, l. 95ob.–96; op. 49, d. 3249, l. 32, 35; d. 7373, l. 141, 141ob.

67 GARF, f. 9226, op. 1, d. 691, l. 154.

68 GARF, f. A-482, op. 47, d. 6335, l. 77–8. I have calculated the theoretical demand for horses from the GSI's formula of one horse per 1,000 head of population. I have also corrected an arithmetical error in the GSI's table for the total population.

69 GARF, f. A-482, op. 49, d. 7324, l. 137.

70 GARF, f. 9226, op. 1, d. 932, l. 49.

71 GARF, f. A-482, op. 49, d. 1628, l. 61, 64.

72 GARF, f. 9226, op. 1, d. 899, l. 304.

sanitation department) could actually do, since everywhere, without exception, vehicles were frequently diverted to other jobs. In Gor'kii the city's cleaning trust used its trucks to haul freight, and sent its horse-drawn carts to the trust's own subsidiary farm to help out during the sowing and harvesting seasons. In Gor'kii oblast' sewage removal vehicles were used to cart fuel, to help out local factory farms, and even to haul bread. In Moscow, at least during the early postwar period, waste removal carts were used to cart vegetables.[73] Leaving aside the public health implications of using garbage and sewage trucks to carry food, this meant that those vehicles not sidelined by gasoline shortages or mechanical faults could not be used full time for their main task.

What were the practical implications of these figures? We can form some idea from this comparison. Glasgow in the mid-1880s had 175 horses and 600 railway wagons available to remove around 233,000 metric tons of waste a year. The city of Kuibyshev in 1947 needed to cart away 285,000 metric tons of fecal waste plus another 110,000 tons of garbage, and to do this it had just fifty-four horses, seven sewage removal tanks, and ten motorized garbage trucks.[74] Kuibyshev generated roughly 70 percent more waste than Victorian Glasgow, but possessed less than a third the number of horses and an infinitesimal percentage of vehicles. It is not surprising, then, that Soviet towns and cities were in a permanent state of filth.

Not a single city or town was able to clear away all the rubbish and excrement it produced over the course of a year. Moscow had the best record, but it still did not gain more or less total control over the situation until 1950 or 1951. In 1946 and 1947 it removed only around three-quarters of the garbage and less than half the sewage from the city's courtyards and streets. By 1949 they were carting away over 90 percent of the sewage, but the GSI cautioned that this was probably a very optimistic estimate, since the points of comparison – wastes actually collected versus the amount the city's population was presumed to be generating – did not take account of Moscow's large illegal and/or non-registered population.[75] Yet there is other evidence to show that the city's

73 GARF, f. 9226, op. 1, d. 798, l. 34ob.–35, and d. 895, l. 95–95ob. (Gor'kii); GARF, f. A-482, op. 47, d. 6335, l. 78 (Gor'kii oblast'); d. 4941, l. 126 (Moscow).

74 Wohl, *Endangered Lives*, p. 100; GARF, f. A-482, op. 52s, d. 224, l. 86–7.

75 The Soviet state tried to control population movements by requiring all residents of a city to hold a residence permit and be registered at an address. The registration process allowed officials to check that the person had a valid passport (collective farmers had no right to a passport – another device for restricting unregulated flight from the land) and was otherwise entitled to reside in the city in question. If the registration was accepted, the

sanitary state genuinely experienced major improvement. In February 1948, when winter conditions made courtyards and cesspits hardest to clean, nearly a third of Moscow's cesspits were overflowing. In February 1951, the number of overflowing cesspits and feces-fouled courtyards had fallen to 8 percent, dropping to less than 4 percent during the rest of the year.[76]

Outside Moscow the situation was less bearable. In Gor'kii the combined efforts of the city's cleaning trust and its industrial enterprises removed only 70 percent of all rubbish and sewage in 1947, but this actually fell to 50 percent in 1951.[77] The proportion achieved in other large cities was even lower: probably around one-third of total need in Kuibyshev in 1951; no more than one-quarter in Molotov (1951 and 1954 data); and 20 to 25 percent in Ivanovo in 1946–1947, rising to just over 40 percent in 1952–1954.[78] Figures for the oblast' towns are anybody's guess, since few oblast' GSI reports dared venture any quantitative estimates. One partial exception is Gor'kii oblast', where the removal rate in 1947 appears to have been no more than 5 percent.[79] In fact, in virtually all the localities just cited the authorities knew that, given the lack of resources, they had no hope of clearing away everything. They measured

citizen received a document called a *propiska*. Residence permits for Moscow were very difficult to obtain, but this did not prevent people from entering Moscow and staying and/or working there illegally. The health authorities were especially concerned about this shadow population since, among other social problems it might cause, it could also be an unmonitored – and difficult-to-trace – source of epidemics.

76 GARF, f. A-482, op. 47, d. 4941, l. 124; d. 6351, l. 88; d. 7669, l. 89, 92, 94–5; and op. 49, d. 111, l. 50; d. 3249, l. 33.

77 GARF, f. 9226, op. 1, d. 798, l. 35; GARF, f. A-482, op. 49, d. 3240, l. 35–6. It is possible that the Gor'kii figures are overly optimistic. The GSI assumed that each resident generated 0.5 cubic meters of garbage and 0.5 cubic meters of fecal wastes a year. The GSI reports in all other localities used a formula of 0.5 cubic meters of rubbish and 1.0 cubic meters of fecal waste. On the other hand, the calculation needs to subtract from the total those houses with sewerage – around a third in 1951 – whose excrement did not need cartage, as well as the fecal wastes that could be carted to nearby farms and used as fertilizer.

78 GARF, f. A-482, op. 49, d. 3243, l. 18 (Kuibyshev); d. 3950, l. 22, and d. 8862, l. 40 (Molotov); op. 47, d. 4925, l. 192; op. 49, d. 1610, l. 15–16, and d. 8836, l. 21 (Ivanovo). The Kuibyshev report claims the city cleared away only 20 percent of total accumulation, but their own figures suggest something closer to 40 percent. This is based on the combined total of solid waste and fecal waste. The municipal cleaning trust received help from industrial enterprises with rubbish removal, but not with carting sewage. Thus, most of the shortfall in collections was in excrement.

79 The 1947 report gives population data for the nine large towns (including Dzerzhinsk) and the amount of wastes removed. Using the formula cited in the Gor'kii report of one cubic meter of rubbish and excrement generated each year by one person, municipal cleaning trusts carted off less than 5 percent of the total: GARF, f. A-482, op. 47, d. 6335, l. 77–8.

their performance against plans, not need, and in most cases these plans were only a small fraction of the actual accumulation. The 1947 plan in Gor'kii oblast', for example, called for local cleaning trusts to remove only around 6 percent of the garbage and excrement, but even this quite modest target was not met, as I have just noted.[80] In many ways even these figures paint an overly rosy view of the actual situation. They refer to the percentage of the wastes accumulated in a given calendar year that cleaning trusts (sometimes aided by industrial enterprises) removed. They do not include the backlog of wastes uncollected from the year before. Suppose, for example, a town generated 100,000 cubic meters of rubbish and excrement a year, but was able to remove only 50,000 cubic meters; 50,000 cubic meters would still be left lying around. Some of this would rot or wash away in the rain or melting snow, but whatever did not simply added to the mound of new wastes that this same town would create the following year.

In the early 1950s the government attempted to introduce the novel idea of regular waste collections. In theory garbage was to be collected every eight to ten days in the summer, and every twelve to fifteen days in winter; cesspits were to be emptied and cleaned once a week in summer, and once every ten to fourteen days during the winter. Except for Moscow, nowhere came close to meeting these targets. Gor'kii city in 1954 could collect garbage only every eighteen to twenty days in summer and once a month in the winter; sewage was removed once every one to two months in the summer, and once every two to three months in winter.[81] Gor'kii, however, was itself somewhat of an exception. Cities such as Kazan', Molotov, Ivanovo, and Yaroslavl' were so underresourced – and underfinanced – that they could not even contemplate any kind of regular removal system.[82]

A closer look reveals that the failure to introduce regular cleaning schedules was not simply due to a shortage of vehicles, horses, or gasoline. It is easy to overlook the fact that the Stalinist command economy made considerable use of market mechanisms and so-called profit-and-loss accounting (*khozraschet*, also known in English as "cost accounting"). Throughout the postwar years the regime imposed (or tried to impose) strict budget constraints in various areas of economic life. The end of

[80] GARF, f. A-482, op. 47, d. 6335, l. 77–8.
[81] GARF, f. A-482, op. 49, d. 8857, l. 11–12.
[82] GARF, f. A-482, op. 49, d. 7324, l. 137 (Kazan'); d. 8836, l. 20–1 (Ivanovo); d. 8862, l. 39–40 (Molotov); d. 8856, l. 85 (Yaroslavl'). Significantly, all these references are from either 1953 or 1954. Yaroslavl' in fact did introduce regular waste removals in one of its central districts, but it was "ineffective."

rationing in December 1947 saw a number of factory dining rooms close because they could not earn sufficient revenue to cover their costs. In early 1948 there were widespread wildcat strikes among railway workers protesting against the late payment of wages – a situation that had arisen because the government had decided to stop covering the railways' massive deficits.[83] In the early 1950s town cleaning also was placed on the cost-accounting system. We have a particularly clear example of how this worked in Kuibyshev. The city's cleaning department worked on the basis of contracts signed with the local housing administrations of the city's central districts. The trust was to maintain a regular cleaning schedule, for which the housing administrations were to pay in advance. This they never did – nor did they pay once the cleaning trust had done the work. Because the cleaning trust worked on a system of cost accounting, the shortfall of revenue created a serious crisis. It found itself unable to pay its workers' wages or any of its bills, and in response stopped cleaning in those areas that had not paid up. In the city's outer districts the problem was somewhat different. The cleaning trust did not serve them – but no other authority did, either, not even the industrial enterprises whose workers lived there. They simply remained dirty. Thus dysfunctional financial systems and administrative conflicts greatly exacerbated the difficulties caused by physical shortages.[84] Yet these did not come out of nowhere. In the last instance they stemmed from the reluctance of the central political and economic authorities in Moscow to give sanitation any kind of priority. Time and again local soviets and/or their cleaning trusts came up against an insurmountable obstacle: lack of funds. The city of Molotov, for example, estimated that it would cost 3 million rubles a year to introduce regular cleaning and waste removal. What did it receive in its central allocation? Nine hundred thousand rubles – just 30 percent of the cost.[85]

We can all too easily imagine how this affected the daily lives of urban residents. For most of the year towns and cities were permanently feculent. The issue here was not simply failures of waste removal. Toilets and cesspits were poorly built and poorly maintained. The worst time of year was the winter. As most toilets were unheated, cesspits froze, making

[83] Filtzer, *Soviet Workers and Late Stalinism*, pp. 83–8.
[84] GARF, f. A-482, op. 49, d. 3243, l. 20–1.
[85] GARF, f. A-482, op. 49, d. 3250, l. 22. For examples in other cities see GARF, f. A-482, op. 49, d. 3261, l. 19 (Chelyabinsk city, 1951); op. 47, d. 7656, l. 69, and op. 49, d. 8835, l. 12 (Gor'kii oblast', 1948–1949, 1954). What made matters worse was the fact that when local soviets did receive funding to expand cleaning operations they might themselves divert the money to other purposes. See the case of Kazan' in 1953, in GARF, f. A-482, op. 49, d. 7324, l. 137–8.

them even harder, if not impossible, to empty. This, plus the fact that many had no lighting, made people reluctant to use them, especially at night, because they feared they would soil themselves.[86] In most cases people would have used chamber pots and carried the contents out to a cesspit or sink hole, but with the toilets and cesspits in such a sorry state they were more than likely just to empty them onto the ground; either that, or they would simply relieve themselves directly on the ground. In either case, the effect was to make the area around the outhouses and cesspits even worse. The industrial districts of Chelyabinsk city – where the large industrial enterprises were responsible for cleaning, not the city cleaning trust – were in a disgusting state. There were lumps of feces around the toilets, mountains of uncollected garbage piled up next to rubbish skips, and the containers where people could empty their chamber pots were in a state of semi-ruin. Some areas of the "socialist city" of the tractor factory – the city's most prestigious enterprise – did not even have these receptacles. There was nowhere for people to pour their slops. Like most cities, Chelyabinsk also had few public toilets. If people were out shopping or waiting for a bus, they would just duck into a nearby courtyard and defecate on the ground.[87] In the barracks settlements of Magnitogorsk, where the outhouses lacked heat and lighting, residents created what they called "Siberian pits," that is, areas around the toilets where they relieved themselves or dumped their slops in the winter time because the toilets were inaccessible.[88] Worse still was the situation in the urban areas of Kemerovo oblast'. Commenting on what it called "the rather dangerous tradition" of people tossing slops and refuse into primitive "winter slop holes or snow bunkers," a health inspector noted, "People throw everything into them: slops, kitchen rubbish, slag, garbage, and the contents of chamber pots. In the course of the long Siberian winter these garbage bins are turned into huge frozen 'flat cakes' [*lepeshki*], containing all the aforementioned refuse of human habitation. Every spring a huge amount of labor power is devoted to chopping up these 'flat cakes' and a significant quantity of transport resources to carting away what's chipped off. Often these 'flat cakes' are just left to thaw out where they are."[89] Even in Moscow, as late as 1951 the SES claimed that most of the city's 27,000 cesspits and slop holes – which served around 1,500,000 people – did not meet even basic sanitary standards and posed a serious health risk. By 1953 the situation had noticeably improved: there were fewer of them

[86] GARF, f. 9226, op. 1, d. 932, l. 46–9, citing the unbelievably primitive toilets and outhouses in the towns of Kemerovo oblast'.
[87] GARF, f. A-482, op. 47, d. 4960, l. 41; op. 49, d. 3261, l. 20.
[88] GARF, f. A-482, op. 49, d. 1628, l. 59. [89] GARF, f. 9226, op. 1, d. 932, l. 48.

(around 24,000), and at least during spring and summer they received more or less regular cleaning; the level of cleaning in winter, however, remained poor.[90]

Throughout this period the authorities constantly complained that the general lack of knowledge about personal hygiene and people's "uncultured" habits exacerbated the problems of maintaining proper sanitation. There is undoubtedly much truth in this, just as there was to similar accusations about British working-class tenement dwellers in Victorian times. As in nineteenth-century Britain and Germany, so, too, in the late Stalinist USSR, poor domestic hygiene was a major contributing factor in high rates of infant mortality.[91] The above descriptions of people's behavior make it easier to understand why factory newspapers, for example, waged an ongoing educational campaign on the basics of good personal hygiene. Thus a 1946 article about how to prevent dysentery and typhoid fever listed the following steps for good food safety:

- Wash your hands with soap before each meal, after using the toilet, and after work. [The article did not mention what everybody already knew – soap was unobtainable.]
- Observe cleanliness at home and at the workplace.
- Use the toilet in a "civilized" fashion. Do not soil the courtyard or the factory grounds.
- Boil all milk and drinking water.
- Before eating, wash raw vegetables in boiled water or pour thoroughly boiled water over them.
- If cooking with produce sold by hand it is necessary to boil, fry, or bake it.
- Before entering into any premises wipe your feet of any dirt that may be stuck to them and particularly of any sewage.[92]

Note that the newspaper is explicitly telling people not to defecate on the ground; it is also telling them that it is important not to track feces indoors on the bottom of their shoes – itself an indication of the ubiquitousness of the phenomenon.

Yet if people essentially fouled their own living areas, to a large degree it was because they had little time or energy – or even the possibility – to find alternatives. We have to bear in mind that in this period people not

[90] GARF, f. A-482, op. 49, d. 3249, l. 35–6, and d. 7373, l. 141ob.

[91] As we shall see in Chapter 5, pp. 315–20, progress in this area probably played the largest role in reducing infant mortality during the early 1950s. On Britain, see Alex Mercer, *Disease, Mortality and Population in Transition: Epidemiological-Demographic Change in England Since the Eighteenth Century as Part of a Global Phenomenon* (Leicester: Leicester University Press, 1990), pp. 82–3; and Thompson, "Infant Mortality," pp. 142–6. On Germany, see Vögele, *Urban Mortality*, p. 82.

[92] *Golos Dzerzhintsa* (Dzerzhinskii spinning and weaving factory, Ivanovo), March 7, 1946.

only had no easy access to sanitation: most people did not have indoor running water, even cold water. Outside Moscow relatively few people had gas or central heating – they relied on wood or coal stoves – and so heating water for washing or cleaning was also an arduous task. Soap was almost impossible to obtain. Even if health education had been better and people had wanted to make a conscientious effort to stay clean, they would still have found this a daunting task in the face of so many obstacles.

This also helps us to understand another feature of urban life: the spontaneous creation of illegal dumps. People may have lived surrounded by rubbish and muck, but they clearly tried their best to remove the worst of it from the area around their dwellings. If the municipalities or enterprises did not cart the waste away, in theory people had access to town dumps. Towns in fact used various ways to dispose of their wastes. Some fecal waste went to sewage farms (known in Russian as irrigation fields, *polya oroshe-niya*) or to collective farms for use as fertilizer; farms could also make use of rotting garbage. This in itself could create a health risk, because if not properly composted the use of human excrement as fertilizer can become a vector for spreading dysentery and other gastrointestinal diseases, including quite serious worm infestations. The latter were surprisingly common in the postwar Soviet Union, and not just in rural areas or Central Asia, where the warm climate and the slow pace of modernization provided ideal breeding grounds for intestinal parasites. Infection rates were also high in the urban areas of the RSFSR, where a combination of factors combined to propagate ongoing cycles of infection. The lack of sewerage, overflowing cesspits, and general contamination of the soil with human excrement provided one vector. The use of poorly composted human excrement as fertilizer provided another. In the Urals, especially in mining areas such as those in Molotov and Chelyabinsk oblasti – areas already vulnerable because of the absence of sewerage – large numbers of workers had private plots and used contaminated fertilizer on their vegetable and potato crops. When they ate what they had grown (cucumbers, for example) they passed the infections on to any family members not yet affected, and reinfected anyone who already was.[93]

[93] L. M. Katsman, "Gel'mintozy u naseleniya Leninskogo raiona g. Sverdlovska," in *Terapiya* (Sverdlovsk, 1958), pp. 127–9; Z. G. Vasil'kova and O. M. Belozerova, "K voprosu o roli podmoskovnykh polei orosheniya v epidemiologii gel'mintozov," *Meditsinskaya parazitologiya i parazitarnye bolezni*, no. 4, 1947, pp. 13–14; A. V. Markin, "Gel'mintofauna naseleniya Nizhnego Tagila Sverdlovskoi oblasti," *Meditsinskaya parazitologiya i parazitarnye bolezni*, vol. 14, no. 4, 1945, p. 44; M. V. Bursdorf and I. G. Kul'nevich, "O nekotorykh osobennostyakh glistnykh invazii v Chelyabinskoi oblasti," in *Trudy 4-go Chelyabinskogo oblastnogo i gorodskogo s"ezda vrachei* (Chelyabinsk, 1955), p. 154. For a fuller discussion of rates of infection and the types of parasites involved, see Chapter 4, pp. 202–4.

This risk aside, one of the difficulties in the early postwar years, however, was that during the war towns had plowed up their dumps and sewage farms in order to grow food; until this land was returned to its original use towns had nowhere to take their refuse.[94] Where rubbish dumps are concerned, invariably they were inadequate, poorly kept, and difficult to reach. Some were sited next to residential areas or in places liable to flooding, causing both risks to public health and a great deal of unpleasantness for the residents.[95] Where dumps received both solid waste (garbage) and excrement, in theory the latter should have been diluted and decontaminated with chlorine, but was often simply plowed into the ground. Approach roads were so bad that they were often inaccessible in winter and spring time. It was therefore not uncommon for vehicles simply to discard their loads before ever reaching their destination.[96]

If these were the problems that local soviets faced disposing of organized collections, what did this mean for private individuals? They found their own ways to solve the problem, namely illegal dumps. Everywhere the pattern was the same. In each locality residents had a number of "beloved" spots where they could discard their refuse: by the sides of roads; along river banks; in gullies, quarries, or abandoned mine shafts; and in winter time on the ice sheets of frozen rivers. Although the dumps were illegal, the local militia did nothing to prevent their formation or to stop people adding to them. The dumps became a major target of the annual spring cleanup campaigns (discussed pp. 61–3), but no sooner would the sites be cleared than they would spring up again, almost overnight and seemingly out of nowhere. They were thus a permanent, ongoing problem. They stank, they fouled the surrounding land with rotting garbage and excrement, they were breeding grounds for flies, and if located near water courses they also posed a direct threat to local water supplies. If any of the waste or excrement was contaminated with infectious material, for example, with dysentery or typhoid, it became a vector for spreading disease or even causing local epidemics.[97]

94 GARF, f. A-482, op. 47, d. 4937, l. 56–7 (Moscow oblast'). The town of Perovo still had no sewage farm as of January 1948. The state of the town, according to the GSI, was "catastrophic": GARF, f. A-482, op. 47, d. 6347, l. 85.

95 GARF, f. A-482, op. 47, d. 6345, l. 311 (Molotov oblast'); op. 52s, d. 224, l. 87 (Kuibyshev). Kuibyshev ordered construction of a new dump in an unpopulated part of town, but the site could not be used because there was no road to it. The city received a special bank credit to build a road in 1948, but I do not know if and when it was ever completed.

96 GARF, f. A-482, op. 47, d. 6347, l. 85 (Moscow oblast'); op. 49, d. 8862, l. 41 (Molotov city); d. 1628, l. 57 (Chelyabinsk oblast'); GARF, f. 9226, op. 1, d. 932, l. 51–2 (Kemerovo oblast').

97 Almost every GSI report makes some reference to illegal dumping. For indicative references see GARF, f. 9226, op. 1, d. 895, l. 97–8, and GARF, f. A-482, op. 49, d. 3240,

The only way that towns could avoid literally drowning in their own waste was to launch seasonal mass cleanup campaigns. Most places did this twice a year. The most important time was in the spring, when the so-called winter accumulations of frozen excrement would thaw out and, if not promptly removed, make towns unbearable to live in and pose a serious danger to public health. The second campaign would take place in the autumn, to clear out the summer buildup before the winter freeze set in. They appear to have grown out of the sanitary emergency created by the war, when localities had to undertake mass mobilizations in order to try to rid themselves of the vast amounts of sewage piling up within town boundaries.[98] Eventually they became regular events, subject to national legislation.[99] The campaigns typically lasted for a month, either from mid-March to mid-April or during the whole month of April, but the exact timing varied according to the climate, and in exceptional cases they could last longer. In Sverdlovsk city in 1945, for example, the "spring" campaign for all practical purposes extended from January right up until May.[100] They were in most cases very carefully organized. Planning might begin as early as January or February, accompanied by preliminary public education in the form of lectures, radio broadcasts, and articles in local and factory newspapers.[101] In Sverdlovsk, the city published a special newspaper, *Za blagoustroistvo* (For Town Improvement). The focus in Sverdlovsk was a series of Special Sundays (*voskresniki*), during which they mobilized all available resources from both the local soviet and industrial enterprises, including nearly 8,000 "horse-days," 35,000 "truck-days," and 126,000 person-days.[102] The spring campaign in Ivanovo in 1946 mobilized 82,500 person-days. If we bear in mind that most cities had available just a handful of trucks and horses for regular

l. 136–7 (Gor'kii city); d. 1628, l. 58, 62 (Chelyabinsk oblast'); op. 52s, d. 224, l. 58 (Kuibyshev); op. 47, d. 4941, l. 134, and d. 6351, l. 97 (Moscow city); d. 3443, l. 71 (Sverdlovsk city).

98 GARF, f. 9226, op. 1, d. 636, l. 55. The wartime campaigns varied in length, anywhere from a single weekend to an entire month. On the use of cleanup campaigns before the war see p. 29, n. 18.

99 Order of A. Tret'yakov, People's Commissar of Health of the RSFSR, March 6, 1945, "O provedenii vesennei ochistki naselennykh mest." This was followed up by a special telegram from Molotov, in his capacity as deputy chair of the Council of People's Commissars, dated April 14, 1945, ordering the cleanup of all cities and towns. Both are cited in the 1945 report of the Sverdlovsk Oblast' GSI: GARF, f. 9226, op. 1, d. 693, l. 73.

100 GARF, f. A-482, op. 47, d. 3443, l. 70–1.

101 GARF, f. A-482, op. 47, d. 6335, l. 80–1.

102 The figures represent the total number of days worked by the combined stock of city and factory horses and trucks, not the number of animals or vehicles. The same is true of person-days – this was the total number of days worked. I do not know how many individuals this involved or what proportion they were of the city's population: GARF, f. A-482, op. 47, d. 3443, l. 69–72.

cleaning, or that Ivanovo devoted just 7,500 person-days to waste removal during the other eleven months of the year, we can see just how extensive this mobilization was.[103]

The main task of the cleanups was to remove sewage and garbage from courtyards and streets and cart it out of town, to municipal dumps, sewage farms, collective farms, sewage plants, or composting fields. In the process they also "liquidated" the illegal dumps. This was not, however, their sole aim. The campaigns also undertook the mass repair of outhouses, toilets, cesspits, and rubbish skips, as well as the construction of brand-new ones. This, too, was a high-priority objective, given the condition most of these were in. The public health authorities in Kuibyshev claimed to have repaired over 650 toilets, nearly 500 rubbish skips, and 2,185 slops pits during the spring 1947 campaign; they also built nearly 300 new toilets and 525 new skips.[104] In Gor'kii in 1951 they repaired over 900 toilets and built 174 new ones; repaired 860 cesspits and built another 115; and repaired 475 rubbish skips. This may sound like a lot, but the repair totals prove quite modest if we consider that the city had over 8,800 outhouses and more than 5,000 cesspits. If we realize further that these facilities provided the population with only one toilet or cesspit for roughly every four residential buildings, the new construction appears quite risible.[105] Nor did all cities achieve even these results, especially the oblast' towns during the early postwar years. Shcherbakov, the second-largest city in Yaroslavl' oblast', repaired just 5 percent of its toilets, 2 percent of its skips, and less than 1 percent of its cesspits during its 1946 spring cleanup; new construction was negligible.[106] Beneath the tedium of all these numbers there is an important point. By and large the work of repairing, replacing, and expanding the stock of outhouses, cesspits, garbage pits, and rubbish skips proceeded very slowly and imperfectly, and even in the best of cities came nowhere near to meeting actual need. If ultimately the solution to the problem of waste removal was to reduce the volume of waste generation by introducing comprehensive sewerage and drainage, the most effective short-term measure

[103] GARF, f. A-482, op. 47, d. 4925, l. 189. These figures for the numbers of people mobilized were more or less typical. The 1947 spring campaign in Kuibyshev mobilized 151,000 people, although it is not clear if this is the number of people participating in the campaign or the number of person-days worked: GARF, f. A-482, op. 52s, d. 224, l. 88. The industrial towns of Sverdlovsk oblast' in 1945 claimed the enlistment of 650,000 person-hours (roughly 90,000 person-days), including every adult in the town of Krasnoufimsk between the ages of eighteen and fifty: GARF, f. 9226, op. 1, d. 693, l. 74.

[104] GARF, f. A-482, op. 52s, d. 224, l. 88.

[105] GARF, f. A-482, op. 49, d. 3240, l. 33–4, and d. 8857, l. 9.

[106] GARF, f. 9226, op. 1, d. 745, l. 103. The 1947 cleanup in the towns of Gor'kii oblast' posted almost identical results: GARF, f. A-482, op. 47, d. 6335, l. 84.

was a radical improvement in courtyard facilities. This the cities failed to achieve.

What of the main goal of waste removal – how effective were the seasonal cleanups? The answer is somewhat complicated. In most cases the spring campaigns appear to have cleared out the bulk of the accumulated muck, but the results were uneven and short-lived. Rarely were the autumn campaigns as successful, perhaps because too much transport had to be diverted to helping with the harvest. Some of the difficulties were understandable in the years just after the war, when the infrastructure was still extremely weak and the task of postwar cleanup was still daunting. In Ivanovo oblast' the 1946 campaigns were hit by a combination of bad weather and a terrible shortage of resources. They had to limit their efforts to public buildings and ignored private dwellings, even though these represented the majority of the urban housing stock. Even within the public sector the focus was on streets and squares, at the expense of homes and courtyards. Thus the "cleanup" ignored the very buildings with the largest amounts of accumulated excrement.[107] Another complaint – and not just in the early years – was that when cleaning cesspits sanitation workers removed only the top layer of excrement, and did not empty them completely, so that they soon overflowed again.[108] Clearly the most basic problem, however, was that, no matter how successful the spring campaigns may have been, within a very short time towns and cities returned to the state they had been in just a few months before. The GSI in Kazan', for example, estimated that soon after the completion of its 1948 spring cleanup a full quarter of its residential buildings were again in a "permanently" unsanitary state.[109] The fact was that even in the early 1950s all hinterland urban areas except Moscow still depended on these campaigns. No other outcome was possible, nor would it be so long as cities did not have the ability to clean courtyards and cart away the refuse regularly and frequently. This, as we have already seen, they could not do.

On the other hand, given this basic truth the campaigns nonetheless fulfilled their main mission. They kept the accumulations of refuse and filth just below that threshold where the miseries of everyday would have been overshadowed by the outbreak of mass epidemics. In other words, what was important was to avoid a return to wartime conditions, and this the cleanup campaigns did.

[107] GARF, f. A-482, op. 47, d. 4925, l. 189–90.
[108] GARF, f. A-482, op. 47, d. 4941, l. 131ob. (Moscow city, 1946); d. 6335, l. 83 (Gor'kii oblast', 1947); op. 49, d. 3243, l. 23–4 (Kuibyshev, 1951).
[109] GARF, f. A-482, op. 47, d. 7668, l. 9. See also Gor'kii city: GARF, f. 9226, op. 1, d. 895, l. 98, and GARF, f. A-482, op. 49, d. 3240, l. 136.

Conclusion

This chapter has had two different aims. The first is to provide a deeper and more detailed insight into how Soviet citizens lived. It is still only a partial picture because we have not yet looked at two other important determinants of the urban environment, namely water supply and personal hygiene. Nevertheless, we now know some things that may come as a surprise to anyone, including younger Russians, whose first encounters with the Soviet Union began in the 1980s or even the post-Soviet period, and has not traveled to very small towns. The hideous high rises of the Brezhnev era were unknown in the postwar period. Much of the housing consisted of low-lying wooden buildings, many of them privately owned, with few or no amenities. These existed alongside a mass of substandard dormitory and barracks accommodation, much of it put up in the 1930s as "temporary" dwellings. Outside Moscow few cities had extensive sewerage systems. People used outhouses that emptied into primitive cesspits or sink holes that for most of the year were unbearable. Towns did not have the means to clean them regularly, leading to accumulations of excrement, rotting garbage, and general rubbish that were cleared away only once or twice a year. The one exception to this pattern, at least among hinterland cities, was Moscow, which attempted to modernize its waste collection system from as early as 1947; although this ran into difficulties, by the early 1950s Moscow nonetheless stood out as a relatively "clean" city – this despite the fact that around a quarter to a third of its population still lived in areas without sewerage. The gap between Moscow and the rest of the country is already visible here. If Moscow began to close the time lag between the postwar USSR and Western Europe, the hinterland industrial regions – including the large cities – did so far more slowly and unevenly.

This takes us to the chapter's second function, to explore what impact the living conditions had on people's health. In Chapter 5 we shall see that, despite the terrible state of urban sanitation, infant mortality from gastrointestinal infections actually fell in this period. Moreover, beginning around 1952, the infant mortality gap between Moscow and the rest of the country began to narrow. For reasons that I shall explain in that chapter, it is probable that this came about not so much because hinterland cities had become fantastically cleaner, as because public health officials were able to compensate for the dirtiness of cities through better public education about personal hygiene and the application of more stringent measures to encourage early diagnosis and the isolation of the carriers of infections. Yet we cannot disregard improvements in sanitation altogether. Improvements were small, piecemeal, and incremental, but their gradual accumulation over the years would have made a noticeable difference in urban conditions, and it is unlikely that even the worst oblast' industrial towns were in quite the same dismal state in 1953 as they had been in 1945. A small percentage increase in the number of people with sewerage, the amount of sewage being decontaminated, and the volume of human waste carted away would have reduced the potential pool of infection, and to this extent made some contribution toward reducing mortality.

We are, however, jumping the gun here, for sanitation is just one piece of the puzzle. There are two others we need to examine: the safety of the water people drank and used for bathing, and the facilities they had for keeping themselves clean. These I address in the next two chapters.

2 Water

The lack of sewerage and efficient waste removal was not the only scourge of the modern industrial city. Another was the difficulty obtaining access to clean water, both for drinking and for washing. The two were intimately related. Lack of sewerage polluted the land on which people lived, worked, and traveled. It could also, however, pollute the groundwater from which communities took their water. Where towns did have sewerage, the tendency was to discharge it untreated into waterways, jeopardizing this source of water as well. For this reason the laying on of central water supplies was fundamental to the nineteenth-century project of sanitary reform. In his examination of urban mortality in England and Germany during the forty years preceding World War I, Jörg Vögele warns his readers not to exaggerate the pace and impact of progress in this area. Construction of urban water supplies and of drainage and sewerage systems had indeed been rapid, but also highly uneven. In a slightly sobering tone, he notes that, although Berlin had begun to build a central water supply in 1853, by 1873 "only" 50 percent of all dwellings were connected. Half of London's population had centralized supply "only" in the 1890s, while in Sheffield coverage reached 100 percent of the population "only" in 1906. Moreover, in their initial stages the systems were not always very effective. In Germany, for example, the pressure was not always sufficient to reach the upper floors of multistory tenements. Hot summers were also a problem, "and could interrupt the constant supply of water until late in the nineteenth century." Although by 1912 the systems in Germany's largest cities were serving virtually 100 percent of properties, there were still significant variations in average per capita daily consumption, from 60 liters a day in Breslau and 80 liters in Berlin, to 160 liters in Frankfurt.[1] What Vögele considers to be a cautionary note of historical realism is yet again evidence that the Soviet Union's sanitary infrastructure lagged some thirty, forty, or

[1] Vögele, *Urban Mortality*, pp. 150–9.

even as much as eighty years behind Britain and Western Europe, depending on which country we take as a point of comparison.

We already know from Chapter 1 that many of the difficulties with sanitary infrastructure were made worse by the war. As with sewerage, however, the USSR's backwardness in this area was structural, not conjunctural. In 1947, over 30 percent of the inhabitants of Moscow still had neither sewerage nor running water – and Moscow was far and away the most advanced city in the country. Coverage in other large urban centers was far worse: the percentage of the population *without* indoor plumbing and sewerage was 50 percent in the industrial towns of Moscow oblast' (1947 data), 70 percent in Gor'kii (1948), and over 90 percent in Ivanovo (1946). In the city of Molotov as late as 1951, although 35 percent of its people took water from a central supply, few actually had indoor running water, which extended to only 10 percent of dwellings.[2] Such figures from the postwar Soviet Union were comparable to Birmingham or Newcastle in the 1840s, a full hundred years earlier.[3]

We can imagine what this meant for the quality of daily life. Most people had to draw water from outdoor pumps located in courtyards or on the streets, and then haul it up flights of stairs in buckets. Wohl's description of Victorian Britain would have applied just as accurately to Soviet cities during late Stalinism:

> For most of the nineteenth century it took far more effort than just turning on a tap to keep clean. It involved hauling in water, perhaps a quarter of a mile or more, and carrying it, perhaps up several flights of stairs. It is easy to dismiss this as a minor inconvenience; even Octavia Hill, the eminent housing reformer, who ought to have known better, thought that a water supply on each floor of a large tenement block, was unnecessary. Yet, for most labourers' families, lack of running water meant queuing up at the local street pump or tap, in foul weather as well as fine, carrying heavy pails through muddy and uneven streets and courtyards, an endless round of drudgery, day in, day out. Perhaps, like filth and noise, smells and overcrowding, the poor got used to it, although no doubt children would grumble when given the task. Even if it was simply another of the many accepted chores of working-class life, it was one which acted as a deterrent to cleanliness and thus to health.[4]

Not everyone in Soviet cities, however, had a nearby pump or standpipe; instead, they had to draw water from wells, the quality of whose water could vary dramatically, from the exceptionally pure to the extremely dangerous.

2 GARF, f. A-482, op. 47, d. 6351, l. 106–107ob. (Moscow); RGAE, f. 1562, op. 329, d. 4591, l. 32 (Moscow oblast'); GARF, f. 9226, op. 1, d. 895, l. 109ob. (Gor'kii); GARF, f. A-482, op. 47, d. 4925, l. 221 (Ivanovo); op. 49, d. 3250, l. 5, 6, 8 (Molotov). See also Table 1.1.

3 Wohl, *Endangered Lives*, p. 62.

4 *Ibid.*, pp. 61–2.

As in German towns over half a century earlier, to have indoor piped water did not guarantee supply: sometimes the pressure fell so low that water did not reach the upper floors or the supply stopped altogether.[5] Even street pumps would go out of service, especially in the winter, when they tended to freeze up. As for per capita consumption, 60 to 70 liters per person per day – the bare minimum in German cities in 1912 – was considered a satisfactory target in most postwar Soviet towns. A 1945 internal document produced for the GSI did not expect cities in the RSFSR to reach that figure until 1950; only in large cities with populations over 400,000 was the medium-term target higher, at 100 liters a day.[6] As we shall see later in this chapter, this was a highly unrealistic figure that virtually no city could achieve. Moreover, figures for average per capita daily consumption are misleading, since as much as half the water went to factories for use in production. Thus though per capita daily consumption in the RSFSR in 1940 was 41 liters per day, only 24 liters actually went to people for drinking and washing. Here, too, the postwar years brought little improvement.[7]

What all this meant in practice should be obvious. First, there was the heightened risk to health. The lack of sewerage and indoor toilets dramatically increased exposure to dangerous pathogens. Without indoor running water it became difficult for people to maintain the levels of personal hygiene needed to prevent sickness and disease. The result was that diseases such as dysentery were endemic, and that gastrointestinal infections were a primary cause of infant mortality. Secondly, it vastly magnified the burden of domestic chores. Try to imagine the huge amount of time and effort involved in washing bed linen and clothing by hand. It was not just the washing itself – a difficult enough task if you have ever lived anywhere without any access to a washing machine – but the fact that you had to haul up heavy buckets of cold water from the street, not once, but several times. Then you had to heat the water on an inadequate stove (for

[5] This situation was universal in Russia. See, for example, GARF, f. A-482, op. 47, d. 4941, l. 117 (Moscow, 1946); d. 4925, l. 163 (Ivanovo oblast', 1946); and op. 49, d. 3243, l. 8 (Kuibyshev, 1951).

[6] GARF, f. 9226, op. 1, d. 635, l. 22–3. To put this in a modern-day perspective, average per capita water consumption at the start of the present century was around 580 liters a day in the USA; 280 liters a day in France; 150 liters in Britain; 80 liters in China; and roughly 50 liters per day in Bangladesh and Kenya. The United Nations defined a daily per capita consumption of less than 20 liters per day as "water poverty." Most postwar Russian cities struggled to provide the same daily allowance as contemporary Kenya or Bangladesh, and many oblast' industrial towns would have regularly experienced periods of water poverty: United Nations Development Programme, *Human Development Report 2006*, p. 34.

[7] GARF, f. 9226, op. 1, d. 635, l. 23.

which there was usually insufficient fuel), wash the clothes, and then rinse and wring them, all by hand.

Water supplies, like the sewerage systems, belonged either to the local soviet or to specific industrial enterprises. In most cities the municipal systems were based on older, sometimes pre-revolutionary systems installed in town centers which had expanded outwards as cities grew. Many enterprise systems served not just their own factories, but also the workers' settlements where the bulk of their workers would have lived, even if these were not geographically contiguous with the factory's own territory. There were, however, cases where factories had water supply only for their own internal use, and did not supply domestic water to surrounding residential districts. Not all factories, however, had their own systems, but took water from the municipal supply. One other point to stress here is that in the Soviet Union to have water supply did not necessarily mean to have indoor running water. The Soviet health authorities considered a population to have access to a water supply if they could take water from street pumps served by a central supply, whether municipal or industrial.

It is important to keep all of this in mind when we consider the different aspects of water supply, of which I can identify at least four.

First, there was the problem of access. Even if you lived in a building that had domestic water supply, the odds were very small that you had indoor running water. You had to draw water from an outdoor pump. If you lived in one of the small private wooden dwelling ubiquitous in Soviet cities of this time your chances of having indoor plumbing were microscopic.

Secondly, there was the problem of the safety of water supplies. In the first instance this relied on adequate sewage and water treatment. Where sewage and waste water are discharged into rivers or lakes ideally they should go through a full cycle of treatment: filtering, sedimentation, and chlorination to remove biological hazards, and coagulation to neutralize chemical pollutants. In theory this should render waterways safe to use, but under Soviet conditions this was not so. Even where a local authority or a factory put their waste water through full treatment before discharge, there were so many other polluters dumping untreated wastes into the same body of water, be it a river, lake, or reservoir, that local water supplies still needed to purify the water to make it safe to drink, a task that many found it difficult to do adequately. When, as discussed in Chapter 1, towns and factories discharged untreated sewage into local waterways, this placed greater pressure on the capacity of water purification works, which could only rarely put water through a full cycle of treatment before delivering it to the local population. In most cases, as we shall see, they simply chlorinated it. Inadequate sewerage systems therefore posed a serious threat to water safety for town populations and for people living in towns and settlements downstream from these discharge points.

Where towns took their water from open bodies of water, that is, rivers, lakes, or ponds, it was equally important to maintain strict protection zones around pumping stations and intake points. This meant guarding them from outside intruders and locating them well away from human settlements, especially anywhere with livestock, as the animals could render a lake or pond unusable.[8] Even something as seemingly innocent as a summer Pioneer camp along a river bank or the shores of a pond could pose a danger if it was too near an intake.[9]

Thirdly, it follows from this that, just as each town was a potential perpetrator, it was also a victim, because its own water sources were being polluted by the discharges from communities and factories located upstream.

Finally, even where water could be treated for sewage, there was the ever-growing menace of chemical pollution, which by the end of the late Stalin period was overwhelming waterways, rendering large stretches of them unusable, and exceeding the limited ability of local treatment works to neutralize the toxins through coagulation.

All four of these problems were closely interrelated. It is impossible to discuss the provision of water supply in a city or town without also discussing the pollution that was going into its local water sources. For this reason I present the material on a region-by-region basis. I begin by describing the state of water supply in the different hinterland regions, beginning with Moscow and Moscow oblast', and then moving eastward through Central Russia, the Volga region, and the Urals and Western Siberia. The final part of the chapter focuses on the Stalinist regime's belated attempts to regain control over river pollution both before and after the war, and analyzes the reasons for its repeated failure.

Urban water supply

Urban water supplies outside Moscow were almost universally poor. Even where the majority of a town's population was served by a central supply, authorities found it difficult ensuring its safety. Unlike sewerage systems, which tended to improve over time, the pressure on water supplies actually worsened. One reason was the increase in the urban population – already inadequate systems had to serve ever-larger numbers

8 GARF, f. A-482, op. 47, d. 4960, l. 31. The example is from Chelyabinsk city in 1946.
9 GARF, f. A-482, op. 47, d. 4925, l. 154, 162 (Ivanovo, 1946).

of people. Another was the rapid growth of industrial production over the course of the postwar reconstruction. This affected water in two ways. First, the more industrial production grew, the more water factories consumed for their own internal use and the greater became the competition between factories and people for this scarce resource. Secondly, the increase in industrial production meant more pollutants being discharged into the bodies of water from which towns took their domestic supply. As a rule, the construction of treatment works could not keep pace with the ever-larger volumes of pollution in the water that they had to process.

One of the striking features of the accounts that follow is how little they differed from early postwar Ukraine, where systems had suffered massive damage during the German occupation and subsequent fighting. The postwar years saw a concerted effort to repair and restore water supplies and treatment works in all Ukraine's major cities, including Kiev, Khar'kov, Zaporozh'e, and the Donbass. During 1947 the urban population received nearly 20 percent more water from water supply systems than it had in 1946; further progress was made during 1948. For all this, water problems remained severe. Per capita consumption could vary from as much as 150 liters per day in some (but only some) districts of Zaporozh'e, to as little as 10 liters a day in cities of the Donbass. During the summer of 1948, people living on the upper floors of houses in Khar'kov had water only at night. That same year there were districts of Dnepropetrovsk where the mains system did not work at all and residents had to draw water from wells. In L'vov the water was turned on only at certain times in the day. Supply, however, was only part of the problem. In every town it was difficult to carry out adequate purification because of undercapacity of filter beds, shortages of chemicals (chlorine and coagulants), and even the incompetent design and manufacture of chlorination equipment.[10] Further inspection, however, shows that even in Ukraine the results of wartime neglect and destruction were compounded by deeper structural problems. This was especially the case in the Donbass, where forced industrialization had taken little account of the region's geological limitations and poor endowment with powerfully flowing rivers. Coal mining is a high water-consuming industry, and so the mines were competing with their workers for water resources. Already in 1938 the Donbass had a shortage of drinking water of some 19 million cubic meters; by the outbreak of war in June 1941, the shortfall had grown by a staggering 42 percent, to 27 million cubic meters. It was not surprising then that, even several years after the war, workers' families in

[10] GARF, f. 9226, op. 1, d. 838, l. 67–83, and d. 924, l. 60–80.

Voroshilovgrad might go several days at a time without drinking water, or stand in long queues at street pumps in the summer.[11]

All this suggests that war damage and neglect explain only some features of local water supplies. The main defects were in the planning of systems, inadequate investment in upkeep and expansion, and chronic shortages of equipment, material, and chemicals. These were defects which all systems shared in common, whether or not they had endured wartime destruction.

Moscow and Moscow oblast'

Relative to other Soviet cities, the water supply for Moscow's residents was reasonably good. Already by 1946, all of Moscow, save for the three outlying districts of Sokol'niki, Timiryazev, and Shcherbakov, where people had to boil water drawn from wells, took water from the city's own central supply. The water came from three main sources: the Moscow River; the Moscow–Volga Canal; and the Yauza River basin around Mytishchi in Moscow oblast'. The water from the Moscow River and the Moscow–Volga Canal went through full treatment, although the GSI complained that coagulation, needed to remove chemical pollutants and solid particles, was done only during the floods caused by the spring thaw.[12] The Moscow–Volga Canal presented a special problem, because pollution from river traffic had worsened dramatically since June 1941. Bacterial contamination ranged from 10 to 100 times prewar levels, depending on which stretch of water was being measured, and in July 1947 contamination around Rechnoi Vokzal (the main riverboat terminal in the north of the city) was on the order of *1,000* times higher. Since the GSI found it almost impossible to impose any kind of enforcement regime to halt the pollution, everything depended on proper treatment.[13]

As already noted, roughly a third of Moscow's population had no indoor plumbing and took its water from outdoor pumps. The horrendous toil this imposed in terms of fetching and carrying was exacerbated by the fact that the pumps tended to freeze up in winter whenever the pressure dropped, as it frequently did, forcing residents to traipse a kilometer or more to fetch water from somewhere else. By 1951, although the proportion of residents still relying on outdoor pumps seems to have

[11] GARF, f. 9226, op. 1, d. 779, l. 23–35ob., 72–5, and d. 924, l. 57–9. Voroshilovgrad (which became modern-day Lugansk) was a large city. There were other mining towns where in the summer of 1948 workers at times had to wait weeks for drinking water to be available.

[12] GARF, f. A-482, op. 47, d. 4941, l. 110–16.

[13] GARF, f. 9226, op. 1, d. 1010, l. 18–21.

remained more or less the same, the irregularities in supply appear to have ceased. Water treatment, too, seems to have become more reliable, with the addition of a new temporary treatment station on the Klyaz'ma Reservoir.[14] The modernization of Moscow did not, however, come without its problems. By the early 1950s the rapid increase in water consumption was overtaxing the system. Districts with older conduits, some of them thirty to sixty years old, were breaking down with increasing frequency, demanding sometimes major excavation work to make the repairs. The other main problem was water pressure. As the city began building high-rise buildings over five stories tall, the city's pumping stations could not provide adequate pressure to allow the water to reach the upper floors. In nearly two-thirds of the city pressure was insufficient go above the fifth floor.[15]

These problems were relatively minor compared to those in Moscow oblast'. When the war ended all fifty-eight of its towns and cities possessed a central water supply, provided either by the local soviet, by local industrial enterprises, or by a combination of the two. A handful of towns on the outskirts of Moscow (Perovo, Mytishchi, Kuntsevo, Babushkin, and Tushino) took their water from Moscow city. The area was therefore not badly provided for by its prewar infrastructure. The latter, however, had suffered serious decline during the war. Pumping stations did not have spare parts; they experienced long interruptions in their electricity supply; and they lacked trained technical staff to provide proper upkeep and maintenance. Street pumps were in a poor state of repair. Some of the largest industrial towns (Shchelkovo, Lyubertsy, Orekhovo-Zuevo) from time to time lost their supply completely, and there was not a single oblast' town where at least some street pumps did not go out of action. Had this weakened infrastructure relied solely on the oblast's heavily polluted rivers, this might have led to a sanitary disaster. Fortunately this was not the case. Only two towns (Stupino and Krasnozavodsk) took their water from rivers; the rest (except for the ones that obtained their water from Moscow) drew their water from artesian springs and wells, where the water was so pure that it did not need purification, even with chlorine. The main difficulties, therefore, were access and reliability of supply, not its biological safety. The years following the war saw considerable progress in repairing, restoring, and

[14] GARF, f. A-482, op. 47, d. 4941, l. 117, 117ob., 119; op. 49, d. 3249, l. 3, 4, 27.

[15] The city tried to solve the problem by building small local pumping stations, each serving a small number of buildings. By 1953 there were more than 1,000 of these, but the experiment failed because the city could not hire enough qualified workers to run them. The focus then shifted to larger, neighborhood-wide pumping stations: GARF, f. A-482, op. 49, d. 7373, l. 133–133ob.

expanding town and enterprise water supplies – although this restoration of capacity merely kept pace with population growth. The percentage of the population with access to water supply (as opposed to drawing water from wells) was the same on January 1, 1948, as it had been two years earlier: 64 percent. Average per capita daily consumption had risen by 10 percent, and stood at 68 liters per head, the same as equivalent German towns forty years earlier.[16]

The great exception to this pattern were the coal mining communities. In every respect, living conditions in the Greater Moscow coal fields were among the worst in the country, and deteriorated further after the war. Beginning in the second half of 1945, the coal mines saw a massive influx of new labor power, primarily repatriates and other indentured laborers. The mines had dormitory space for only 10 percent of the new arrivals; the rest were crammed into whatever space could be found. No additional sanitary infrastructure had been prepared either, including access to drinking water. In 1945 half the mines were able to take water from relatively safe artesian springs, but this had already fallen to 40 percent just a year later. The rest took water from unsafe wells. Some mines did not have even these, and workers had to use mine water for washing and drinking. By the end of 1949 some improvement had been made, most notably in Stalinogorsk, which completed construction of a municipal water supply, but on the whole mining towns remained short of drinking water.[17]

The truly intractable problem in Moscow oblast' was the pollution of its waterways, a phenomenon which also illustrates the nature of its political relationship with Moscow city. Neither the city nor the oblast' was able to cope with the huge amounts of sewage generated by their populations. There were a number of oblast' towns situated along the Moscow River, upstream from the capital, and whatever efforts were made to clean up the river and control pollution were concentrated here, in order to protect the water sources of the capital itself. This effort was sufficiently successful that the SES in 1953 could claim that, at its point of entry into Moscow, the Moscow River was "a conditionally clean" river.[18] As the Moscow River left Moscow, however, the story was rather different. Each and every day Moscow discharged 500,000 cubic meters of untreated domestic and industrial waste into the Moscow River and its various tributaries, including the Yauza. This figure remained virtually unchanged up to the early

16 GARF, f. 9226, op. 1, d. 691, l. 109–14; GARF, f. A-482, op. 47, d. 6347, l. 38.
17 GARF, f. 9226, op. 1, d. 691, l. 73–4, 118; GARF, f. A-482, op. 47, d. 4937, l. 14–15, and op. 49, d. 103, l. 14–15.
18 GARF, f. A-482, op. 49, d. 7373, l. 139.

1950s.[19] After flowing through Moscow, the Moscow River was once again badly polluted by both human and chemical waste, and by some measurements was only slightly cleaner than raw sewage. Ammonia levels were vastly in excess of the concentrations that would kill fish, and there were times of the year when the water as it left Moscow was almost totally depleted of oxygen. At its exit point the river also contained relatively high numbers of fecal bacteria – this was particularly alarming since samples from the river in the north of the city, where it was "conditionally clean," had already found large numbers of typhoid and paratyphoid bacteria.[20]

All of this waste entered Moscow oblast' downstream from Moscow, to the south of the city. The oblast' towns and factories then supplemented it with another 350,000 cubic meters: 150,000 cubic meters of chemical pollutants and 200,000 cubic meters of untreated sewage. Many of the pollutants were highly toxic, including arsenic, sulfuric acid, iron salts, phenols, and oil. To this was added untreated infectious material from several oblast' hospitals.[21] Equally important was the fact that this situation did not improve over time. On the contrary, it became increasingly worse. By January 1950, the pollution from the oblast' itself had grown by some 15 percent, to 400,000 cubic meters a day, all on top of the 500,000 cubic meters still coming from Moscow city. The list of pollutants was both long and daunting; what follows is only a very small sample:

19 GARF, f. 9226, op. 1, d. 691, l. 130, 139; GARF, f. A-482, op. 49, d. 103, l. 26–7.

20 GARF, f. A-482, op. 49, d. 7373, l. 139; Irina Mikhailovna Belova, "Eksperimental'nye issledovaniya effektivnosti biologicheskoi ochistki bytovykh stochnykh vod ot vozbuditelei kishechnykh infektsii" (Candidate of Medical Sciences Dissertation, Moscow, 1953), pp. 79–85, 106. What Soviet and contemporary Russian biologists call the "*E. coli* titer" is known elsewhere as the coliform index. It measures the number of intestinal bacteria in a milliliter of water. It is, in fact, a poor test because, while it suggests the probable presence of fecal contamination, it is otherwise not very precise. Water authorities use it because it is prohibitively expensive and impractical to test for every possible pathogen in water, and the presence of fecal matter can mean that the water also contains other pathogens (other bacteria, protozoa, viruses) that can be extremely dangerous. Hence the relevance of Belova's finding of typhoid bacteria in what should have been clean river water. The current limit allowed by the United States Environmental Protection Agency is zero *E. coli* per ml of water. US cities with populations of over 2.5 million people have to test their water 400 times a month, and if more than 5 percent of samples show contamination water companies must report this to state health authorities and to the public. Raw sewage being processed at an aeration station in the north of Moscow recorded between 71,000 and 200,000 *E. coli* per milliliter of water. In the north of the city the Moscow River contained between 0.01 and 25 *E. coli* per ml. By the time the Moscow River left the city in the south it contained 25,000 *E. coli* per ml. This was far below the levels of raw sewage, but immeasurably greater than modern-day standards. The latter are given on the United States Environmental Protection Agency webpage, "Total Coliform Rule": www.epa.gov/safewater/disinfection/tcr/basicinformation.html.

21 GARF, f. 9226, op. 1, d. 691, l. 130–5, 139–40.

- The Shchelkovo chemical combine dumped over a ton of arsenic a day into the Klyaz'ma River, together with a "huge quantity" of sulfuric acid and other chemicals which, in the words of the GSI, "overwhelmed the normal life" of the river for a distance of 10 km downstream.
- The oil refinery in Ukhtomskii district (which later became Lyubertsy district) each day discharged into the Moscow River "tons of petroleum" (over and above several thousand cubic meters of untreated sewage), which rendered the river completely unusable over a distance of several kilometers. The water surface was covered with a thick film of oil, the river bed had become black with sludge, and fish had died off.
- The Karbolit factory dumped so much carbolic acid and formalin into the Klyaz'ma that the smell was present in the water supply of Vladimir, over 150 km away.
- The dyes discharged by the melange yarn combine in Egor'evsk into its local river, the Guslanka, killed off fish over a distance of 10 km downstream.
- The Kolomna locomotive works dumped each day into the Moscow River "up to" 17,000 cubic meters of toxic chemicals, including cyanide compounds, lead, and chromium salts.

In total, 90 percent of the industrial and domestic wastes discharged into the oblast' rivers and their tributaries went untreated. The Klyaz'ma, as noted, carried its pollution all the way to Vladimir. The Moscow River flowed south, carrying its pollution into the Oka at Kolomna, and the Oka was said to remain polluted at least 40 km further downstream, as it made its way southeast toward Ryazan'.[22] But let us bear in mind the above-noted fact that most Moscow oblast' towns did not take their water from these rivers. They were thus saved from their own pollution. Instead, they were passing on their problem to somebody else – in fact, to a lot of somebodies else.

Central Russia (1): Gor'kii and Gor'kii oblast'

From Ryazan', the Oka veers east-southeast, and then northeast into Gor'kii oblast' and on to Gor'kii, where it formed one of that city's two water sources, the other being the Volga. The Gor'kii water supply covered almost 100 percent of the population, except for a few outer districts which took their water from wells. Less than a third of the population, however, had indoor running water. Everyone else had to rely on water

[22] GARF, f. A-482, op. 47, d. 4937, l. 35, and op. 49, d. 103, l. 20–7.

pumps in streets and courtyards. Ten of the city's eleven districts were fed by a municipal system; the other system belonged to the Molotov motor vehicle works, which supplied the Avtozavodskii district, in which the factory was located. Both systems had filtering stations, but they did not work properly. One, built only in 1928, had "defects" in its design and construction; the others were old installations that badly needed major overhaul and modernization. The water taken from the Volga was deemed to be especially hazardous; the Oka less so, although it was coming under increasing threat from raw sewage discharged by the neighboring city of Dzerzhinsk, whose discharge point was, incredibly enough, located inside the protection zone of Gor'kii's water supply.[23] We shall return to Dzerzhinsk and Gor'kii oblast' in a moment.

What is most instructive about Gor'kii, however, is that the quality of the city's water deteriorated over time, for two reasons. First, the city's filter stations encountered ever more severe technical problems and, secondly, the Oka and the Volga were becoming more polluted. As of the end of 1951, the main water intake serving two major pumping stations in Avtozavodskii district (one belonging to the motor vehicle works, the other to the municipal system) had gone completely out of service. The stations therefore began to take their water from a water supply intended strictly for industrial purposes because of its unsafe quality (the water was heavily polluted by storm runoffs and raw sewage), but they could give it only partial treatment. The filters did not have regulating instruments; the chlorination units did not have spare parts; and they could carry out coagulation only during the spring floods because of a shortage of coagulant. Other stations in the city faced the exact same problems, but produced even worse results than in Avtozavodskii district because the water they were trying to purify was even more heavily contaminated. One filter station had thirty-five outbreaks of bacterial contamination during 1951; another had seventy-four. Despite extensive work undertaken during the early 1950s – replacing filters, extending the network of water pipes, and major reconstruction work at one of the city's filter stations – the overall impact was minimal. Only two of Gor'kii's smaller filter stations were able to carry out continuous coagulation; its two largest stations still coagulated only during the spring floods. The general state of the city's water supply remained "completely unsatisfactory."[24]

Gor'kii oblast', as discussed in Chapter 1, had one reasonably large city, Dzerzhinsk, and a host of small industrial towns of around

[23] GARF, f. 9226, op. 1, d. 798, l. 28ob.–31; GARF, f. A-482, op. 47, d. 7656, l. 60.
[24] GARF, f. A-482, op. 49, d. 3240, l. 8–11, 20, and d. 8857, l. 5–7. The latter report covers the period up to January 1955.

20,000–50,000 inhabitants each.[25] Its water supplies were a patchwork of systems provided by local soviets and industrial enterprises. In most towns the enterprise systems played the dominant role, and the quality varied from one to another, depending on the nature of the nearby water sources, what type of pollution the factories themselves produced, and the willingness of their parent industrial ministries to finance improvements. Dzerzhinsk, for example, had six supplies, one municipal and five belonging either to factories or the railways. The municipal system drew water from boreholes and had no treatment plant – just a chlorination unit which, as of the end of 1947, was still awaiting final assembly. Most of the time the water met minimum standards for bacterial contamination, but not always, since the chlorination came to a halt whenever the electricity supply failed. Some of the factory and railway systems functioned reasonably well: at a minimum they chlorinated their water, and at least one other was able to supplement this with sedimentation tanks and fast-acting filters. Two of the five, however, could not treat their water: one (the Zavodstroi industrial construction organization) because it had no chlorination plant, the other (the Rulon factory) because both its chlorination and filtration plants were so dilapidated that water treatment had no effect on the water's final quality. It was not until 1954 that the municipal water supply began systematic chlorination. By that year the other systems in Dzerzhinsk were meeting state quality standards, but only thanks to ongoing trouble-shooting and more or less constant emergency repairs. The city still suffered from shortages of coagulants (thus limiting its ability to counteract chemical pollution), and the volume of water now requiring purification was outstripping the capacity of the various treatment works.[26]

Water supply in the smaller towns revealed no common pattern. The systems in Bogorodsk and Pavlovo (both towns of around 28,000–29,000 people) covered virtually their entire populations, and the quality met minimal safety standards. The capacity of their systems was so limited, however, that they could provide only small amounts of water: 33 liters a day per person in Bogorodsk, and just 28 liters a day in Pavlovo. The greatest problem area was the workers' settlement belonging to the Zhdanov factory in Pavlovo, which came under the Ministry of the Motor Vehicle and Tractor Industry. The factory had a water supply, but its network of pipe was for all intents and purposes unusable, and the water quality was poor, being polluted by a nearby petroleum storage depot and the town's heavy atmospheric pollution. Its workers lived "in the most

[25] See Table I.2.
[26] GARF, f. A-482, op. 47, d. 6335, l. 41, 43, 77; op. 47, d. 7656, l. 55; op. 49, d. 8835, l. 15–17.

adverse conditions when it comes to being provided by drinking water." Correction of these problems required substantial investment, but the factory's parent ministry refused to provide any funds. Balakhna (with a population in 1948 of around 53,000) had no central water supply, but drew water from each of the factories that dominated its economy: the paper combine, a cardboard factory, and a local power station. Per capita daily supply in Balakhna was much better than in Bogorodsk or Pavlovo – between 50 and 60 liters a day. Despite the fact that the sources of its three water supplies were heavily polluted, the treatment works were able to provide water of adequate quality. The town of Arzamas told a different story still. The town took its water from three sources, a borehole, a drainage basin known as the "Wet Ravine," and the Tesha River. The water in the Tesha was of such poor quality that it could be used only for industrial purposes, and even then only in emergencies. The town chlorinated its water, but the chlorination unit suffered from extensive wear and tear. In all, the population received water only during certain hours of the day and only 30 liters a day per person. A dry summer in 1948 brought an acute water crisis to the town. Its main source of water, the Wet Ravine, dried up, and the water from the Tesha was unsafe to use, even by Soviet standards. They coped in the short term by tapping into temporary underground water sources and setting up an emergency coagulation unit to decontaminate water from the Tesha, and at the same time set about constructing a new reservoir. By the end of 1948 the reservoir was completed and supplies from then on were adequate. These reports all date from 1947 and 1948. Later reports are less detailed, and in some places internally contradictory. The 1954 Gor'kii oblast' report, for example, in one place claimed that the overall state of water supplies in the oblast' towns required "root-and-branch improvement," was allegedly endangering the health of town populations, and was actually placing an obstacle on further housing construction, since the SES would not authorize the inhabiting of new residential buildings if they did not have water supply. Just a few pages later, however, it said that most urban water supplies were "in a satisfactory state," although there was still a problem obtaining coagulants.[27]

One possible reason for this ambiguity was that assessments of water supplies were looking at both the quality and safety of water for domestic use (drinking and washing) and the pollution going into the country's rivers. Of the two, it was river pollution that consistently attracted the greatest concern, far more so than the state of the population's drinking

[27] GARF, f. A-482, op. 47, d. 6335, l. 31, 32, 34, 36–41, 43, 45–8, 77 (1947); d. 7656, l. 54–5 (1948); op. 49, d. 8835, l. 6, 15 (1954).

water. Gor'kii oblast' was home to a vast range of industries. Paper, chemicals, building materials, agricultural machinery, iron and steel, electric power, food, and light industries all had enterprises there, and most were located on, or very near, open bodies of water, ranging from the Volga and the Oka, to smaller tributaries (the Ryazanka, Arzinka, and Chugunka being the most important). Irrespective of the diversity of what they produced or where they were located, they all had one thing in common: they dumped their waste waters either totally untreated, or treated only in rudimentary and unsatisfactory fashion.[28]

Let us start with Dzerzhinsk. The city was located on the Oka, not far from Gor'kii. Its most important industry was chemicals. Its largest chemical works was the Kalinin Chernorechensk Chemical Combine, whose existence was so secret that the GSI reports (which themselves were classified documents) could refer to it only obliquely. In 1946 it discharged an average of 85,000 cubic meters of waste waters a day into the Oka, including 34 tons of chloride salts and 42.5 tons of sulfates. The factory had no treatment facility whatsoever. By 1947 the volume of discharges had risen by 35 percent, to 115,000 cubic meters a day. The other chemical plants in Dzerzhinsk contributed smaller, but still considerable amounts to the overall pollution – in 1946 their combined discharges came to 60,000 cubic meters a day. The Oka was a powerful river, and according to the Soviet theory of "self-cleaning" that was then dominant, it should have been able to cope with this kind of pollution.[29] The fact is, however, that it could not. If in 1946 sanitary experts raised the alarm that the number of fish in the Oka below Dzerzhinsk was sharply declining, by 1947 they claimed that fishing in the river had virtually ceased. In some ways this seemed more alarming than the fact that the pollution from Dzerzhinsk was also threatening the water supply of Gor'kii city.[30]

Outside Dzerzhinsk the industry that attracted the most attention was paper. Balakhna, as noted, had its paper combine and cardboard factory; there was another cardboard factory in the town of Kalinin. The main pollutant from the Balakhna paper combine was wood fiber, and it had already proved a serious source of worry before the war, when it had rendered the Volga unusable as a source of clean water by the population living in settlements along its banks. The pollution had been so severe that the rather limited treatment works in Gor'kii and other nearby Volga towns had been unable to cope with it. Moreover, the scale of the

[28] GARF, f. A-482, op. 47, d. 6335, l. 65.
[29] On the Soviet concept of "self-cleaning" see pp. 118–19.
[30] GARF, f. A-482, op. 47, d. 4914, l. 107–8, and d. 6335, l. 71–2.

pollution caused by the combine was daunting. It left a layer of minute fiber particles several centimeters thick on the river bed, and extended over a distance of 100 to 200 kilometers downstream. The major impact was on fish, since fish are especially vulnerable to cellulose fibers. Every year prior to 1941 there were mass fish kills along the Volga and its tributaries, and the GSI warned that the fishing industry that depended on these rivers was on the brink of ruin.[31] By the postwar period the factory had started to provide some treatment of its wastes, but the overall volume was so great that even after trapping roughly 70 percent of the fibers it still discharged some 30 tons of it, together with 500 cubic meters of sulfite ash, into the Volga each and every day. In the area around the factory the Volga remained unusable for drinking water. The pollution extended several tens of kilometers downstream – not on the scale of the prewar pollution, but a large stretch of the river nonetheless. The cardboard factory, located seven kilometers downstream from the paper combine, found it difficult to purify enough Volga water for the domestic use of its workers, thanks to the volume of cellulose fiber in the river. It was no longer possible to fish along this part of the Volga, primarily because of massive growth of the fungus, *Leptomitus lacteus*. The cardboard factory itself added to the pollution, as it discharged into the Volga 10,000 cubic meters of waste water per day – far less than the paper combine, but all of it completely untreated. The cardboard factory in Kalinin was a relatively small enterprise, but it fed into a similarly small river, the Vol, which the GSI characterized as "a bedraggled tributary" of the River Vetluga. The weak flow of the Vol meant that it was totally unable to dilute or wash away the pollution. On the contrary, it had become "putrid, with a dark color," almost totally devoid of fauna, with fish able to survive only in its lower reaches.[32]

The Vetluga had other small tributaries that were equally in peril and perilous in turn. Again, the problem lay in relatively small factories which, however, produced highly toxic discharges. A tar factory along the Belen'kaya, for example, released only 1.5 cubic meters of waste water an hour, but this contained an array of organic compounds, including acetone, methylated spirit, phenols, and tar, which turned the bed and both banks of the Belen'kaya totally black, while the water itself was brown and covered in a chemical film. All this ran into the Vetluga.[33]

The town of Bor was home to the Maksim Gor'kii glass factory. The town of Vyksa was the site of an iron and steel works. What linked them

[31] GARF, f. A-482, op. 47, d. 157, l. 94–5.
[32] GARF, f. A-482, op. 47, d. 4914, l. 105–6, and d. 6335, l. 66.
[33] GARF, f. A-482, op. 47, d. 6335, l. 67.

was the pollution from their gas generators. The process of gas generation produced chemicals which, even in small quantities, were highly toxic: phenol compounds, tars and resins, and acetic acid. Both factories discharged their waste water not into the Volga (at least not directly), but into lakes or ponds with underground connections to the Volga. The lakes and ponds had become "dead" bodies of water. The local pond at Vyksa had a number of population settlements on its banks, but the water was so poisoned that no one could use it. The pollution from the Bor glass works was said to have killed off fish along the Volga over a stretch of 20 kilometers.[34]

Finally, there was the damage done by food processing and leather tanneries. The oblast' had a number of starch factories, which operated only for three months of the year following the potato harvest, that is, from October to December. These months saw massive fish kills, and the water was so contaminated that no livestock could drink it. Even more damaging were the leather factories, which released lime, fleece, bristle, sodium chloride, soda ash, hydrochloric acid, and sulfuric acid. These went into the Ryazanka River and, although they caused only "occasional" fish kills, they had destroyed all crustacean life.[35]

The above data are all from 1946 and 1947. Over the next seven years both the Oka and Volga saw considerable improvement, insofar as the SES now claimed that water samples only "sometimes" exceeded permitted limits of pollutants. In addition to the above-noted range of toxins, however, they now detected lead and cyanide (although they could find no obvious source for the latter). The main difficulty was the continued slow pace of construction of waste treatment plants. The Balakhna paper combine, the Bor glass works, and the chemical plants in Dzerzhinsk still had not gone past the design stage. Neither they nor any of the other large enterprises in the oblast' still without treatment works had begun actual construction during 1954, a full seven and one-half years after a decree of May 1947, which ordered urgent construction of waste treatment plants at all industrial enterprises.[36] What of those factories that had done something in this interval? The main progress had been in the leather factories at Bogorodsk. They now had equipment that removed anywhere from 50 to 90 percent of their waste products,

[34] GARF, f. A-482, op. 47, d. 4914, l. 111–12, and d. 6335, l. 70.

[35] GARF, f. A-482, op. 47, d. 6335, l. 68–70. Crustaceans are more sensitive to pollution than fish, and are the first to die off when levels of toxins in the water begin to rise. Like canaries in coal mining, their disappearance is a warning signal that the situation is already potentially dangerous.

[36] I discuss the decree and its non-implementation in detail on pp. 116–24.

yet they were still discharging effluent containing fats, chromium, sulfates, dyes, and calcium.[37]

Central Russia (2): Yaroslavl' and Ivanovo oblasti

By the time the Volga River reached Gor'kii it would already have been polluted by the industrial regions further north, most prominently the industries of Yaroslavl' oblast'. Like neighboring Ivanovo oblast', it was heavily dependent on textile production, but, as noted in Chapter 1, it also had a chemical industry, several defense plants, a small engineering sector, petroleum refining and storage, and food processing. Its main city, Yaroslavl', is an interesting case study because its industrial layout was such that it did not just compromise the water quality of towns and communities down river, but was in effect poisoning itself with its own industrial wastes and its own sewage.

In 1946 Yaroslavl' had fifteen different water supplies, one belonging to the city itself, and fourteen enterprise systems. Eight of these fifteen supplies took their water from open bodies of water; seven drew water from artesian wells. Around 20 percent of residential dwellings (but probably a larger percentage of the population) had indoor running water; the rest had to use outdoor water pumps. The safety of the water supply was threatened from a number of sources. One was the fact that the city discharged all its raw sewage untreated into the Volga at a point still within the city limits, and below which lay a number of factories that used the river for their own water requirements. Another was the extremely unfortunate location along the Volga of the intake point for the municipal water supply. Most Soviet cities made at least some attempt to draw their water upstream from major pollution discharges, but the Yaroslavl' supply took water downstream from a number of large industrial enterprises: a chemical works, a blacking factory, a defense plant, and a petroleum refinery. Since the original water supply dated back to the nineteenth century, it was no doubt Soviet officials who had decided to locate these factories up river from the city's water supply, without any regard for the implications this might have had for public health. The safety of the drinking water therefore depended exclusively on the capacity of the city's water purification plants. However, owing to the advanced age of the system's network of pipe and the general inability of its purification works to cope with the volume of pollution in the water, the chemical properties of the water following treatment differed little from the polluted

[37] GARF, f. A-482, op. 49, d. 8835, l. 7–8.

water in the Volga itself. Matters were even worse with the fourteen smaller enterprise supplies, only two of which were able to put water through a reasonably full cycle of treatment. Of the other twelve, eleven had no treatment plant at all, and one had only sedimentation tanks. Six of these twelve systems carried out basic disinfection via chlorination; the other six did nothing at all. This means that none of them took any steps to neutralize chemical contaminants through coagulation.[38]

This same general arrangement, where upstream polluters degraded the water for users down river, was reproduced in microcosm by many of the city's factories. The Krasnyi Pereval textile mill, for example, took its water downstream from the fecal discharges of a number of blocks of flats, a hospital, and a wharf. It had only "primitive" chlorination equipment to try to deal with this, and some 90 percent of its pipe was beyond repair and needed replacement. The Krasnyi Perekop textile mill took water not from the Volga, but the Kotorosl', which was polluted by logs being floated down river. Although it managed to discharge its own wastes and those of its workers' settlement downstream from the collection point of its water supply, these wastes in turn poisoned the water supply of a large settlement of railway workers, the city's main railway station, and one of its polyclinics.[39]

As in Gor'kii, the situation in Yaroslavl' worsened over time. The 1951 SES report described the area along the Volga where the city's sewage collector disgorged its wastes as thick with sediment and bubbling with gases. It also added three further factories to the list of those polluting the Volga up river from the city: an asbestos factory, a tire factory, and a factory making rubber technical goods. Whereas in 1948 100 percent of all water samples taken from the Volga had been free of chemical odors, now nearly three-quarters failed, most of them due to traces of petroleum products. One-quarter of samples failed tests for color, although this was actually a significant improvement over past years.[40] Most important, the city's treatment facilities could not deal with the demands now being made on the system. They resolved this contradiction by curtailing the time spent in sedimentation tanks and filtration. More water was being coagulated, but still during less than half the year. The worst levels of water quality were recorded during the spring and fall floods and in the summer, when inadequate chlorination imposed a real health hazard.

38 GARF, f. 9226, op. 1, d. 745, l. 60–1, 88–9; GARF, f. A-482, op. 47, d. 6367, l. 23, and op. 49, d. 3236, l. 28.
39 GARF, f. 9226, op. 1, d. 745, l. 67–8, 70; GARF, f. A-482, op. 47, d. 6367, l. 26–7.
40 Color can indicate various sources of possible contamination, including fecal waste, decaying vegetation or other organic matter, or chemical contaminants.

Enterprise-run water supplies were even worse, as water shortages forced at least two of them to start giving unchlorinated, industrial-grade water to domestic users. Bacterial contamination reached a point where the SES had to intervene and arrange for emergency chlorination units to be set up.[41]

Only three cities in Ivanovo oblast' had centralized water supplies: Ivanovo, Shua, and Kineshma. The rest relied on limited municipal and enterprise systems or, as in Vichuga, almost exclusively on wells. Yet even the centralized systems did not provide universal coverage. Nearly half of Ivanovo residents depended on wells (47 percent in 1946, and still 44 percent in 1950), and right after the war leaks were so bad that both factories and the small number of residential buildings with indoor plumbing rarely had water above the second floor. The system in Kineshma also did not reach everybody – there were districts in the town without even wells, and people had to draw water from open bodies of water or so-called random springs (*sluchainye klyuchi*).[42]

Water quality was a persistent problem from the end of the war right up to the time of Stalin's death. During the early postwar period the water quality of the Ivanovo municipal system was on the whole satisfactory, although in outlying districts one in seven samples was tainted with bacteria and showed chlorine residues too low to maintain safety. Nor was the quality of the wells reliable, as they routinely showed high levels of acidity and chemical pollution from chlorides, ammonia, and nitrates. By the 1950s the city was coagulating its water, but only during the spring and autumn. Coagulation in the winter was impossible because the chemicals were stored in an unheated warehouse and froze solid. In 1954 around 8 percent of laboratory tests showed high *E. coli* counts, although the SES maintained that the number of contaminated samples taken from the taps in its own building was much higher, an anomaly they attributed to the dilapidated state of the local pipework and frequent blockages in the sewerage system.[43]

Bacterial and chemical contamination in other textile towns in the oblast' was more serious. The water supply in Kineshma was affected by pollution from a textile combine lying some 8 kilometers upstream, in the town of Navoloki. In 1946 the combine agreed to build a sewerage system and waste treatment plant, but work was due to begin only in 1948 and to be completed only in 1950. It was not until 1951 that Kineshma itself had a properly functioning treatment works, but this

[41] GARF, f. A-482, op. 49, d. 3236, l. 15–19, 28.
[42] GARF, f. A-482, op. 47, d. 4925, l. 163, 176; op. 49, d. 1610, l. 6, 9–10; d. 8836, l. 8.
[43] GARF, f. A-482, op. 47, d. 4925, l. 163, 176–7; op. 49, d. 1610, l. 8; d. 8836, l. 3.

was only for the municipal system; enterprise systems were still delivering poor-quality water at least until the mid-1950s.[44] In Shua the main threat was chemical rather than bacterial contamination. Already in 1950 the color index of Shua's water was exceeding permitted limits, indicating pollution from a number of possible sources: fecal waste, humus from soil or peat bogs, and industrial chemicals. Water quality could be restored only through filtration and coagulation, but the town's filters were old and overtaxed, and as of 1954 the town still did not coagulate its water.[45]

Worse still was the situation in Furmanov. The town did not have its own municipal water supply, but relied on those of two local textile plants. These in turn drew their water from artesian wells. The water was polluted and had required chlorination since before the war, but the results of the chlorination had never been satisfactory. In 1954, the deterioration in quality received considerable assistance from the managements of both factories. Their water storage tanks, which held the recently chlorinated water, were sited too low to deliver water into the water supply system with adequate pressure. The factories decided to "solve" the problem by simply bypassing the tanks and sending the water from the chlorination units directly into a network of dirty pipe which promptly repolluted it. The result was an outbreak of typhoid fever in January 1955, which at least had the salutary effect of prompting the SES to investigate the causes of the outbreak, thereby discovering what the factories had done. If this was not bad enough, the town also had what in Russian was known as a "technical" water supply, that is, water of such poor quality that it was suitable for industrial use only. Yet water from this supply – which came originally from the polluted local river, the Shachi – was being fed into a number of residential buildings and the city bathhouse. The only way to render the water potable was to put it through "intensive" chlorination – but the amount of chlorine needed was so great that it itself made the water unfit to drink. By this time it had become obvious that Furmanov would have to construct a municipal water supply covering the entire town. Even after Stalin's death, however, this was easier said than done. Even if the work had begun in 1955 the town would not have had a reliable supply of clean water until 1958 – but work could not begin in 1955, since Moscow would not issue any funds.[46]

[44] GARF, f. A-482, op. 47, d. 4925, l. 155–6, 166–8; op. 49, d. 1610, l. 9; d. 8836, l. 5–6.

[45] GARF, f. A-482, op. 49, d. 1610, l. 8–9, and d. 8836, l. 4.

[46] GARF, f. A-482, op. 47, d. 4925, l. 168, and op. 49, d. 8836, l. 6–7. This type of contamination was by no means uncommon. An unidentified factory in either textiles or light industry had an outbreak of dysentery in 1948 because the water pressure was

The Volga region: Kazan' and Kuibyshev

From Gor'kii the Volga travels eastward toward Kazan', where it makes a sharp turn and heads south through Vladimir Lenin's birthplace of Ul'yanovsk (now reverted back to its pre-Revolution name of Simbirsk) and Kuibyshev (Samara), before making its long journey down through Southern Russia past Stalingrad (Volgograd), and then emptying into the Caspian Sea. The Volga was not yet the cocktail of toxins it was to become in the 1980s, when the untreated discharges from over 200 large industrial installations, dozens of towns and cities, and the chemical and manure run-offs from agriculture made a large, though perhaps unquantifiable, contribution toward halving the Caspian sturgeon catch between 1974 and 1987.[47] The problems of postwar Kazan' and Kuibyshev were on a far more modest scale: how to supply their populations with adequate quantities of water that contained a minimum of biological and chemical hazards.

Kazan' is of particular interest, because by the end of the late Stalin period it appears to have been one of the few cities that was able to put its domestic water supply through a full cycle of treatment and purification, and yet still could not satisfy the needs of its populace. The improvement in water quality had been an event of relatively recent vintage. During the war the city, like everywhere else, suffered serious water shortages, being able to meet only around 70 percent of the already reduced wartime allocation. Much of the network of water pipe was made of wood and was decaying. The resultant leaks caused water pressure to drop, and this

too low to raise potable drinking water to the top floors. Workers on these floors, where temperatures were especially high, being unable to access clean drinking water, took water from the "technical" supply, which was contaminated with dysentery: Yu. I. Guseva, F. L. Vil'shanskaya, L. K. Kas'yanova, and R. M. Vorobeichikova, "Epidemiologicheskie osobennosti smeshannykh kishechnykh infektsii vodnogo proiskhozhdeniya," in Krestovnikovaya, ed., *Voprosy*, pp. 21–5. A similar outbreak occurred at another (unnamed) factory in light industry in 1951. Here the factory had located the tank with its "technical" supply above the tank holding its clean drinking water. When the top tank overflowed, it contaminated the drinking water tank underneath – a tank which also supplied drinking water to part of the local municipal supply. How the "technical" supply became contaminated with dysentery is not clear, but once it did it spread the bacteria to the drinking water, causing a number of infections: Zhdanova, "Epidemiologiya," p. 28.

47 According to Murray Feshbach and Alfred Friendly, the Caspian was the recipient of 40 million tons of polluted waste water, over a quarter of all the wastes produced in a year over the whole of the USSR. Much of this came from the Caspian oil fields; the rest came from the Volga. In 1988 there were eighty-two mass fish kills along the length of the Volga. Residues of copper compounds around Ivanovsk, near Volgograd, in 1989 averaged 36 times permitted concentrations (at one point peaking at 294 times the allowable limit); concentrations of petroleum and its byproducts at Tutaev, near Gor'kii, reached 1,320 times the permitted maximum: Feshbach and Friendly, *Ecocide in the USSR: Health and Nature Under Siege* (London: Aurum Press, 1992), pp. 120–1.

in turn created major health risks, as people began to draw unsafe water from manholes. As a result of this, one of the city's districts had an outbreak of typhoid fever during April 1943. Even without the leaks, the population was not well served. The city had just 104 street pumps. This was a very small number for a city of this size, and each pump had to service a very large area. This would have been of no small consequence during the war, when the diet was inadequate and the need to fetch and haul water over long distances placed an avoidable strain on people's limited energy reserves. To make matters worse, the pumps frequently went out of action – around 20 percent were broken down at one point or another during 1943 – but the city did not have enough maintenance workers to repair them. Interruptions to electricity supplies would bring pumping stations to a halt, leaving parts of the city without water. The impact of these factors can be gauged by the extremely low figures of per capita daily consumption: from an already meager 36.5 liters per day in 1941, it dropped to 23.5 liters in 1942, before recovering back to 30.5 liters in 1943 and 35.0 liters in 1944.[48] These were desperately low figures.

By 1953 the city had three well-equipped water supplies: the municipal supply, which took its water from underground sources, and two enterprise supplies, which drew water from the Volga. The enterprise systems were a rarity in this period, in that they had all the equipment and chemicals they needed, including fast-acting filters, an automated coagulation system with ample supplies of coagulants, and enough chloride of lime and chlorine to put the water through two stages of chlorination. The underground sources which fed the municipal system were already pure and did not need further treatment. The stumbling block remained capacity. The total capacity of the system was insufficient to meet the needs of both industry and people. Industry sucked up the lion's share – 86 percent – leaving just 14 percent for the general population, or a per capita daily average of just 30 liters. This was the same as in 1943, and considerably less than what people had had in 1941 and 1944.[49]

In terms of quality, there were two blots on the landscape. One was the poor color index of the water in the Volga around one of the water supplies. The SES blamed the factory – a military factory designated simply as Post Box No. 747 – while a committee of scientific experts perhaps conveniently determined that the culprit was the high peat content of the Rybinsk Sea, a vast manmade reservoir which flows into the Volga above Yaroslavl', some 750 kilometers from Kazan'. The other was

48 GARF, f. A-482, op. 47, d. 1418, l. 7, 7ob., 8, and d. 2328, l. 90–1.
49 GARF, f. A-482, op. 49, d. 7324, l. 120–2.

the still poor quality of the water from artesian wells, which continued to show high bacteria counts, not least because of contamination from a local meat processing plant, which was dumping its untreated wastes into a nearby lake.[50] On the whole, however, Kazan' probably had better water quality than the majority of cities and towns in this study.

Kuibyshev presents a somewhat different picture, because, unlike the other major cities in this study, its evolution as a major industrial center was due to the war itself. If cities such as Moscow, Gor'kii, Kazan', Sverdlovsk, and even Chelyabinsk had much older industrial histories, and yet still found their sanitary infrastructures overwhelmed by rapid population growth, this must have been all the more true of Kuibyshev. Whether its problems differed fundamentally from those in other towns is hard to assess, but problems there certainly were. As with other cities, its water supply suffered ongoing shortages of chlorine and coagulant, and *E. coli* levels in the city's reservoir rose, although rarely to concentrations high enough to pose a major health risk. The main difficulty was keeping up the network of water pumps. In 1943, half the pumps in building courtyards were out of service, but an acute labor shortage made it impossible to have them repaired; maintenance of street pumps, to which people would have turned as an alternative, was, however, better. The other great problem was a more or less constant fuel shortage. There were times during 1943 when there was no fuel in the city at all, and during the winter of 1943–1944 the water and sewerage pipes in buildings with indoor plumbing and drainage froze up. The labor shortage also affected water treatment. A treatment plant in the city's Bezymyanka district, where most of the city's defense factories were located, stopped work because it had no trained staff; all wastes then ran untreated into the Samarka River. The city had also wanted to erect a local factory to supply it with coagulants, but this, too, had to go on hold because there were no workers to build it.[51]

In the postwar period the water supply noticeably improved. In 1947, 95 percent of the city's population, including the Bezymyanka industrial district, had access to water supply, either through street and courtyard pumps, or through residential hookups, of which by 1951 there were some 2,600. Thus only 5 percent relied on wells, the state of which was generally unsatisfactory. Aside from their poor physical condition, the spring floods would inundate them with untreated water from the Volga and the Samarka, and the resulting bacterial and chemical contamination made them unfit to use. The bacteriological quality of the drinking water from

[50] GARF, f. A-482, op. 49, d. 7324, l. 122–4.
[51] GARF, f. A-482, op. 47, d. 1414, l. 48ob., 49.

the water supply, however, was acceptable. Chemical pollution was a different matter. The water showed high oxidizability, indicating the significant presence of chemical contaminants, and the city did not have adequate supplies of coagulant to bring it down to permitted limits.[52]

This points to another difficulty the system faced, maintaining adequate capacity. On paper the water supply gave some 70 liters a day to each resident, and this rose to 80 liters by 1951, but over half of this went to industry. The root of the problem was somewhat complex, lying in a combination of the city's poor waste and sewage removal, the limited physical capacity of its water treatment plants, and the lack of a regular supplier of coagulant. Kuibyshev had two pumping stations. One took water from the Volga, which it had to purify for both bacterial and chemical pollution; the other took water from groundwater. Let us begin with the latter. The groundwater was by nature clean, although it was exceptionally hard, the implications of which we return to in a moment. This pumping station, which supplied less than a quarter of the city's water, was located in the city center along the Volga, above an underground current. The soil above this current was highly porous and therefore vulnerable to contamination, most notably from sewage seeping into the soil – itself the product of the city's inability to organize adequate and regular cleaning of streets and courtyards. Therefore the groundwater required year-round chlorination, because the originally clean water was being contaminated by the city's own excrement. The pumping station that used Volga water faced a different set of problems. In order to meet overall demand it had to process between 110,000 and 130,000 cubic meters of water each day. In fact, it could purify only 80,000 cubic meters; it had to make up the difference by mixing the Volga water with groundwater. This raised the hardness of the water to very high levels – between 140 and 250 mg of calcium per liter of water,[53] which, although not a

52 GARF, f. A-482, op. 52s, d. 224, l. 81–3; op. 49, d. 3243, l. 8, 9.

53 Water hardness is currently measured in terms of milligrams of calcium or magnesium salts per liter of water. Soft water contains less than 60 mg per liter; very hard water contains over 180 mg per liter. Like a number of countries, notably France and Germany, the Soviet Union used a system of measuring hardness in degrees (Russia now uses moles per cubic meter). The French and German scales differed, in that one French degree was equivalent to 4 mg/liter; one German degree was equivalent to 7.1 mg/liter. There was also a scale measuring "general degrees of hardness," where one degree was equivalent to 10 mg of calcium oxide per liter. It is not clear from the GSI reports which of these scales they were using. The groundwater in Kuibyshev had a hardness of 50°; that mixed with Volga water had a hardness of 35°. On the French scale the Volga/groundwater mixture would have contained 140 mg of calcium carbonate per liter of water; on the German scale it would have contained 250 mg per liter. On the General Degrees of Hardness scale, it would have contained 350 mg of calcium oxide per liter. The Volga water was safe to use on its own only during the winter, when the river froze over and the water became totally clear.

hazard to people, would have caused water pipes, boilers, and other industrial equipment to become clogged with limescale. The potential damage could be considerable. In theory the station could have used more Volga water if it had had a regular supply of coagulant. When and if the city resolved this bottleneck the reports do not tell us. We only know that it persisted up to the beginning of 1952.[54]

One new problem did emerge in Kuibyshev during the postwar years. In 1945 the city acquired an oil refinery, which each day dumped 25,000 cubic meters of liquid wastes into a network of rivers that passed through flood plains, and eventually emptied into the Volga. These small streams soon became badly polluted, and by 1951 all flora and fauna had disappeared. The refinery's "solution" to this disaster was to build a new sewerage system that would bypass the flood plains and discharge its wastes directly into the Volga. The SES clearly thought the idea was insane. Without the installation of equipment to trap and neutralize all the wastes, they foresaw a serious threat to the Volga.[55] Their fears, of course, were to come true, although just how true would become evident only several decades later.

The Urals and Western Siberia

Of all the regions in this study, perhaps none shows the link between water supply and river pollution more clearly than the Urals and Western Siberia. The four industrial oblasti of Sverdlovsk, Chelyabinsk, Molotov, and Kemerovo oblast', together with the regional metropolises, Sverdlovsk, Chelyabinsk, and Molotov cities, were of central strategic importance to Soviet industry. They were also areas of rapid population growth. In 1951, they accounted for around 15 percent of the entire urban population of the RSFSR, but over 19 percent of all live births.[56] As we shall see in Chapter 5, they accounted for an even higher percentage of the RSFSR's urban infant mortality, a direct reflection of their slow pace of sanitary reform. Although the destruction of their rivers and waterways did not achieve the notoriety of the Volga, the Aral Sea, Lake Baikal, or the Dnepr, the great rivers of the Urals and Western Siberia – the Kama, the Chusovaya, the Iset', the Tagil, the Ural, and the Tom',

[54] GARF, f. A-482, op. 52s, d. 224, l. 79–82; op. 49, d. 3243, l. 7.
[55] GARF, f. A-482, op. 49, d. 3243, l. 17–18.
[56] Population figures are from *Naselenie SSSR 1987* (Moscow, 1987), pp. 16, 21–2, and GARF, f. A-374, op. 34, d. 1540, l. 82, 83, 84, 84ob. Live births are from GARF, f. A-374, op. 14, d. 1702, l. 11, 19.

among others – were to play a not inconsequential role in the USSR's environmental degradation.

From the point of view of water resources, the Urals had a number of locational and hydrological disadvantages. Many of its large industrial centers (Sverdlovsk, Chelyabinsk, Nizhnii Tagil, Zlatoust, and Serov, among others) were badly located from the point of view of the efficient organization of water supplies. Many of them were sited along the upper reaches of Urals rivers. The flow rate of some of these rivers was slow, making it more difficult to dilute untreated discharges of sewage and industrial wastes. Given these conditions, the organization of adequate water supplies would have required special hydrological planning and investment. Stalinist industrialization, however, had a different logic. It placed exclusive emphasis on the development of large-scale industry at the expense of the water infrastructure. In fact, the Urals in the 1930s became an archetypical example of Stalinism's essential planlessness.[57] In a region where the use and development of water resources required careful long-term planning and coordination between localities and between industrial commissariats, each commissariat instead set out on its own autonomous course, taking no account whatsoever of the overall short- and long-term needs of the region.[58] In doing so, as we shall see, they eventually undermined the integrity of the water supplies needed by their own factories.

Let us begin with the oblast' centers, Sverdlovsk, Chelyabinsk, and Molotov. Sverdlovsk built its first water supply only in 1924. Initially it relied on groundwater, but by the start of the First Five-Year Plan this was already inadequate, and the city began to take water from the Verkh-Isetskii Pond. At the time the pond was relatively clean, because it lay upstream from the city along the main river, the Iset'. The water supply underwent two further phases of expansion before the war; additional work had been planned for 1942 but the war prevented its completion. The large industrial enterprises, such as the Uralmash heavy engineering works and the Urals Chemical Engineering Factory (Uralkhimmashzavod) had their own water supplies. The Uralmash system must have been comparable in scale to those in many small towns, and would have exceeded them in water quality. It provided water not just for its factory buildings and the "socialist city" that housed its workers, but also to some of Sverdlovsk's other large enterprises. Already by 1945, the Verkh-Isetskii Pond had been compromised as a water source, since it had become badly polluted by the city's railway sorting yard. As a result, the

[57] For elaboration of this concept, see this chapter, pp. 105–6, and Conclusion, pp. 343–51.
[58] GARF, f. A-482, op. 47, d. 157, l. 45–6.

various supplies had to begin mixing pond water with water from the Chusovaya, a river which was itself to become a poisonous cauldron. In terms of scope, in 1945, around 70 percent of Sverdlovsk's population took water from any of the water supplies, but this had already fallen to around 60 percent by 1947, with an even smaller percentage (around 25 percent) having domestic hookups and indoor running water. The rest of the population had to use wells of questionable safety. Yet the main problem in Sverdlovsk was not so much the safety of the drinking water as the sheer inability of its systems to cope with demand. In 1945 the city system could only pass about two-thirds of the water it supplied through filtration beds; the rest, along with that of most of the enterprise systems, was simply chlorinated. By 1947 the city faced severe shortages of water. Pressure was so low that water would not reach the top floors of buildings; but the problem also affected outdoor pumps, and there were districts where residents could draw water from the pumps only between four and five o'clock in the morning. The age of the pipe, combined with unspecified abuse by the public, meant a number of pumps were always out of action; repairs were slow and often shoddily done, so that the pumps might break down again just a few days after they had been fixed. Another difficulty was that factories were competing with the population for the same water. Instead of having their own supplies of "industrial grade" water, they were drawing water from the city system. This was water that had already been purified, but the factories were then taking it, repolluting it, and sending it back again for repurification.[59]

A very similar picture emerges from the reports on Chelyabinsk. Considering the speed with which the city had mushroomed into a major industrial city during World War II, the catastrophic state of its housing and sewerage systems, and the amount of raw sewage regularly dumped into its local river, the Miass, its water supply seems to have coped surprisingly well. In terms of coverage, the system of pipe extended almost throughout the city, and in theory could supply water to between 80 and 100 percent of the population, depending on the district – although few people actually had running water in their apartments. In reality, however, access fell far short of this. The number of outdoor pumps was woefully inadequate and, as in Sverdlovsk, these pumps were frequently broken. There were several parts of the town where people had to use untreated water directly from the Miass (a highly perilous undertaking) or from wells, or had to walk to pumps in other parts of town. For all these problems, however, the water quality in 1946 was

[59] GARF, f. A-482, op. 47, d. 3443, l. 58–62, and d. 6358, l. 4–6.

adequate. By 1951 the shortages had certainly not improved and may even have become worse. One of the three main enterprise-run water supplies was able to supply water only four or five hours a day in the summer time, but in fact the entire city suffered water shortages in hot weather. On the whole, however, the water from the city and the principal enterprise systems was still safe to drink, largely thanks to repair and renovation of the treatment works. The same was not true, however, of the large number of wells. These were badly polluted with ammonium chloride, nitrous and nitric acids, and *E. coli*. The sanitary inspectors had to organize street committees to clean and chlorinate the wells, and where this was not possible they did it themselves.[60]

Turning finally to Molotov, the city's main districts relied on a large system built in 1936, which took its water from the Kama River, plus two local systems, each of which served a specific district. At the far end of the city, away from the major industrial areas, there was an old municipal system which relied on groundwater, the quality of which was good enough to require no purification. In general the population was not well served: only around 40 percent of residents could take water from these various supplies, although average daily consumption had increased from a very low 39.5 liters per person in 1941 to 60 liters by 1945. The other 60 percent of the population had to use wells but, as in other towns I have discussed, the wells were polluted and inadequately cleaned. As in Yaroslavl', the location of the pumping stations for the Kama River system was catastrophic: they were actually inside the grounds of the giant Molotov engineering works, a major defense enterprise, which discharged all of its fecal and chemical wastes untreated into the Kama, just above the location of the pumping stations. But this was not all. The factory's gas generator station had a major construction defect, as a result of which two or three times a year it poured large amounts of resins into the river, causing the city's drinking water to smell of chlorophenol for a week or two afterwards. Nor was the Molotov factory the only polluter. Further upstream from the pumping stations were a chemical plant, an iron and steel works, coke-oven products factories, and a petroleum depot, all of which dumped their wastes into the Kama. So polluted was the Kama River that the GSI report commented wryly that its water "was like a very complex chemical solution which, as they say, 'contains the entire Mendeleev system.'" Incredibly, the actual water supplied into the pipes and street pumps was of satisfactory quality, mainly because, almost uniquely among industrial towns (Kazan' was another exception), it

[60] GARF, f. A-482, op. 47, d. 4960, l. 30–7, and op. 49, d. 3261, l. 11–14.

went through a full cycle of treatment: chlorination, sedimentation, filter beds, and coagulation. This in turn was due to the fortuitous fact that Molotov was one of the few cities to have sufficient supplies of coagulant, as one of its chemical works produced ferrous hydroxide as a byproduct of making sulfuric acid.[61]

All this was to change over the ensuing years. In quantitative terms coverage shrank: in 1951, it extended to 35 percent of Molotov's population, versus 40 percent in 1945. This was to rise to 60 percent by 1954, but only at the expense of a deterioration in water quality. The local supply in the Kirov district went to the expense and effort of purifying its water but then mixed it with untreated water set aside for industrial use. One military factory which relied on this system was taking the untreated water from the Kirov substation, rather than the treated water, for its living quarters, hospital, and dining room. Elsewhere in the city, high-quality groundwater was contaminated by the poor condition of the pipe and street pumps. At the Molotov works there was an outbreak of dysentery in 1951, brought about when a cooling pipe running through a tank of boiled drinking water sprang a leak and contaminated the tank. As diverse as they were, all of these examples had one thing in common: they took water that had been intrinsically clean, either through treatment or because it came from a pure source, and turned it into a health hazard. In such circumstances it might even have seemed a blessing that such a small proportion of the city's residents took their water from a water supply, were it not for the fact that the safety of the city's wells was even worse than it had been in 1945, with 99 percent of samples failing to meet minimum standards for drinking water.[62]

By 1954 the situation had changed dramatically for the worse. There were a number of reasons for this. Up to this time the city had relied on treating the water at the intake point for its main supply, rather than curbing the original sources of the pollution by reducing and/or decontaminating the discharges from the city's factories. Thus the Kama River supply – the most important in the city – was having to deal with untreated discharges from no fewer than twenty-eight different large-scale enterprises, sixteen of which released their waste water directly into the Kama, with the remaining twelve discharging into its tributaries. The pollutants included dyes, phenols, chlorides, nitrates, petroleum residues, chromium, tin, lead, and cyanide compounds. It was only in 1953 that the

[61] GARF, f. A-482, op. 47, d. 3431, l. 11–18; the quotation is from l. 12. Dmitrii Mendeleev is credited with creating the first periodic table; the implication here is that a wide range of chemicals was present.

[62] GARF, f. A-482, op. 49, d. 3250, l. 10–20, and op. 52s, d. 309, l. 15, 22ob.

City Executive Committee approved plans to build treatment works at twelve of the city's industrial enterprises (that is, at fewer than half of the main sources of pollution), but as of 1954 only two of these had actually started any construction work. The city now faced a major water crisis. Since the early 1950s it had already had to cut back on the process of coagulation. Although in the early postwar years it coagulated regularly, from 1951 onward it did so only during the spring and summer, mainly because the ferrous hydroxide they used as the coagulant proved ineffective in hard water at very cold temperatures, especially when, as it turned out here, it was also of poor quality. The only way that the city could have brought the water back to acceptable standards would have been to halve the amount of water treated at the pumping station. The dilemma was clear cut: the city had managed to extend water supply to 60 percent of its population, but the quality of the water was substandard; it could provide clean water only by dramatically reducing the amount of water available.[63]

As difficult as the situation may have been in the large Urals cities, it was in the towns and cities of the oblasti that the real environmental and public health crisis was taking shape. In Kemerovo oblast' only one town, Gur'evsk, took its water from good-quality groundwater. Every other town and city drew water from rivers polluted by industrial wastes "of the most diverse character and to the most diverse degree."[64] Stalinsk, Prokop'evsk, and Kemerovo depended on the River Tom'. Stalinsk and Prokop'evsk both took their water from a point on the river polluted by runoffs from coal mines upstream around Osinniki. The Tom' at Kemerovo was polluted by discharges from the coke-oven factories in Stalinsk. Osinniki in turn took water from a tributary of the Tom', the Kondoma, which was polluted by iron ore workings located upriver. The other major towns – Leninsk-Kuznetsk, Anzhero-Sudzhensk, Kiselevsk – relied on other rivers, all of which were polluted by nearby coal mines. What made the situation worse was that none of the municipalities except Kemerovo controlled their own water supplies: all relied on industrial enterprises and mining trusts, for which production was their first priority, and which "only due to extreme necessity" began to provide water to their local populations. This created two problems. First, the mines and factories took the lion's share of what water was available. Daily per capita consumption in most Kuzbass towns in 1947 was barely more than 30 or 40 liters, and exceeded 60 liters only in Stalinsk. Secondly, they displayed little urgency when it came to making investments to upgrade and extend

[63] GARF, f. A-482, op. 49, d. 8862, l. 9–12, 14, 17, 23–4, 30–4, 36–8.
[64] GARF, f. 9226, op. 1, d. 932, l. 28.

local supplies. Plans to construct a new water supply for the Prokop'evsk–Kiselevsk industrial complex during 1948 never even made it to the design stage: of the 4 million rubles allocated for the project, a munificent 71,000 rubles were actually spent. This was the grandest, but by no means the only, investment project to be stalled because of the indifference of local mining trusts. It left a large number of workers scavenging for water, taking it from puddles and mine runoffs in the summer and melting snow in the winter, or hiking long distances to the nearest pump.[65]

In Sverdlovsk oblast' few urban areas were able to take water from underground sources. They relied heavily on rivers. Most industrial towns – Kushva, Nizhnii Tagil, Karpinsk, Revda and the Revda–Pervoural'sk industrial district, Krasnoural'sk – had water supplies, but these varied considerably in terms of their safety. They were also very limited in scope, and most people had to rely on wells. Krasnoural'sk, for example, was said to have a very good system because it put its water through a full cycle of purification and properly maintained a protection zone around the source of its supply, but the system in fact provided water to less than 10 percent of the local population; everyone else had to use wells. Nizhnii Tagil also took its water from a pure source, and chlorination was sufficient for it to meet safety standards, but only 15 percent of the town's residents had access to it; here, too, most people relied on some seventy-eight wells, the quality of which varied. The other towns in the above list were even less fortunate: they could not provide consistent or adequate chlorination to kill bacteria, much less cope with the increasing amounts of industrial pollution.[66]

The most important rivers in the oblast' were the Chusovaya, the Tagil, the Neiva, the Iset', the Tavda, and the Sos'va, but smaller rivers such as the Tur'ya were to acquire what we might call considerable ecological significance. The Chusovaya flowed westwards from just north of Sverdlovsk over a stretch of 600 km, where it fed into the Kama River, the main waterway in Molotov oblast'. It provided much of the water – both drinking water and water for industry – for the city of Sverdlovsk and for the large number of industrial enterprises located on its shores. At its source it was already polluted by fluorine, sulfuric acid, oil, alkalis, and slag from copper mines, a cryolite factory, and an iron and steel works along two of its tributaries, the Zheleznyanka and the Severushka. As it passed through the area around Revda it picked up more of these same pollutants from the copper mines around Degtyarka, the metallurgical works in Revda itself, and the copper smelting plant in Sredne-Ural'sk.

[65] GARF, f. 9226, op. 1, d. 932, l. 27–39; GARF, f. A-482, op. 47, d. 7659, l. 35–41.
[66] GARF, f. 9226, op. 1, d. 693, l. 55–8, and d. 736, l. 52–4, 57–64, 157–65.

As it flowed further west through Pervoural'sk it acquired chromium salts, phenols, and a wide variety of resins from the Novotrubnyi iron and steel works, a dinas brick factory, and a chemical plant. As impressive as this list is, the early postwar GSI reports were more sanguine about the situation than we might suspect, and pointed to a number of protective measures which at least partially reduced the discharges of phenol and fluorine. They did, however, warn that there were stretches along the river where the contamination was so bad that the water could no longer be used even for industry, much less for people. The same was true of the Tagil, which was already polluted at its starting point by copper, zinc, iron, and various acids. Downstream in the city of Tagil itself, the Nizhnii Tagil coke-oven factory poured phenols, cyanide, ammonia, and rhodium compounds into the river, most of it in the city center, and around 10 percent into a tributary of the Nizhnii Tagil Pond, just upstream from where the town took its drinking water. Aside from the health hazards this may have caused to people, the discharges from the factory were killing off fish and other life over a stretch of 200 to 300 kilometers downstream. Here, too, the GSI noted attempts to capture the toxic metals and neutralize the acids from the copper mines, but these were blocked – as were the measures designed to protect the Chusovaya – by a shortage of lime, needed as a coagulant.[67]

Whatever optimism the GSI may have harbored in 1945 and 1946 had completely disappeared by 1953. The quality of the water supply in Nizhnii Tagil, which the 1946 report had considered to be very good, was now described as "catastrophic," as the pond from which it drew its water was also the receptacle for the industrial wastes of a whole slew of local factories. There were plans to switch to a new water source, but these were going to require massive investment in a bulkhead and a new chlorination plant. The remedial measures along the Chusovaya appear to have come to naught: it was receiving "tens of thousands of cubic meters" a day of copper compounds, iron, phenol, resins, various acids, and other organic compounds. The Tagil was taking in phenol, resins, xanthates, cyanide, and iron. The Iset' continued to be a virtual sewer for the large metallurgical and engineering plants in Sverdlovsk. The Tur'ya, a small river just 70 km long, within just a few years had been turned into a virtual "sewage collector" of the aluminum factory in Bogoslovskii (now the city of Karpinsk), which had come on line after the war. The Bogoslovskii plant also did serious damage to the Sos'va, a river already contaminated

67 GARF, f. 9226, op. 1, d. 693, l. 63–72, and d. 736, l. 72–84. The Chusovaya was the subject of a 1943 order issued by the Council of People's Commissars as well as a 1946 decree of the Council of Ministers.

by gold mines and the iron and steel works in Serov. So concentrated was the pollution in the Sos'va that the electric power station along the river could not use the water in its boilers; nor, in fact, could factories some 800 km away along the Tavda, into which the Sos'va emptied as a tributary. Even more sinister was what happened to the Neiva. This river had long been seriously polluted by copper and ore mines, the Kirovgrad chemical works, and other factories. Even in 1945 the river around Kirovgrad and Belorechka was no longer usable for drinking water. To these pollutants were now added nuclear waste from the uranium enrichment plant at Novoural'sk, known as Sverdlovsk 44.[68]

The situation in Molotov oblast' was in many ways even more unsatisfactory than in Sverdlovsk oblast'. The oblast' had been carved out of Sverdlovsk oblast' before the war, and regime policy had been to focus on building up its industries and exploiting its vast natural resources at the expense of any investment in social infrastructure. It lacked just about everything needed to make life tolerable: housing, paved roads, schools, hospitals, and, not least, adequate sewerage and water supplies. Its main waterway was the Kama River, which, like the rivers elsewhere in the Urals, was very badly polluted. The main culprits were paper mills in Krasnokamsk and Krasnovishersk; chemical works and a paper mill in Solikamsk; more chemical plants and a power station in Berezniki; iron and steel works in Chusovoi, Chermoz, and Dobryanka; two large coal fields around Kizel and Gubakha; and last but not least the chemical and engineering works in Molotov city itself. The paper mills were especially hazardous, because in addition to chemicals they also discharged cellulose fibers which killed off fish by blocking up their gills. The effluent from the soda factory in Berezniki was said to be so toxic that even at dilutions of 500,000 to 1 it was still killing off fish and microorganisms. The fish kills were of some significance, as they jeopardized the oblast' fishing industry – not to mention the risk to anyone who ate those fish that managed to survive.[69]

In 1948 the oblast' contained nineteen towns and cities and thirty-six workers' settlements, some of which were quite large. Although the oblast' boasted forty-four water supplies, the overwhelming majority of these were factory or institutional systems that served their own internal needs

[68] GARF, f. 9226, op. 1, d. 693, l. 69–71, and d. 1249, l. 27–9, 30–1, 33, 47–8, 52–3. Regarding Sverdlovsk 44, the GSI commented cryptically that, in addition to sewage, the factory was discharging "industrial waste waters, the composition of which the Oblast' Sanitary Inspectorate does not know" (*ibid.*, l. 28).

[69] GARF, f. 9226, op. 1, d. 899, l. 56–60, 291–300; GARF, f. A-482, op. 47, d. 6345, l. 255–7. Significantly, the latter report (l. 257) commented only on the economic damage done by the fish kills and not their potential implications for public health.

and did not supply water to the surrounding residential population. A quarter of the factory systems did not give drinking water to their own workers; their water was only for industrial use. In all, only thirteen of the nineteen towns, and eight of the thirty-six workers' settlements had water supply. Across the oblast', a mere 18 percent of its urban population could take water from some form of water system.[70]

The quality of the water coming from these systems was highly unreliable. Only four of the seven municipal systems chlorinated their water. However, in one of these – the system at Chusovoi, home of a large iron and steel works – the chlorination plant broke down in 1941 and was not repaired until six years later, in October 1947; at another, the system in Lys'va, chlorination, which has to be maintained on a constant basis in order to be effective, was frequently interrupted by shortages of chlorinated lime. Two other municipal systems, in Berezniki and Osa, took their water from pure underground sources which required no chlorination, although the Berezniki supply covered only 60 percent of its population, and even then could give them just 40 liters a day. Unlike many localities, however, the wells in Berezniki (which provided for 40 percent of its population) were clean and the water from them met basic safety standards. The quality of the water from the various enterprise supplies was considerably more questionable: only one, in Krasnokamsk, had a modern treatment plant with American fast-acting filters; six others chlorinated their water; the rest did nothing at all. Even Krasnokamsk, which took its water from the Kama River, could not ensure adequate water quality. The effectiveness of the main treatment works was compromised by the high temperature of water taken in from the Zakam thermal-electric power station; a subsidiary supply belonging to the Krasnovishersk paper mill was jeopardized by discharges from a local hospital and a leather processing factory.[71]

Chusovoi is worth further comment, because the health risks there were especially high. The city had both a municipal supply and a supply from the iron and steel works. Until 1948 the iron and steel works did not chlorinate its water at all, despite numerous sources of contamination – including the factory's own discharges – at the part of the Chusovaya River from which it took its water. Repeated demands from the Oblast' GSI that the factory build a chlorination plant met with equally persistent refusals,

[70] GARF, f. 9226, op. 1, d. 899, l. 223, 236, 277. There were seven municipal systems and thirty-seven belonging to enterprises or other public institutions. Of the factory systems, no more than fourteen (six in the larger towns and eight in workers' settlements) provided water to the public.

[71] GARF, f. 9226, op. 1, d. 899, l. 150–2, 226, 238; GARF, f. A-482, op. 47, d. 6345, l. 290, 294.

on the grounds that this would "hinder the technological process." Even when the factory finally relented and built a chlorination facility, its water still led to an outbreak of typhoid fever in 1948. As for the city supply, this had to deal with sewage from a local school, a tuberculosis dispensary, and a nursery, as well as the danger of seepage into the local water supply of waste stored in unsound cesspits at the city's hospital. If we recall that the city's chlorination plant was out of action from 1941 until late 1947, we can readily grasp how serious the threat must have been – reflected officially in the fact that the water from this supply failed to meet state health standards.[72]

We also need to keep in mind that the oblast' had a large coal mining industry, where, like coal mining communities everywhere, the water situation was very serious indeed. The two main mining towns, Kizel and Gubakha, both had water supplies, but neither was of sufficient capacity to meet the needs of the local population. In Gubakha the supplies were contaminated by runoffs from mining communities further upstream along the Kos'va River, yet the water was not chlorinated. Outside Gubakha and Kizel the pressure on water resources was far greater. Only three mines in the town of Kospash provided adequate quantities of drinking water to their settlements. Elsewhere in Kospash workers and their families had to take water from ditches or from melted snow. Nowhere had indoor running water to houses or dormitories – if there was water supply it was available only from outdoor pumps, and was never chlorinated. In Polovinka, another small mining community in the Kizel fields, most mines took water from ponds too polluted to be used for human consumption; other mines had supplies, but these, too, were not chlorinated, despite numerous orders to the mine managements to start doing so.[73]

Finally we turn to Chelyabinsk oblast', and begin with its largest city, Magnitogorsk. Magnitogorsk was one of the grand projects of Stalinist industrialization, being built from almost nothing during the early and middle 1930s. Its focal point was the giant iron and steel works, which provided most of the city's infrastructure, including its main water supply. Water had been a scarce resource from the very beginning, as the city lacked a clean water supply for the whole of the 1930s. Initially it had obtained water by damming the Ural River and creating an artificial lake. The iron and steel combine quickly polluted both the lake and river. Although it eventually acquired some basic processing equipment, several

72 GARF, f. 9226, op. 1, d. 899, l. 155, 229, 236–7.
73 GARF, f. A-482, op. 47, d. 6345, l. 303; GARF, f. 9226, op. 1, d. 899, l. 154, 243–4, 256–7, and d. 900, l. 117–19.

settlements either had no water at all or had to take water from the now badly contaminated Ural. Given the other sanitary shortcomings in the city, the shortage of clean water was a virtual guarantee of periodic epidemics.[74] Given this background it comes as somewhat of a surprise to learn that the main problem in Magnitogorsk during the war was an acute water shortage, but that the quality was good. Shortages were most severe in the summer, when people made heavy use of water for their allotments. Not just drinking water was scarce: the bathhouses and laundries had to endure temporary closures because they did not have enough water to keep running. The one source that might have alleviated the problem, the artificial lake along the Ural, was off limits – it was too polluted with phenols. The city's reservoirs claimed to be free of bacterial contamination, but the same was not true of its street pumps. During spring and summer, particularly during the spring floods, sewage from storm runoffs seeped into the groundwater, and from there into the pumps, which were not hermetically sealed.[75]

If we leap forward a decade we see that by the mid-1950s Magnitogorsk had failed to solve any of its water problems. The extra capacity obtained by tapping into a deep underground source in 1951 failed to alleviate the shortage, in large part because the iron and steel combine and the city's other factories were gluttonously lapping up water at the expense of the population. Meanwhile, they continued to despoil the combine's "factory pond" (the artificial lake discussed by Steven Kotkin) and the city's reservoirs, both of which were receptacles of untreated sewage and industrial discharges from a range of residential settlements and industrial enterprises. A number of factories had equipment designed to neutralize acids and resins or to precipitate out phenols, but they were largely ineffective.[76]

[74] Kotkin, *Magnetic Mountain*, pp. 139–41. Kotkin quotes from the September 14, 1936, issue of the local newspaper, *Magnitogorskii rabochii*: "Right now, all life in the lake is dead – the fish perished and the underwater plants died" (*ibid.*, p. 139).

[75] GARF, f. A-482, op. 47, d. 1415, l. 84ob.–85ob., 94ob. The report makes the cryptic comment that in the winter, when the ground was frozen, "pits" formed around the pumps, and foul water collected in them, causing outbreaks of gastrointestinal illnesses, including forty-seven cases of typhoid fever in one settlement during February 1943. Whether the "pits" were just topological aberrations due to heavy use of the pumps or whether people were using the area around them as makeshift toilets is not clear. As we saw in Chapter 1, the latter was hardly an unknown occurrence.

[76] GARF, f. A-482, op. 49, d. 1628, l. 16–17; d. 8850, l. 9, 17. The situation in Magnitogorsk reached a point of such seriousness that the combine became embroiled in a major confrontation with the All-Union GSI in 1951. For years the combine, which had responsibility for the city's sewerage system, had been in dispute with the GSI over whether or not it had to build a modern waste treatment plant. The combine had been given a deadline to complete the plant by July 1952. It claimed not only that a treatment plant was unnecessary, but also that its design and construction would take at least

The oblast's second largest city was Zlatoust, home of several defense factories and a large iron and steel works. When the war ended Zlatoust had a limited water supply that served 30 percent of its population, a figure that remained unchanged at least until 1950; everyone else had to rely on shallow wells or springs.[77] Its equipment was badly overtaxed. The water supply itself was handling twice the volume of water it had been planned for, and its sewage treatment plant was in such poor condition (it had not had any maintenance since 1932) that it kept going only by working at half-capacity. During the mid-1950s there was some suggestion that there had been improvement in the water supply. The drinking water went through chlorination and coagulation, but the quality of the latter was poor. What saved the situation was the purity of the water in the River Tes'ma, from which the city took its drinking water. Where Zlatoust stood out was in the profligacy with which factories, most notably its defense plants, were polluting its other local river, the Ai. In October 1954 there was a momentary crisis when one of these factories, Post Box No. 36, had discharged petroleum products into the river, and there was a rush to keep the contaminated water from entering the domestic drinking water system until the river could be cleaned up. However, this was clearly not an exceptional case. It was routine for the iron and steel works and the military factories to discharge their untreated wastes into the Ai. Three of these enterprises had begun to build treatment plants, but each of them halted all work in 1952–1953 and consistently resisted pressure from the GSI to resume it.[78]

In fact, the only industrial town in the oblast' that appears to have made progress in the treatment of industrial wastes was Miass. The town had two water supplies, both belonging to large industrial enterprises, the Urals Stalin motor vehicle works – the postwar incarnation of the famous Moscow factory of the same name, evacuated to Miass during

three years and substantially raise the costs of expanding the city's sewerage system. Significantly, the combine appealed not to the GSI, but directly to I. F. Tevosyan, the deputy chair of the USSR Council of Ministers, who passed the matter to T. E. Boldyrev, head of the All-Union GSI. Boldyrev dismissed the combine's protest as groundless and insisted the work be finished more or less on schedule, not least because the existing methods of sewage treatment (filter beds and adsorption) in Magnitogorsk left settlements in the town extremely vulnerable to gastrointestinal infections: GARF, f. 9226, op. 1, d. 1142, l. 45–7. I do not know how this dispute ended, but it is worth pointing out that, until 1950, Magnitogorsk had had one of the highest rates of infant mortality in the RSFSR – roughly 60 percent above the urban RSFSR average. Infant mortality in the city declined substantially after that date. See Table 5.7.

[77] The 1954 report does not give the percentage of the population with water supply. It does note, however, that in that year the iron and steel works mothballed a project to hook up its workers' settlement to the city water supply, even though half the pipework had already been laid: GARF, f. A-482, op. 49, d. 8850, l. 8.

[78] GARF, f. A-482, op. 47, d. 3445, l. 45–6; op. 49, d. 1628, l. 8–9; d. 8850, l. 7–8, 18.

the war – and the Turgoyakskoe ore mine administration. How the ore mines handled their effluents we do not know. Mining generally had an appalling record in this regard, although by the 1950s the GSI was able to give the water supplies of the two coal mining towns in Chelyabinsk oblast', Kopeisk and Korkino, a relatively clean bill of health. The Stalin motor vehicle plant itself produced a daunting list of toxic substances in its liquid wastes: sulphuric and nitric acids, chloride salts, cyanide, thiocyanate, lubricants, and petroleum products. Allegedly it trapped, isolated, or neutralized all of these, and in 1954 completed construction of a new treatment plant. It is worth contrasting this with the experience of the small town of Verkhnii Ufalei, home of a nickel factory and a large iron and steel works (the latter had absorbed the Ekonomaizer factory evacuated from Kiev early in the war). The town lay on the Generalka and Ufalei rivers. Neither the nickel factory nor the iron and steel works had a waste treatment plant, so the two rivers received a cocktail of soda, cobalt, slag, and industrial lubricants, plus the wastes of a local chemical laboratory, the hospital, the bathhouse, the school, and the town's club. The population took its drinking water from these two rivers. There were no treatment works and no plans to build any.[79]

To sum up this section of the chapter, we can say that, while most localities managed to extend the provision of water supply, this barely kept pace with population growth. The real problems, however, were with the pollution of water sources. There was little or no treatment of wastes being discharged into waterways, which placed almost the entire burden for ensuring water safety on the pumping stations at intake points. To some extent the inadequacy of sewerage provision, while it made life in towns extremely difficult, if not dangerous, was helping to protect rivers and lakes by reducing the volume of wastes going into them. There were other dangers here, however, insofar as fecal matter from cesspits or from leaking or overflowing sewers often contaminated otherwise clean groundwater. Looking at sewage contamination of water sources as a whole, the main thing to note is that, as bad as the situation was, there were no outbreaks of major epidemics, although localized outbreaks of dysentery and typhoid were far from uncommon. The greater, if still hidden, danger was from chemical pollution, but the effects of this would not become clear for another two decades.

[79] GARF, f. A-482, op. 49, d. 1628, l. 17–18, 24–5, and d. 8850, l. 8, 9, 16, 18. All was not completely well in Korkino. A new residential settlement, named after Rosa Luxemburg, did not chlorinate its water, and the water consistently failed safety tests. Residents used it anyway: GARF, f. A-482, op. 49, d. 8850, l. 9.

The political economy of river pollution

Earlier in this chapter, when discussing the water supplies in Gor'kii oblast', I noted that pollution from the Balakhna paper combine had already attracted a great deal of attention prior to the war. In fact, by the end of the 1930s the impact that Stalinist industrialization was having on the country's rivers and lakes was causing more widespread concern, way beyond what was happening on this limited stretch of the Volga. Of equal, or perhaps even greater, worry than the danger to human health was the effect of pollution on manufacturing industry and fishing. There was no absence of legislation, either before or after the war, designed to curb hazardous discharges into open bodies of water. The most notable thing about these laws was their utter failure. Factories not only continued to spew hundreds of thousands of tons of pollutants into rivers and lakes but, as postwar industrial recovery advanced, so, too, did the volume of pollution. The failure of the anti-pollution regulations was not, I shall argue, due so much to the obstinacy of enterprise managers or to their desultory enforcement by public health officials (although both were in abundant supply), as to structural obstacles created by the Stalinist economic system itself. This system, like its capitalist alter ego, placed a premium on the self-interest of the individual economic "actor." If under capitalism that premium takes the form of profit and profit maximization, in the USSR it was embodied in gross plan fulfillment by each individual enterprise and by each shop or workshop within the enterprise. The Soviet Union never succeeded in developing a system of planning indicators that would not encourage both managers and workers to alter plans at enterprise or shop level, change the product mix, cut corners, or falsify output reports. If plans were set according to the ruble value of gross output, factories would concentrate on producing only those items with the highest ruble value, at the expense of inexpensive but absolutely essential items such as fastenings (nuts, bolts, screws), spare parts, or inexpensive consumer goods. If the center fixed output targets in terms of physical criteria, for example, by weight, managers concentrated on producing inordinately heavy items, be they steel ingots or large pieces of machinery, and neglected essential but lightweight items that would count little toward plan fulfillment. When plan fulfillment for the production of window glass was set in square meters, glass factories maximized output by producing large amounts of very thin glass – so thin, in fact, that windows shattered as soon as they were installed in new buildings. This shows another aspect of the problem: such methods of plan fulfillment were hugely costly. In the case of glass, the country required an inflated glass making industry because a large percentage of its production capacity had to be devoted to replacing broken window panes and overly fragile drinking glasses. Essentially, whatever criteria the planning authorities dreamed up, enterprises would distort them in order to maximize their results, even if this left the economy with severe shortages of vital equipment and parts.[80] The practical result of this system was that factory managers, shop superintendents, and foremen alike all worked according to the same logic: do whatever you need to do in order to fulfill the plan, irrespective of how the final outcome might prove dysfunctional for the overall economy. Thus Stalinism, no less than capitalism, could not subordinate the behavior of the individual enterprise to the needs of society as a whole, and in fact, did not seek to do so. In short, neither Stalinism nor capitalism could plan.

Looking back at the historical documentation we can now, with hindsight, see in both the pre- and postwar Soviet economy the roots of what Ze'ev Wolfson (writing under the name Boris Komarov) in the 1970s called the destruction of nature in the USSR, and Murray Feshbach and Alfred Friendly termed "ecocide."[81] Both documented the near-terminal evisceration of the Soviet Union's natural resources and its consequences for the state of the country's health. Of course, the damage to the Soviet Union's ecology, including its citizens, involved far more than the poisoning of its waterways. Yet a study of river pollution in the late Stalin period throws considerable light on the events that were to follow. It is true that the rivers I have discussed thus far, or those noted in the rest of this chapter, were not in anywhere near the terminal state they were to achieve under Leonid Brezhnev and Mikhail Gorbachev. If specific stretches of them were polluted, unfit for human use, or even unable to sustain fish, crustaceans, or flora, large parts of them remained clean and perfectly safe. However, the processes that were to lead to the calamity of later decades were already under way. To this extent the early postwar years contain the final outcome in embryonic form, and studying them can tell us a great deal about how and why it happened.

Prewar attempts to control river pollution

By the end of the 1930s, the damage that industrialization was doing to the USSR's rivers and lakes had become impossible to avoid. In May 1937 the regime issued a decree which, in theory, at least, placed severe restrictions

80 For excellent and accessible expositions of this problem see Alec Nove, *The Soviet Economic System* (London: George Allen & Unwin, 1977), pp. 93–99, and Robert G. Kaiser, *Russia: The People and the Power* (London: Secker & Warburg, 1976), pp. 16–18, 319–21.

81 See Boris Komarov [Ze'ev Wolfson], *The Destruction of Nature in the Soviet Union* (London: Pluto Press, 1978), and Feshbach and Friendly, *Ecocide in the USSR*.

on industrial discharges of pollutants. It forbade all enterprises from discharging harmful substances within the sanitary protection zones surrounding water supplies or within the boundaries of populated areas. Enterprises either had to discharge their wastes into urban sewerage systems (where such existed), or build waste treatment plants to neutralize the effluent prior to discharging it into a water course. They were given six years, from 1937 to 1942, to implement these measures.[82] I need to point out here a basic flaw in the decree's logic. Since most Russian cities had either no sewage treatment plants, or plants that could cope with only small volumes of waste, the discharge of factory wastes into urban sewers would not have eased the problems of pollution. To illustrate this point we can take the example of Kazan', where a number of tanning and felting factories, hospitals, public buildings, and workers' settlements discharged untreated or primitively treated wastes into the city's sewerage system. From the point of view of the local population this was certainly beneficial, because it transported the sewage out of the city to discharge points along the Volga and the Kazanka (a tributary that joins the Volga at Kazan') downstream from the city's water supply intake. In other words, it removed the offensive ordure from the city itself and reduced potential seepage into the city's water supply. What it did not do was protect the rivers themselves, which were still receiving large amounts of raw sewage and industrial discharge. From this point of view, a factory connected to the Kazan' sewerage system was little different from the large number of other Kazan' factories which simply released their wastes directly into the Volga, the Kazanka, or Lake Kaban. In fact, so many enterprises were dumping their wastes into the Kazanka (in some cases *upstream* from the city water supply) that it had become impossible to measure the total quantity of the pollution.[83]

I have used Kazan' as an example, but in fact there was nothing special about that city. In the year or so prior to the German invasion, health officials in the RSFSR had become alarmed at the state of Russia's rivers. One river of special concern, naturally enough, was the Volga. Heavy pollution was already noticeable at Yaroslavl', not far from the river's source. Around Gor'kii, the discharges from the Balakhna paper combine were killing off fish, as I have already noted. The Volga and its network of tributaries was not

[82] Decree of TsIK and SNK SSSR, May 17, 1937,"O sanitarnoi okhrane vodoprovodov i istochnikov vodosnabzheniya" (No. 96/834), discussed in E. I. Smirnov, *Meditsina i organizatsiya zdravookhraneniya (1947–1953)* (Moscow, 1989), p. 171. Smirnov does not, however, outline the decree's specific provisions. These I have taken from a draft of a report prepared sometime in early 1941 on the failure to implement it within the RSFSR, in GARF, f. A-482, op. 47, d. 157, l. 96.

[83] GARF, f. A-482, op. 47, d. 157, l. 50–50ob., 52.

alone, however. Chemical pollution was depleting oxygen levels to such an extent that in winter fish were dying of oxygen starvation in the Oka, Klyaz'ma, Northern Donets, Dno, Vyatka, "and other" rivers.[84]

In the Urals the more or less unbridled release of fecal and industrial wastes into the region's rivers – almost all of it without any prior treatment – posed obvious health risks for populations. It also made the Urals a classic illustration of a problem already observed during Britain's industrial revolution: the pollution of rivers by factories lying upstream rendered them unusable even for industrial purposes by factories lying downstream. Urals factories were finding it harder and harder to acquire water of sufficient quality to carry on production, and were going to find it harder still in the future, given the region's rapid industrial development and population growth. So, too, were enterprises in the Kuzbass, further to the east in Western Siberia. The coke-oven products factory in Kemerovo had so polluted the River Tom' that factories located even hundreds of kilometers downstream from Kemerovo could not use its water.[85]

Irrespective of public health issues, it was now obvious that the uncontrolled pollution of Russia's rivers was jeopardizing industrialization, in particular the surge in military investment during the years leading up to June 1941. Yet a review of implementation of the 1937 decree shows two things. First, much of the construction that enterprises were to undertake in order to implement the decree was due for completion only in 1941; another, even larger proportion was scheduled to be finished only in 1942. Thus, even if everything had proceeded trouble-free, the war would have stopped the work dead in its tracks. Secondly, in reality, the work did not proceed trouble-free. There was a whole raft of commissariats and enterprises that had made little or no progress. An analysis of the reasons why progress was so slow is very revealing. It shows, among other things, that we need to analyze water pollution within the larger context of the political economy of the Stalinist system as a whole.

I can illustrate this point by producing a small table, itself adapted from a much larger table and accompanying documentation in one of the GSI archive files. Table 2.1 charts the progress made by seven major industrial

84 GARF, f. A-482, op. 47, d. 157, l. 94–5.

85 GARF, f. A-482, d. 157, l. 45 (Urals); d. 154, l. 92 (Kemerovo). Regarding Britain, Wohl cites this passage from the Royal Commission on River Pollution, in 1867: "Manufacturers pollute the water for each other until the streams have to be abandoned for all but the coarsest purposes of trade, and clean water has to be purchased from waterworks companies, or must be sought at great cost in well-sinking and boring, to which must be added the charges for extra steam-power. In some cases the manufacture and dyeing of finer sorts of goods has been necessarily abandoned" (Wohl, *Endangered Lives*, p. 237).

Table 2.1 *Sewage and waste treatment construction at major industrial enterprises, RSFSR, 1937–1940 (as of March 1941)*

City	Task	Outcome and reasons not fulfilled
Moscow	Hook up a number of railway stations, food processing plants, and some heavy industry enterprises to the city's main sewage collector.	Completed – in fact, completed installation and connection of sixteen units, against a plan of nine.
	Ongoing work on the construction of treatment works at two textile mills feeding into the Rublevskii and Cherepovets water supplies serving Moscow city.	Work due for completion only in 1941, but was behind schedule. Cause not given.
	Ongoing work on treatment facilities at three factories in Mytishchi, in Moscow oblast', but which had a pumping station serving Moscow city.	Work due for completion in 1941 and 1942, but behind schedule. Funds were allocated but had not been fully utilized.
Moscow oblast'	Karbolit factory, Orekhovo-Zuevo, Moscow oblast': construct phenol neutralization plant; construct sewage collector; connect collector to factory sewerage system.	Work on both installations could not be finished because the factory could not obtain essential equipment or building materials and because of changes imposed on the factory's construction plan.
Leningrad	Most scheduled work involved renewing or reconstructing the already existing sewerage system.	Progress unknown.
	Construction and installation of sewerage at several factories not yet joined to the city system.	Still in the design stage – no construction scheduled to begin during 1941.
Sverdlovsk	Verkh-Isetskii iron and steel works: draw up technical designs for sewerage and treatment plant.	No funds allocated.
	Sverdlovsk linen spinning factory: connect the factory to the city sewerage system.	Work completed.
	Polevskii cryolite factory (non-ferrous metallurgy): construct treatment plant.	Work halted due to labor shortage.
	Degtyarka copper mine: construct treatment plant.	Designs approved, but work not yet started, despite being scheduled for completion in 1940.
	Pervoural'sk Novotrubnyi iron and steel works: construct phenol removal installation, to be completed in 1940.	Design approved and building materials for the work allocated, but could not begin work because the construction area still had barracks on it, which could not be removed.

Table 2.1 (*cont.*)

City	Task	Outcome and reasons not fulfilled
	Zyuzel'skie copper mines: complete waste treatment plant by 1940.	Completed and started up a neutralization unit, but had not started work on construction of treatment plant to remove copper from waste water.
	Uralmash factory: complete design work on phenol removal unit and start construction by 1940.	Design work finished and building materials acquired, but start of construction delayed until 1941.
Kemerovo	Coke-oven products factory: build a citywide sewerage system; in conjunction with two other factories, also to build factory sewerage systems and treatment (phenol removal) plants, to neutralize factory wastes before they enter the city system.	Funds allocated for the city system, but no funds allocated for the factory systems or the special treatment plant.
Gor'kii city and Gor'kii oblast'	Gor'kii Motor Vehicle works: build a sewage collector and treatment plant by 1940.	No funds allocated.
	Krasnoe Sormovo heavy engineering factory: connect the factory to the city sewerage system during 1939–1941.	Had used all funds allocated and completed "preparatory" work.
	Balakhna paper combine: construct treatment works to treat both fecal wastes and industrial wastes by 1940.	No funds allocated.
	Balakhna cardboard factory: construct treatment works by 1940.	No funds allocated.
Yaroslavl'	Yaroslavl' motor vehicle works: rebuild sewage collector during 1940.	Work completed.
	Krasnyi Perekop textile factory: connect the factory to the city sewerage system during 1937–1940.	Work completed.
Kazan'	Linen combine: connect the factory to the city sewerage system during 1937–1940.	Could not complete the work because it depended on the prior completion of a sewage collector. Work on the collector had not yet started.

Source: GARF, f. A-482, op. 47, d. 154, l. 1–5, 15–18ob., 64–64ob., 92.

centers (six of the regions in our case study, plus the city of Leningrad) in fulfilling their 1940 targets for constructing sewerage systems and waste treatment installations. It also lists the reasons why these plans went unfulfilled.

Anyone familiar with the system of Stalinist "planning" will recognize the difficulties most of these projects encountered. One was the lack of funds. Because industrial commissariats considered these projects to be of low priority, they would approve them in the plan, and even authorize the design work, but would not allocate funds for the actual construction. A second obstacle was the shortage of building materials and, in one case, also of labor power. A third was the lack of coordination in the "planning" process – the essential planlessness (*besplanovost'*) of the Stalinist economic system. This operated at both macro- and micro-level. Typical of macro-level planlessness was the Urals. The region had no general plan for the utilization of water resources. Each individual commissariat determined the needs of its own enterprises, and these in turn carried out any work – for example, on waste treatment facilities – only to meet their own local needs. There was no attempt to coordinate the work done by one factory with that being done by any other. Where the quest for clean water was concerned, enterprises were in competition with one another, and the success of one district in locating and collecting adequate supplies could leave others with water shortages. As for the discharge of industrial wastes, as we have already seen, there was no coordination of discharge points or waste treatment. One factory's discharges posed a hazard to factories downstream.[86]

A graphic illustration of micro-level planlessness was the Karbolit factory in Orekhovo-Zuevo, in Moscow oblast'. Table 2.1 shows that the factory had two projects to complete: construction of a phenol neutralization unit, to detoxify its high volume of phenol discharges into the Klyaz'ma River; and construction of a factory sewerage system. Work on the phenol removal unit began in 1939, and by 1940 they had finished the construction work and installed much of the equipment. The plant could not actually go into operation, however, because it still lacked some essential equipment: a boiler, a refrigerator, two pumps, and four motors. The *glavk* responsible for supplying this equipment claimed it had no planning authorization to produce or deliver it. As of May 1941 – just a month before the German invasion – the factory had effectively abandoned work on the unit, even though it needed just this small number of items to begin functioning. All the investment in its construction and outfitting had effectively been wasted.[87]

[86] GARF, f. A-482, op. 47, d. 157, l. 46. [87] GARF, f. A-482, op. 47, d. 154, l. 16.

Similar difficulties beset the sewerage system. Construction of the system, and of the pumping station needed to move the sewage from the collector to the sewerage network, had gone relatively smoothly, but then came to a halt because the factory could not obtain the last bits of pipe, a pump, 900 meters of high voltage cable, lubricants, and 150 cubic meters of gravel. However, the factory eventually solved these problems, but with both the materials and the labor power needed to finish the project now on hand, it came up against a new obstacle. It could not extend the sewerage system to include the factory's workers' settlement or essential communal buildings (bathhouse, nursery, and kindergarten) because this required construction of a separate pumping station, which had not been included in the 1941 plan. If this was not bad enough, the Orekhovo-Zuevo City Soviet then stepped in and raised the stakes. They would not allow the factory to begin using its new sewerage system until it had built a new pumping station for the city itself. There was certainly a compelling logic behind the local soviet's stance, because the added sewage coming from the factory very probably would have overtaxed the undoubtedly limited capacity of the city's sewerage system. Whether a justified demand or not, the factory could not carry out this work: it could not lay hold of the cement, the gravel, the timber, the metal, the ruberoid, or a host of other materials needed to build the station, and had no chance of doing so at any time during 1941.[88]

What we see, therefore, is that river pollution in the prewar period had several interlocking causes. One was the weakness of sanitary infrastructure. Few cities had comprehensive sewerage systems, and those that did merely collected the sewage and discharged it downstream, below the point where the town or city took its water supply. There was little or no attempt to treat it prior to discharge. A second was the impact of forced industrialization. The regime devoted all its resources to rapid industrial growth (with a commensurate growth in population centers), but made little or no investment in sanitary infrastructure. The latter simply could not cope with the vast amounts of pollution that factories and urban populations were now generating. Here the Soviet Union presented a picture typical of Britain or Germany in the middle to late nineteenth century. Factories discharged their waste into open waterways without prior treatment, and in so doing created major risks for public health and for industrial production itself. Thirdly, once the regime became alarmed at the problems its own policies had created, it attempted to compel enterprises and their commissariats to install anti-pollution

[88] GARF, f. A-482, op. 47, d. 154, l. 17, 18, 18ob., 64.

equipment – but these attempts largely failed. And this is the most interesting aspect of the problem. The 1937 law had so little effect because it fell victim to the inexorable logic of Stalinist planlessness. Industrial commissariats and enterprises applied the same calculus to waste treatment as they did to investments in labor safety. These were of minor importance compared to the need to meet gross output plans, and so had little or no priority when it came to allocating funds, building materials, equipment, or labor power. Even where a commissariat or enterprise might actually commit resources, as in the case of Karbolit, the whole effort could still turn out to be wasted because they could not acquire the last bits of material or machinery needed to finish the job and allow these installations to go into operation. Truly vast sums of materials and labor time were expended to no practical end, because they produced no usable product. This was a problem endemic to the Stalinist system, and it affected all areas of production. In fact, it was such a commonplace occurrence and such a drag on economic growth that the Soviets created a special word for it: "incompleteness" (*nekomplektnost'*).[89]

Postwar legislation and its evasion

The war, as we know, took a terrible toll on all sanitary infrastructure, including water supplies. In the occupied territories there was widespread damage to pipework, pumping stations, and sewage and water treatment plants. What was not physically destroyed in the fighting decayed due to neglect. In the hinterland regions, as we have seen, infrastructure also suffered through neglect and lack of investment, and from the fact

[89] In part incompleteness was an inevitable result of the chronic shortages that plagued the Soviet economy. It also was a natural byproduct of those aspects of the planning system noted on pp. 105–6. Since the system encouraged factories to concentrate on those items that made it easiest to fulfill its plan, the neglect of useful items, whether fastenings, spare parts, or relatively cheap or lightweight pieces of equipment, often meant that machinery, buildings, and assemblies that depended on these missing products could not be finished. The other aspect of incompleteness was that receiving factories would accept incomplete equipment rather than wait around for the supplier to finish and deliver it. They would rather have a machine with parts missing, which they could then try to manufacture themselves in their own machine shops, than have no machine at all. The problem here was that, as they had no drawings to go on and lacked the right materials, parts made in this way were often defective, and when fitted to the equipment caused it to break down and go out of service, thus negating the potential benefit of having acquired the machinery in the first place. For a general analysis of "incompleteness," see Filtzer, *Soviet Workers and De-Stalinization: The Consolidation of the Modern System of Soviet Production Relations, 1953–1964* (Cambridge: Cambridge University Press, 1992), pp. 162–3. On the calculus of labor safety, see Filtzer, *Soviet Workers and the Collapse of Perestroika: The Soviet Labour Process and Gorbachev's Reforms, 1985–1991* (Cambridge: Cambridge University Press, 1994), chapter 5.

that badly weakened systems had to sustain much larger populations than before. Even if the depreciation of plant and equipment had been less than it was, water quality would still have deteriorated because industry no longer produced the necessary chemicals, instruments, or parts, including water gauges, chlorinators, cylinders for liquid chlorine, taps, valves and stopcocks, water pumps, spare parts for water treatment equipment, and coagulants for decontaminating chemical pollutants.[90] Nor were the shortages simply material. Water supplies, waste treatment, and water purification plants required skilled engineers, technicians, and maintenance staff. Their numbers had fallen during the war, but at least in the early postwar years there was no effort to train their replacements.[91]

The postwar situation was therefore the product of the interaction between structural and conjunctural factors, factors compounded, or rather reproduced on a larger scale, by the renewed emphasis on the rapid restoration and expansion of industrial output at the expense of investment in infrastructure. A draft report by A. Lavrov, a deputy chief sanitary inspector at the All-Union GSI and their expert on water resources, gave a devastating summary of the state of the USSR's water resources as of mid-1947. According to Lavrov, incomplete returns from local GSI inspectors had identified no fewer than 518 large-scale industrial enterprises polluting 155 major bodies of water used for domestic water supplies. These figures excluded pollution of smaller rivers and local lakes and ponds upon which many localities depended – something we have already seen from accounts of the various oblast' industrial towns. Nor did they include pollution from the literally thousands of smaller enterprises that were under republican or local control, and for which no data existed. What officials did know was that there were already cases, most notably in the Donbass, the Urals, and the Krivoi Rog ore mining region in southern Ukraine, where the pollution of certain reservoirs had reached such an extent that it had become necessary to stop using them. All this had come about through industrial expansion, and was pushed further by the war. The war, by displacing industrial activity and population growth to the eastern regions of the USSR, had also spread the geographical range over which this was occurring, heightening the risk to waterways in the Urals, Siberia, the Soviet Far East, Central Asia, and the Caucasus. Although the war had slowed down the rate of pollution in Ukraine and Belorussia, with the postwar reconstruction it had once again picked up pace. Lavrov then produced a list of the waterways and towns

[90] GARF, f. 9226, op. 1, d. 636, l. 50–2. [91] GARF, f. 9226, op. 1, d. 1010, l. 100–1.

suffering major pollution, extracts from which I have used to construct Table 2.2.

Lavrov noted one other legacy of the war. It had brought to a halt all the prewar research into pollution and methods of treating industrial waste. Monitoring and the study of how pollution affected those bodies of water used for domestic water supplies had also stopped. Records were no

Table 2.2 *Rivers and open bodies of water suffering major pollution, May 1947*

Body of water	Areas affected
Central and Northern Russia and the Baltic republics	
Moscow River	From Moscow to where it emptied into the Oka
Moscow–Volga Canal and Klyaz'ma–Khimkii Reservoir	Moscow city and Moscow oblast'
Klyaz'ma River	From Shchelkovo to Vladimir
Uvod' River	Unspecified
Volga River	Areas around Yaroslavl', Gor'kii, Saratov
Oka River	Around Gor'kii and Dzerzhinsk
Izh River	From Izhevsk in Udmurtiya to where it emptied into the Kama River
Northern Dvina River	Around Arkhangel'sk
Baltic Sea	Around the Bay of Finland and the Bay of Riga
Urals and Siberia	
Kama River	Around Berezniki and Molotov city
Chusovaya River	Along the entire river, beginning at its source
Iset' River	From Sverdlovsk down to Kamensk-Ural'skii
Tavda River	Along the entire river
Neiva River	Along the entire river
Tagil River	Along the entire river
Tom' River	Area around Kemerovo
Ob' River	From Novosibirsk to where it emptied into the Tom'
Kazakhstan	
Ural, Irtysh, Ishim, Chirchik, and Salar Rivers	Unspecified
Southern Russia and Ukraine	
Kuban' River	Around Krasnodar
Black Sea	Around Batumi, Tuapse, Poti, Novorossiisk, Sukhomi, Odessa, and the southern shore of the Crimea
Azov Sea	Around Kerch', Taganrog, and Mariupol'
Dnepr River	Around Kiev, Dnepropetrovsk, Dneprodzerzhinsk
Northern Donets River	From Rubezhnoe to where it emptied into the Don
Lugan', Lopan', Kal'mius, Mius, Torets, and Krynka Rivers	Along their entirety

Source: GARF, f. 9226, op. 1, d. 1010, l. 90–2, 102.

longer being kept on what state they were in, the chemical properties of discharges, or how these discharges were affecting them over time.[92]

It was clear that the issue could no longer be ignored, even by industry. In May 1947, almost exactly ten years after the major prewar decree, the regime passed new legislation in an effort to compel industry to curb toxic discharges. Note that the emphasis here was on industrial pollution. The pressing question of how to stop cities and towns from discharging their untreated sewage into open waterways received less attention, at least until the early 1950s. According to the new law, factories were encouraged to reduce the volume of harmful products (including sewage) in their discharges in three main ways. First, improved technology might reduce the number and volume of harmful byproducts of production processes. Secondly, factories might capture more of these byproducts for recycling, primarily through traps and filters. Thirdly, whatever they could not capture they were expected to neutralize in treatment plants before releasing their waste waters. The new decree, together with follow-up orders and decrees in 1948, 1949, and 1950, compelled industrial ministries to install treatment equipment in their enterprises and to halt the discharge of untreated wastes into open bodies of water by no later than 1950. The worst-polluting ministries were given the tightest time frame. The iron and steel, non-ferrous metallurgy, chemical, agricultural machinery, cellulose and paper, textile, armaments, and light industries were in theory required to erect water treatment installations in each and every one of their factories by the end of 1947. Factories in areas with exceptionally bad pollution, most notably Kemerovo oblast', were given until the end of 1948 – perhaps in recognition of the Herculean scale of the task.[93]

We know that there had been a sharp conflict between the All-Union GSI and Gosplan over the contents of the 1947 decree. The GSI had wanted to impose on the industrial ministries a comprehensive set of antipollution measures, to be enforced by a specially created Committee on Water Protection, under the USSR Council of Ministers. Gosplan reacted hostilely to this proposal, and instead submitted an alternative draft law,

[92] GARF, f. 9226, op. 1, d. 1010, l. 103–4.

[93] Decree of the USSR Council of Ministers, May 31, 1947, "O merakh po likvidatsii zagryazneniya i sanitarnoi ochistke vodnykh istochnikov." It is discussed in Smirnov, *Meditsina*, pp. 171–3, and in a number of archive documents, including GARF, f. 9226, op. 1, d. 950. The latter contains the transcript of the Second Inter-Departmental Conference on Questions of Coordinating Scientific Research Work in the Field of Cleaning Industrial Waste Waters, held in December 1948. The follow-up orders were dated March 1, 1948, and May 29, 1949, and are discussed in Smirnov, *Meditsina*, pp. 172–3. The 1950 decree, passed on February 9 of that year, specified a further 371 industrial enterprises that were to install treatment plants. I deal with the outcome of this below. It is discussed in GARF, f. 9226, op. 1, d. 1142, l. 24–5.

according to which there would be an initial list of 300 industrial enterprises obliged to neutralize their wastes before discharging them into any body of water. Moreover, they would have four years, from 1947 until the end of 1950, to implement the measure.[94] Although we cannot be entirely sure, since we do not have the full texts of the decree or the alternative drafts, it appears from the various descriptions of the decree's provisions that the Gosplan version won out. The GSI's plan for a unified water protection authority certainly never saw the light of day, for it reemerged again in 1951 – and again without spurring any action. This time its champion was V. A. Frolov, a member of the USSR Academy of Sciences, who advocated the creation of a Chief Administration of Water Resources under the USSR Council of Ministers, to coordinate the planning and construction of all water-related projects, including the digging of canals, major irrigation schemes, and the proposed construction of a string of hydroelectric power stations along the Volga and the Dnepr, as well as along their respective tributaries. All of these would require the regulation of the competing interests of different water users (factories, power stations, agriculture, and domestic users), in contrast to the existing situation, where each ministry acted in its own interests without regard to the needs of other users of the same waterway. He was particularly alarmed about the Volga, where reservoirs being built along its shores threatened to slow down its currents, and in some places halt the current altogether or even send it in reverse. We do not know what happened to Frolov's scheme, but something comparable to his Chief Administration of Water Resources did not come into being until the 1960s, initially under the aegis of the Ministry of Agriculture of the RSFSR, and then in 1965 as the USSR Ministry for the Improvement of the Water Industry (Minvodkhoz). As for the prescience of Frolov's document, Feshbach and Friendly note that in 1989 water from Rybinsk in Yaroslavl' oblast' took 500 days to travel down the Volga to Volgograd, versus the 50 days it had taken some decades before.[95]

Given what we know about enforcement of the 1937 law, and about the Stalinist system in general, it should come as no surprise that even the more liberal timetables imposed by Gosplan proved more or less fictitious, as did the timetables specified in later legislation. According to data cited by Lavrov in December 1948, that is, nineteen months after the May

[94] GARF, f. 9226, op. 1, d. 1010, l. 104–5. This is, of course, Lavrov's version of the conflict, written a month before the Council of Ministers actually issued the decree.

[95] Feshbach and Friendly, *Ecocide in the USSR*, p. 120. The draft of Frolov's proposal is in GARF, f. 9226, op. 1, d. 1142, l. 84–104 and 105–7. The history of the Ministry for the Improvement of the Water Industry is from the website of the Russian Federation's Federal Agency for Water Resources: voda.mnr.gov.ru/part/?pid=413.

1947 decree, of 181 factories that were due to build treatment works, only 20 percent had actually done so. Around a quarter were in various stages of construction – although, as he later noted, this did not necessarily mean that the units were anywhere near completion. Just under a quarter (22 percent) were still in the design stage. Another 25 percent had designs in hand, but construction had either not started or was only just getting under way. Finally, twelve factories had done absolutely nothing.[96] Just under three years later, in August 1951 (that is, eighteen months after the follow-up decree of February 1950), Boldyrev, the head of the USSR GSI, reported that of 356 enterprises ordered to construct treatment works (15 on the original list of 371 were later exempted), one-third (114) had done so on time, work was still going on at just over one-third (123), but the remaining one-third had not even started, including 88 which were to have finished the plants and put them into operation before the end of 1950. Significantly, some of the worst-polluting industries were also the worst offenders: half of all chemical factories affected by the 1950 decree and two-thirds of factories in the paper and woodworking industry had taken no steps whatsoever even to initiate design work, much less do any construction.[97]

The question is: what factors and forces worked to create such massive non-compliance?

Christopher Burton has argued in great detail that one of the main obstacles to effective control over water pollution was ideological adherence to two faulty scientific theories, namely the idea that rivers were self-cleaning, and the concept of maximum allowable concentrations of toxins (*predel'no dopustimye kontsentratsii*, or PDK).[98] The first – which was by no means an idiosyncrasy of Soviet environmental science[99] – mistakenly held that powerful rivers could dilute even massive quantities of toxins and thereby render them harmless. The second ignored two crucial facts: (a) that even small amounts of toxins build up over time in aquatic flora and fauna, as well as in humans; and (b) that toxins often interact with one another to produce greater and/or longer-lasting hazards. The fallibility of

96 GARF, f. 9226, op. 1, d. 950, l. 173–4.

97 GARF, f. 9226, op. 1, d. 1142, l. 24, 108–10. The data for the chemical and paper industries appear to be from April 1951, which was still fourteen months since the decree's issue.

98 Christopher Burton, "Destalinization as Detoxification: The Expert Debate on Permissible Concentrations of Toxins (PDK) Under Khrushchev," in Frances Bernstein, Christopher Burton, and Daniel Healy, eds., *The Science, Culture, and Practice of Soviet Medicine* (forthcoming).

99 The idea of "self-cleaning" had dominated thinking in Victorian Britain, not least because it provided industrialists with a perfect justification for indiscriminately discharging their hazardous wastes into the country's rivers: Wohl, *Endangered Lives*, p. 238.

both of these theories was manifestly obvious to local GSI inspectors and research specialists in river pollution. They cited countless cases where levels of pollution had grown so great that they had overwhelmed the "natural" processes of self-cleaning. Whether they actually believed in the theory and saw these as genuine exceptions, or whether they thought the doctrine was bogus and were using their counterexamples in a more subversive way, we do not know. It must certainly have been difficult to believe in self-cleaning when, as we have seen, the discharges from a single factory like the Nizhnii Tagil coke-oven products factory could kill off fish and other fauna in the River Tagil over a distance of 200 to 300 kilometers.[100]

Burton makes a very convincing case, but what I want to emphasize here are the behavioral and structural reasons for these laws' failure. At one level, there is plenty of evidence that ministries and enterprises deliberately avoided implementing the decree. One large defense factory in Kemerovo oblast', which each day discharged 100,000 cubic meters of contaminated waste water into its local river, including 4.5 tons of nitrocellulose, brazenly claimed there was no need to neutralize the latter, and therefore also no need to build a treatment facility.[101] This was a more or less general phenomenon. During 1948 a host of major ministries (light industry, timber, paper and cellulose, and textiles, and the Southern Region oil industry) petitioned the USSR Council of Ministers with requests to have at least some of their enterprises exempted. One *glavk* (that of the hydrolytic industry) sought an exemption until 1952, on the grounds that the problem of pollution "had been insufficiently studied" (a plaint with an interesting modern-day echo in George W. Bush's

[100] GARF, f. 9226, op. 1, d. 693, l. 71–2. See p. 98. Even during the war, the GSI in the city of Kazan' could remark about the Kazanka River, "In its lower reaches the Kazanka River has, for all practical purposes, been turned into an open sewer, and any talk about the natural self-cleaning process is simply impossible": GARF, f. A-482, op. 47, d. 2328, l. 117. Belova, who studied bacterial contamination of the Moscow River and appeared basically to accept the theory, nonetheless cited numerous examples in the Soviet and German research literature where pathogens had proven able to survive in rivers for protracted periods and over distances far downstream from the original point of discharge: "Eksperimental'nye issledovaniya," pp. 19–23. She tried to salvage some coherence for the theory by noting that most studies of self-cleaning had until then (1953) focused on chemical pollutants, and that the evidence regarding bacterial pollution was more ambiguous.

[101] GARF, f. 9226, op. 1, d. 951, l. 69–70, 78–80. Nitrocellulose is an explosive used in ammunitions manufacture, but there remains no clear consensus on its hazard as a water pollutant. The only clearly established danger is that in high enough concentrations it kills fish – a major concern of the GSI. In this sense it is similar to the role that phenol played in the postwar Soviet discussions of industrial discharges. There was widespread concern, if not alarm, about it, but the main immediate hazard is to fish, to which it is *highly* toxic. Phenol in low doses is used today in cough medicines. For nitrocellulose, see www.pesticideinfo.org/Detail_Chemical.jsp?Rec_Id=PC37277.

responses to global warming).[102] Other ruses were much cruder. A factory might draw up plans and then its ministry would refuse to authorize the work, in this way letting the factory off the hook. Alternatively, the ministry could approve the plan and then not issue any funds. The factory and the ministry would both be fulfilling the law on paper but ensuring that nothing would be done in practice.[103] All this was aided and abetted – at least in the eyes of the All-Union GSI – by the weakness of local GSI inspectors. They were either easily intimidated by local enterprises and too afraid to press for enforcement, or hampered by their own lack of information. Thus, in the case of the defense plant in Kemerovo oblast', cited above, the GSI genuinely had no knowledge of what pollutants the factory generated – it had to ask the parent ministry to provide this information, something akin to asking the tobacco industry to volunteer all the evidence that cigarette smoking causes lung cancer.[104]

Behind such willful circumvention lay a much more complex range of structural factors that made these decrees unworkable. Some were absolutely obvious. One was built into the very nature of Soviet anti-pollution legislation: enterprises paid a special tax for releasing toxic discharges into waterways; in effect, this provided an in-built incentive to ignore the law, since for many enterprises it was cheaper and easier to pay the fine every year than to divert scarce investment resources to the construction of waste treatment plants.[105] This conformed to the general calculus that informed ministerial and enterprise decisions: enterprises would build and install treatment plants only if it brought them direct economic benefit – as when the oil industry installed traps to recapture oil for reprocessing. What damage their discharges did to other factories (or to people) was of no concern to them.[106]

[102] GARF, f. 9226, op. 1, d. 950, l. 177–8. A similar example in the Ministry of the Metallurgy Industry is in GARF, f. 9226, op. 1, d. 951, l. 54.

[103] GARF, f. 9226, op. 1, d. 951, l. 54; d. 1142, l. 25.

[104] GARF, f. 9226, op. 1, d. 951, l. 44–52, 69. One of the interesting things about the document on l. 44–52 is that it casts the work of the local sanitary inspectors in a rather different light from their own local reports. In the latter the inspectors portray themselves as diligent, dedicated, and highly conscientious sanitary physicians, whose enforcement powers may have been limited, but who used them as best they could. This was not always the perception of their superiors in Moscow, who here accuse them of being too cozy with factory managers.

[105] This issue comes up constantly in the documentation. For an indicative reference, see GARF, f. 9226, op. 1, d. 950, l. 179 (part of the address by Lavrov discussed in n. 106).

[106] This was well articulated by Lavrov in his address to the Second Inter-Departmental Conference on Questions of Coordinating Scientific Research Work in the Field of Cleaning Industrial Waste Waters, held on December 6–7, 1948 (see n. 93). The discussion in the following paragraphs is taken from his survey, found in GARF, f. 9226, op. 1, d. 950, l. 173–82.

Yet even if ministries acted in good faith and tried to abide by the decree, they found themselves blocked by other obstacles. The Soviet Union still did not have any standard designs or protocols for constructing waste treatment plants, nor any lists of standard parts and equipment. Most ministries would not know what equipment they would need, and much of it (specialized pumps, pipework of the correct size) the economy did not manufacture. The same applied to the preliminary design work, which tended to be done with inordinate delays and then, when design organizations delivered their plans to the construction organizations, the latter found the plans to be incomplete. If, after all these difficulties, a factory nevertheless managed to build a treatment plant, it could then discover it had no one qualified to operate it. Lavrov claimed that local GSI inspections in Ukraine found that many treatment plants were being operated so incompetently that they were doing more harm to the environment than if they had not existed in the first place.

There was, therefore, some basis to industry claims that attempts to control or neutralize water pollution came up against factors outside its control. The paper industry, for example, pleaded that it could greatly reduce the amount of fiber in its discharges by going over to a new generation of traps, but the latter required special reagents which the industry could not acquire. Other industries laid the blame on limitations in the technology. Sugar refining could remove gross contaminants in sedimentation tanks, and then reuse the water. The waste water from other parts of the production process, however, contained organic compounds that could not be extracted via sedimentation. The water had to go to irrigation farms – but the volumes involved were so large that each and every sugar refinery would need a farm of 20 to 30 hectares, which was outside the realm of practical possibility. The implication was that whatever could not go to the irrigation farms would have to be released into waterways. The resin industry lay the blame on the wide range of pollutants its factories generated. Their composition depended on what a given factory produced, what raw materials it used, and what chemical reactions this involved. Their argument was that not just each factory, but each shop within a factory required separate study and special means of neutralizing the contamination. This task was compounded by the fact that there were no clearly established techniques of chemical analysis for identifying which pollutants were in which discharge and in what amounts, nor were there clear state standards against which to measure their laboratory results. They claimed this was true even of the industry's most common pollutant, phenol.[107]

[107] GARF, f. 9226, op. 1, d. 950, l. 15–17, 23–6, 28–31, 35.

It might be tempting to think that this complex of problems was entirely an inheritance of the war, and thus confined to the early postwar years. By late 1951 it was clear that this was now a permanent state of affairs and, moreover, one institutionally sustained by Gosplan itself. The country still did not manufacture sufficient quantities of pipe or crucial parts, such as Raschig rings,[108] without which treatment plants could not operate. If work passed beyond the design stage, construction work fell hopelessly behind schedule, not least because industrial construction projects took priority. Ministries still did not issue funds to their factories to allow them to build treatment plants. More insidiously, enterprises paid out millions of rubles a year in tax for releasing untreated waste water. The iron and steel combine in Magnitogorsk paid out 12 million rubles in tax during 1950, and had already paid out another 4 million during the first three months of 1951 (an annual rate of 16 million rubles). Yet its parent ministry, the Ministry of the Iron and Steel Industry, refused to sanction the money for it to build a waste treatment plant. The same was true of the giant Kuznetsk Iron and Steel Combine in Kemerovo oblast' and the Kemerovo coke-oven products factory. They even included the cost of the tax in their annual budgets. The iron and steel combine set aside 3.5 million rubles a year as a specific budget item for this. It is worth reflecting on this fact, because it means that Gosplan must have included this cost in the factory's annual plan – at the same time as elsewhere Gosplan was deliberately refusing to include in local plans the funds for treatment works. The point was that no matter how high the tax (which was in effect a fine), in reality this cost the enterprises nothing, since the money was now part of their centrally approved budget. If there were any need of evidence of just how lightly the Stalinist system took the problem of water pollution, we have it here.[109]

The other element in the equation was the fatal weakness of the GSI itself. Its enforcement powers were extremely limited. It could, as we know, block the use of the occasional new dormitory or school if it did not meet basic sanitary requirements, but where water pollution was concerned there were no credible weapons in its armory. When, around the time of Stalin's death, major enterprises in Sverdlovsk

108 Raschig rings are rings, usually metal or ceramic, used as packing agents in distillation columns and chemical separation techniques. They have wide application throughout the chemical industry and are still used today in water treatment.

109 GARF, f. 9226, op. 1, d. 1142, l. 24–6. To give yet another example of Gosplan's reluctance to fund anti-pollution investment, in 1951, the USSR Ministry of the Food Industry issued funds for finishing the design work for treatment plants at Lithuania's sugar refineries. Gosplan of the Lithuanian SSR, however, did not include these funds in the plan of the republic's Sugar Trust. Thus no design work was done in 1951.

were hopelessly behind schedule in constructing treatment works, and in some cases had not bothered to begin work at all, the GSI duly responded by fining the worst offenders. In 1953, the Tagilstroi construction organization – which must have had an annual turnover of several million rubles – was fined just 13,000 rubles, and its director a mere 700; the Novo-Tagil iron and steel works received a fine of 12,000 rubles, and its director a fine of 500. These sums were derisorily small, and it is inconceivable that they could have had any impact on the behavior of the offending enterprises. Yet as small as they were, not even these penalties could always be collected. The bank refused to collect a fine on one iron and steel plant in the oblast' because the GSI had drawn up the order on an old version of the appropriate form. Even threats of criminal prosecution did not work: a pending prosecution of the director of the Bogoslovskii aluminum works – who for years had simply ignored GSI demands to halt the astronomical volume of pollution generated by his factory – had to be dropped because of the Beria amnesty following Stalin's death. In the new post-Stalin atmosphere he simply carried on as before.[110]

What we see here is not simply evidence of the GSI's essential powerlessness when up against the might of the industrial ministries, but the pernicious calculus that informed all Soviet safety legislation, from Stalin's day until the end of *perestroika*. The fact was, even if the fines and penalties had been higher, it would still have been cheaper for an industrial manager to pay them than to invest in traps, treatment facilities, or less polluting technologies – even assuming that the required equipment had in fact been available.[111] The financial logic of the Stalinist planning system produced antinomies

[110] GARF, f. 9226, op. 1, d. 1249, l. 31–4, 40. In 1953, just after Stalin's death, Lavrentii Beria, the head of the Ministry of Internal Affairs, declared an amnesty for criminals (but not political prisoners) serving sentences shorter than five years. He also closed down some of the Gulag camps holding common criminals. This led to the fear – and in some cases the reality – of cities being flooded with ex-convicts who would then unleash a crime wave. Beria's political opponents, Georgii Malenkov and Nikita Khrushchev, claimed that Beria then used this impending menace as a pretext for stationing in and around Moscow large numbers of MVD troops. Since the latter were under Beria's direct authority, Khrushchev and Malenkov cited this as evidence of his desire to stage a *coup d'état*, which in turn they used as justification for his subsequent arrest and execution. See Roy A. Medvedev and Zhores Medvedev, *Khrushchev: The Years in Power* (New York: W. W. Norton, 1978), pp. 9 and 14.

[111] GARF, f. 9226, op. 1, d. 1010, l. 99. The same principle applied to safety regulations inside the factory. During *perestroika* a manager might pay a fine of just 10 to 50 rubles for violating safety rules (*Rabotnitsa*, no. 7, 1990, p. 10). If a worker suffered a serious accident, it was actually more profitable to the factory if the worker died rather than survived, since the level of compensation was lower (*Rabochaya tribuna*, December 5, 1990).

not very dissimilar from those created by the capitalist market. What was rational behavior from the point of view of the individual enterprise or industrial ministry proved catastrophic for the economy (not to mention the society) as a whole.

Conclusion: water pollution as an example of self-negating growth

Just what were these costs to the Soviet economy and society? One, of course, was the short-term impact on human health and the quality of life. Lack of sewerage and inadequate facilities for treating and disinfecting human waste posed a constant threat of outbreaks of typhoid, dysentery, and other serious gastrointestinal diseases, an issue to which I will return when analyzing infant mortality in Chapter 5. Another cost, but one more difficult to measure, is the long-term effect that prolonged exposure to industrial pollution had on health and life expectancy. It is interesting that, of these two classes of hazard, the GSI had already in the early postwar period identified industrial pollution as by far the greater danger. Lavrov calculated that a single sugar-beet refinery producing 10 tons of granulated sugar per 24 hours discharged as much pollution into its local waterway as a town of 320,000 people; a wool-washing plant processing 10 tons of wool per day would generate the same pollution as a city of 635,000 people; and a paper mill making 400 tons of paper a day would yield as much as a city of 550,000. These calculations were obviously very crude, being based on just one indicator (the impact each type of pollution had on the oxygen content of the water) and on unspecified assumptions about the degree to which the water was or was not purified before being released; but they nonetheless show the overall scale of the problem. Nor was Lavrov in any doubt as to the cause: the absence of any genuine planning. Citing the very cities and oblasti we have studied in this chapter, he noted that, when siting plants and the residential settlements for their workers, ministries paid no regard to the availability of water resources, or to the harm that additional discharges of sewage and industrial wastes would do to local rivers and lakes; nor did they make any effort to coordinate the location of new enterprises with the plans of other ministries. His most powerful illustration, however, came not from the hinterland regions, but was from Ukraine, a manganese enrichment factory in Marganets, in Dnepropetrovsk oblast'. The factory regularly discharged untreated sludge into its local river, transforming that stretch of the river around the town from a navigable waterway into a swamp. This then created a backwash, which flooded and destroyed residential homes in the factory's workers' settlement, inundated a bridge, and put the local water supply and treatment works completely out of action. The combined cost of dredging the river bed, rebuilding the homes, repairing the bridge, building a levee, and combating the malaria brought about by the swamp came to many tens of millions of rubles. This may have been a rather large-scale example, but it was not exceptional. River contamination damaged the turbines of hydroelectric plants, destroyed steamship boilers, killed fish, and deprived farms located near waterways of drinking water for their livestock.[112] Nor does this take into account the sheer physical waste of resources. Factories could have recovered and recycled many of the chemicals they spewed into rivers, but they did not.[113] To the extent that these materials literally floated away, the Soviet economy had to invest in additional chemical production – factory buildings, equipment, and labor power – to replace them, all of which constituted an unnecessary drain on its resources.

What Lavrov had perhaps inadvertently highlighted, and what the raft of GSI reports reiterate through their local examples, was simply one dimension of a phenomenon that lay at the very essence of the Soviet system: its tendency toward self-negating growth. The economy expended labor power and means of production, but these did not lead to commensurate increases in usable output. Defective products had to be remade. Poor-quality equipment demanded frequent repair. Wasted fuel and raw materials had to be replenished. The byproducts of one factory – as we have seen here – could damage or destroy the results of the labor process carried on somewhere else. In the case of the urban environment this process began to negate the most important product of all – human labor power. Beyond the misery and tragedy it caused to the individuals whose health it ruined, degradation of this environment had a more general significance for the political economy of the system. By endangering workers' health it limited the value-creating capacity of those who generated the surplus from which the Soviet elite drew their privileges. Of course the same is true of capitalism. But capitalism has rarely destroyed its labor power without being assured of its ready replacement: a reserve army of the unemployed, pools of women and children vulnerable to hyperexploitation, streams of migrant workers, and now, in its more "global" phase, the migration of the factories themselves to regions of the world where the replacement of labor power costs almost nothing. The Soviet system had fewer such replacement sources at its disposal. While Stalin was alive, it had the Gulag and later the labor power of

[112] GARF, f. 9226, op. 1, d. 1010, l. 80–105. [113] GARF, f. 9226, op. 1, d. 899, l. 303a.

Eastern Europe. When it lost these it found temporary sources of internal migrants through its *limitchiki*.[114] But these supplies were not endless, and yet the system continued to undermine their health and well-being. Here is yet another example of how the collapse of the Soviet system was inherent in its Stalinist origins.

114 The term comes from the Russian word for quota, *limit*. There was no shortage of people in rural areas or small provincial towns who wanted to migrate to large cities such as Moscow, which could offer better-paying jobs and more abundant supplies of food. They could not do so, however, without a residence permit which was almost impossible to acquire (at least legally) without a job. From the 1960s onward the authorities regulated in-migration by giving factories a quota, or *limit*, on how many migrants they could accept, and workers who came under these arrangements became known as *limitchiki*. By the 1980s they had become, along with women, a reserve army of labor, doing the lowest-paid and worst-quality jobs that local (especially male) Muscovites would no longer accept. See Filtzer, *Soviet Workers and the Collapse of Perestroika*, pp. 27–30.

3 Personal hygiene and epidemic control

Given the state of housing and urban sanitation as well as limited access to water, maintaining personal hygiene required a monumental effort. People were exposed to dirt at work, in the streets, and around the home, but had few resources for keeping themselves and their families clean. In the previous chapter I noted that, outside Moscow, only a minority of buildings had indoor running water. People had to haul cold water up in buckets from street pumps. Heating water was not easy, since most people still relied on wood-burning stoves and fuel was in short supply right up until the end of the 1940s. Only in Moscow was there a concerted effort to install gas into people's flats, and even this campaign achieved significant results only in the early 1950s. To make matters worse, the country suffered a serious soap shortage, which began to ease only at the very end of the 1940s. Undoubtedly people did wash at home, but to bathe properly they relied on the famous Russian *banya*, or bathhouse. The *banya* was not a bathhouse in the British sense. There were no bathtubs. Instead there were cubicles with taps of hot and cold water and a basin, which people would use to pour water over themselves, almost like a makeshift shower. Bathing in this way was a serious business, and bathhouses assumed that each bather would spend around an hour scrubbing themselves thoroughly with soap and a loofa (*mochalka*) and rinsing themselves clean. As in Britain and Western Europe in the nineteenth century, the maintenance of personal cleanliness in the postwar USSR relied on a large network of well-functioning bathhouses. The difficulty was that the network was not adequate to the task, either in quantity or quality. Bathhouses had suffered serious neglect during the war, and in the early postwar years were frequently out of action due to lack of fuel, equipment breakdown, and in some cases even shortages of water. There were very few urban areas where people were able to bathe more than once every two or three weeks.

If people viewed the bathhouse as a vital means of ensuring a minimal degree of personal comfort, the authorities saw it as a key weapon in the battle against epidemics and disease. Their chief worry was typhus, a potentially deadly disease transmitted to people by lice. Typhus, and a similar louse-borne disease known as relapsing fever, are diseases of poverty. The microorganism that causes typhus – a bacteria-like organism known as *Rickettsia prowazeki* – lives in the lice feces. It enters the bloodstream through breaks in the skin, whether from the lice bites themselves, from scratching to relieve the itching caused by the bites, or from other open sores. It is also possible to breathe in infected lice feces lying in dirty clothing or bedding. The lice maintain the cycle of infectivity by biting an infected person and ingesting the rickettsiae from their blood. Relapsing fever, which had a somewhat lower mortality rate, is caused by a spirochete living in the lice. It enters the bloodstream of the victim when the latter scratches and crushes the lice, thereby releasing the spirochete, which then passes into the victim through breaks in the skin. The link with poverty is direct. Overcrowded housing makes it easy for the lice to pass from one person to another. This is especially true during cold weather, when people would tend to huddle indoors and would be least likely to change their clothing. Lack of bathing facilities, piped water, and soap meant that only with the greatest difficulty could people avail themselves of one of the most effective means of curbing the spread of the disease: killing the lice, washing away the lice feces from their bodies, and washing both the feces and lice eggs from their clothes and bedding. Typhus is also a disease of hunger, not because the path of the disease is in any way dependent on malnutrition (it is not), but because famines and hunger encourage mass migrations as people flee areas of dearth in search of food. Infected people spread the disease along the route of their travels, as happened during the Soviet famine of 1947. Citing the experience of nineteenth-century Ireland, Leslie Clarkson and Margaret Crawford note, "When food shortages force people to congregate in feeding centres, in houses of industry, in poor houses or to huddle together in cramped urban squalor, lice enjoy lush grazing grounds."[1]

[1] L. A. Clarkson and E. Margaret Crawford, *Feast and Famine: Food and Nutrition in Ireland 1500–1920* (Oxford: Oxford University Press, 2001), p. 153; Bill Luckin, "Evaluating the Sanitary Revolution: Typhus and Typhoid in London, 1851–1900," in Woods and Woodward, eds., *Urban Disease and Mortality*, p. 104. Irish physicians in the nineteenth century noted the connection between typhus and food shortages, with unfortunate consequences. Believing that hunger caused the disease, they placed fever patients in general hospitals, where they spread the infection to other patients: Clarkson and Crawford, *Feast and Famine*, p. 154. In the early nineteenth century typhus was commonly confused with typhoid fever, because many of their early symptoms were the same, and in many languages the terms for the two diseases remain closely related or identical. In Russian typhoid fever is *bryushnoi tif* (literally, abdominal typhus); typhus is *sypnoi tif* (rash-causing typhus), sometimes referred to in the literature as "parasitic typhus"; and relapsing fever is *vozvratnyi tif* (recurrent typhus).

Until the invention of antibiotics effective against *R. prowazeki*, most notably tetracycline, there were few medical interventions available to deal with outbreaks of typhus. The Soviet Union had its own version of anti-typhus vaccines developed in Europe and the USA before and during World War II. Depending on the method of production, these either attenuated the infection, sharply reducing death rates, or provided temporary immunity. Unlike the vaccines used to give mass immunity against smallpox or diphtheria, the USSR did not try to use its anti-typhus vaccine in routine prophylaxis, but reserved it for acute outbreaks. During the 1947 famine, for example, it administered nearly 1.2 million inoculations in Ukraine.[2] On the positive side, patients who contracted the disease and recovered had lifelong immunity. The main line of defense, however, was a highly elaborate system of public health measures, designed to limit, detect, and eradicate lice infestations. The bathhouse was central to this strategy, but it was not alone. In theory, at least, people were inspected for lice at almost every juncture: at school; in the dormitories for students or young workers; if they attended a hospital or clinic; if they traveled on a train or boat; at work if they handled food or otherwise came into contact with the public; and from time to time as part of mass random inspections. Those found with lice, or deemed at high risk of harboring them (such as dormitory residents or people traveling), were immediately sent for "sanitary processing" (*sanitarnaya obrabotka*) at a sanitary processing station (*sanpropusknik*), a purpose-built, small-scale bathhouse designed thoroughly to disinfect and disinfest the user. During the procedure the person not only bathed, but had clothing removed for disinfection (sometimes by laundering, sometimes in a disinfection chamber [*dezkamera*]), an important step, given that few people had a change of clothes or more than one set of underwear. Of course, let us not forget one of the most effective anti-lice "systems" of all – maternal vigilance. Mothers inspected their children for lice on a daily basis. Despite the

[2] GARF, f. 8009, op. 3, d. 607, l. 27. On the development of anti-typhus vaccines in the interwar period see Paul Weindling, "Between Bacteriology and Virology: The Development of Typhus Vaccines Between the First and Second World Wars," *History and Philosophy of the Life Sciences*, vol. 17, no. 1 (1995), pp. 81–90. The first effective vaccine was developed by Rudolf Weigl in Poland in the early 1930s. It was made from louse intestines infected with rickettsiae, which were then chemically deactivated. The vaccine gave partial immunity, and those who did contract typhus tended to have only mild cases. The vaccine was, however, difficult to manufacture on a mass scale. The United States developed a more effective vaccine made from typhus-infected egg yolks. This was easier to produce and gave temporary immunity. I do not know which of these methods the Soviet Union was using in the postwar period, but according to Weindling the Soviets were working on an egg yolk-based vaccine from 1942 onward (*ibid.*, pp. 84–7, 89; H. J. Parish, *Victory with Vaccines: The Story of Immunization* [Edinburgh and London: E. and S. Livingstone, 1968], pp. 173–4).

enormous effort involved doing laundry, they tried to send them off to school in clean underwear. They ironed their husbands' work clothes every day after work to kill off any lice the men may have picked up on commuter trains.[3] Here, as in every aspect of Soviet daily life, behind the official programs and public health measures lay the unpaid labor of Soviet women.

The anti-typhus measures were by and large successful, no small achievement given the enormous obstacles in their path. Everything about the Soviet urban environment provided a classic breeding ground for lice and the eruption of typhus: overcrowded housing, cold winters, poor sanitation, the near-impossibility of bathing regularly at home, the decrepit state of urban bathhouses, the lack of soap, and mass population movements. The latter warrant special attention, because many, if not most, of them were the specific result of the regime's reliance on prison and indentured labor. During the last years of the war and the early postwar period, the regime dispatched eastwards millions of people who fell under the Gulag economy or its associated settlements. These included at least 1 million Axis prisoners of war; several hundred thousand internal exiles; countless numbers of Gulag prisoners transported between camps or from camps to industrial enterprises; and almost a million members of "special contingents" and "labor battalions" made up of former Soviet soldiers and civilians captured by the Germans, sent to work in the Reich as slave laborers, and then redirected into the MVD economy once repatriated to the USSR. All of these traveled to their destinations on special trains (*eshelony*[4]), each of which had to be carefully monitored for signs of typhus and other contagious diseases. The conditions under which these people lived and worked were truly horrific, but while in transit they posed a serious threat to public health, and so they merited careful care and attention.

Later, when most of these prison laborers were already in place, new waves of what I have termed indentured laborers continued the pattern of mass migrations. These were mainly young labor conscripts dragooned into the Labor Reserve schools, a large proportion of whom were destined for construction sites and coal mines of the Urals and Western Siberia, and workers recruited via "organized recruitment"

[3] I learned about the indispensable role of mothers in the campaign against lice from a small sample of questionnaires administered on my behalf by a colleague in Kazan'. I am grateful to the respondents for answering my questions and to my colleague for organizing the survey.

[4] An *eshelon* was a specially mobilized train. The term applied to troop trains, as well as the trains that carried evacuees, mobilized workers, youths conscripted into the Labor Reserve schools, prisoners, and prison laborers.

schemes (*orgnabor*).[5] These, too, made their crosscountry journeys on *eshelony*, and required the same degree of close medical monitoring. There were also mass movements among the free population. During 1945 and 1946 demobilized soldiers and wartime evacuees returned to their homes. Every year during the postwar period many tens of thousands of peasants did seasonal work in logging and peat digging. They traveled by rail, often on *eshelony* – and were subject to the same controls as the non-free workforce. All of these were part and parcel of the Stalinist regime's postwar labor policies, which relied heavily on forced and semi-forced labor to restore the country's economy. The point is that this economy perforce created enhanced risks of major epidemics; the regime knew this and put in place detailed, and largely successful, measures to prevent them. The one time that it failed was the typhus epidemic of 1947. This, however, broke out not among the prison or indentured workforce, but among the spontaneous migrations caused by the 1947 famine, including the mass of itinerant homeless waifs known as *besprizorniki* (homeless children) and *beznadzorniki* (unsupervised children).

The chapter begins with a detailed look at the state of urban bathhouses, which suffered serious neglect during the war and returned to normal working only very slowly. In most towns and cities the main problem was lack of capacity. Even if all bathhouses had been able to operate at full strength and without interruption – which they were not – they could not have met the full needs of the population. I also discuss the state of public laundries, which, given the extreme difficulties of washing bed linen and clothing at home, should have been another line of defense in the battle to

[5] The Labor Reserve system was introduced in October 1940 as a system of compulsory labor service for rural teenagers. It consisted of two main elements. The first were factory training schools, or FZO (*shkoly fabrichno-zavodskogo obucheniya*), which trained sixteen- and seventeen-year-olds to become workers in so-called mass trades over a period of six months. The second were the trade schools, or RU (*remeslennye uchilishcha*; they had a counterpart on the railways known as ZhU, short for *zheleznodorozhnye uchilishcha*), which trained fourteen- and fifteen-year-olds for two years. The FZO, where conditions were extremely bad, depended overwhelmingly on conscription from the countryside; the RU offered better conditions and were more or less able to fill their ranks through volunteers from both towns and villages. After completing their training, workers were assigned to factories, to which they were in effect indentured, since they had no choice over where they were sent and, like all other workers, they were subject to laws which made it a criminal offense to change jobs without permission. Organized recruitment (*orgnabor*) was a notionally voluntary system that mobilized workers to work in metallurgy, construction, and coal mining, as well as in seasonal industries like peat digging and brick making. Much of the recruitment was done via deception or coercion, and even where workers willingly signed up they were placed on non-breakable contracts which amounted to semi-indenture. The systems are explained in more detail, together with figures for prison labor and the "indentured" workers in the Labor Reserve schools and *orgnabor*, in Filtzer, *Soviet Workers and Late Stalinism*, pp. 22–39.

control lice. In reality they could fulfill this role only partially because, like the bathhouses, their production capacity was simply too small to take in washing from private citizens. Finally, the chapter examines the systems in place to prevent the transient population, both free and unfree, from spreading epidemics across the country.

Bathhouses and public laundries

As with other areas of sanitation, the difficulties of keeping clean in the postwar USSR were hardly unique or historically unprecedented. In Victorian Britain, where water supply was limited and families not only had to haul water up from the street in heavy buckets, but also had to pay for it, bathing for many households was a rare event indeed. According to Wohl, in 1894 only 5 percent of houses in the industrial towns of Northern England had baths. The number rose only slowly: in 1930 two-thirds of Northern homes were still without them.[6] One has to treat these figures somewhat carefully, since the absence of a fixed bath or bathroom did not mean that people did not bathe. In working-class homes of Northern England it was certainly common to have a tin bath that would be placed before the fire and filled with boiling water from pots and kettles. Still, in Victorian times, at least, regular bathing was an exception, not a rule. Wohl cites the 1895 report of the MOH of Birkenhead, who claimed that "the greater proportion of our lower working-class population pass their lives from year to year without washing their hands or faces directly." Similarly, Dr. James Kerr, the MOH for Schools in England, reported in 1894 that fully a third of the school children he examined had not taken off their clothes for at least six months.[7] For Wohl, the amazing thing was not that people washed so rarely, but that such a large number of working-class families made a concerted effort to surmount the obstacles in their way and keep clean, even to the point of spending a large share of their weekly budget on soap and washing materials.[8]

In Britain, as in Germany, the network of public bathhouses originated during the first half of the nineteenth century, fostered by such

[6] Wohl, *Endangered Lives*, pp. 61–3. According to Richard Titmuss, at the outbreak of World War II, the percentage of families living without a bath was 90 percent in Stepney in East London, 50 percent in Glasgow, 40 percent in Hull, and 33 percent in Birmingham: Titmuss, *Problems of Social Policy* (London: HMSO, 1950), pp. 131–2.

[7] Wohl, *Endangered Lives*, p. 69. This practice survived in some British working-class homes right up to World War II. Middle-class rural families who received children evacuated from London and other large cities right after the outbreak of war were shocked to find that some children had been sewn into their garments or into brown paper under-linings for the winter: Juliet Gardiner, *Wartime: Britain 1939–1945* (London: Headline, 2005), p. 35.

[8] Wohl, *Endangered Lives*, p. 65.

organizations as the Association for the Establishment of Baths and Washhouses for the Labouring Poor. As I discussed in the Introduction, much of the motivation behind this was the belief that a dirty proletariat harbored the potential for public disorder and disease, both of which in equal measure threatened to undermine middle-class prosperity. The *Lancet* in 1846 carried a petition from a group of Southampton physicians and surgeons, which put the case quite succinctly: "the rich are deeply interested in the health of the poor, not only on economic grounds, but also because many infectious disorders, which eventually attack individuals of all ranks, originate in and spread from the densely-crowded quarters inhabited by those who are poorest." By 1912 the network of public baths in Britain accommodated 5 million visits a year, 3 million of them in London.[9] This sounds like a lot, but it is actually pitifully small. The population of London at that time was roughly 4.5 million people. Three million visits to a bathhouse would have given each London resident two-thirds of a bath over the course of a year. Even if we make the far-fetched assumption that two-thirds of Londoners had some sort of bath and could bathe at home, the remaining population would still have used the public baths at a per capita average of only around twice a year. For the rest of Britain, which collectively chalked up a mere 2 million visits, the per capita average is microscopic. To appreciate just how microscopic let us begin with a fanciful hypothesis. In 1912 Greater Manchester had a population of around 2.3 million people. Let us assume that 300,000, or 13 percent of these people, had a home with a bath (remember, in 1894, the average in Northern England cities was just 5 percent). Let us further assume that the remaining 2 million residents of Manchester accounted for all of the 2 million visits to public baths in the UK outside London. This would have provided each Mancunian with one bath a year. In reality, of course, these 2 million bathhouse visits served not 2 million people, but around 36.2 million, the combined population of England, Wales, and Scotland, excluding London. If seen in these terms, the public baths, as important as they might have been in certain cities or neighborhoods, probably made only a very modest contribution to public hygiene in Britain.

In the Soviet Union the *banya* played a far more central role. The health authorities set a standard of one "bathing" (*pomyvka*) every ten days, or thirty-six "bathings" a year. This was the frequency that they deemed necessary in order to keep lice infestations at bay. What people may have needed or desired in order to maintain some degree of personal comfort did not enter into the calculation. In all the discussions of how well or how

9 *Ibid.*, pp. 73–5. The quotation is from p. 73.

poorly the bathhouses were working, this was the norm against which health officials determined if local needs were being met. To cite just one example, in 1944, while the war was still going on, the city of Chelyabinsk, with a population of roughly 450,000 people, recorded around 6.5 million visits to its public baths. This was nearly one-third more than all of Britain in 1912, and to that extent it helps illustrate the importance of the *banya* in Soviet life. At the same time, however, this was still only enough to provide each resident with a thorough cleaning once every 17.5 days – little better than half the frequency deemed necessary to prevent the outbreak of epidemics.[10]

The war caused a major crisis in bathhouse provision. Huge movements of people into the industrial cities and towns of the hinterland taxed local systems to their limits. Bathhouses had to work flat out, often around the clock, and in the face of serious disruptions to their water supply, electricity, fuel deliveries, and soap. In Moscow during 1943, residents could bathe once every twenty-eight days. The main obstacle was fuel shortages: many baths had to close down because they had no fuel; others were so cold that people simply refused to use them.[11] In Moscow oblast' the baths in several large industrial towns, including the Moscow suburbs of Mytishchi and Tushino, had to cut back to just two days' operation a week due to lack of fuel. Here, too, people could bathe no more than once every three to four weeks, not simply because the baths were often shut, but because even when they were open they were too cold, or because extended wartime working hours prevented people from going.[12] The same situation prevailed in Ivanovo oblast'. In Ivanovo itself residents could bathe once every three weeks, but other textile towns were more unfortunate. The baths in Furmanov, for example, allowed each resident just six visits during the whole of 1943.[13] A little further north, in Yaroslavl' in 1943, the combined total of municipal and factory-owned baths in 1943 allowed just eight "bathings" a year.[14]

If anything, the situation was even more critical in the cities further east, which had taken in large numbers of evacuees, mobilized workers, and "special contingents" of deported or penal laborers. The authorities had certainly tried to anticipate the need for additional facilities. In Chelyabinsk oblast' they quickly expanded the number of baths by around

10 GARF, f. A-482, op. 47, d. 2313, l. 156. The report estimated that only 70 percent of the city's population required access to public baths. The figure for the frequency of visits is based on this.
11 GARF, f. A-482, op. 47, d. 1420, l. 30–30ob.
12 GARF, f. A-482, op. 47, d. 1421, l. 26–7.
13 GARF, f. A-482, op. 47, d. 1414, l. 84, 112.
14 GARF, f. A-482, op. 47, d. 1422, l. 14–14ob.

a third, while the number of laundries, hairdressers, and disinfection chambers more than doubled. The problem was that they were simply overwhelmed by the scale of the in-migration. In Magnitogorsk, where the vast majority of baths suffered relatively little disruption, capacity was sufficient to meet only around two-thirds of actual demand. By the same token, much of the additional capacity was simply wasted, as baths were idled by shortages of fuel and soap. The municipal and enterprise bathhouses in the city of Chelyabinsk had sufficient places to have given each person 23 "bathings" a year – but in reality could deliver only an average of 19.5.[15] This figure, however, proved absolutely luxurious compared to other cities and towns. The municipal bathhouses in Kazan' saw the volume of visits drop from nearly 6 million in 1941 to 3.7 million in 1942, and then to 3.15 million in 1943, before climbing back up to 4.2 million in 1944. The low point was actually August of 1942, during the bleakest period of the war, which recorded just 179,000 visits, versus 495,000 during August 1941. Bear in mind that this lower volume covered a larger population. The municipal baths and the bathhouses belonging to industrial enterprises together provided each Kazan' resident with just nine "bathings" in 1943 and twelve in 1944 – against a public health "norm" of thirty-six. The baths lacked just about everything: fuel, linen, regular supplies of both hot and cold water, and, of course, soap.[16] In Kuibyshev the combined efforts of municipal and factory baths should have allowed each resident twenty-one "bathings" a year in 1943 – the real figure, however, was just seven.[17] In the Urals, which received the full brunt of the mass influx, the situation was equally, if not more, critical. Capacity in the heavily industrialized towns of Sverdlovsk oblast', for example, was stretched to the limit by the sheer numbers they had to cope with. The bathhouses worked flat out – many of them had been hastily erected as temporary units – and some were already becoming unusable by 1944. The only bathhouse in the industrial town of Krasnoufimsk was out of service for the whole of 1944. The need to remove some baths from general use in order to treat the large number of penal laborers in "special contingents" further curbed provision for the "free" population. The only

[15] GARF, f. A-482, op. 47, d. 682, l. 2–5 (1942); d. 1415, l. 87 (Magnitogorsk, 1943); d. 2313, l. 154ob., 156 (Chelyabinsk city, 1944).

[16] GARF, f. A-482, op. 47, d. 1418, l. 11–12, and d. 2328, l. 121–3. The municipal baths gave each person six "bathings" in 1943 and eight during 1944. These are actual figures, not based upon hypothetical capacity. The reports do not give detailed information on the enterprise baths, but merely note that they had roughly 55 percent of the capacity of the municipal bathhouses, from which I have extrapolated the figures for total "bathings."

[17] GARF, f. A-482, op. 47, d. 1415, l. 47–47ob. Aside from the usual problems obtaining fuel and soap, one of the city's five bathhouses was sidelined for all of 1943 because it had no boiler.

thing that mitigated the crisis was the fact that in some of the oblast' industrial towns a sizable proportion of the local population – around 20 percent of people in Revda and its surrounding district – lived in private dwellings with their own bathhouse.[18]

The soap shortage deserves special mention, because it was to persist at least until the end of the 1940s, if not beyond. The plan was for local factories to manufacture soap using whatever materials were to hand, in particular fats and caustics left over as byproducts of the production processes at other factories. I have not seen a single case where local industries were able to meet this demand. Probably the best-documented illustration is from the Tatar ASSR. Up until 1944, soap was virtually unobtainable, and it was only in December 1943 that the republic's bathhouses could offer any for sale to visitors – and even then it was industrial-grade soap, not toilet soap. The authorities worked on the assumption that each "bathing" in a bathhouse required 25 grams of soap. Using this figure, the GSI calculated that the Tatar Republic (not just Kazan') would need 2,250 tons of soap. Note that this calculation made no allowance for the amount of soap needed by laundries or for daily personal hygiene at home. Local industry's production plan was just 625 tons, but it managed to produce less than half of that, 304.5 tons. Local soviets and factory Departments of Workers' Supply (ORSy) scraped together another 1,133 tons from the trading network, making a grand total of 1,437.5 tons, or just 64 percent of actual need. As in other towns, the authorities had to prioritize. They used the soap for the so-called organized contingents, that is, those groups in state institutions – primarily young workers or trainees living in dormitories or Labor Reserve schools and youngsters in children's homes – whom the health authorities regularly inspected and put through "sanitary processing"; for workers and clerical employees entitled to a soap ration; and for the work of the sanitary processing stations, which were the first line of defense in epidemic control. In other words, most ordinary citizens had no access to soap. This, however, is just the quantitative side of the story. The quality of the soap, at least in the Tatar Republic, was so poor that people could not always use it. In Kazan' the soap was "semi-liquid" and the population used it only "unwillingly." Overall, the GSI claimed that the shortage of soap deterred people from using the baths.[19] This situation was duplicated across the country. In Yaroslavl' neither bathhouses nor sanitary processing stations could issue soap to users. The city reserved its scarce

18 GARF, f. A-482, op. 47, d. 1416, l. 60–60ob., and d. 2327, l. 14; GARF, f. 9226, op. 1, d. 693, l. 81–2.

19 GARF, f. A-482, op. 47, d. 1418, l. 12, 12ob., 16, and d. 2328, l. 134.

supplies for hospitals, children's institutions, and laundries, and then only when it was needed to combat epidemics.[20] In Moscow oblast' only the baths in the largest industrial towns had soap for sale, but only irregularly: Kolomna had no soap at all during the last three months of 1943; Orekhovo-Zuevo had no soap for six months. Only workers at industrial enterprises occasionally received soap through their ORSy. Here, too, the health authorities cited the lack of soap as one of many factors keeping people from going to the public baths.[21]

It will come as no great surprise, therefore, that at war's end the stock of bathhouses needed substantial investment in repairs. Bathhouses located in the occupied areas required almost total restoration – there were ten oblasti where the network of baths had been totally destroyed and had to be rebuilt from scratch. In the RSFSR as a whole, the total capacity of urban baths in 1945 remained below that of 1941, despite considerable efforts to build new units during the latter part of the war. The soap crisis proved equally persistent: in mid-1945, only Moscow, Leningrad, Kuibyshev, Arkhangel'sk, Novosibirsk, and Chkalov could give bathers soap on a regular basis, while Gor'kii, Kazan', Saratov, and Ul'yanovsk could do so occasionally. Everywhere else, including the large industrial centers, soap was nonexistent.[22]

The early postwar years remained difficult virtually everywhere. Of the major industrial cities and oblasti, only the city of Gor'kii could claim to meet the recommended sanitary threshold of thirty-six "bathings" a year (see Table 3.1). Everywhere else, including Moscow, the networks of municipal and factory baths buckled under the burden of wartime deterioration, continued fuel and soap shortages, and lack of funds for repairs and reconstruction. Moreover, progress over the next four to eight years was very uneven. Some cities saw a significant increase in bathing capacity, mainly via the restoration and expansion of factory shower rooms and/or boosting the number of residential buildings where people could bathe at home. At the very least they could meet the basic requirements of epidemic control. Others, however, including major industrial centers such as Ivanovo and Chelyabinsk, made almost no headway at all.

Table 3.1 summarizes the situation in a number of hinterland cities and towns during the early postwar period and, where data were available, in the early 1950s. The picture during 1946–1948 was almost universally

20 GARF, f. A-482, op. 47, d. 1422, l. 15. The report is from 1943.

21 GARF, f. A-482, op. 47, d. 1421, l. 27–8. For similar but less detailed accounts, see GARF, f. A-482, op. 47, d. 1414, l. 85 (Ivanovo, 1943), and d. 1415, l. 47ob. (Kuibyshev, 1943).

22 GARF, f. 9226, op. 1, d. 636, l. 68–9.

Table 3.1 *Average number of "bathings"* (pomyvki) *per resident provided by municipal and enterprise bathhouses per year and per month*

Town and year	Per year	Per month
Moscow region		
Moscow, 1948	15	1.25
Moscow, 1953 (large parts of population had gas and could bathe at home or shower at work – provision adequate)	9.6	0.8
Moscow oblast' industrial towns, 1947	12–15	1.0–1.25
Moscow oblast', industrial towns, 1949 (GSI assumed large numbers now bathing at home or showering at work – provision deemed adequate)	12–18	1.0–1.5
Central Russia		
Ivanovo region		
Ivanovo city, 1946	19.2	1.6
Ivanovo city, 1950 (enterprise showers made a negligible contribution)	16.8	1.4
Ivanovo city, 1954 (state of enterprise showers as in 1950)	18.0	1.5
Other cities in Ivanovo region		
Kineshma, 1946	21.6	1.8
Kineshma, 1954	19.2	1.6
Shuya, 1946	13.2	1.1
Vichuga, 1946	14.4	1.2
Vichuga, 1950	19.2	1.6
Furmanov, 1946	10.3	0.9
Teikovo, 1946	7.2	0.6
Teikovo, 1950	24	2.0
Yaroslavl' region		
Yaroslavl', 1946 (enterprise baths not working)	24	2.0
Yaroslavl', 1948 (excludes enterprise showers – provision now deemed adequate)	15.6	1.3
Shcherbakov (Yaroslavl' oblast'), 1948	12.0	1.0

Table 3.1 (*cont.*)

Town and year	Per year	Per month
Yaroslavl' oblast', industrial towns, 1954 (excludes enterprise baths – provision now deemed adequate)	14.4	1.2
Gor'kii region		
Gor'kii city, 1947	40	3.3
Gor'kii city, 1951 (excludes factory showers – provision probably adequate)	17.9	1.5
Volga region		
Kuibyshev, 1947	14	1.2
Kazan', 1953 (maximum estimated capacity, includes enterprise baths, but excludes factory showers)	27.7	2.3
Urals		
Sverdlovsk, 1947	12	1.0
Chelyabinsk, 1946	17.3	1.4
Chelyabinsk, 1947	17.4	1.5
Chelyabinsk, 1951	18.0	1.5
Molotov oblast' (all 1948)		
Polovinka	36	3.0
Berezniki	36	3.0
Dobryanka	36	3.0
Gubakha	24	2.0
Lys'va	24	2.0
Solikamsk	24	2.0
Kemerovo oblast' (all 1947)		
Gur'evsk	13.0	1.0
Prokop'evsk	10.0	0.8
Leninsk-Kuznetsk	10.0	0.8
Anzhero-Sudzhensk	7.7	0.6
Kemerovo	7.5	0.6
Stalinsk	7.0	0.6

Table 3.1 (*cont.*)

Town and year	Per year	Per month
Osinniki	5.7	0.5
Kiselevsk	3.0	0.25

Sources:

Moscow city:	GARF, f. A-482, op. 47, d. 7669, l. 105 (1948); op. 49, d. 7373, l. 155–155ob. (1953).
Moscow oblast':	GARF, f. A-482, op. 47, d. 6347, l. 94 (1947); op. 49, d. 103, l. 54–5 (1949).
Ivanovo oblast':	GARF, f. A-482, op. 47, d. 4925, l. 202 (1946); op. 49, d. 1610, l. 22–8 (1950); op. 49, d. 8836, l. 25–6 (1954).
Yaroslavl' oblast':	GARF, f. 9226, op. 1, d. 745, l. 110 (1946); op. 47, d. 7685, l. 98–9 (1948); op. 49, d. 8856, l. 87 (1954).
Gor'kii:	GARF, f. 9226, op. 1, d. 798, l. 40–40ob. (1947); GARF, f. A-482, op. 49, d. 3240, l. 39 (1951).
Kuibyshev:	GARF, f. A-482, op. 52s, d. 224, l. 89.
Kazan':	GARF, f. A-482, op. 49, d. 7324, l. 162–4, calculated from capacity figures, assuming a 96-hour operating week (the maximum for large baths), and no down time, but excluding possible use of enterprise showers.
Sverdlovsk:	GARF, f. A-482, op. 47, d. 6358, l. 8.
Chelyabinsk:	GARF, f. A-482, op. 47, d. 4960, l. 49 (1946); op. 47, d. 6363, l. 27–8 (1947); op. 49, d. 3261, l. 25–6 (1951).
Molotov oblast':	GARF, f. 9226, op. 1, d. 899, l. 313–14.
Kemerovo oblast':	GARF, f. 9226, op. 1, d. 932, l. 24–5.

discouraging: urban residents could bathe on average no more than once or twice a month. In most cases, the figures in Table 3.1 show bathings only in bathhouses (both municipal and factory-owned) and sanitary processing stations; that is, they exclude showers that people may have had at work or summer shower pavilions, or "bathings" they may have performed at home. With very few exceptions, however, during these early years factory shower rooms were in a sorry state and added little to the general figures. Even in 1950, the factory showers in Ivanovo provided a grand total of just 80,000 showers a year – compared to the roughly 4.5 million visits to the public baths during that same year.[23] Similarly, very few people had bathrooms in their flats or ways to heat water. In Moscow in 1947, just under 9 percent of residential buildings had bathrooms, but

[23] GARF, f. A-482, op. 49, d. 1610, l. 23.

half of them were out of order.[24] This does not, of course, mean that people went around permanently dirty. People undoubtedly did the best they could with whatever means were available, whether using a washcloth and small basin, or just dousing oneself under a spurt of cold water from a street pump, as depicted in some Soviet films. The point is that the alternatives were very limited given the general lack of indoor running water, the shortages of fuel, and, most important of all, the severe shortage of soap. By the end of the 1940s and early 1950s, this situation in many, but by no means all, cities had begun to change. Soap was becoming more generally available, and the enterprise showers and private baths were beginning to compensate for the continued poor work of the bathhouses.[25]

As with other areas of sanitation, Moscow stands out as a unique case. In 1946 its bathhouses suffered from the same basic difficulties as elsewhere. They needed extensive renovation, including the repair or replacement of boilers. Premises required replastering, painting, tiling, and other surface improvements. They were short of taps, linen, and, most seriously of all, soap – the baths had enough to meet only two-thirds of actual need. By the following year, however, repair and restoration work were well under way. The baths were installing new boilers, renewing their plumbing, repairing or replacing ventilation systems, replastering walls and ceilings. Soap supplies improved, and now met almost 80 percent of demand, in a year when almost everywhere else in the USSR soap shortages were actually deepening. In typical Soviet fashion, not all of the repair work proved very durable, and much of it was undone by the poor state of the ventilation or the failure to damp-proof the internal walls. Yet progress was being made. In 1949 soap was freely available in the shops, and people no longer depended on the bathhouse to acquire it. The quality of the repair work was improving, although poor ventilation continued to plague the bathhouses well into the 1950s. Supplies of hot water became more reliable, as nearly half of baths had either switched their boilers from solid fuel to gas or were taking hot water directly from centralized thermal power stations. Most telling of all, the number of per capita visits to the

24 GARF, f. A-482, op. 47, d. 6351, l. 107. There were 80,000 private baths. We can only guess what percentage of the population they served. A bath in a communal flat would have served several families. A bath in the single-family flat of a Party official might have served just three or four people. If an average of ten people had access to each bath, but half the baths were not working, this would have given coverage to around 10 percent of Moscow's 4 million population.

25 Just how much impact workplace showers had is difficult to quantify. In no report did the GSI attempt to calculate their contribution. Beginning in the early 1950s, a number of reports simply began to presume that, although the numbers of bathhouse visits remained stagnant or even fell, overall provision had now become more adequate from the standpoint of public health.

baths was falling steadily, at the same time as the bathhouses themselves had become more efficient, due to the rapid increase in the number of flats with gas stoves (making it easy to boil water) and gas hot-water heaters. This explains the seemingly paradoxical figures in Table 3.1, which shows the average Muscovite in 1953 visiting the baths less than once a month.[26] In short, here, too, Moscow was taking on the trappings of a "modern" city.

Cities and regions outside Moscow followed a somewhat different pattern, or rather patterns. Not surprisingly, the oblast' towns were in a far worse condition just after the war. The towns and cities of Moscow oblast' suffered from fuel shortages, disruptions to electricity supply, breakdowns of power plants and boilers, interruptions to the water supply, inadequate sewerage, and, of course, almost no soap. The problems were compounded by the slow pace of repairs. These problems persisted until 1949, the first postwar year to record significant cuts in down time and adequate soap supplies. In that same year, however, bath usage actually fell, because the regime had ordered public baths to put up their prices, and these turned out to be beyond the reach of many residents. The documents do not tell us if the price rises were ever reversed, but we do know that a similar situation in Ivanovo in 1950 was resolved only when the local authorities lowered admission prices.[27] In Gor'kii oblast' even as late as 1947, eighteen of the fifty municipal (as opposed to enterprise-owned) bathhouses were in such an advanced state of disrepair that they were virtually unusable – despite which no repair work was done on them during the whole of that year. This may have been just as well, because repair of the remaining baths was so badly organized and the allocated funds so poorly utilized (and often diverted to other uses) that the necessary work was rarely finished and the baths would go out of service again shortly after reopening. Of the thirty-two baths that underwent what the Soviets called "capital" repair – that is, major, root-and-branch renovation – during 1947, the GSI estimated that every single one would need to repeat the process all over again in 1948. While the factory-owned baths generally performed better, this was by no means always the case. By the same token, by 1954, that is, in a space of just six or seven years, the towns of Gor'kii oblast' had moved from this near-catastrophic situation to boast baths that were at least reasonably clean and adequately supplied with the bare basics of equipment and supplies.[28]

26 GARF, f. A-482, op. 47, d. 4941, l. 135ob.–137ob. (1946); d. 6351, l. 101–101ob. (1947); op. 49, d. 111, l. 56–57ob. (1949); d. 7373, l. 155–156ob. (1953).

27 GARF, f. A-482, op. 47, d. 4737, l. 68–72; d. 6347, l. 94–6, 99–100; op. 49, d. 103, l. 51–2, 54–5. The price reductions in Ivanovo are in GARF, f. A-482, op. 49, d. 1610, l. 23.

28 GARF, f. A-482, op. 47, d. 6335, l. 94–8; d. 7656, l. 82–5; op. 49, d. 8835, l. 13–14.

The main difficulty in these and many other localities, however, was simple lack of capacity. The baths in Chelyabinsk suffered extensive periods when they were out of action in the early postwar years, which when added together were equivalent to each and every bathhouse in the city being closed down for an entire month during 1946. Yet the fact was that, even if all the baths had worked perfectly, the city's residents could have bathed no more often than twenty times in 1946 and twenty-four times in 1947. It is this lack of capacity, as much as the greater number of showers and "bathings" taken at home or at work, that explains why in cities like Chelyabinsk or the towns of Ivanovo oblast' the population bathed no more frequently in the early 1950s than just after the war.[29]

The other factor to take into account is need. Workers did not always see the basic sanitary "norm" as adequate to their personal requirements. The lack of bathing facilities was certainly a source of complaint on the railways, while Party officials in Chelyabinsk oblast' cited workers' grievances over bathhouses as one of the main causes of labor turnover.[30] The larger point is that some communities suffered more than others, even if on paper general provision may have looked comparable. Perhaps worst afflicted would have been mining areas because of the nature of the work and their worse state of general sanitation. Table 3.1 gave bathing figures for the towns of Kemerovo oblast' and Molotov oblast'. Aside from coal mining, the main industries in Kemerovo were iron and steel and construction. In none of these industries were workers' basic needs even remotely met. Stalinsk, the largest city in the oblast', had fourteen baths in 1947, three belonging to the local soviet and eleven to various factories. All three of the municipal bathhouses were falling down and scheduled for closure during 1948. At least three of the eleven factory baths were in a similar state, although they were still working. In Leninsk-Kuznetsk, two of its six municipal baths had collapsed due to mine works. In Osinniki, the GSI had to shut down one of its four bathhouses due to its advanced state of dilapidation. These are just the more graphic examples from a long list.

[29] GARF, f. A-482, op. 47, d. 4960, l. 48; d. 6363, l. 27–8. Optimal capacity in the urban areas of Ivanovo oblast' actually went down slightly between 1946 and 1950: GARF, f. A-482, op. 47, d. 4925, l. 198; op. 49, d. 1610, l. 27.

[30] On the railways, see RGAE, f. 1884, op. 31, d. 7884, l. 60, 64–5, 67. This report is from 1948. On worker discontent in Chelyabinsk, see RGASPI (Russian State Archive of Contemporary Political History, Rossiiski gosudarstvennyi arkhiv sotsial'no – politicheskoi istorii), f. 17, op. 125, d. 518, l. 9–10. The Chelyabinsk report is from the famine year, 1947. Not surprisingly, workers' other main grievances were the poor state of the dining rooms and public transport, and the refusal of factory managers to give them plots to grow hay to feed their livestock.

Yet this refers only to the condition of the buildings. There was no shortage of other problems. Bathhouses – especially municipal baths – could not lay hold of boilers, pipe, or taps. In the past local industrial enterprises had supplied these, but now their parent ministries had told them to halt the practice. Then there were the usual shortages. Kemerovo oblast' was a coal mining region – yet its public baths were short of coal. It was a region of powerful rivers, but its bathhouses suffered long stoppages because they had no water supply. The amount of down time was so great that in both Kemerovo and Leninsk-Kuznetsk each and every bathhouse averaged the equivalent of nine weeks' total closure. This, however, was not the worst of it. There were whole mining communities with populations of between 10,000 and 25,000 people that had no bathhouse at all. Elsewhere, the miners' settlement of Berezovaya Roshcha outside Prokop'evsk had just one tiny bath with twenty-four places to serve a population of over 30,000 – enough to give each person just over two "bathings" a year.[31] Much the same situation prevailed in the mining towns of Molotov oblast'. Although the number of "bathings" in Polovinka, for example, was only slightly below the sanitary norm, the baths were in an appalling condition – not just filthy and overcrowded, but often without hot water. It was not uncommon for miners to be unable to wash at the end of a shift underground. Here, too, some of the miners' settlements had no bath at all. The GSI had to order the local coal trust, Kospashugol', to build bathhouses for these settlements, but the trust did not carry out the work.[32]

Before we turn to the next section, which examines the public health measures that tried to compensate for the lack of bathing facilities, I should say a few words about public laundries. Anyone familiar with the Soviet Union during its final decades will know that laundries – or rather, the absence of them – loomed large in family life. Soviet women did almost all domestic labor, even while holding down a full-time job, and did this without the aid of modern appliances. Among the worst of these labors was washing bed linen and clothes, which had to be done almost exclusively by hand. In the late 1950s, the 61 million urban residents of the RSFSR owned between them a mere 300,000 domestic washing machines (compared to the roughly 15 million washing machines in

[31] GARF, f. 9226, op. 1, d. 932, l. 18–26; GARF, f. A-482, op. 47, d. 7659, l. 30–2. The Kemerovo GSI assumed that each bathhouse working normally would be open eight hours a day for 365 days a year. With twenty-four places the bathhouse in Berezovaya Roshcha could accommodate 192 bathers a day, on the unrealistic assumption that it worked without any down time. This would allow it to provide its 30,000 residents with a grand total of just over 70,000 "bathings" a year.

[32] GARF, f. 9226, op. 1, d. 900, l. 113–16, 124.

domestic use in the United States in 1940). When the Soviet Union began large-scale production of domestic washing machines in the 1960s, ownership among worker households was still only 10 percent, although it was to expand rapidly from the 1970s onwards. It is equally important to keep in mind that even in the late Soviet period these were not washing machines as we would know them. They saved a great deal of labor compared to doing everything by hand, but the work was still time-consuming drudgery. The machines had to be filled and emptied manually and did not spin dry the clothes, which had to be wrung out by hand. Even during *perestroika* over half of all *new* washing machines manufactured required hand wringing, and only 4 percent were fully automatic. In theory public laundries, where you could drop off your sheets or clothes and collect them washed, dried, and ironed, should have compensated for these difficulties, but they did not. In the mid-1960s only 13 percent of all Soviet women used laundries, and even then they did not trust them sufficiently to give them more than a small proportion of their washing. There were limited experiments in Moscow, Yaroslavl', and probably other Soviet cities to open self-service laundries in 1962, similar to our launderettes and laundromats, but the number of washing machines was small: just 20 four-kilogram capacity machines in Moscow and 63 in Yaroslavl'. The experiment did not become widespread. In 1990 Moscow, which by then had a population of 9 million people, had just sixty-five self-service laundries, but one-third of these were dilapidated and falling apart.[33] Even then, public laundries could not make up the shortfall. The largest laundry trust in Moscow during *perestroika* could meet just 10 percent of demand, and the quality remained poor. This should not be surprising, given the terrible conditions under which the laundry women worked, shifting 150-kilogram loads by hand and working in constant damp and extreme temperatures, which could reach 60 to 70° Celsius in summer.[34]

All this, however, is a universe away from what conditions were like during the late Stalin years. Like the baths, laundries were primarily a line of defense in the effort to curb lice. Their main function was not to ease the domestic burdens of the general population, but to prevent disease. This was not so much a matter of overt policy as a necessity that derived from their poor physical condition and limited capacity. The context, of course, was that, for private citizens, washing bed linen and clothes at home was a monumental task. There were, as noted, no domestic washing

[33] Filtzer, *Soviet Workers and De-Stalinization*, p. 200, and *Soviet Workers and the Collapse of Perestroika*, p. 166; *Narodnoe khozyaistvo SSSR za 60 let* (Moscow, 1977), pp. 42–3.

[34] *Sovetskie profsoyuzy*, no. 11–12 (1990), pp. 55–8.

machines, and few people had piped water, hot or cold. Therefore, washing had to be done in a basin, and involved lugging buckets of cold water up from street pumps or standpipes, heating the water, and then rinsing and wringing by hand. All this took place in the cramped premises of a communal flat, a dormitory, or even a barracks. The only way out of this was to take clothes to a public drop-off point, where you would leave clothes or linen for forwarding to a central laundering unit, the biggest of which would be organized like a factory. A few might have been fully "mechanized," but most were "semi-mechanized," which meant they had some industrial-sized washing machines, but most other operations, including wringing, drying, and ironing, were done by hand. Smaller laundry units would have been totally unmechanized. During the early postwar years all laundries had difficulties acquiring soap, and the quality of the washing was poor.[35] Conditions for the workers in these laundries were difficult. The work itself was backbreaking. The buildings were damp and hot, and ventilation was either inadequate or nonexistent.[36] Most of the larger laundries were owned by the local soviet and organized into a local laundry trust. In addition, factories, hospitals, and some children's homes also had their own laundries, but these tended to be small, with most of the work done by hand. From the public's point of view, the main difficulty was that the laundries took in very little washing from ordinary citizens. They simply did not have the capacity to do so. Instead they concentrated on the "organized" population, that is, those living in dormitories, hospitals (if they did not have their own laundry), schools, children's homes, and army barracks. The railways also had their own laundries, the first priority of which was to wash the bed linen on sleeper trains to kill off any lice.[37]

[35] GARF, f. A-482, op. 47, d. 4960, l. 50.

[36] In the city of Molotov as late as 1951, not a single laundry met even basic sanitary standards for its workers. Moreover, there was a tendency for conditions to worsen as laundries expanded the amount of work they took in, since the state of buildings did not improve. Thus in Moscow in 1953, as the laundries increased the volume of washing they handled, ventilation systems were no longer able to cope with the amount of steam generated, and the sewerage systems could not deal with the larger amount of contaminated waste water: GARF, f. A-482, op. 49, d. 3250, l. 24 (Molotov), and d. 7373, l. 159 (Moscow).

[37] This obligation placed tremendous pressure on soap supplies for railway workers. To take just one example, workers on the Perm' Railway (which ran through Molotov oblast') were to receive 90 tons of soap for their personal use during 1947. The railway was also to receive a further 20 tons to launder the bed linen in its workers' dormitories. In reality, it received just 9.4 tons, of which 1.3 tons immediately were siphoned off to launder the sheets on passenger trains. This left the railway with just 40 percent of what it needed for its dormitories, and nothing at all for its workers: RGAE, f. 1884, op. 31, d. 7884, l. 32. The other points noted in this paragraph are illustrated further later.

We can best understand the range of facilities and the major difficulties they encountered by looking at Moscow, which had the most-developed laundry network. In 1949, Moscow had 130 laundries. Ten belonged to the City Laundry Trust, and twenty-one to district communal trusts, which together handled the bulk of the work, around 22 million tons, a figure virtually unchanged since 1946. In addition, there were a number of smaller units belonging to hospitals, children's institutions, and enterprises; eight medium-capacity laundries belonging to the Red Laundry Artel'; and twenty-three laundries attached to residential housing blocks. The large city and district trusts devoted only about a sixth of their capacity to private individuals, and the Red Laundry Artel' about a third; the rest was for institutions. Public demand was highest in the winter months (when the health risks from lice were greatest), and it was precisely then that the laundries had to refuse to accept their washing. Serious expansion of the system began only in the early 1950s, so that the volume of laundry handled in 1953 (38,664 tons) was nearly double that of 1949. Yet they remained unable to meet public demand. The USSR Council of Ministers even cooked up a scheme in 1951, according to which the Ministry of Railways, the Ministry of Trade, and the Ministry of Health were ordered to construct their own laundries for their own institutional needs, thus freeing up the stock of existing laundries to take in washing from the general public. By the end of 1953 – a year after the final deadline for them to go into operation – not one of these laundries had been built.[38]

If Moscow gives us a glimpse of how the laundry system worked, it was certainly not typical even of other large cities in terms of performance, especially during the early postwar years. The network of laundries in Sverdlovsk in 1947 functioned so poorly that not even institutions used them. Dormitories, hospitals, and children's homes either did their washing themselves using "primitive" methods, or farmed it out to private washerwomen.[39] Chelyabinsk, also in 1947, had twenty-five laundries, all but two of them belonging to its large industrial enterprises. Of this total, only four were "mechanized," that is, they had washing machines; six were "semi-mechanized"; and the remaining fifteen did everything by hand. Even the "mechanized" laundries did not work well, since the equipment had suffered extensive wear and tear during the war. More to the point, not a single laundry accepted washing from the public. They only served the so-called organized population, that is, the military, the

[38] GARF, f. A-482, op. 47, d. 4941, l. 136, 140, 140ob.; d. 6351, l. 103ob., 104; d. 7669, l. 112; op. 49, d. 7373, l. 158–60.
[39] GARF, f. A-482, op. 47, d. 6358, l. 9.

penal system, and workers' dormitories.[40] The city of Gor'kii told a similar story. In 1947, the city had only one laundry (albeit "mechanized") to serve its entire population. The situation in 1954 was exactly the same: there was still just one laundry for the public, and most residents remained without access to laundry services.[41]

Here, too, oblast' industrial towns fared worse than their regional metropolises. Perhaps the worst provision right after the war was in Gor'kii oblast', which had not a single municipal laundry anywhere. Factories, hospitals, and children's institutions had their own laundries, but these were specifically for their own use – the general population was not allowed to use them.[42] By the same token, starting out from such a low level, at least some oblasti had made significant progress by the mid-1950s. The industrial towns in both Ivanovo and Chelyabinsk oblasti, the laundries of both of which had been in desperate condition in 1945 and 1946, by 1954 had at least reached a point where they could operate without large amounts of down time and could accept washing from the general population.[43]

Given the severe difficulties that laundries faced – their limited capacity, the poor quality of the laundering, and the abysmal state of most of the buildings – there was a certain logic to concentrating resources on serving those institutions which posed the greatest risk of spreading infectious diseases, in particular typhus. This meant not only hospitals, but also dormitories and children's homes, or in fact anywhere where large numbers of people lived and slept in cramped conditions and close proximity to one another. To a certain extent the poor work of the laundries would have been mitigated by another public health institution, the disinfection chambers attached to hospitals and sanitary processing stations. As I discuss in the next section, anyone found with potentially infected or infested clothing had to surrender it for high-temperature or chemical disinfection. From this standpoint, the disinfection chambers, while they may have dealt with a relatively small volume of clothing in absolute terms, cleansed a much larger proportion of high-risk items.

The lack of laundries, therefore, placed an enormous burden on individuals and their families. If in the 1960s this was a question of increasing ownership of domestic washing machines and the capacity of the public laundries, in the late Stalin years alleviating this burden

40 GARF, f. A-482, op. 47, d. 4960, l. 50–1, and d. 6363, l. 29.
41 GARF, f. 9226, op. 1, d. 798, l. 42ob., 43; GARF, f. A-482, op. 49, d. 8857, l. 23.
42 GARF, f. A-482, op. 47, d. 6335, l. 100.
43 GARF, f. A-482, op. 47, d. 3445, l. 42–3, and op. 49, d. 8850, l. 25–6 (Chelyabinsk oblast'); op. 47, d. 4925, l. 206–7, and op. 49, d. 8836, l. 26–7 (Ivanovo oblast').

required things far more basic: providing indoor plumbing, hot water, and gas. As with so much else in Soviet society, progress in this area remained painfully slow.

Disease control measures

The Stalinist regime presented an apparent contradiction. On the one hand, it refused to make the necessary investments in public health infrastructure. On the other hand, it tried to compensate for this through an elaborate set of measures designed to inspect, detect, isolate, and then decontaminate anyone who might possibly start or help spread an epidemic. Aside from routine examinations of the "organized contingents" – school children, those living in dormitories or barracks, prisoners, hospital patients – and periodic mass inspections of the general population, anyone found ill with a fever was immediately treated as a potential typhus carrier and isolated for observation. The scale on which this took place was massive. In 1947, Kuibyshev had a population somewhere in the vicinity of half a million people. During that year the authorities carried out 1,647,197 inspections for lice, the equivalent of one inspection for every resident every four months. Over 43,000 people were found infested and sent to the sanitary processing stations for cleansing; nearly 80,000 pieces of clothing or other personal belongings were disinfected. Out of this effort they found 590 people with typhus.[44] In Molotov oblast' special "detachments" of health workers – known as "disinfectors" – carried out over 4,000,000 examinations for lice during 1948 and put 800,000 people through "sanitary processing," of whom 10,000 had a fever. They also decontaminated 2.5 million pieces of clothing. As a result of this effort they uncovered 181 people with typhus.[45] All of this may seem like a small return for such a huge endeavor, but lice and typhus can spread quickly. One carrier, be it a homeless child living in a basement or loft with other street children, a worker or prisoner mobilized from another locality, or simply transients on rail or river transportation, would be enough to start a local outbreak. The typhus epidemic that broke out during the famine of 1947 spread across the entire country in just this way. It also strengthened the regime's antipathy toward its *besprizorniki* and *beznadzorniki*, the

[44] GARF, f. A-482, op. 52s, d. 224, l. 61–3.

[45] GARF, f. 9226, op. 1, d. 899, l. 104, 106. The city of Ivanovo in 1946 inspected each of its inhabitants an average of three times (only 2.1 percent were found to be "sanitarily neglected," that is, lice-infested). Among the smaller towns in the oblast', Vichuga inspected everyone twice and Kineshma once, with lower infestations rates even than Ivanovo: GARF, f. A-482, op. 47, d. 4925, l. 211, 213–14.

homeless or unsupervised waifs. Not only did they spread the social pathologies of crime and defiance of authority (from the regime's point of view, the latter was far more serious than the former), they also carried typhus and were diabolically hard to track down.[46] Of course there were plenty of sources of lice much closer to home, and it was no doubt due to strict epidemiological measures that the epidemic did not become worse than it did and that the case fatality rate remained relatively low. When Moscow witnessed a surge of typhus cases in September 1947, health officials there began to devote special attention to school children. Large-scale, but not comprehensive, examinations found rates of lice infestation had shot up from 1 percent to 4.6 percent in the space of one month. The GSI then ordered teachers regularly to inspect the children, and to direct anyone with lice for "sanitary processing." If the infestation recurred, health officials went and examined the entire family, again sending them for "sanitary processing" if necessary. Throughout the autumn the scope of the inspections broadened, although infestation rates declined only insignificantly, allegedly because the children had not been properly treated with insecticide. What is important, however, is that the epidemic was contained. Although ninety of Moscow's schools reported cases of typhus, almost all of these were isolated – the disease did not spread, at least among school children.[47]

The fear of lice also explains why health officials exercised strict controls over barbers and hairdressers. The state of these was fairly dismal – most were located in makeshift premises, some without running water or sewerage – which made the task of controlling hygiene much more difficult. Controls, however, were strict, at least in the large cities. Anyone working at a hairdresser's had to have a medical inspection. All hair was to be gathered up and burned. Each customer was to get a fresh apron or peignoir, and all used linen was to be disinfected. Brushes were to be used no more than once, and cities like Gor'kii and Moscow had special "laboratories" for sterilizing. In Moscow they sterilized 12 million hairbrushes during 1947. Needless to say, this was an ideal situation. In more remote areas, such as the smaller towns of Moscow oblast', sterilization of brushes was not routine, at least during the very early postwar period, and some hairdressers violated health codes by burying hair, rather than burning it. Even in Moscow hairdressers found it difficult to obtain all the fresh linen they needed. Yet, given the state of shortages elsewhere in

[46] On the typhus epidemic of 1947, see Zima, *Golod*, pp. 173–5. The authorities in Chelyabinsk (which recorded 1,467 typhus cases in 1947 – the city's worst year since 1942) traced more than 100 of these back to just one *besprizornik*: GARF, f. A-482, op. 47, d. 6363, l. 7–8. For similar, but less dramatic, claims in Kuibyshev, see GARF, f. A-482, op. 52s, d. 224, l. 56–7.

[47] GARF, f. A-482, op. 47, d. 6351, l. 141ob.–142ob.

the economy, including bathhouses, hairdressers overall appear not to have fared badly.[48]

By far the most stringent controls, however, were over people traveling or in transit. The idea of quarantining and controlling travelers in order to contain epidemics long predated the germ theory of disease. The first known use of quarantine in Europe was in Venice in 1348, when it sealed off its territory in order to contain an outbreak of plague.[49] In the seventeenth century, the Habsburg Empire tried to impose a *cordon sanitaire* along its borders with the Ottoman Empire in an effort to keep plague from entering Europe. Port cities quarantined ships coming from infected regions, and towns tried to screen travelers arriving from areas where they knew there had been plague. Similar measures were applied in Britain following outbreaks of plague in the 1660s and in Marseilles in 1720.[50] The growth of railways in the nineteenth century provided a ready vector for the rapid spread of cholera from Asia into Europe via Russia. With an outbreak of cholera in 1892 in Afghanistan, and from there into European Russia, Germany tried to keep the disease at bay by sealing its borders. According to Evans, migrants from the Russian Empire seeking to secure passage to the United States were transported across Germany in sealed trains, from which they were not allowed to alight until they had reached their final destination, the ports of Bremen or Hamburg. If anyone did leave a train, "the station was cleared of people and disinfected after the train's departure." Migrants who had made their way to Hamburg and were awaiting embarkation to the United States were housed in special barracks, given medical examinations, and had their belongings disinfected.[51]

I discuss this case in such detail because it very closely resembles the experience of the Soviet Union some fifty years later, at the outbreak of

[48] GARF, f. 9226, op. 1, d. 798, l. 44, and d. 895, l. 107ob., 108 (Gor'kii); GARF, f. A-482, op. 47, d. 6351, l. 104–5 (Moscow); GARF, f. 9226, op. 1, d. 691, l. 190–1.

[49] George Rosen, *A History of Public Health* (Baltimore: Johns Hopkins University Press, 1993), pp. 44–5; Lloyd F. Novick and Cynthia B. Morrow, "Defining Public Health: Historical and Contemporary Developments," in Lloyd F. Novick, Cynthia B. Morrow, and Glen P. Mays, eds., *Public Health Administration: Principles for Population-Based Management* (Sudbury, MA: Jones and Bartlett, 2008), p. 6. According to Rosen, the origin of the word "quarantine" derives from the measures taken by the Italian city-state of Ragusa on the Dalmatian coast in 1377. Any traveler arriving from a region with plague had to remain in isolation for a period of thirty days, later extended to forty days. The Italian word for forty is "quaranta," and the forty-day isolation period was referred to as "quarantenaria" – hence our word "quarantine."

[50] Mercer, *Disease*, p. 27.

[51] Evans, *Death in Hamburg*, pp. 279–84. Ironically, it was the stringency of these measures that led to cholera breaking out in Hamburg in 1892. The sanitary state of the barracks was allegedly very poor, and the medical examinations often perfunctory. The excrement from the barracks went directly into the River Elbe. Since Hamburg's city fathers did not subscribe to the germ theory of disease and Hamburg had no sewage treatment plant, cholera quickly spread into the local population.

World War II. The early days of the war caused a sanitary crisis on the Soviet railways of almost unbelievable proportions. By the same token, it was precisely this crisis that gave rise to the system of hygiene and sanitary controls over human railway traffic that formed the core of postwar policy. We need to keep in mind here that the mass movements of people across the country, which began with the evacuation of the western territories at the start of the war, continued, albeit on a diminished scale, during the postwar years. Various categories of prison or MVD-controlled workers, millions of indentured laborers dragooned into the Labor Reserve schools or mobilized via *orgnabor*, hundreds of thousands of seasonal workers digging peat and logging, and, of course, soldiers in the Red Army: all traveled by rail and posed, and were in turn exposed to, inordinate health risks. That epidemics rarely occurred was largely due to the systems put in place during the war.

When Germany invaded the Soviet Union, rail and water transport had to cope with two main sanitary tasks. The first was to exercise some sort of control over the movement of evacuees so that epidemics did not erupt and spread along transport routes to the far corners of the country. The second was to prevent any epidemics from breaking out within the Red Army and decimating its ranks. To meet the first of these, the regime set up evacuation councils at all major evacuation points. Their job was not simply epidemic control: they were asked to service, resettle, and find work for evacuees. Each council had a medical section, which over and above general medical assistance administered inoculations, carried out "sanitary processing," and removed passengers who were sick or suspected of harboring an illness, placing them in hospitals or isolation units. To oversee this work, the All-Union GSI placed plenipotentiaries at the twenty-four most important railway junctions, including Gor'kii, Kazan', Ivanovo, Yaroslavl', Stalingrad, Chkalov, Aktyubinsk, Petropavlovsk, and a host of smaller population centers further east. To deal with the second task the government, on April 18, 1942, set up sanitary control stations (*sanitarno-kontrol'nye punkty*) at 198 large rail junctions and stations.[52] These were to ensure that all passengers on troop trains (*eshelony*) went through "sanitary processing," rolling stock

[52] The first sanitary controls on the railways stemmed, in fact, from the Civil War, in the form of so-called sanitary observation posts (*sanitarno-nablyudatel'nye punkty*), established at the country's largest rail junctions in 1920. I do not know what happened to them in the intervening years, other than that the railways did have a network of sanitary processing stations in place when war broke out, but it was soon overwhelmed by the sheer size of the evacuation: I. I. Dreizin, "Sanitarnoe obsluzhivanie massovykh lyudskikh perevozok po zheleznym dorogam v gody velikoi otechestvennoi voiny," *Mediko-sanitarnye posledstviya voiny i meropriyatiya po ikh likvidatsii: trudy vtoroi konferentsii*, vol. I (Moscow: Izdatel'stvo Akademii meditsinskikh nauk SSSR, 1948), p. 74.

was properly disinfected, railway stations were kept clean, and passengers had boiled water to drink while in transit. The basic principle was that troop trains should be kept completely separate from trains carrying civilians, in order to minimize the risk of soldiers contracting typhus. From here came the practice that became standard both during and after the war, that anyone traveling had to undergo a medical exam and "sanitary processing" prior to boarding a train or boat, should be kept under medical observation while traveling, and should then go through further "sanitary processing" once they had reached their destination.[53]

The situation with which the medical sections and the sanitary control stations had to deal was truly horrendous. Soviet train stations, both mainline stations (*vokzaly*) and smaller stations, simply did not have the capacity or infrastructure to deal with the vast numbers that were now passing along the country's rail network. The first problem was the lack of toilets. The areas around stations and the railroad track itself soon became littered with excrement. Most major rail stations could not provide clean drinking water, not even contaminated water that had been boiled. Overcrowding reached a point where the stations had to refuse to allow people in – they congregated outside, thus making the sanitary situation worse. Worse still, from a military point of view, stations were not able to isolate military passengers from civilians. Child evacuees presented their own special problems. There were not enough medical personnel to look after them while in transit. Many trains did not have special cars where they could isolate any children who fell ill. Medicines were in short supply, including the all-important immune serums for attenuating outbreaks of measles and diphtheria.[54] General sanitary precautions were also not enforced: children did not go through "sanitary processing" before departure, and the responsible officials who accompanied the trains were themselves poorly trained in how to handle food and water and even in basic rules of personal hygiene. It is small wonder, then, that there were outbreaks of dysentery, measles, scarlet fever, diphtheria, and typhus among evacuees right across the central and eastern USSR.[55] It is difficult to overestimate the impact this must have had. At risk were not just the passengers themselves, especially young children, but the cities and towns for which they were destined, for it meant bringing new disease carriers into populations already at risk from poor housing, sanitation, and diet.

[53] GARF, f. 9226, op. 1, d. 636, l. 74–6.
[54] The surge in measles deaths in hinterland areas during 1942 and the use of immune serum are discussed in Chapter 5, pp. 277–81.
[55] GARF, f. 9226, op. 1, d. 636, l. 74–7, 83–4.

It was nearly a year after the German invasion before the Soviet authorities put in place more stringent controls that could effectively deal with the crisis. Evacuation trains were to be shunted onto special sidings, near sanitary processing stations, where they were to have access to toilets, boiled water, and food. After a train's departure, the area where it had been standing was to be thoroughly cleaned and decontaminated. When special trains arrived at a destination, the receiving authorities were to inspect each and every evacuee, wagon by wagon. All evacuees were to go through "sanitary processing" before they could be assigned to a dormitory and given any food. Control over sanitation at railway stations also became tighter. Special brigades were hired to remove refuse and human waste from station grounds; the residents of local railway settlements were employed to clean rubbish and excrement from the railway tracks. Stations received chlorination units to disinfect drinking water, outhouse toilets, and, in a small number of cases, also new bathhouses and disinfection chambers. The regime considered it a sign of these measures' success that the "vast majority" of mainline stations managed to clear away all their human waste before the hot weather set in in the summer of 1943. But these systems were hardly foolproof. There were numerous complaints that medical personnel attached to the sanitary control stations were allowing trains to pass through their junctions without inspection, and were not pulling sick passengers off trains.[56]

If these efforts came too late to help dampen the surge in death rates in hinterland cities that occurred almost everywhere in 1942, the need for them hardly abated as the war continued. As the flow of evacuees slowed, other groups – so-called contingents – took their place: "special contingents" (mainly deported nationalities, including Crimean Tatars); internees; captured prisoners of war; and residents of formerly occupied territories deported to do penal labor as punishment for either real or alleged disloyalty. These various human waves traveled from the far western corners of the USSR into the Urals and Siberia, and many of them carried lice and/or active typhus or relapsing fever. Later, as the Red Army liberated the occupied zones and chased the German army back into Eastern and Central Europe, large numbers of evacuees were sent home, so-called re-evacuees. So while tens of thousands of suspect people (and peoples) continued to move eastward, mass movements now began in the other direction, as hundreds of thousands moved westward back to Poland, Estonia, Karelia, Leningrad oblast', Belorussia, and Ukraine. On top of all these groups were the seasonal workers. Sverdlovsk oblast'

[56] GARF, f. 9226, op. 1, d. 636, l. 77–9.

alone took in 20,000 peat diggers in the summer of 1944, most of whom came from regions with endemic typhus. All these groups, whatever their status and however dismal the fate that awaited them at their final destination, had to be controlled for disease. To obtain some idea of the scale of this task, during 1944, *eshelony* carrying nearly 1 million people passed through the Tatar ASSR alone – half a million through Yudino, its major rail junction; over 132,000 passed through Kazan'. The various railway medical teams did not inspect all of these; they checked around 200,000, or 20 percent, but that would still have been around 550 a day. In theory the examinations should have been routine, since all these passengers should have been inspected before setting off. Yet they were not. Of the 200,000 passengers examined over the course of 1944, inspectors found 8,000 infested, a rate of 4 percent. This may seem low, but it was sufficient evidence that inspectors elsewhere had either not been doing their job or had themselves been overwhelmed by the sheer numbers they had to examine. More to the point was the potential risk of an epidemic erupting had these 8,000 or so lice carriers not been detected.[57]

By the time the war ended, the wartime regulations had become more or less standard procedure, although they were not always strictly applied in practice. In Sverdlovsk oblast', a major receiver of indentured and prison labor, the GSI had an agreement with the personnel departments of local factories whereby the latter would inform health officials when trains carrying "contingents" were due to arrive; the GSI would then meet them and carry out the required sanitary inspections and follow-up. To their dismay, most of these trains had not undergone the necessary "sanitary processing" *en route*, and came without their required "sanitary passports," the documentation that showed that all essential hygiene and public health measures had been carried out prior to dispatch. The numbers arriving with serious illnesses were not small. They also give us an interesting glimpse into the diversity of the groups who were being transported to the Urals to do forced or indentured labor. A trainload of deported Bulgarians sent to a military factory in Nizhnii Tagil had forty typhus cases. Twenty more were found on a train of deportees from Stavropol oblast', who were to work at the Nizhnii Tagil coking plant. Another train of deportees from Ukraine had twenty-three passengers with relapsing fever. A special train of recently released labor camp prisoners assigned to the Verkhne-Ural'sk iron and steel works arrived with undisclosed medical problems. Still another carrying conscripts for the coking factory's FZO had been in transit for three weeks and, although no

57 GARF, f. 9226, op. 1, d. 636, l. 79–81; GARF, f. A-482, op. 47, d. 2327, l. 16, 16ob. (Sverdlovsk oblast'), and d. 2328, l. 150–1 (Tatar ASSR).

infections were found, the teenagers had had no opportunity to bathe during the whole of the journey. All this took place in 1945. As the size of the transits fell during 1946, even the formal systems began to break down, as enterprises stopped alerting the oblast' GSI about incoming trains. While many of these trains proved infection-free, others were not, and cases of typhus were picked up only after the sufferers had been admitted to local hospitals.[58]

As the postwar period progressed and the transport of prisoners and deportees slowed, epidemic control should have become easier. To some extent it did, but health authorities still had to cope with two enormous burdens. One was the typhus epidemic of 1947. The other, as noted, was the regime's heavy reliance on indentured labor. The issue was not simply the size of the indentured workforce, but the fact that the sources of indentured and "semi-indentured" labor (seasonal workers and those recruited via *orgnabor*) tended to be located hundreds, and in many cases thousands, of kilometers away from the industries to which they were conscripted or mobilized. In 1947, over 278,000 Labor Reserve students, most of them conscripts, came from outside the oblast' where they eventually worked; in 1948 the number rose to 380,000.[59] The scale of workers mobilized through organized recruitment was even greater: over 2,160,000 in 1946; 577,200 in 1947; and 596,860 in 1948.[60] These two categories alone generated over 850,000 rail journeys in 1947 and nearly a million in 1948. Thus, over and above the myriad other problems that indentured labor created for the regime, not least the high levels of illegal flight from the Labor Reserve schools and the questionable efficiency of unwilling workers,[61] the system also placed significant pressure on the public health infrastructure.

How this policy acted to help spread the 1947 typhus epidemic we can see from Table 3.2, which shows the increase in typhus cases between 1946 and 1947 in a number of our case study cities, and in cities closest to the famine's epicenter in Ukraine and Moldavia. I should caution that the files from which I have taken these data (Central Statistical Administration

58 GARF, f. 9226, op. 1, d. 693, l. 107–9, and d. 736, l. 166–8.

59 Of these, during 1947, 23,700 went to Sverdlovsk, Molotov, and Chelyabinsk oblasti in the Urals, and another 12,447 to Kemerovo oblast'. This figure increased dramatically in 1948, when 46,370 went to the three Urals oblasti from other parts of the country, and 44,492 to Kemerovo oblast': GARF, f. 9507, op. 2, d. 418, l. 3, 17, 19, 21, 22, and d. 420, l. 6, 34–6, 38.

60 The numbers actually rose in subsequent years to 616,180 in 1949, 647,685 in 1950, and 669,220 in 1951: GARF, f. 9507, op. 2, d. 828, l. 7–8 (1946); d. 834, l. 4 (1947); d. 842, l. 3, 25, 195 (1948–1950); d. 855, l. 2–3 (1951).

61 On the problems of the Labor Reserve schools see Filtzer, *Soviet Workers and Late Stalinism*, chapters 4 and 5.

Table 3.2 *Number of typhus cases and case fatality rates in selected hinterland cities and cities in famine regions, 1946–1947*

	1946			1947			
	Cases	Deaths	Case fatality %	Cases	Deaths	Case fatality %	% Increase in cases, 1946–1947
Cities closest to famine areas							
Kiev	245	6	2.4	1,162	63	5.4	374.3
Khar'kov	121	11	9.1	3,017	226	7.5	2,393.4
Kishinev	28	3	10.7	156	11	7.1	457.1
Rostov-on-Don	335	6	1.8	796	48	6.0	137.6
Moscow and Leningrad							
Moscow	1,153	21	1.8	3,910	234	6.0	239.1
Leningrad	429	12	2.8	2,043	81	4.0	376.2
Central Russia							
Gor'kii	93	3	3.2	211	11	5.2	126.9
Ivanovo	45	1	2.2	221	13	5.9	391.1
Yaroslavl'	57	3	5.3	229	15	6.6	301.8
Volga region							
Kazan'	180	5	2.8	256	3	1.2	42.2
Kuibyshev	149	6	4.0	484	22	4.5	224.8
Urals and Siberia							
Molotov	159	7	4.4	252	13	5.2	58.5
Novosibirsk	145	5	3.4	548	14	2.6	277.9
Omsk	91	7	7.7	161	9	5.6	76.9
Sverdlovsk	198	n/d	n/d	1,202	38	3.2	507.1
Chelyabinsk	112	4	3.6	1,448	51	3.5	1,192.9

Sources: RGAE, f. 1562, op. 18, d. 361, l. 10, 14, 17, 25, 28, 30, 31, 35, 36, 40, 44, 59, 62, 64, 65, 74 (1946), and d. 418, l. 14, 17, 21, 29, 32, 34, 35, 39, 41, 44, 47, 64, 67, 69, 70, 77 (1947).

reports showing the incidence of major diseases in these two years) appear to contain a number of mistakes.[62] The figures for typhus also deviate slightly – but not significantly – from the numbers of cases cited in the local GSI reports. Nevertheless, they show clearly enough the general relationship between the spread of the disease in 1947 and the regime's labor mobilization patterns.

[62] For example, some cities which I have not included in Table 3.2 registered more deaths from typhoid fever than the number of reported cases.

That the number of typhus cases should have doubled or tripled – and in the case of Khar'kov, increased 24-fold – in cities near to the famine's epicenter is hardly surprising. Nor is the sharp increase in Leningrad and Moscow, or that reported in the Baltic republics, especially in Lithuania, to which hungry people fled in search of food.[63] Even the large increases in Central Russia and the Volga region could conceivably fit this pattern. What spontaneous migration cannot explain is the huge rise in Sverdlovsk and Chelyabinsk, two of the largest recipients of indentured labor. This is especially true of Chelyabinsk, where the number of cases increased by nearly 1,200 percent, and the incidence per 10,000 population reached a figure only matched by another typhus epidemic that had swept the country in 1942.[64] It is also worth noting here that, despite the sharp increase in the number of infections, actual case fatality rates, while often doubling or tripling, nonetheless remained low. Whether this was due to vaccination programs or partial immunity acquired from earlier infections I do not know.[65]

The extent of the epidemic overwhelmed even the strictest of controls. Leningrad (admittedly not one of our case study cities, but one which described its procedures for typhus control in considerable detail) claimed to exercise a very rigid inspection regime on all incoming passengers. In 1947, Leningrad was no longer receiving large "organized contingents," nor was it a major rail junction for passengers in transit. The city's health department organized brigades to inspect railway staff and passengers on incoming trains and then treat anyone found with lice infestation or suffering from an illness. Yet none of these circumstances could prevent typhus cases from rising by nearly 400 percent.[66] Far less surprising is Moscow, whose position as the capital created quite specific problems seen nowhere else. As the USSR's best-supplied city, even in calmer times it attracted huge numbers of outsiders coming in the hope of finding goods, primarily food, unobtainable elsewhere. With the harvest failure, food price rises, ration cuts, and impending famine of late 1946, these problems only worsened. In September 1946 between 8,000 and 10,000 people were sleeping rough in Moscow's train stations every night – scenes which must have been reminiscent of the first months of the war.

63 I do not have figures for typhus cases in the Baltic republics. The increase there is reported in Zima, *Golod*, pp. 174–5, who also gives no figures.

64 Cases per 10,000 population in Chelyabinsk were 50.0 in 1942, 19.0 in 1943, 5.0 in 1944, 8.6 in 1945, 2.5 in 1946, and 36.6 in 1947: GARF, f. A-482, op. 47, d. 6363, l. 6, 7, 9.

65 See also Chapter 4, pp. 222–3.

66 GARF, f. 9226, op. 1, d. 799, l. 118–20. The Leningrad GSI complained that the examinations were far from thorough. Inspectors did not have flashlights, and tried to spot lice using the extremely dim lighting in railway carriages. Whether this alone could account for the huge jump in typhus is difficult to assess.

The famine, however, was only part of the story. Many people who worked in Moscow could not find housing there, and lived instead in the suburban towns of Moscow oblast'. They had to travel into the city and back again on overcrowded suburban trains. Similarly, most of the large numbers of daily "visitors" did not stay in Moscow – there was no accommodation, and the railways would not sell intercity tickets from Moscow stations, no doubt in order to discourage people from coming in the first place. But come they did, and the only way they could get home was to cram into suburban trains to an oblast' city or town, and try to intercept an intercity train from there. As there were not enough trains and certainly not enough places on them, they rode on the buffers, footboards, and platforms, and on the roofs of the wagons. Local stations even had signs: "Traveling on the roofs of railway carriages can be fatal – high voltage." Such unorganized and uncontrolled travel would have created inordinate sanitary hazards just on its own. We can be reasonably sure that none of these passengers would have seen a bathhouse or sanitary processing station since departing for the capital; nor could they have been inspected *en route*. The risk of epidemics – especially gastrointestinal infections and typhus – was compounded by overcrowding at the local stations, around each of which hundreds of passengers congregated every day in the hope of hopping a train back home.[67]

Other cities tried to keep the epidemic at bay through an array of stringent measures. Kuibyshev erected barriers at entry points to the city, organized special brigades to inspect and disinfect all trains traveling into or through the city, and initiated round-the-clock operation of the railway's disinfection station. As in other cities, no one could buy a rail ticket unless they presented a certificate proving they had recently gone through "sanitary processing."[68] Sverdlovsk imposed similar safeguards, plus a few more. The police would issue newcomers with a residence permit only upon presentation of such a "sanitary certificate," proving that they had gone through "sanitary processing." In fact, a person needed such proof just to enter station waiting rooms. The GSI also pressed the police to take firmer action to disperse the *besprizorniki* who regularly congregated around the station toilet, although there is no evidence that the police actually did so.[69]

There is no question that the typhus epidemic inordinately complicated the structural difficulties of monitoring the movements of indentured laborers and workers on *orgnabor*, not to mention spontaneous travelers. The fact was that the Ministry of Labor Reserves and its local offices were

[67] GARF, f. A-482, op. 47, d. 4941, l. 157ob., 158; RGAE, f. 1562, op. 329, d. 4591, l. 22, 26.
[68] GARF, f. A-482, op. 52s, d. 224, l. 95–6. [69] GARF, f. A-482, op. 47, d. 6358, l. 12–13.

under pressure to meet targets for conscripting and delivering trainees to industry, and the industrial enterprises were just as eager to lay hold of them. Thus there was pressure at both ends to ignore the health regulations. In extreme cases the youths were crammed into filthy railway wagons that had not been fitted out for passenger travel, with no prior "sanitary processing," and with several people carrying lice. If, as in one incident in Yaroslavl' oblast', the local GSI tried to stop the train from leaving, the local Labor Reserve Administration and the station managers colluded to send the train anyway. There were similar violations at the receiving end. Industrial enterprises in Moscow oblast' routinely housed new arrivals without "sanitary processing" or quarantine, although many came infested with lice, and several of these eventually came down with typhus. The practice of housing relatively large numbers of new workers in private flats or houses only increased the general risk to the public.[70] On the other hand, even regular access to bathing could not contain infestations if living conditions were bad enough. We know from the discussion in Chapter 1 that housing conditions in Kemerovo oblast' were extremely primitive, with large numbers of workers residing in substandard dormitories. Yet these were like palaces compared to the squalor in which indentured workers lived in the region's coal mining districts. The dorms for Labor Reserve conscripts were cramped, ramshackle premises, bug-infested, short of bed linen, and had poor access to water. Despite regular "sanitary processing," lice infestation in one mining community in Stalinsk persisted at around 3 percent, but went as high as 20 percent in some dormitories in Leninsk-Kuznetsk.[71]

The one exception to this general picture appears to have been seasonal workers coming into the peat industry. They tended to come from very poor rural areas, where sanitation was no more than basic. GSI reports from a number of oblasti euphemistically referred to them as "sanitarily neglected," meaning that they were lice-infested and probably had not bathed for a very long time. Despite this, and despite the very large numbers involved, they appear to have received prompt medical checks, "sanitary processing," and inoculations against typhoid. Even in Gor'kii oblast', where both the general state of hygiene around its railway stations and its enforcement of sanitary controls were nothing short of dismal, the

70 GARF, f. A-482, op. 47, d. 6367, l. 59–60 (Yaroslavl'), and d. 6347, l. 119–20 (Moscow oblast'). Whereas the Yaroslavl' example may have been atypical, the description here of Moscow oblast' was not.

71 GARF, f. 9226, op. 1, d. 932, l. 15–18. Most pathetic of all were the special settlers dragooned into the coal mines. At best they lived in dormitories even worse than those for Labor Reserve students, but it was not uncommon for them to be "housed" in vegetable storerooms, stables, pigsties, or shanties made of packing crates.

authorities managed to take in 36,000 peat workers in 1946 and adhere to the above regimen.[72]

The mass reliance on indentured labor showed that the system of hygiene controls might be adequate for "normal" times, but had difficulty coping when subjected to the strain of an actual epidemic. Once the typhus epidemic waned in 1948, the control measures proved adequate to their task, and there were no further serious outbreaks of disease. Perhaps the most persuasive illustration of this is from Molotov oblast'. In 1948 the oblast' took in 26,000 workers from other oblasti; another 80,000 people within the oblast' changed their place of abode. These figures included a "special contingent" of 20,000 collective farmers sent to do logging work in the far north of the oblast'. They came from extremely poor parts of Chelyabinsk oblast', the Komi ASSR, Udmurtiya, and Mordova. Yet despite the large numbers involved, the sanitary state of the trains that brought them was far better than in 1947 (when the numbers had been much smaller), and the exercise of sanitary controls was much tighter. There were a few exceptions to this pattern, notably in Gubakha, but on the whole the oblast' managed the intake of indentured workers without major incident.[73]

Conclusion

This chapter concludes our analysis of the urban environment. Taking the first three chapters together we see that, with the exception of Moscow, sanitary reform in hinterland Russian cities and towns was either slow or nonexistent. There was some investment and a limited degree of progress in extending sewerage lines, water supply, and access to public baths, but in none of these areas did the tentative steps forward match the increase in demand from a growing urban population. Even where local soviets attempted to implement improvements, they often found themselves stymied by Moscow's unwillingness to grant them the necessary funds. Just as before the war, the regime's priority was to accelerate the expansion of industrial production. Investment in sanitary infrastructure was important only insofar as it affected the ability of factories to meet their plan targets.

[72] GARF, f. A-482, op. 47, d. 4925, l. 258–9, and op. 49, d. 1610, l. 35 (Ivanovo oblast'); op. 47, d. 6335, l. 123–7, 129, 132 (Gor'kii oblast'). In Ivanovo – and presumably elsewhere – workers also received vaccinations against dysentery. This was a waste of time, because no effective anti-dysentery vaccine existed.

[73] GARF, f. 9226, l. 899, l. 356-b–356-g.

What we have seen in this chapter is that this same calculus applied to issues of personal hygiene. The aim of the Stalinist regime was not to make the lives of its citizens more bearable, but to control disease. Unwilling or unable to provide investment for more and better bathhouses or for the manufacture of something as basic as soap, the regime relied on stringent public health measures to identify and isolate those who might put public health at risk. Economists might argue that in a society constrained by shortages such targeting represented a rational use of scarce resources. Taken on its own, such a proposition is certainly true, but it ignores the political context in which such decisions were made. Stalinism had always constrained consumption for the sake of accumulation. To this extent the curtailment of food supplies and the neglect of housing and sanitation were aspects of the same phenomenon.

The story, however, does not end there. Being singularly unwilling to divert resources away from heavy industry to the creation of a safe urban infrastructure, and with an agricultural system that could not provide the population with an adequate diet, the late Stalin years nevertheless mark the start of a long-term secular improvement of general health and welfare and declining mortality. Although we cannot measure with any precision exactly which causes contributed to this achievement or the weight of their relative contributions, the qualitative evidence strongly suggests that most of it was due to a combination of better medical provision (including the advent of antibiotics), the continued application of strict public health controls, and improved education among the general population about the need to maintain basic personal hygiene. In effect, the regime used organizational measures to compensate for the investments it could not or would not make in its cities or on its farms. At one level this policy was successful, insofar as it forestalled mass epidemics and brought adult and infant mortality down to levels lower than any in Russian or Soviet history up to that time. At another level, however, it left its citizens poorly nourished and having to do daily battle with an exhausting and often squalid urban environment. Cities were no doubt cleaner in 1953 than they had been in 1945, but they were not clean. People were undoubtedly healthier, but they were not necessarily healthy. They were better fed, but they remained badly fed. What the Stalinist regime did do was raise conditions up past the threshold below which they had caused not just misery, but high mortality. I illustrate this in more detail in the second half of this book, where we look at two key barometers of social well-being: nutrition and infant mortality.

4 Diet and nutrition: the 1947 food crisis and its aftermath

The background to the crisis

During the summer of 1946 the Soviet Union suffered a serious drought, leading in the autumn to a failure of the grain harvest, which came to just 39.6 million tons. The last prewar harvest, in 1940, had yielded 95.5 million tons of grain. During the war, with all of Ukraine (one of the country's most important grain-growing regions) under German occupation and labor power on the collective farms in the non-occupied areas severely depleted because of the military call-up, harvests fell to calamitous levels: just 29.7 million tons of grain in 1942 and 29.4 million in 1943, which led to mass starvation among the civilian population in these years. The years 1944 and 1945 saw a modest recovery – 49.1 and 47.2 million tons respectively – but this was still only around half the 1940 level. As I discuss later in this chapter, there are alternatives to bread which in theory might have compensated for the loss of grain. The most important of these is potatoes, but wartime potato harvests also collapsed: from 75.9 million tons in 1940 to just 23.8 million tons in 1942, 34.9 million tons in 1943, 54.9 million tons in 1944, and 58.1 million tons in 1945. Thus when the war ended the two staple foods that provided the overwhelming bulk of the population's calories and protein were in perilously short supply.[1] It was against this background that the 1946 harvest failure occurred, and the result was a serious famine from late 1946 until early 1948,[2] which claimed somewhere between 1 million and 1.5 million lives.[3]

[1] Harvest data are from Mark Harrison, *Accounting for War: Soviet Production, Employment, and the Defence Burden, 1940–1945* (Cambridge: Cambridge University Press, 1996), p. 262.

[2] For the sake of convenience I refer to this famine as the famine of 1947, since most deaths occurred in that year. It should be understood, however, that mortality began to increase sharply during the late autumn of 1946, and people were still experiencing serious food shortages well into 1948.

[3] Michael Ellman, "The 1947 Soviet Famine and the Entitlement Approach to Famines," *Cambridge Journal of Economics*, vol. 24, no. 5 (September 2000), p. 613.

The epicenter of the harvest failure was not in Russia, but further west, in Moldavia and southern Ukraine, and it was these republics that bore the brunt of excess deaths. Michael Ellman has estimated that Moldavia lost roughly 5 percent of its population; Ukraine lost about 1 percent.[4] The food shortages and the mortality that resulted from them nonetheless rippled right across the USSR. Moreover, if previous Soviet famines had disproportionately claimed peasant lives, the famine of 1947 was more "democratic": outside its immediate epicenter it victimized urban and rural residents alike.

The economic literature on famines distinguishes between famines caused by lack of food availability (so-called food availability decline, or FAD, famines), and entitlement famines, that is, famines where the state authorities possessed sufficient stocks of food to prevent excess mortality, but for whatever reasons chose to withhold them either from the population at large or from specific sections of the population.[5] The 1947 famine does not fit neatly into either of these categorizations. There is no question that the country had suffered a succession of bad harvests, from 1942 through 1946. At the same time, however, the state did have grain reserves which it could have used to forestall mass starvation. Instead, the state chose to try to maintain its reserves and to bring demand into line with a reduced supply by curbing the population's already low levels of consumption.

The impact on rural areas is easiest to chart. The 1946 harvest was around 16 percent lower than 1945; from this smaller harvest the state increased the share that it took for itself – so-called procurement – from 42.3 percent to 44.2 percent. It raised procurement levels still further in the autumn of 1947, although by this time the worst of the famine had passed. The state in this way increased its gross stocks of grain, leaving less in the villages for the peasants themselves to consume. Admittedly, it gave some of this back to the peasantry in the form of seed loans, but as Ellman notes this was not to alleviate peasant hunger, but to ensure that enough seed would be planted to avoid another bad harvest in 1947. The state also cut back on its exports of grain abroad, although it did not halt them altogether.[6]

The result of these policies was virtually to denude the countryside of grain. Unlike urban residents, peasants had no access to the state

[4] *Ibid.* [5] *Ibid.*, pp. 603–4.

[6] *Ibid.*, pp. 606–8. Grain reserves held by the Ministry of Procurements stood at 3.1 million tons in July 1946, 3.6 million tons in January 1947, 1.5 million tons in July 1947, and 9.9 million tons in January 1948. Since grain reserves should normally be highest in the winter, following the autumn harvest, the low level of reserves in January 1947 shows the depth of the 1946 harvest failure.

rationing system. Peasants were expected either to grow their own food on their private allotments or to survive from the payments, either in kind or in cash, they received from the collective farms on which they lived. These payments were based on the number of "labor days" each household put in over the course of the agricultural year, each labor day entitling its holder to a proportional share of any surpluses the farms held after they had met their compulsory deliveries to the state. Even in normal times many *kolkhozy* had little or no surplus to distribute. In 1947, over a quarter of all collective farms made no labor day cash disbursements whatsoever. In Gor'kii and Yaroslavl' oblasti and in Tatariya – three regions covered in this study – the figure ranged between 50 and 60 percent. In terms of payments in kind the situation was equally as bad. For the country as a whole over 70 percent of collective farms issued less than 1 kilogram of grain per labor day, with farms in many oblasti issuing less than 300 grams.[7]

Our main concern here is how the state restricted consumption in the towns. It did this in two main ways.[8] First, on September 16, 1946, the state imposed a dramatic increase in ration prices. As I noted in the Introduction, the price of rye bread, the staple of the Soviet diet, more than tripled. The price of groats also tripled, while the prices of meat and milk more than doubled.[9] The price rises were not enough on their own, however, to reduce consumption by the desired amount. Far more telling was the regime's next step, imposed on September 27, 1946, which was to pare the numbers of urban residents entitled to bread rations by roughly 30 percent. In July 1946, some 87.5 million urban residents across the whole of the USSR received bread via rationing. Of these, 58.6 million lived in cities and towns; 27.6 million were workers who lived in villages and workers' settlements in rural areas – what the state called the "rural contingent" – and it was they who made up most of the victims of regime policy. The official justification was that these workers should have been able to grow their own food, and therefore should no longer rely on the state for bread. Besides this rural contingent, the state also removed ration entitlements from the dependants of workers living in the towns, as well as

[7] V. P. Popov, *Rossiiskaya derevnya posle voiny (iyun' 1945–mart 1953): sbornik dokumentov* (Moscow: Prometei, 1993), pp. 38–9, 41–2, citing RGAE, f. 9476, op. 2, d. 18, l. 40–79. Concerning payments in kind, I should note that these were disbursements per labor day, not per day. Thus average daily per capita allocations for most families would have been far lower. The percentage of *kolkhozy* issuing less than 300 grams per labor day was 46 percent in Gor'kii oblast', and 39 percent in both Ivanovo and Yaroslavl' oblasti.

[8] The following discussion is from Filtzer, *Soviet Workers and Late Stalinism*, pp. 45–53.

[9] Zaleski, *Stalinist Planning*, pp. 688–96.

from 37 percent of residents in state-run homes for children, the disabled, and the elderly.

The changes were in fact even more drastic than these figures imply. Industrial workers tended to receive additional meals at work over and above their ration entitlement. These were by and large eliminated after September 1946. Therefore, even where workers retained their own ration entitlement, their nutritional intake suffered severely for two reasons. First, they no longer received these supplemental meals at the workplace; and, secondly, because their children no longer received a bread ration, they had to share their own allocation among the rest of the family, to the detriment of their own health and survival.

These policies caused widespread discontent and protest not just among their direct victims, but also among local officials, who flooded the USSR's Ministry of Trade[10] with appeals to increase the ration allocations for their own locality – appeals which in almost all cases met with flat refusal. The policy also caused considerable consternation among trade union, Komsomol, and even local legal authorities, who had to witness the devastating effects of hunger and hardship on their members or those for whose welfare they held themselves responsible. Some local legal officials protested to the USSR Procurator General that the ration cuts must surely be illegal. Here their outrage was matched only by their naivete.[11]

As I discuss later in this chapter, we need to remember that bread was the main source of energy and protein for workers and their families. It provided from half to two-thirds of all calories and protein, depending on the region. Thus any restriction in bread consumption was going to have very serious consequences for health, especially among a population that had not yet recovered from the prolonged and very serious malnutrition of the war years. It should come as no surprise, therefore, that workers in the towns, even in regions far removed from the epicenter of the harvest failure, also suffered from starvation, and many of them died.

We can analyze the 1947 food crisis from two contrasting perspectives. As we know, the food situation began to improve in 1948, and in this sense

[10] The regime administered these cuts in such a way as to conceal their political nature. Officially it was not Stalin, the Politburo, or the Council of Ministers who imposed them, but the Ministry of Trade. The ministry in Moscow issued local allocations for ration entitlements to its regional offices in the oblasti. The latter then set quotas for each city or district within their jurisdiction, and it was these local officials who had to decide how to parcel out their sharply reduced food supplies to factories, children's homes, hospitals, and other claimants. In this way blame for the cuts was diverted away from the political leadership onto the Ministry of Trade.

[11] Filtzer, *Soviet Workers and Late Stalinism*, pp. 57–64.

we can regard the famine as an acute, highly destructive, but nonetheless transitory, event. It is possible, however, to view the famine in a different way, as the final episode of a protracted food crisis that extended back to the late 1930s. In fact, food shortages and famine were fundamental to the history of Russia and the USSR. In the twentieth century we can note at least three major food crises.[12] The first began with the Russian Empire's entry into World War I. Food shortages were a major factor in precipitating the 1917 demonstrations that led to the February Revolution, while the Provisional Government's failure to solve these shortages played no small role in the shift of both urban and rural opinion away from it toward the more radical Bolsheviks and Left Socialist Revolutionaries. When the new Bolshevik government found itself embroiled in civil war, the food crisis deepened further. Stephen Wheatcroft has calculated that, in early 1919, adult members of workers' families consumed as little as 2,000 calories a day in Moscow, 1,600 in Petrograd (later renamed Leningrad), and 1,900 in Yaroslavl' and Nizhnii Novgorod (later renamed Gor'kii). Although the diets of urban workers then began to improve, it was not until late 1922 that they even remotely approached the 3,000 to 3,500 calories a day that an adult doing reasonably strenuous physical labor requires. The peasantry, who generally ate better than working-class town dwellers, did not remain immune from catastrophe. A famine in autumn 1921 and winter 1922 saw per capita peasant consumption in the worst-affected regions drop to starvation levels. In the area around Orenburg – the most extreme case that Wheatcroft records – per capita peasant consumption fell from a healthy 3,500 calories a day in April 1921 to just 1,700 in September of that year, and then to a miserable 900 calories a day in February 1922.[13] In all, we can say that this first major food crisis lasted for around eight years, from late 1914 to late 1922.

The New Economic Policy saw a steady increase in urban welfare, but the respite lasted barely five years. Stalin's sudden lurch toward a policy of breakneck industrialization in 1928, coupled with the poor harvests of 1927 and 1928, and then, in 1929–1931, the calamity of collectivization, precipitated a second prolonged food crisis, which culminated in the

[12] I have adopted the periodization suggested by Stephen G. Wheatcroft, "The Great Leap Upwards: Anthropometric Data and Indicators of Crises and Secular Change in Soviet Welfare Levels, 1880–1960," *Slavic Review*, vol. 58, no. 1 (Spring 1999), pp. 44–5. His article is not to blame for any idiosyncrasies in the way I have interpreted it.

[13] Wheatcroft, "Famine and Food Consumption Records in Early Soviet History, 1917–1925," in Catherine Geissler and Derek J. Oddy, eds., *Food, Diet and Economic Change Past and Present* (Leicester: Leicester University Press, 1993), pp. 164–5, and Wheatcroft, "Soviet Statistics of Nutrition and Mortality During Times of Famine, 1917–1922 and 1931–1933," in *Cahiers du Monde russe*, vol. 38, no. 4 (October–December 1997), p. 548.

famine of 1932–1933. Although the overwhelming bulk of deaths were in the countryside, most notably Ukraine, the towns also went hungry, with bread rationing being introduced into Soviet towns as early as 1928, and workers in many industrial centers facing starvation or near-starvation conditions during 1932 and 1933.[14] In its acute phase this second crisis lasted from 1928 to 1934, or approximately six years. There then followed another brief period of perhaps three, at most four years, from 1934 to 1937, during which food supplies and workers' diets improved, before the third crisis emerged. This was to be a protracted crisis with at least two acute phases. Consumption began to fall in 1937, partly in the wake of the economic disruptions caused by the Terror, but also because of a reorientation of investment priorities toward military spending. The decline then became a near-total collapse of food supplies during the USSR's war with Germany, reaching a nadir in late 1942, as millions of civilians died of starvation even in the non-occupied hinterland regions. There was a small recovery during 1945–1946, but then the harvest failure of that latter year led to the 1946–1947 famine and the generalized food crisis which forms the focal point of this chapter. This third crisis, therefore, lasted over ten years. Its first and most serious acute phase was obviously the war; the second acute phase (late 1946 to early 1948) was of lesser severity and shorter duration. Its legacy, however, was profound. Although food supplies began to recover in 1948, at no point before the mid-1950s did average daily diets meet full physiological requirements.

The point I wish to make here is that, certainly during the first three to four decades of its existence, Soviet society was rocked by a succession of demographic shocks, each of which lasted longer than the intervening periods of recovery. Society barely began to recover from one shock when a new crisis descended, long before society could make good the demographic losses or the medium- and long-term damage to people's health that the previous crisis had caused. In each of these crises food shortages played a major, although by no means exclusive, role. Forced collectivization, mass terror, and war casualties (both the Civil War and World War II) taken as a whole claimed many millions of lives over and above those caused by hunger. To this extent, what happened with food was emblematic of the larger pattern of demographic upheavals. A long period of chronic food shortage culminated in an acute crisis (famine), followed by an incomplete recovery, and then another lengthy crisis.

Because with each crisis society had time to effect only a partial recovery, the impact of the next crisis was worse than it otherwise might have

[14] R. W. Davies, *Crisis and Progress in the Soviet Economy, 1931–1933* (Basingstoke: Palgrave Macmillan, 1996), pp. 184–92, 368–70.

been. I leave out of account here the role that the Stalinist political leadership played in exacerbating, and in 1946–1947 actually creating, famines and food shortages. I am speaking strictly from the point of view of people's health and well-being. Populations that are malnourished, ill housed, inadequately clothed, and constantly exposed to dirt and disease will have worse chances of surviving a severe food shortage, even a short-term one, than a population that is adequately fed and basically healthy.

This chapter examines the food supply and nutrition available to workers' families in our hinterland regions during the whole of the late Stalin period. It begins by briefly surveying the impact of food shortages during World War II, then reexamines the 1947 food crisis in the light of new archival evidence. Much of the discussion revolves around data from the Central Statistical Administration's household budget surveys. These allow us to calculate food consumption and nutritional intake for workers' families across a number of cities and regions, and to measure the differential impact the food crisis had in various parts of the RSFSR. In some cases we have comparable data from peasant households. These are especially interesting, because they show that, at least in the regions dealt with in this study, peasants and workers had different mechanisms for coping with postwar food shortages, and that in some ways peasants enjoyed a distinct nutritional advantage over workers. We shall also see that, although recovery saw a permanent end to famine conditions, it did not mean adequate nutrition. On the contrary, daily calorie intake in workers' families remained below accepted requirements at least until the mid-1950s.

World War II and its legacy

Diet on the home front

The one basic fact affecting civilian life in the Soviet rear during World War II was this: the country did not possess sufficient resources to feed the front and the civilian population at the same time. The task of provisioning civilians thus fell to local authorities, who coped as best they could.[15]

[15] The most detailed account in English of food supplies during World War II remains William Moskoff, *The Bread of Affliction: The Food Supply in the USSR During World War II* (Cambridge: Cambridge University Press, 1990). In many ways his is a remarkable study. Written during *perestroika* and without access to Soviet archives, he compensated for this by carrying out large numbers of interviews with survivors of the war and making extensive use of reports filed by US and British diplomatic personnel stationed in the USSR after June 1941. The lack of archives affected the long-term validity of his work in only one major respect. Although his book includes numerous eyewitness accounts of starvation in

For all but the most important groups of defense workers, official rations were not sufficient to keep people alive, and indeed were not intended to. One supplemental source of food was the local peasantry, from whom many people, including workers, bought food. Factories had their own allotments and farms, and workers and clerical employees had private plots (of which there were some 16.5 million in 1944).[16] In fact, one of the problems of maintaining basic levels of communal sanitation after the war was the fact that during the war localities had plowed up waste dumps, and in some cases even their water filtration beds, and used them to grow food.[17]

Estimating the actual calorie and protein intake of urban residents during the war is not easy. The most common approach is to look at the official ration allowances and calculate how many calories and grams of protein they would have provided per day. The information this yields is certainly revealing, for it shows just how meager these allowances were, but it does not tell us much about real levels of nutrition. The first problem is that it presumes that people were able to obtain all the food to which they were entitled, something that was by no means a certainty. The second is that it does not measure outside sources of food, in particular purchases from the peasantry or food grown on private plots. One very important food item not provided on rationing, but which would have been a mainstay of survival, was potatoes. As we shall see when we discuss the postwar diet, availability of potatoes could spell the difference between survival and starvation. A third difficulty is that, even if we could calculate real, as opposed to hypothetical, calorie intake, we have to measure this not against the normal daily calorie requirements of peacetime, but against the much larger energy needs created by the war.

Let us look first at rationing. Urban residents fell into one of five ration groups: (1) manual workers in "leading" military enterprises; (2) manual workers working under exceptionally difficult conditions (for example, coal miners working below ground); (3) clerical employees; (4) adult dependants; and (5) children. Each group had notional entitlement to so many grams of bread per day, plus monthly allowances of meat or fish, fats, sugar, and flour. William Moskoff cites US Department of

the non-occupied regions, he nonetheless concluded that truly mass starvation occurred only in the occupied territories. Had he been able to consult Soviet archives or even to read the work of later Russian historians from the mid-1990s he would have known that starvation was universal. See, among other sources, the collections *Naselenie Rossii v 1920–1950-e gody: chislennost', poteri, migratsii* (Moscow: Rosspen, 1994) and *Lyudskie poteri SSSR v period vtoroi mirovoi voiny* (St. Petersburg: Institut rossiiskoi istorii RAN, 1995).

16 Zaleski, *Stalinist Planning*, p. 336.

17 GARF, f. A-482, op. 47, d. 4925, l. 194; d. 4937, l. 56; and d. 6347, l. 145.

Table 4.1 *Daily food intake of workers on basic ration, mid-1943*

Ration category	Basic food items, grams per day: Bread	Meat and fish	Fats	Sugar	Flour	Total calories per day	% calories from bread and flour	% calories from fats
1	800	72	20	20	73	2080	83	8
2	800	60	13	13	40	1881	87	6
3	500	40	10	10	27	1204	85	7
4	400	13	10	10	27	975	86	8
5	400	13	7	7	20	915	89	6

Source: Calculated using physical quantities given in William Moskoff, *The Bread of Affliction: The Food Supply in the USSR During World War II* (Cambridge: Cambridge University Press, 1990), table 7.2, p. 139, and the energy values published by the Central Statistical Administration in 1925, *Trudy TsSU*, vol. 12, vypusk 1, 1925: *Normal'nii sostav i pishchevoe znachenie prodovol'stvennykh produktov*. For bread, the main item in the diet, I have taken the calorie content of the lowest-quality rye bread, the quality (and energy content) of which in 1925 would have been rather higher than during the war.

Agriculture reports from the middle of 1943 – that is, when the food situation was beginning to improve – from which it is possible to calculate the daily calorie intake of each of these groups if they had lived solely on their ration entitlement.

The daily energy requirement of a worker in Category 1 would, even in peacetime, have been somewhere on the order of 3,500 calories a day, or even higher. Thus, the official ration barely covered half of daily energy needs. Moreover, the diet was extremely unbalanced. More than 80 percent of calories came from bread and flour; only between 6 and 8 percent came from fats. Modern-day Western dietary advice stresses the need to reduce the amount of fat we eat, but for those doing heavy labor in cold climates fats should ideally provide around a third of total calories. Among other things, fats are essential for the synthesis of fat-soluble vitamins, A, D, E, and K. Fat also creates the sensation of satiety, no small benefit in countries where the daily diet is not sufficient to curb feelings of hunger.[18] The figures in Table 4.1 give only a general picture. In reality, ration allowances varied from one city and region to another, depending on local food availability. Moreover, in November 1943 the

[18] E. Margaret Crawford, "The Irish Workhouse Diet, 1840–1890," in Geissler and Oddy, eds., *Food, Diet and Economic Change*, pp. 91–2; Clarkson and Crawford, *Feast and Famine*, pp. 183–4.

regime introduced new ration allowances with greater variations between and within the different rationing groups. While the allowances for those at the lower end of the scale (clerical employees, dependants, and children) changed relatively little and in many cases worsened, at the higher end workers in key industries and trades, at least in theory, were to see their daily calorie intake rise to very near the biological requirement.[19]

What did workers and their families actually, as opposed to hypothetically, consume? This is much more difficult to determine. As Moskoff aptly points out, the official ration was "often meaningless."[20] Not only did the ration not guarantee supply, but it was frequently the case that local authorities had to substitute nutritionally inferior foods for those on the official list. In some cases, such as the substitution of honey, jam, or confectionery for sugar,[21] or the officially sanctioned use of potato, barley, or oat flour to make bread, this would not necessarily have affected calorie content. When, however, the bread also had a very high moisture content and contained large amounts of chaff, the calorie content would fall. Some contaminants, most notably sagebrush, made the bread so bitter that people could barely eat it.[22] More ominous was the general absence of vital foods. During the winter of 1942–1943 children's homes in Stalinsk (Kemerovo oblast') had no vegetables, just small amounts of potato, and no milk. Each home was given three cows to provide milk, but 75 percent of them had brucellosis, and in any event their milk yields were very low, no doubt because of the general lack of fodder.[23] Workers in Chelyabinsk during this same winter were probably receiving fewer than 2,000 calories a day; the diet allegedly improved during the second half of 1943 with the arrival of potatoes, turnips, and swede (rutabaga), all of which pushed the daily intake over the 2,000-calorie mark, but this had to sustain people doing heavy physical labor. Students in the city's Labor Reserve schools did slightly better, averaging between 2,000 and 2,400 calories, but even

[19] Moskoff, *Bread of Affliction*, pp. 141–3, 148. Thus certain groups of coal miners were, at least in theory, entitled to between 4,100 and 4,500 calories per day.

[20] *Ibid.*, p. 141. [21] *Ibid.*, p. 142.

[22] GARF, f. A-482, op. 47, d. 2328, l. 186–7; d. 1416, l. 99ob.; d. 1415, l. 137. The main concern with contamination and adulteration was not so much calorie content as food safety. Local slaughterhouses posed a particular problem, since they were often set up in makeshift premises with no sanitation and with almost no regard for the most basic rules of hygiene. Undressed carcasses were cut up alongside processed foods, while meat products and tinned foods were not properly heated or autoclaved. In Troitsk in Chelyabinsk oblast' nearly half the tinned goods turned out by the local packing house in August 1943 were bulging. So bad were conditions at the meat packing plant in Kopeisk that the GSI had to shut it down – and this at a time when the food situation was absolutely desperate: GARF, f. A-482, op. 47, d. 1415, l. 39–40 (Kuibyshev), and d. 1417, l. 65–8 (Chelyabinsk oblast').

[23] GARF, f. A-482, op. 47, d. 1416, l. 101.

this was nowhere near what they needed to carry out the jobs they were doing.[24]

For what it is worth, these data are not very far out of line with the TsSU's budget surveys for 1943, from which it is possible to calculate that the average member of a Soviet worker's family in early 1943 consumed around 2,300 calories a day. However, for reasons that I discuss in this chapter's final section, it is doubtful that these surveys were sufficiently comprehensive or rigorously controlled, and so we should treat these results with some caution.[25] Yet both the Chelyabinsk and TsSU figures would imply that teenage and adult workers were receiving perhaps 1,100 to 1,400 fewer calories per day than they really needed. We could contrast this with British estimates, cited by Moskoff, which put the daily calorie deficit in Moscow at around 600 calories for adult workers and white-collar employees, and roughly 1,400 calories for teenagers.[26] There is enough variation in these different accounts to caution us that we require much more research at local level if we are to understand how the food situation impacted upon the home front's individual regions. What we can say, however, is that in the best of cases the diets cited here would have produced severe weight loss and reduced work efficiency, and in the worst cases would have led to serious excess mortality either from starvation or because of the exacerbation of nutrition-sensitive diseases such as tuberculosis.

Patterns of mortality

To a large extent the issue of how many calories people notionally consumed is of only secondary relevance. It gives us some conception of how difficult it was for the average person to survive, but calorie intake alone cannot convey the true extent of the tragedy that befell the civilian population. There is barely a history of the Soviet home front in World War II that does not dwell at length on the incontrovertible evidence that hunger and starvation were widespread. The most immediate manifestation of

24 GARF, f. A-482, op. 47, d. 1417, l. 83.

25 RGAE, f. 1562, op. 15, d. 1562, l. 52–3. One ambiguity is that the main food item in the family budgets, bread and flour, does not make clear if the figures, given in grams per day, are converted to flour equivalents. This was a common statistical practice and has important implications for calorie calculations. Rye bread had a calorie content of 189 kcal per 100 grams; rye flour contained 300 kcal per 100 grams. The figure I have given here of 2,300 calories per day assumes that bread has been converted to its flour equivalent. Given that workers consumed very little flour and a large amount of bread, if this assumption is wrong it would reduce the daily calorie intake to around 1,600 calories a day – something more closely in line with the official ration allowance.

26 Moskoff, *Bread of Affliction*, pp. 146–7.

Table 4.2 *Crude death rates for selected hinterland industrial centers, 1940–1945 (deaths per 10,000 population)*

	Moscow	Kazan'	Sverdlovsk	Chelyabinsk	Siberia
1940	144	n/d	198	n/d	n/d
1941	149	271	169	n/d	241
1942	345	409	260	n/d	296
1943	248	258	267	402	272
1944	147	218	254	250	173
1945	133	n/d	126	n/d	122

Sources: Moscow and Sverdlovsk: Table 4.3; Kazan': GARF, f. A-482, op. 47, d. 2328, l. 18–19; d. 3443, l. 5, 7; Chelyabinsk: GARF, f. A-482, op. 47, d. 2313, l. 147–8; Siberia: John Barber and Mark Harrison, *The Soviet Home Front 1941–1945: A Social and Economic History of the USSR in World War II* (London: Longman, 1991), p. 88. The Chelyabinsk report gives two different population figures. The text states the population at 480,000 in 1944, but an accompanying table listing disease rates per 10,000 population implies a population figure of 450,000. I have used the latter here, not least because the official website of the city of Chelyabinsk gives this same figure for 1944 in its history of the city. With a population of 480,000, the crude death rate would be 376/10,000 in 1943, and 234/10,000 in 1944.

this was a surge in death rates. Hunger alone was not the only cause of this. Rather, it arose from the lethal combination of hunger, massive overcrowding, lack of sanitation, and the near-impossibility of containing or preventing epidemics. The pattern appears to have been the same almost everywhere. We do not have comprehensive local data for the war years, but we do have scattered data culled from a number of different sources that allow us to construct a rough picture. Table 4.2 shows crude death rates for the war years for Moscow, Kazan', Sverdlovsk, Chelyabinsk, and the urban areas of Siberia. The latter, perhaps unjustifiably, I take as a proxy for Kemerovo oblast', one of our case study regions.

Table 4.2 is not so straightforward as it may seem. The death rate rose rapidly during 1942 and then began to decline. There are several reasons for this. First, 1942 and 1943 were clearly the low point of the war in terms of civilian food supply and living conditions. Therefore the weakest and most vulnerable sections of the population (babies, small children, the elderly, those with advanced tuberculosis) would have perished first, during 1942, given the harshness of conditions in that year. By dying prematurely these people were not around to die in later years, as some of them would have done even if living conditions had been better. Secondly, infant mortality always accounted for a large share of deaths in Russia and the prewar USSR. As the birth rate fell and fewer babies were born, fewer babies also died, thus bringing down the general death rate.

Table 4.3 *Crude death rates, infant mortality, and death rates for the non-infant population, Moscow and Sverdlovsk, 1940–1945*

Crude death rates expressed as deaths per 10,000 population; infant deaths as deaths up to age 1 year per 100 live births

Year	Population at January 1	Midpoint population	Births	Births per 10,000 population	Total deaths	Deaths per 10,000 population	Infant deaths up to 1 year	Infant mortality (deaths per 1,000 live births)	Infant deaths as % of all deaths	Deaths of population over 1 year per 10,000 population over 1 year
Moscow										
1940	4,340,000	4,361,061	102,768	235.6	62,571	143.5	18,341	178.5	29.3%	101.4
1941	4,382,122	3,204,970	77,909	243.1	47,619	148.6	8,729	112.0	18.3%	121.3
1942	2,027,818	2,385,734	35,384	148.3	82,411	345.4	10,108	285.7	12.3%	303.1
1943	2,743,649	2,885,117	27,047	93.7	71,433	247.6	4,543	168.0	6.4%	231.8
1944	3,026,584	3,175,698	51,351	161.7	46,586	146.7	5,340	104.0	11.5%	129.9
1945	3,324,812	3,324,812	69,439	208.9	44,354	133.4	7,008	100.9	15.8%	112.3
Sverdlovsk*										
1940	468,180	468,180	14,476	309.2	9,254	197.7	3,652	252.3	39.5%	119.7
1941	468,180	558,790	15,199	272.0	9,449	169.1	2,922	192.2	30.9%	116.8
1942	649,400	651,433	10,241	157.2	16,933	259.9	3,474	339.2	20.5%	206.6
1943	653,465	586,733	6,434	109.7	15,670	267.1	1,296	201.4	8.3%	245.0
1944	520,000	503,000	6,239	124.0	12,788	254.2	835	133.8	6.5%	237.6
1945	486,000	486,000	10,706	220.3	6,126	126.0	875	81.7	14.3%	108.0

Notes: *The Sverdlovsk report lists identical population figures for 1940 and 1941. This is almost certainly a typing error. Therefore the calculations for 1940 and 1941 should be treated with caution, as, too, should those for 1944 and 1945, where the population figures are almost certainly rounded up or down to the nearest thousand.

Population figures are for January 1 of each year, while births and deaths are for the calendar year. Usual practice is therefore to calculate birth and death rates by taking the average of the populations at January 1 of the year in question and the year following. This can be risky at times of mass population movements, such as experienced in World War II. Despite this problem, this still gives a more accurate picture than using data from January 1. The latter, for example, would artificially inflate Moscow's 1941 population, which fell sharply during the second half of the year due to evacuations, especially of women and children. It equally artificially deflates the population in 1942, a year in which the city was gradually repopulated after the threat of its capture by the Germans had receded. Unfortunately we do not have 1946 population figures, so I have had to give the 1945 figure as at January 1. This will underestimate the population in Moscow, which was growing, and therefore overstate the birth and mortality rates (but not infant mortality, which is calculated from the number of live births, a known figure). Similarly, it will probably overestimate the population of Sverdlovsk, from which throughout 1945 wartime evacuees were returning to their home regions, and thus understate birth and crude mortality rates.

Sources: Moscow population: GARF, f. A-482, op. 47, d. 4941, l. 11, 11ob., 13ob.; Sverdlovsk population: GARF, f. A-482, op. 47, d. 3443, l. 5, 7; demographic data: GARF, f. A-374, op. 34, d. 1540, l. 1, 3, 16, 20, 29, 32. Columns 2, 4, 6, and 8 are from the sources. Other columns have been calculated from these.

Finally, as I discuss in more detail in the next chapter, the regime learned a number of lessons from the experience of 1942 and began adopting more stringent public health measures from 1943 onwards, and these very probably began to reflect themselves in the death statistics. This much all seems logical. What is somewhat surprising is that as the war approached its end the death rate did not simply return to prewar levels; it actually improved on them. In Kazan' and Siberia the crude death rate in 1944 was already lower than in 1941; Sverdlovsk dropped below the prewar level only in 1945, but the difference is striking. In Moscow the crude death rate in 1944 was very nearly back to its prewar level, and by 1945 had significantly improved on it. This may be further evidence of the impact of public health improvements. It may also reflect the very difficult situation during the immediate prewar years, so that the contrast between 1945 and 1940–1941 may not have been as great as we might tend to assume. Without further detailed research at local level we can only speculate on these questions.

Crude death rates, of course, can always be misleading, because they do not take account of the age structure of a specific population. Even in prosperous countries with excellent health care, localities containing large numbers of elderly people will have higher death rates per unit of population than localities with disproportionately large numbers of people in their twenties and thirties. In this case crude death rates would be a poor instrument for comparing living conditions in the two places, because we would not know if our first locality had a larger number of deaths because it was genuinely an unhealthy place to live, or simply because of its age structure. Demographers are able to get around this problem by calculating what they call standardized mortality ratios, that is, death rates adjusted to take account of the age and gender composition of the different geographic entities being compared. In the wartime Soviet Union evacuation brought into receiving cities very large numbers of babies, small children, and elderly people – groups among whom there was a high death rate in any case and whose presence would have pushed death rates upwards, even with no deterioration in living conditions or nutrition. By the same token, evacuation also caused a large influx of relatively healthy young workers mobilized from the countryside to work in military industry. This was a group with a very low death rate, and their presence would have lowered the general death rate, all other conditions being equal. In theory these two sets of population movements should have counteracted one another and at least partially canceled each other out. In fact, this failed to happen, as the special conditions of wartime created an anomalous result. Instead of the influx of younger workers balancing out the higher death rates among the vulnerable, the young, too, experienced rising mortality. It is difficult to show this precisely, because we do not have age-specific population data, and so cannot calculate standardized mortality ratios. We therefore have to make inferences from the information we have available. In 1942, a year of sharply rising infant mortality, deaths of children under the age of four years accounted for a *smaller* percentage of all deaths in Russia's hinterland towns and cities than they had in 1941 – 35 percent in 1942 versus 47 percent in 1941 – while the total number of deaths in these towns went up by as much as 50 percent. Children's share of all urban deaths fell even more sharply in succeeding years: to 20 percent in 1943 and 18.7 percent in 1944. The burden of deaths shifted onto older age groups. The most obvious was the elderly, but also adults of prime working age – and among these, most notably men. The worst year in this regard was 1943, when adults aged twenty to forty-nine accounted for 33 percent of all deaths, as opposed to 21 percent in 1941, an increase of 57 percent.[27] We gain further insight into what was happening by looking again at more detailed demographic figures for Moscow and Sverdlovsk (Table 4.3). These show crude death rates, infant mortality, and the death rate for the non-infant population, that is, for the entire rest of the population older than one year, the age after which the risk of early death normally declines. They suggest a somewhat more complex picture than that which we saw in Table 4.2.

Moscow and Sverdlovsk represented cities with sharply contrasting wartime demographics, yet their mortality and natality patterns were very similar. We tend to think of Moscow as having a privileged position and protected supplies, but 1942 and 1943 were catastrophic years for Moscow, just as they were elsewhere,[28] a fact reflected in both the crude and infant death rates. Not long after the outbreak of war with Nazi Germany, Moscow's population shrank due to the evacuation of women and children, and only gradually repopulated after the danger of its capture by the Nazis had passed. This explains the large absolute drop in births during 1941, as virtually all of the decline would have occurred during the second half of the year. The following year, 1942, saw a huge leap in both general and infant mortality, together with a calamitous fall in the birth rate. Infant mortality leapt to 286 deaths per 1,000 live births, which means that more than one out of every four babies born that year failed to survive their first year of life. There was a moderate improvement

[27] N. A. Aralovets and O. M. Verbitskaya, "Osobennosti smertnosti gorodskogo i sel'skogo naseleniya v tylu v 1941–1945 gg.," in *Naselenie Rossii v XX veke: istoricheskie ocherki*, vol. II, *1940–1959* (Moscow: Rosspen, 2001), pp. 114, 116–17. Among males the shift was even more striking: men aged 20–49 accounted for 23.6 percent of all male deaths in 1941, and 39.2 percent in 1943, a rise of two-thirds.

[28] Moskoff, *Bread of Affliction*, pp. 142–3.

during 1943, and a very rapid improvement after that. Sverdlovsk, by contrast, was a major recipient of evacuees and mobilized workers, and so its population swelled. Infant mortality had been high even before the war, and infant deaths accounted for a very large percentage (roughly a third) of all deaths – considerably more than in Moscow. In 1942, the first full year of the war, infant mortality then rocketed to nearly 340 deaths per 1,000 live births – in other words, one out of every three babies born in Sverdlovsk during that year died. As in Moscow, the birth rate then virtually collapsed, to around a third of its prewar level. With so few babies being born, during the remaining war years infant mortality had only a minimal impact on the general death rate. Unlike Moscow, however, the non-infant death rate remained high right through to the end of 1944. Given the low birth rate and the "combing out" of vulnerable toddlers during the dearth years of 1942 and 1943, these non-infant deaths were almost certainly among older children, teenagers, and adults.

That this should have been the case is hardly surprising once we look not just at diet, but also at the general deterioration in living and working conditions in hinterland industrial centers during the war. The issue was not simply hunger, but hunger at a time when people's nutritional demands were increasing, not falling. It is the natural reaction of a starving person to limit physical activity in order to conserve energy. Blood pressure drops and heart rate slows down, as the heart attempts to preserve itself even at the expense of reducing peripheral blood circulation to other parts of the body.[29] Conditions in Soviet industry simply did not permit a reduction of effort in this way. Work time was extended to monstrous proportions. The minimum working week was lengthened to around 55 hours, not including compulsory overtime. Days off and holidays were canceled. These were statutory provisions: it was not uncommon for workers to work much longer than this, some never leaving their workshop or underground coal face. They quite literally worked themselves to exhaustion.[30] Yet work alone was not the only claim on energy. Fuel shortages meant that workplaces and residential buildings were extremely cold, and the body had to compensate by burning up more calories. Fuel shortages also sidelined public transport, so workers had to walk long distances to work and back. When we add all these factors together, we see

[29] Ancel Keys, Josef Brožek, Austin Henschel, Olaf Mickelsen, Henry Longstreet Taylor, *et al.*, *The Biology of Human Starvation* (Minneapolis: University of Minnesota Press, 1950), pp. 633–4.

[30] John Barber and Mark Harrison, *The Soviet Home Front 1941–1945: A Social and Economic History of the USSR in World War II* (London: Longman, 1991), pp. 60–1, 163–4; V. F. Zima, *Mentalitet narodov Rossii v voine 1941–1945 godov* (Moscow: Institut rossiiskoi istorii RAN, 2000), chapter 1.

that the gap between calorie intake and calorie expenditure inexorably widened. Mass deaths were the inevitable result.

The effects of starvation in besieged Leningrad have been well studied, and in fact the city became a virtual medical laboratory for the diagnosis and treatment of acute starvation.[31] Starvation, however, was ubiquitous over the entire home front, so much so that younger doctors who had been trained since the Civil War (and presumably since the 1932–1933 famine) had no clinical experience of recognizing and classifying it as a medical condition or as a cause of death. According to the medical historian Nadezhda Cherepenina, by the spring of 1942 the TsSU had received queries from the local statistical departments in Vologda and Molotov, asking how to list deaths from extreme emaciation on death registration certificates.[32] The Soviets even had their own special term for the phenomenon, "alimentary dystrophy [*alimentarnaya distrofiya*]," an umbrella term that covered both cachexia, or emaciation, and starvation-induced edema.[33] Cachexia was the largest single cause of death in Chelyabinsk in both 1943 and 1944, accounting for 29.6 percent of all deaths in 1943 and 31.5 percent in 1944, dwarfing the other major urban killers of tuberculosis, pneumonia, and coronary artery disease.[34] What was true in Chelyabinsk was almost certainly true in other large industrial centers. By 1943 starvation had become sufficiently widespread that it was well studied, and doctors had worked out refined analyses of its various stages of severity and the appropriate methods of treatment. In the late summer of that year the Sverdlovsk Institute of Labor Hygiene and Occupational Disease convened a special conference on the subject. Its proceedings are worth noting in some detail.

[31] See the collection of articles in John Barber and Andrei Dzeniskevich, eds., *Life and Death in Besieged Leningrad, 1941–1944* (Basingstoke: Palgrave, 2005).

[32] Nadezhda Cherepenina, "Assessing the Scale of Famine and Death in the Besieged City," in Barber and Dzeniskevich, eds., *Life and Death in Besieged Leningrad*, p. 40.

[33] In its most general sense "dystrophy" refers to any disorder resulting from defective nutrition. Thus the Russian term "nutritional" or "alimentary dystrophy" (whose usage, I believe, dates back to the Civil War) both was redundant and did nothing to pinpoint the real nature of the processes at work. Russian–English medical dictionaries usually translate the term into English as "dropsy," the edema that results when severe malnutrition leads to a lack of protein in the blood, but this is too narrow, and fails to capture the more common cachectic form of starvation. Josef Brožek, Samuel Wells, and Ancel Keys, who were perhaps the first Western medical experts to study the Leningrad siege, used the terms "acute semi-starvation" and "acute starvation" (which they employed more or less interchangeably). I shall follow their usage here. See Brožek, Wells, and Keys, "Medical Aspects of Semistarvation in Leningrad (Siege 1941–1942)," *American Review of Soviet Medicine*, vol. 4, no. 1 (October 1946), pp. 70–86.

[34] GARF, f. A-482, op. 47, d. 2313, l. 147.

Soviet doctors were caught between two competing imperatives. The first was the need to return people to work as soon as possible in the interests of production. The other was proper treatment of the patient. According to the official position, as set out in the opening address to the conference by Professor B. I. Mardinkovskii, Soviet doctors recognized three stages of acute starvation. In its earliest and mildest phase, Stage 1, they deemed it unnecessary to hospitalize the patient – it was sufficient simply to transfer the patient to lighter work, by which they had in mind an eight-hour workday and release from heavy physical labor. If at the same time the patient received high-protein nutritional supplements such as pine or yeast extract, they hoped to have the worker back on the job within six to eight weeks. Stage 2 patients were more seriously ill. They required hospitalization for six to nine weeks, but after this the patient would be fit to go back to work. Stage 3 meant that the patient was gravely ill, with serious complications and high rates of mortality. Assuming the patient survived, treatment would last from three to four months, followed by several months' further rest; some patients, they considered, would never be fit enough to work again.[35]

This was the official line. Other papers at the conference, based on detailed clinical observations, painted an altogether more serious picture.[36] The most pressing question was why different workers receiving roughly similar levels of nutrition showed such large variations in their susceptibility to starvation. Those with the lowest incidence were electric welders, quality controllers, brigade leaders, and timekeepers, that is, workers whose jobs involved little heavy labor. Using them as a benchmark, doctors found that the incidence among crane operators, electricians, mechanics (*montery*), and truck drivers was twice as high; among machine-tool operators and fitters, three times as high; among foundry workers (molders, fettlers), four times as high; among scaffolders and riggers, six times as high; and among laborers, loaders, and cleaners, eight times as high. As noted, variations in food intake did not explain these huge differences. Workload and wartime working conditions, however, did. One factor was that many jobs that before the war had been fully or partially mechanized, or had been done with the help of an auxiliary worker, now involved heavy manual labor. Machine-tool operators and fitters, for example, now had to mount heavy parts themselves, without hoists, cranes, or a laboring assistant. Even storeroom attendants, a position normally considered light work, now did heavy physical labor because

[35] GARF, f. A-482, op. 47, d. 1408, l. 1–5ob.
[36] The following account is based on GARF, f. A-482, op. 47, d. 1408, l. 7ob.–16.

there were not enough assistants. They had to unload deliveries and sort heavy industrial parts on their own.

The other great wartime change was that people had to travel long distances to and from work. This was not just because of the breakdown of public transport; it also arose from the emergency of siting and setting up factories evacuated from the western USSR. The factories sprang up wherever there was room to put them, often many kilometers away from where their workers were housed. Doctors found that half of all starvation patients spent at least 90 minutes walking to work and back; over a quarter walked for over two hours; and around 7 percent walked more than three hours. The issue here was not simply the physical energy needed to travel to work. People spent such long hours on the job that, with the extra time needed between home and work and back again, they simply did not have enough sleep. They also lived far from factory dining rooms, on which they relied for a major part (and, in some cases, all) of their nutrition. Once already weakened, people had to use up even more energy to access the limited food available to them.

Finally, there was the extreme cold. In addition to the serious wartime fuel shortages which made it difficult, even impossible, to heat buildings, there was no glass to replace broken window panes. Hastily erected production shops did not have anterooms to insulate them from the outside air when people opened doors.[37] In short, people required a large number of calories simply to maintain body warmth.

If these were the conditions that caused or aggravated starvation, the other great difficulty was diagnosis and treatment. Late diagnosis was common, partly because of the slow onset of the condition, partly because the sufferer was not always aware of what was happening, and partly because factory doctors tended to mistake the symptoms of advanced nutritional deficiency for its early signs. By the time that patients experienced such symptoms as difficulty standing, loss of vision, incontinence, bradycardia, or hypothermia, the condition was already well advanced. Factory doctors, perhaps feeling themselves under pressure to keep people on the job, therefore tended to think that the main solution was to transfer patients to lighter work (the officially prescribed treatment for Stage 1 sufferers), or if necessary sign the patient off work with a sick note. This was totally ineffective, even where patients received a succession of sick notes and stayed off work for a protracted period. The reason was clear. Rest alone merely conserved energy; it did not solve the problem of malnutrition. For this there was only one treatment – additional feeding.

[37] Most Russian entryways have two sets of doors, the inner doors protecting the premises from heat loss and a rush of freezing winter air when the outer doors are opened.

Therefore treatment had to address both problems: adequate food intake and curtailment of energy expenditure.

All this was very good in theory, but the reality was that even with correct diagnosis the wherewithal to effect a cure was difficult or impossible to obtain. Even if an alert factory physician referred a patient to hospital, this might not help. Hospitals were short of beds, and so might simply send the worker home. If they admitted the patient, the hospitals did not have enough food to carry out refeeding for the length of time required.[38] This was even more true if patients had already begun to develop diarrhea. Yet because food supplies were inadequate, those patients already in the hospital required even longer periods of rest and enforced inactivity merely to survive, much less to recover, thus putting further pressure on the limited supply of beds. The outlook was therefore quite grim. It was possible to provide a regime of adequate rest and nutrition only in very special cases. It was not possible to provide it on a universal basis to all who needed it. The result, as we already know, was mass starvation even among sections of the population who in normal times were healthy.

For those who survived wartime hunger, what were the long-term effects? This, too, is difficult to assess. Long-term follow-up studies of survivors of the Leningrad siege purported to show a slightly shorter life expectancy, an increased predisposition toward high blood pressure, and increased rates of coronary artery disease (including strokes) and diabetes compared to those in the same age cohort who did not experience the siege.[39] Whether or not hinterland famine victims showed comparable long-term changes in morbidity and mortality we do not know, but it is difficult to believe that the victims of prolonged starvation elsewhere in the USSR did not go on to develop similar health problems.[40]

[38] This was not just a problem in the Urals. Even as late as the spring of 1944, the main hospital in Kuibyshev had very high fatality rates among those admitted with starvation because it did not have the food available to carry out refeeding. Nor did it have enough blankets to keep patients warm: GARF, f. A-482, op. 47, d. 2336, l. 16.

[39] Lidiya Khoroshinina, "Long-Term Effects of Lengthy Starvation in Childhood Among Survivors of the Siege," in Barber and Dzeniskevich, eds., *Life and Death in Besieged Leningrad*, pp. 201–11; Pär Sparén, *et al.*, "Long-Term Mortality After Severe Starvation During the Siege of Leningrad: Prospective Cohort Study," *British Medical Journal*, vol. 328, January 3, 2004, pp. 12–14. The latter found the highest risk among children aged between nine and fifteen during the siege, that is, children just entering or going through puberty.

[40] One very useful measure of the potential long-term damage caused by food deprivation is longitudinal anthropometric studies of child growth. These would show if food shortages had caused any growth retardation, and whether or not this retardation was temporary (being reversed once normal diets were restored) or led to a long-term decline in stature. Soviet physicians made large-scale studies of school children, Labor Reserve students,

The early postwar food crisis

Qualitative evidence of how the 1947 food crisis affected the Soviet population exists in abundance, and I have summarized some of it at the start of this chapter. In the remaining sections I try to take a more systematic look at this issue using different types of statistical data: data on causes of mortality and surveys of workers' diets. The quality of these two types of data varies considerably. The data on workers' diets come from the TsSU household budget surveys which, for all their flaws, give a reasonably accurate picture of workers' consumption and nutrition, from which we can draw some quite precise conclusions. The mortality data are much more problematic. We have national data on causes of death by age and gender, but we do not have age-specific population data from which we might calculate actual death rates per standard unit of population, the only way to measure differences between localities and changes over time.[41] As I note below, even the figures for cause of death are of uncertain

and young workers in almost every locality after the war, but unfortunately the results are virtually unusable. I have examined dozens of these studies, and none has a suitable local prewar comparison group against which to measure the possible effects of the war itself. This, in turn, was due to various factors. One was shoddy methodology in the design and interpretation of the studies. Another was more basic: very often doctors did not have the instruments they needed to make accurate measurements. During the early postwar years doctors in Chelyabinsk, Sverdlovsk, Molotov, and Moscow oblast' reported that they did not have scales to weigh the children and could only judge their general development by eye. In 1947, schools in Kemerovo oblast' carried out no anthropometric studies at all because not a single one of its schools had any instruments: GARF, f. A-482, op. 47, d. 4960, l. 79 (Chelyabinsk); d. 6435, l. 14 (Molotov); d. 6350, l. 21 (Moscow oblast'); d. 6358, l. 129 (Sverdlovsk); d. 6340, l. 213 (Kemerovo oblast').

The only study I came across that was methodologically sound was E. I. Panteleeva's dissertation on Labor Reserve students in Ivanovo, "Fizicheskoe razvitie uchashchikhsya remeslennykh uchilishch i shkol fabrichno-zavodskogo obucheniya Ivanovo v 1945–1948 gg." (Candidate of Medical Sciences Dissertation, Ivanovo, 1954). Yet even her results are of questionable value, because the only prewar comparator group available to her was Ivanovo teenage school children during 1931. The problem here is that school children were generally taller and healthier than teenage workers or Labor Reserve students, a fact that suggests significant class differences in diet, growth patterns, and general health. I return to this point in a different context in Chapter 5, pp. 264–9.

Although local comparisons are therefore not possible, Wheatcroft has done national estimates of male heights. He found that males whose teenage growth spurt took place during the protracted food crisis of 1937–1948 were 1.8 centimeters shorter when they stopped growing at age twenty than they would have been if the USSR had maintained the long-term trend displayed during the years 1857–1903, a period when adult male heights showed a steady, linear increase. It was only children born in 1943 and after, who reached their mid- to late teens in the late 1950s and 1960s, who showed heights at or above the projected long-term trend: Wheatcroft, "Great Leap Upwards," pp. 44–5.

41 See pp. 177–8. To cite an example relevant to the present discussion, we know that in the urban areas of the RSFSR more males between the ages of 20 and 24 died of tuberculosis in 1947 compared to 1946. Because we do not know the sizes of the male population in this age group we cannot determine in which year the actual risk or probability of dying of tuberculosis was greater. For this we would have to calculate TB deaths per 1,000 or

reliability, because most localities would not have had enough physicians competent to determine exact causes of death, or the laboratory facilities to conduct autopsies on every person who died.

Still, for all these weaknesses, there remain enough in the data to warrant an attempt to review them and to extract from them those conditional conclusions that we can.

Nutrition in hinterland industrial regions: basic outlines

Let us begin with the Central Statistical Administration surveys of household consumption in workers' and peasants' families in the RSFSR's main industrial oblasti during the years 1946–1950. The Central Statistical Administration had conducted household budget surveys of the families of workers, clerical employees, and technical specialists (so-called engineering-technical personnel, or ITR in Russian) since the 1920s. By World War II the methodology of the surveys was quite well developed, as was their scope: by early 1941 the surveys followed nearly 14,000 families, including roughly 12,400 families of workers. The war, as we would expect, essentially wrecked the system. Within a year of the Nazi invasion the number of families in the surveys had dropped to just over 4,200, including 3,480 workers' families, 30 percent and 28 percent respectively of the prewar sample. Once the war was over the TsSU began to restore the size of the sample. By August 1946 it already included 6,355 worker households, and the numbers increased with each passing year. Still, the surveys did not yet cover the whole of the USSR. Over 80 percent of surveyed families were in the RSFSR, with the rest in Central Asia or the Caucasus. Ukraine, Belorussia, Moldavia, and the Baltic republics were not included.[42]

In most other respects the TsSU tried to ensure that the surveys were representative of the population. In each region they attempted to choose families from the full range of local industrial enterprises, and not just from higher-wage priority enterprises in heavy industry. They equally stipulated that local "instructors" (the officials responsible for monitoring budget diaries and collecting the data) were to select only families whose main wage earner earned the average wage for her or his particular branch of industry. The reasoning behind this was clear, to eliminate the bias that especially high or low earners could introduce into the averages, but the decision was flawed. First, focusing on the primary wage earner excluded

10,000 males aged 20–24 in both years. In fact, as I show later, there are good reasons to infer that the 1947 famine increased the incidence of TB deaths among those of prime working age. See pp. 214–22.

42 See RGAE, f. 1562, op. 15, d. 1562, l. 7, 13; d. 2126, l. 2, 8–12.

differences in family incomes from non-wage incomes, which in some cases could be substantial. More importantly, by choosing the average wage the surveys excluded a huge mass of low-paid, young single workers who earned at or below basic subsistence levels. These workers were desperately poor and often desperately hungry. Insofar as the surveys did not record their experiences they significantly *overestimate* the levels of food consumption (and the calorie and protein intake that I calculate from them) of the typical Soviet worker.[43] Beyond these methodological weaknesses, the surveys were further marred by far from exemplary implementation. Given what we know about the Soviet system, it is not at all surprising to learn that local instructors were less than diligent in ensuring the representativeness of their samples, and were not averse to manufacturing their data if families did not fill out their daily diaries correctly or completely.[44] Finally, we need to note the inaccuracies intrinsic to such surveys, where families are asked to estimate to the gram how much of each food item they consumed, and where food weights do not take account of wastage, spoilage, or losses during preparation.

Despite these drawbacks, the surveys remain a valuable source of information. The data may be less than precise and the samples not fully typical of a large subgroup of impoverished workers, but there is no question that the TsSU tried to make them as accurate as possible. Certainly the picture they paint about levels of nutrition and consumption is by no means flattering. It is probably safe to assume that the calculations I make from them to derive average per capita daily calorie and protein intake may overestimate actual consumption, but they certainly will not underestimate it. Given that they show persistent undernourishment of the working population right up into the 1950s, this is a rather somber picture indeed.

I have gathered data series for workers in seventeen industrial cities and oblasti: Moscow city and oblast'; Leningrad city; Gor'kii city and oblast'; Ivanovo oblast'; Yaroslavl' oblast'; Kuibyshev city; Kazan' (Tatariya);

[43] A more accurate standard would have been to take the median wage, that is, the wage level at which exactly 50 percent of the population earn more and 50 percent earn less. In the early postwar period this would have been considerably lower than the arithmetical mean wage. On the poverty of young workers, see Filtzer, *Soviet Workers and Late Stalinism*, pp. 65–7, 117–19, 134–9.

[44] On the TsSU's own account of these problems, see RGAE, f. 1562, op. 15, d. 2470, l. 105–7 and d. 2691 (entire file). We should bear in mind that the surveys were designed to record not only physical consumption of food and basic consumer goods, but also monetary income and outlays. Notionally, at least, these did take account of outside incomes, although we can question how willing respondents would have been to report them.

Sverdlovsk city and oblast'; Molotov city and oblast'; Chelyabinsk city and oblast'; Bashkiriya; and Kemerovo oblast'. I selected these particular regions because, with the exception of Bashkiriya and Leningrad, we have longitudinal State Sanitary Inspectorate reports on them as well as infant mortality data, with both of which we can correlate the dietary information.[45] For the Moscow, Gor'kii, Kuibyshev, Tatariya, Sverdlovsk, Molotov, and Bashkiriya regions we also have peasant consumption surveys, allowing us to compare and contrast how worker and peasant families coped with the food crisis within the same locality.

The surveys give average monthly per capita consumption of major food items in grams, from which we can calculate consumption in grams per day. From these I have calculated average per capita daily calorie and protein intake for families in each city and oblast', using the nutritional values applied by the All-Union Central Council of Trade Unions (VTsSPS) in its own, smaller-scale household budget surveys which it began to carry out in 1950. These values in turn were derived, with slight modifications, from the detailed nutrition tables published by TsSU in 1925.[46] The TsSU and VTsSPS values differ from those of modern-day foods in a few, but significant ways. The most important difference is that Soviet bread had lower calorie and protein content than our modern-day Western bread, or even Soviet bread from the early 1950s. Given the importance of bread in the postwar diet, this had major nutritional implications. Another difference is in meat products. VTsSPS assumed that almost all meat consumed was from scrawny animals. It was thus low in calories, although not in protein. Similarly, salami and sausage products were not the high-fat, calorie-laden foods we would expect today, because most of it was boiled and loaded with filler, not smoked (which was a rare

[45] For Bashkiriya we have infant mortality data, but no GSI reports. Leningrad – for which there exist very detailed GSI reports – is not strictly speaking part of our comparative study. I have included the budget data because, after Moscow, Leningrad was the most privileged Soviet city, and it provides an additional point of contrast with the other industrial regions.

[46] *Normal'nii sostav i pishchevoe znachenie prodovol'stvennykh produktov, Trudy TsSU*, vol. xxii, vypusk 1, 1925. The VTsSPS food values are calculated from GARF, f. 5451, op. 43s, d. 997, l. 231. The VTsSPS food values diverged from the 1925 TsSU values in only one major respect. The 1925 TsSU tables assumed that potatoes were young, fresh potatoes, with a caloric value of 63 kcal per 100 grams; VTsSPS took the value of 84 kcal per 100 grams, which is typical for older potatoes kept in storage for long periods. We know from the household budget surveys that families accumulated large stocks of potatoes at harvest time, which they then stored and consumed gradually over a six- to eight-month period. It is worth noting that when the Ministry of Health's Institute of Nutrition issued revised food value tables in 1954, to reflect the improved quality of food, they chose a calorie value for potatoes of 90 kcal per 100 grams, that is, they assumed an even higher starch content than did the VTsSPS statisticians: *Tablitsy khimicheskogo sostava i pitatel'noi tsennosti pishchevykh produktov* (Moscow, 1954), p. 10.

delicacy). Yet even these values overestimate the nutritional content of key foods, especially in the earlier postwar period. As with the war years, although presumably not to the same degree, much of the bread had excessive moisture content and was baked with flour contaminated with impurities, such as chaff and husks. In some cases the flour was ground from damp grain or grain that had started to germinate. Aside from making the bread unpalatable or even hazardous to eat, it also reduced further the amount of calories it contained. Inspectors in Gor'kii oblast' found some batches of bread that contained over 50 percent water. The same was true of meat products, which, aside from their high moisture content, contained a considerable amount of connective tissue and gristle.[47]

Tables 4.4 and 4.5, and the accompanying figures (4.1a–f and 4.2a–f) show average per capita calorie and protein intake in workers' families in major hinterland cities and surrounding industrial oblasti, and for peasant families in the seven oblasti or autonomous republics for which we have data. I have divided each year into two halves, January–June and July–December, to capture seasonal fluctuations in consumption, as well as to accentuate the first half of 1947, when the famine was at its worst. I designate the two half-years in the tables with the roman numerals I and II. Bear in mind that these are averages per family member and do not take account of age and gender composition, both of which affect how we interpret the results. Essentially, a child needs fewer calories than an adult, and an adult woman, even one doing manual labor, will need fewer calories than an adult male doing a job of the same relative intensity. I shall adjust the figures to allow for this later in the discussion. Further on in the chapter I shall also analyze the specific components of workers' and peasants' diets, which relied on different food groups. For the moment, however, let us concentrate on these two general indicators, calories and protein. Unless otherwise stated, the sources for all of the tables in the remainder of this chapter are given in Appendix C.

There is one further qualification I need to make here. The TsSU food data covered all major food groups except alcohol. The household monetary budgets included an item on purchases of alcohol (although we can

[47] See, for example, GARF, f. A-482, op. 47, d. 6335, l. 201–2, and d. 7656, l. 274–80 (Gor'kii oblast'); d. 6340, l. 80–2, 85–6 (Kemerovo oblast'); d. 7677, l. 78–9 (Rostov-on-Don); d. 6367, l. 101–4 (Yaroslavl' oblast'). The GSI's main concern here was food safety. In fact, even during the famine they had to condemn large amounts of bread and meat products as unfit for human consumption. In Kemerovo the bread smelled and tasted of kerosene (used to line the baking tins); in Gor'kii oblast' inspectors found a mouse baked into a loaf. The use of mildewed flour or flour made from germinating grain could also be dangerous.

Table 4.4 *Estimated daily calorie intake by region, 1946–1950*

Average per capita intake of members of worker and peasant families in kilocalories per day, by half-year (excluding alcohol)

Region	1946 – I	1946 – II	1947 – I	1947 – II	1948 – I	1948 – II	1949- I	1949 – II	1950 – I	1950 – II
Moscow city workers	2375	2273	2135	2367	2677	2687	2655	2713	2735	2776
Moscow oblast' workers	2047	2131	1753	2127	2559	2560	2499	2577	2627	2708
Moscow oblast' peasants	2724	2759	2415	2794	3088	3127	3025	3058	3056	3013
Leningrad city workers	2441	2446	2184	2457	2614	2604	2553	2620	n/d	n/d
Central Russia										
Gor'kii city workers	2056	2048	1759	2069	2431	2572	2522	2469	2486	2618
Gor'kii oblast' workers	1906	1891	1720	1956	2185	2375	2389	2501	2616	2660
Gor'kii oblast' peasants	2491	2776	2473	2581	2701	2836	2901	2822	2726	2792
Ivanovo oblast' workers	2194	2198	1908	2399	2702	2718	2615	2679	2621	2707
Yaroslavl' oblast' workers	2033	2024	1794	2089	2399	2453	2415	2401	2471	2496
Volga region										
Kuibyshev city workers	2090	1886	1771	1927	2244	2223	2364	2308	2352	2348
Kuibyshev oblast' peasants	2504	2430	2256	2527	2577	2618	2592	2569	2494	2662
Tatariya workers (Kazan' city)	1937	1946	1827	2082	2276	2465	2459	2537	2474	2581
Tatariya peasants	2373	2615	2140	2601	2681	2727	2831	2863	2864	2897
Urals and Siberia										
Sverdlovsk city workers	2359	2374	2184	2350	2436	2600	2571	2569	2527	2628
Sverdlovsk oblast' workers	2473	2337	2136	2354	2624	2717	2748	2665	2661	2769
Sverdlovsk oblast' peasants	2673	2696	2406	2764	2534	2901	2930	2943	2668	2871
Molotov city workers	2046	1973	1806	1914	2316	2392	2360	2457	2454	2580
Molotov oblast' workers	2162	2098	1980	2113	2325	2459	2541	2574	2600	2572
Molotov oblast' peasants	2594	2566	2392	2601	2810	2811	2714	2762	2593	2735
Chelyabinsk city workers	2180	1969	1796	2024	2197	2421	2450	2458	2466	2493
Chelyabinsk oblast' workers	2440	2112	1952	2234	2311	2489	2602	2523	2546	2648
Bashkiriya workers	2066	1968	1627	1984	2137	2253	2248	2413	2400	2396
Bashkiriya peasants	2524	2374	1898	2261	2141	2421	2530	2547	2332	2743
Kemerovo oblast' workers	2502	2288	2273	2350	2465	2659	2847	2759	2797	2688

Sources: See Appendix C.

Table 4.5 *Estimated daily protein intake by region, 1946–1950*

Average per capita intake of members of worker and peasant families in grams per day, by half-year

Region	1946 – I	1946 – II	1947 – I	1947 – II	1948 – I	1948 – II	1949- I	1949 – II	1950 – I	1950 – II
Moscow city workers	72	68	63	69	75	75	75	79	81	85
Moscow oblast' workers	56	66	48	57	67	68	68	71	74	78
Moscow oblast' peasants	79	80	66	79	86	90	88	91	95	93
Leningrad city workers	74	71	64	71	72	72	73	75	n/d	n/d
Central Russia										
Gor'kii city workers	62	59	48	56	63	69	68	70	71	77
Gor'kii oblast' workers	56	54	47	52	57	64	64	69	74	78
Gor'kii oblast' peasants	67	75	63	69	74	77	76	79	77	82
Ivanovo oblast' workers	65	63	54	66	72	72	70	73	73	76
Yaroslavl' oblast' workers	60	60	55	61	63	65	65	67	70	73
Volga region										
Kuibyshev city workers	64	59	52	56	60	63	66	69	67	70
Kuibyshev oblast' peasants	78	79	74	82	80	84	80	83	77	87
Tatariya workers (Kazan' city)	53	53	51	57	63	67	67	71	70	73
Tatariya peasants	64	72	58	72	73	75	75	80	77	82
Urals and Siberia										
Sverdlovsk city workers	70	74	68	69	66	69	70	72	72	78
Sverdlovsk oblast' workers	74	70	68	71	75	75	76	76	76	80
Sverdlovsk oblast' peasants	81	84	73	84	77	90	88	93	83	91
Molotov city workers	64	63	55	57	65	66	65	70	71	77
Molotov oblast' workers	61	61	56	59	64	66	68	71	74	75
Molotov oblast' peasants	76	79	69	82	88	88	83	89	83	87
Chelyabinsk city workers	68	62	60	61	62	68	71	70	72	74
Chelyabinsk oblast' workers	77	69	62	66	67	72	75	75	75	78
Bashkiriya workers	57	56	47	55	61	66	63	70	70	71
Bashkiriya peasants	67	66	55	65	62	68	69	73	68	80
Kemerovo oblast' workers	74	67	66	68	71	78	82	79	78	76

Sources: See Appendix C.

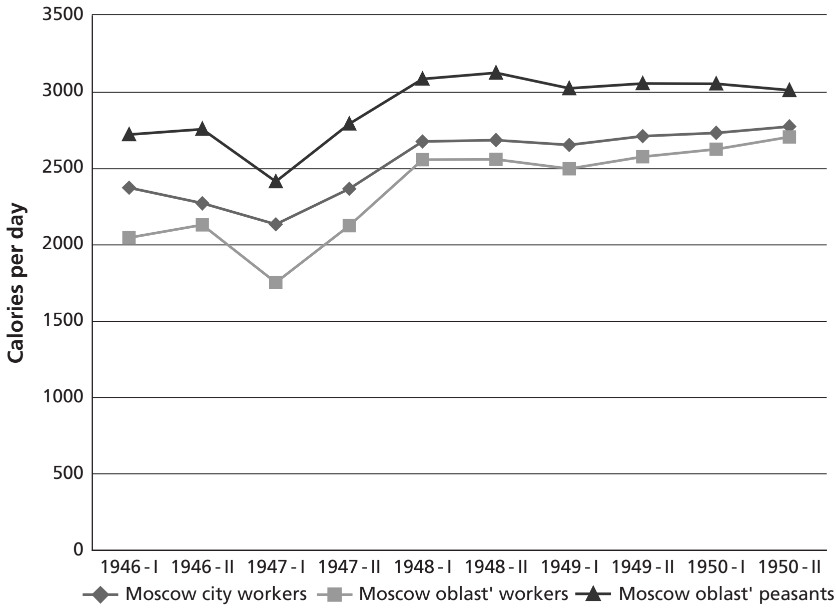


Figure 4.1a Average daily per capita calorie intake of members of worker and peasant families, Moscow region, 1946–1950

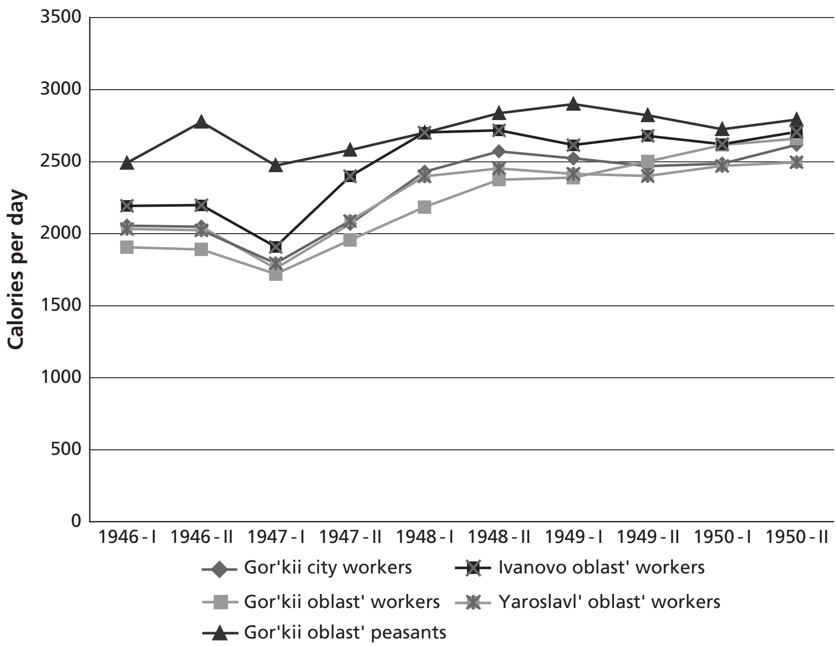


Figure 4.1b Average daily per capita calorie intake of members of worker and peasant families, Central Russia, 1946–1950

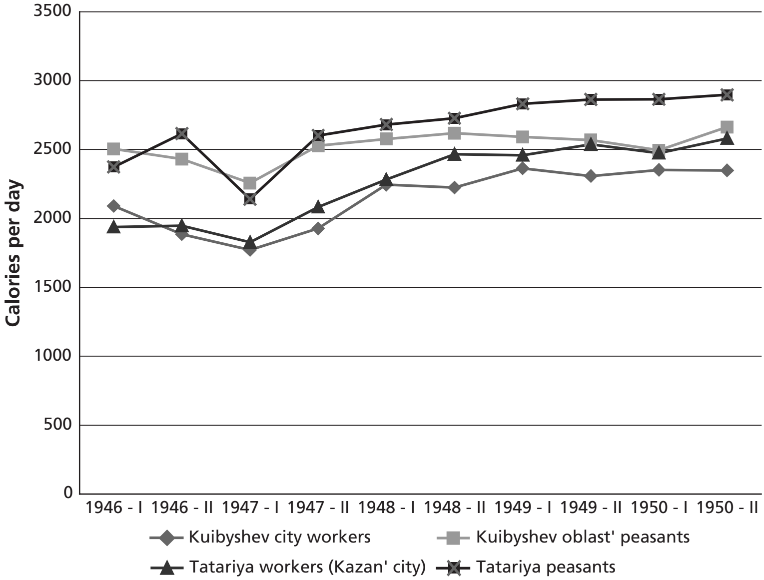


Figure 4.1c Average daily per capita calorie intake of members of worker and peasant families, Volga region, 1946–1950

Figure 4.1d Average daily per capita calorie intake of members of worker and peasant families, Sverdlovsk and Chelyabinsk regions, 1946–1950

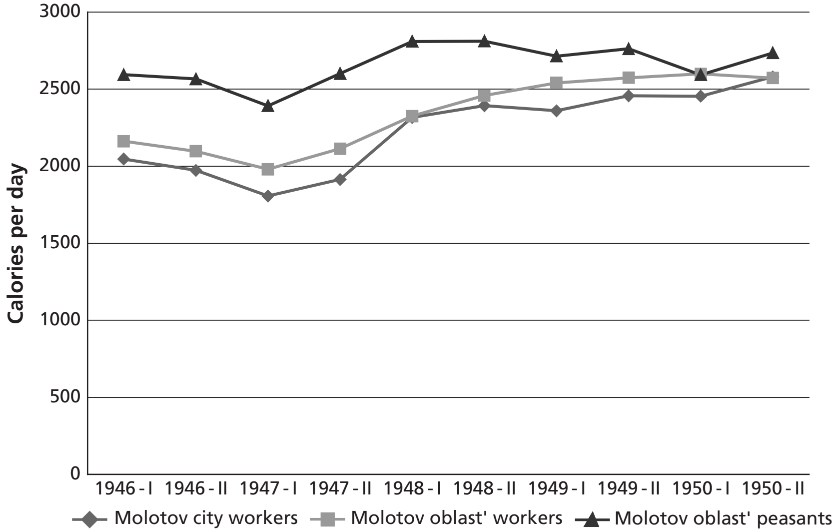


Figure 4.1e Average daily per capita calorie intake of members of worker and peasant families, Molotov region, 1946–1950

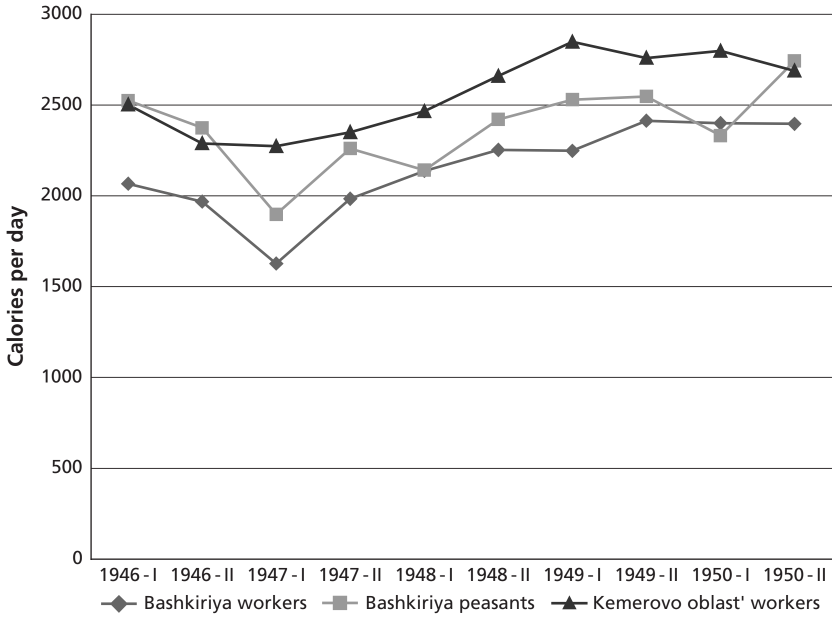


Figure 4.1f Average daily per capita calorie intake of members of worker and peasant families, Bashkiriya and Kemerovo oblast', 1946–1950

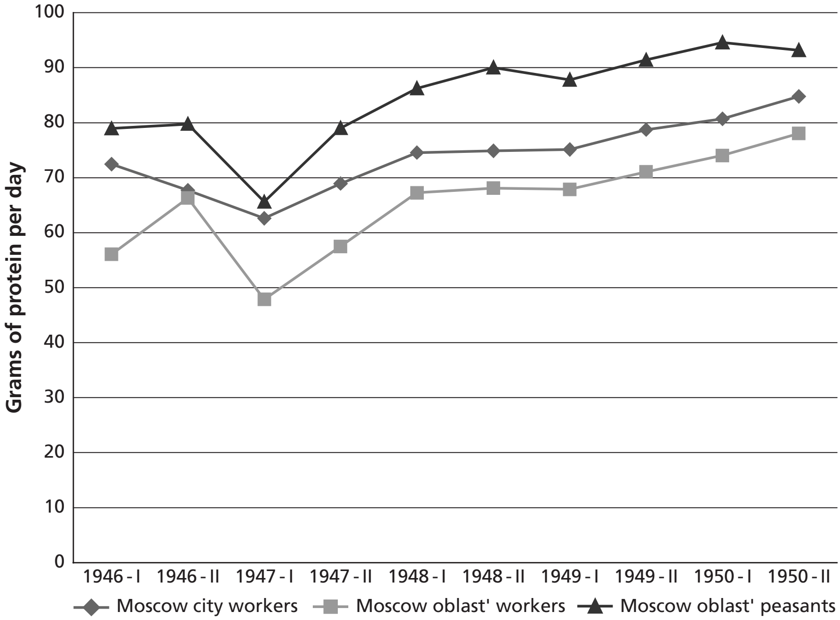


Figure 4.2a Average daily per capita protein intake of members of worker and peasant families, Moscow region, 1946–1950

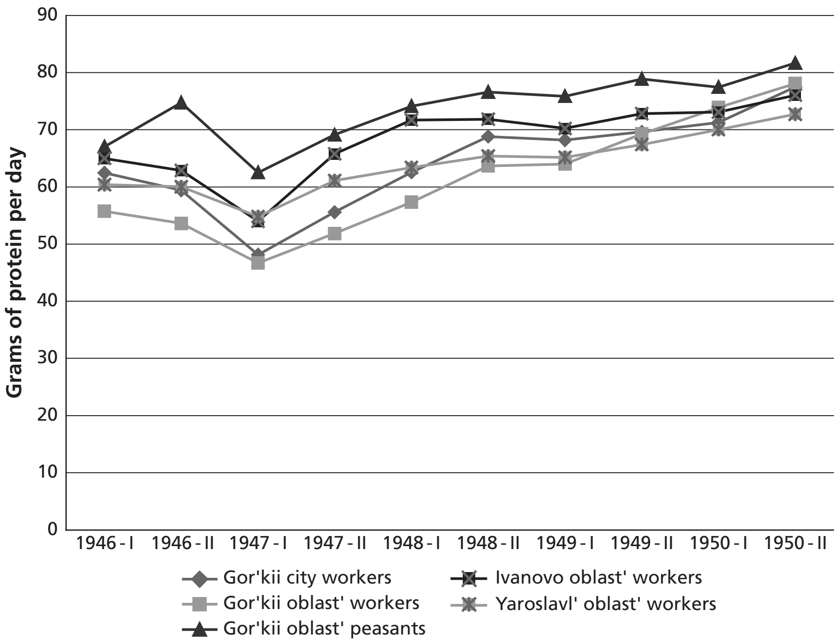


Figure 4.2b Average daily per capita protein intake of members of worker and peasant families, Central Russia, 1946–1950

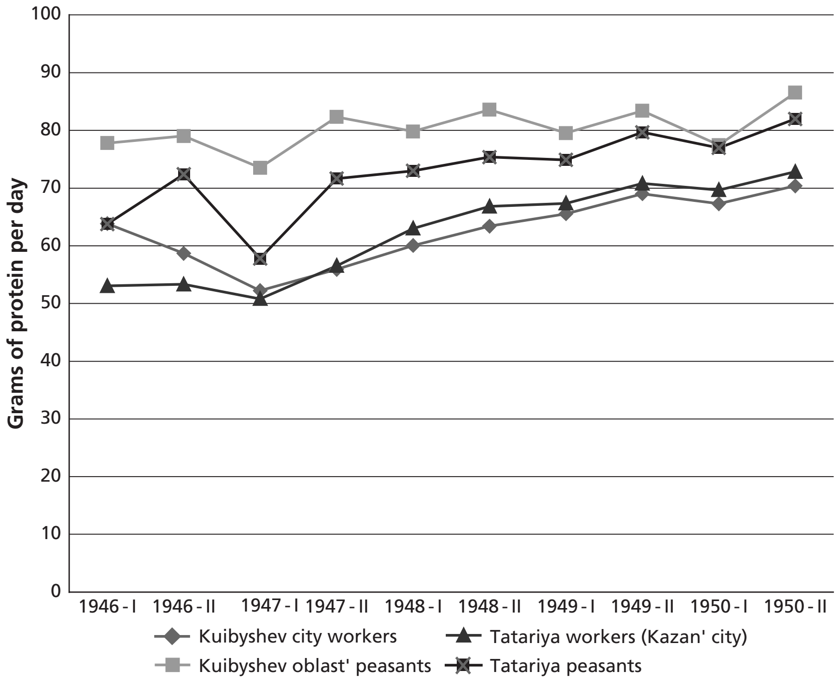


Figure 4.2c Average daily per capita protein intake of members of worker and peasant families, Volga region, 1946–1950

question how accurately people may have filled it in), but not physical consumption. Vodka contains just over 200 kilocalories per 100 milliliters, and so it is probable that adult males from at least their late teens onward were receiving perhaps 200 or 300 hundred additional calories (but no extra protein) per day from this source.

The calorie intake of workers' families – as distinct from the peasantry – was already precariously low in early 1946, that is, before the crisis erupted. Once it hit, workers' consumption in most oblasti – including Moscow oblast' – fell below 2,000 calories a day. Even in those cities and oblasti where consumption stayed above this level (the cities of Moscow, Leningrad, and Sverdlovsk, and Sverdlovsk and Kemerovo oblasti), it exceeded it only marginally. There is therefore a strong *a priori* association between the drop in calorie intake and accelerated urban death rates in these localities, all of which, I stress, were geographically far removed from the famine's epicenter. This is most obvious in the case of infant mortality, for which we have reasonably good data (see Tables 5.7 and 5.8), but it also conforms to the crude death rates I shall note later in the discussion (see pp. 209–10).

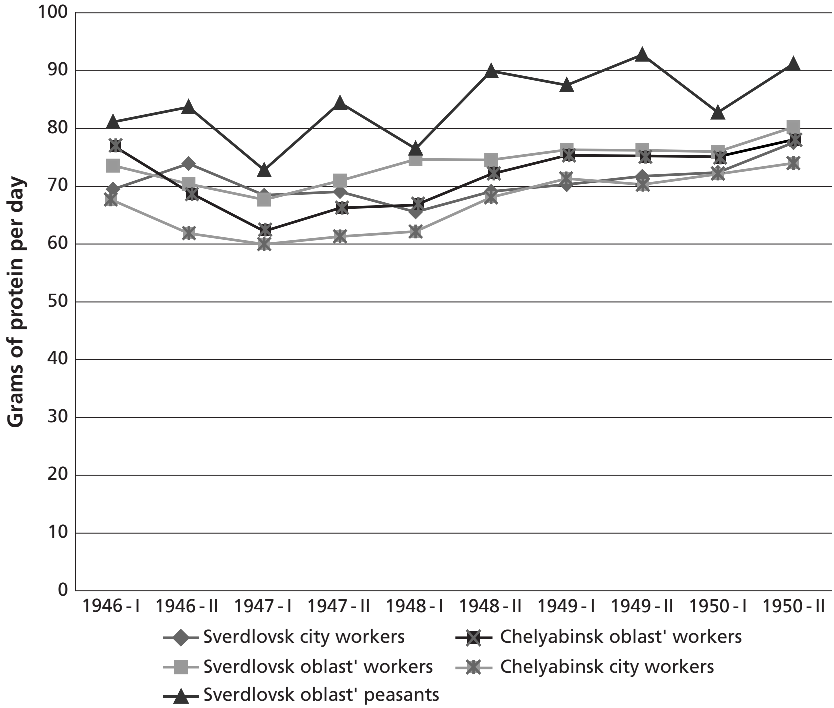


Figure 4.2d Average daily per capita protein intake of members of worker and peasant families, Sverdlovsk and Chelyabinsk regions, 1946–1950

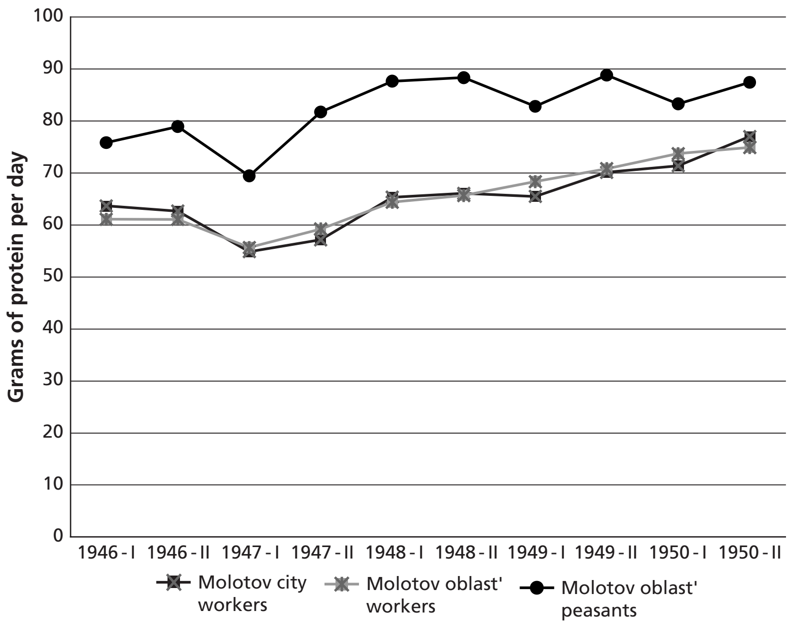


Figure 4.2e Average daily per capita protein intake of members of worker and peasant families, Molotov region, 1946–1950

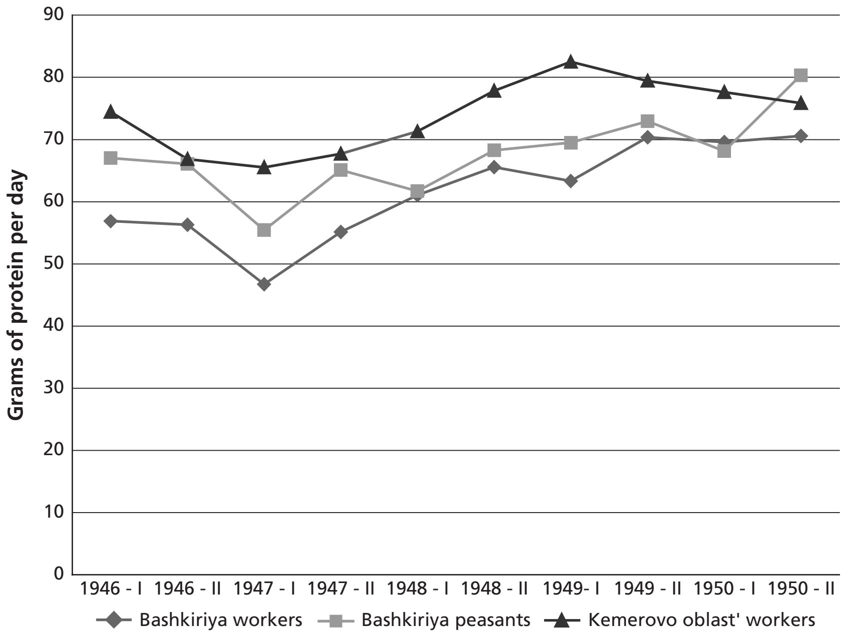


Figure 4.2f Average daily per capita protein intake of members of worker and peasant families, Bashkiriya and Kemerovo oblast', 1946–1950

What is the real-life significance of these magnitudes? Here it is useful to compare them to the diets of the poor in other countries at different periods in history. The 1,700–2,200 kcal per day consumed by members of Russian workers' families in 1946 and 1947 are very similar to what the Irish workhouse provided Irish paupers in 1849, just after the great Irish famine – around 2,075 calories a day.[48] It was also very close to what working-class British families consumed in late Victorian and early Edwardian times. Derek Oddy has calculated that average daily per capita consumption in working-class families in late Victorian Britain (1887–1901) was just under 2,100 calories, with 57 grams of protein. During the years 1902–1913 this rose to 2,398 calories and 71 grams of protein. However, because families divided up their food in order to give the best portions to the male breadwinner at the expense of women and children, the latter suffered chronic undernourishment, especially since the diet, like the wartime and postwar Soviet diet, was heavily dependent on starch and poor in foods of animal origin, in particular dairy products and animal

[48] Crawford, "Irish Workhouse Diet," pp. 89–91.

fats. The lack of dairy products helps explain the high incidence of rickets among British children; the lack of fats contributed to vitamin deficiency.[49] Even Britain in the 1930s had a very large minority of its population obtaining inadequate calories and protein. In 1933 the British Medical Association calculated the cost of what it considered to be a minimum diet, by which it meant a diet sufficient to allow people to live without any "obvious deficiency," but not enough to allow an adult male to do moderately heavy work or a child to achieve normal growth. Sir William Crawford, in his book, *The People's Food*, found that a full third of British citizens did not spend enough each week on food to allow them to reach the BMA's standard. Specifically, 33 percent of Britons did not take in enough calories; 40 percent did not consume enough protein; over half were deficient in calcium; nearly three-quarters did not have enough iron; 47 percent were lacking in vitamin C, 82 percent in vitamin A. An even less sanguine picture emerged from the work of John Boyd Orr, who published his classic study, *Food, Health and Income*, in 1936. Boyd Orr studied the ability of the British population to afford not a minimum diet, as implied by the BMA standards, but a physiologically optimal diet, that is, a diet whose nutritional content was sufficiently high that if the diet were to improve this would not necessarily produce better health. Boyd Orr found that a full 50 percent of the British population were unable to avail themselves of his ideal diet. The diet of the worst-off 10 percent was deficient in every category: calories, protein, fats, vitamins, and essential minerals. The next poorest 20 percent took in enough fats and protein, but not enough calories or micronutrients. The diets of the middle 20 percent were adequate in gross terms, that is, calories, protein, and fats, but not in vitamins or minerals. Only the top 10 percent of the British population had a diet that physiologically was fully adequate.[50] There are two points that emerge from these comparisons. First, during most of European industrialization, and right up until World War II, large sections of Western populations were undernourished. Secondly, although the people represented in these examples suffered chronically poor nutrition and various health problems, including tragically high infant mortality, they did not starve. They were not living in famine conditions.

We see this even more starkly if we look at some other international examples. Even calorie intakes below 1,700 kcal per day did not cause mass famine. In Western Holland, the region of the Netherlands that was

[49] D. J. Oddy, "A Nutritional Analysis of Historical Evidence: The Working-Class Diet, 1880–1914," in Derek Oddy and Derek Miller, eds., *The Making of the Modern British Diet* (London: Croom Helm, 1973), pp. 227–8.

[50] Cited in Burnett, *Plenty and Want*, pp. 269–71, 274–5, 281–2.

to suffer serious famine in the winter of 1944–1945, average daily per capita calorie intake in October 1944, that is, just before the famine hit, was around 1,876 calories in Amsterdam, 1,685 in Rotterdam, and 1,783 in Utrecht. Daily protein consumption ranged from 40 grams a day in Delft and Rotterdam to 60 grams in Utrecht and Amsterdam.[51] Average daily consumption in China just before and just after the famine of 1960–1962 was around 1,700–1,800 kcal and 45–46 grams of protein. Famine set in only when consumption dropped well below this level.[52]

The other side of this argument, however, is that if this was the consumption of Soviet workers' families with access to an *average* wage, it means that those families on *below average* wages would have been consuming far less. These people would indeed have been at risk, for once we arrive at 1,400 kcal a day and daily protein intake falls below 40 grams death becomes a real danger. At the nadir of the Dutch "Hunger Winter" in April 1945, daily calorie intake fell to 1,240 calories in Amsterdam, 1,415 in Rotterdam, and 1,441 in Utrecht. Perhaps more critically, protein intake in all three cities fell below 40 grams a day – in Amsterdam and Rotterdam to as little as 25 grams a day.[53] In China in 1960, the worst famine year, average consumption dropped to 1,450 calories and just 39 grams of protein.[54] Even worse was the experience of the Soviet famine of 1932–1933, when peasants in Kiev and Odessa oblasti consumed just 1,100–1,200 calories a day.[55]

Table 4.6 provides a summary of these different comparisons. If we look at it in conjunction with Table 4.5, which shows daily protein consumption, we see that, as serious as the food situation was in the RSFSR in 1947, and as poor as the diet continued to be in later years, only in relatively few regions did protein intake fall to the dangerously low levels experienced in Western Holland or China on the eve of their respective famines, and nowhere saw protein consumption drop below what we might take as the

[51] G. C. E. Burger, J. C. Drummond, and H. R. Sandstead, *Malnutrition and Starvation in Western Netherlands, September 1944–July 1945*, Parts I and II (The Hague: General State Printing Office, 1948), Part I, pp. 80–2; Part II, pp. 153, 186, 210. Their calculations were based on detailed surveys with famine survivors after liberation, and include estimates of what people acquired through non-official and non-charitable channels, mainly black-market purchase and foraging.

[52] Carl Riskin, "Food, Poverty, and Development Strategy in the People's Republic of China," in Lucille F. Newman, ed., *Hunger in History: Food Shortage, Poverty, and Deprivation* (Oxford: Basil Blackwell, 1990), p. 333.

[53] Burger, Drummond, and Sandstead, *Malnutrition and Starvation*, Part I, pp. 80–2, and Part II, pp. 153, 186, 210.

[54] Riskin, "Food," p. 333.

[55] Wheatcroft, "Soviet Statistics," pp. 537–8 (Kiev oblast'); R. W. Davies and Stephen G. Wheatcroft, *The Years of Hunger: Soviet Agriculture, 1931–1933* (London: Palgrave, 2004), p. 283 (Odessa oblast').

Table 4.6 *Comparative daily calorie and protein intake, RSFSR and selected international examples*

Country	Year	Calories	Protein (grams)	Comments
Moscow	Early 1947	2,135	63	Workers' families on average wage at height of 1947 famine
Kuibyshev	Early 1947	1,771	52	
Ireland	1849	2,075	63	Irish workhouse diet for paupers in extreme hardship, post-famine
Britain	1887–1901	2,099	57	Within the home, food distributed in favor of male wage earner. Women and children suffered undernourishment
Britain	1902–1913	2,398	71	
Germany	April 1917	1,985	60	Civilians at depth of hunger in World War I
Amsterdam	October 1944	1,876	60	Prior to the onset of the famine
Amsterdam	April 1945	1,243	25	Worst month of the Dutch famine
China	1959	1,722	46	Prior to the onset of the famine
China	1960	1,453	39	Famine
China	1963	1,776	46	Post-famine

Sources: Moscow and Kuibyshev, Tables 4.4, 4.5; Ireland, E. Margaret Crawford, "The Irish Workhouse Diet, 1840–1890," in Catherine Geissler and Derek J. Oddy, eds., *Food, Diet and Economic Change Past and Present* (Leicester: Leicester University Press, 1993), p. 91; Britain, D.J. Oddy, "A Nutritional Analysis of Historical Evidence: The Working-Class Diet, 1880–1914," in Derek Oddy and Derek Miller, eds., *The Making of the Modern British Diet* (London: Croom Helm, 1973), p. 224; Germany, Ancel Keys, Josef Brožek, Austin Henschel, Olaf Mickelsen, Henry Longstreet Taylor, *et al.*, *The Biology of Human Starvation* (Minneapolis: University of Minnesota Press, 1950), p. 1240; Netherlands, G. C. E. Burger, J. C. Drummond, and H. R. Sandstead, *Malnutrition and Starvation in Western Netherlands, September 1944–July 1945*, Parts I and II (The Hague: General State Printing Office, 1948), Part I, p. 81, and Part II, p. 153; China, Carl Riskin, "Food, Poverty, and Development Strategy in the People's Republic of China," in Lucille F. Newman, ed., *Hunger in History: Food Shortage, Poverty, and Deprivation* (Oxford: Basil Blackwell, 1990), p. 333.

famine threshold of 40 grams a day. Even in the worst Russian regions – Bashkiriya, Gor'kii city, Gor'kii oblast', and Moscow oblast' – workers maintained protein levels above these amounts. Moreover, unlike the drop in calorie intake, the fall-off in protein consumption recovered very quickly, a fact which undoubtedly helped to attenuate the impact of the food shortages, and without which mortality almost certainly would have been higher.

Besides the special plight of the low-paid, we also need to remember that calorie and protein intake alone do not tell the whole story. As I have already had cause to note when discussing wartime food shortages, what is important is not gross nutrition, but net nutrition, that is, calorie intake relative to how much energy a person needs to expend. There are several factors we need to consider here. The most obvious is work effort: those doing heavy physical labor will need many more calories than someone who is sedentary. Another key variable is climate, because people in cold climates with inadequate clothing and heating will need considerably more calories than someone in a temperate climate. Children and teenagers need energy for growth.[56] We already know that during World War II conditions in the RSFSR's hinterland industrial regions were extremely unfavorable in all these respects, and they remained so after the war. Almost the entire population, from their early teens to old age, performed arduous manual labor. Homes, factories, and public buildings were badly heated, and on many winter days would barely be above freezing. Even as late as 1950, factories in Moscow and Gor'kii reported winter temperatures at or below freezing – temperatures in the foundry of the Gor'kii milling machine factory dropped to –14° C.[57] Hospitals in Moscow oblast' during 1947 considered that they had adequate fuel supplies if they could maintain winter temperatures on the wards at 14°–16° C, but on most days they failed to achieve this. The temperature in the main hospital for infectious diseases in Gor'kii during the winter of 1948 rarely rose above 12° C.[58] Dormitories applied the same standard: the goal was to keep indoor winter temperatures between 16°–18° C, but this proved beyond the reach of many industrial enterprises, especially during 1946

[56] Robert William Fogel gives a very good summary of these interrelationships: "The body's ability to generate a surplus for growth will vary with such factors as the climate, the nature of the available food, clothing and shelter, the disease environment, the intensity of work, and the quality of public sanitation. In other words, the same nutritional input can have varying effects, depending on environmental conditions. The differing nutritional requirements for different intensities of work and in different environmental conditions suggest that changes in the level of gross input (measured by food consumption) provide less than a perfect indication of changes in the nutrients available for physical growth. On the other hand, while mean height measures the nutrients available after allowing for physical maintenance, for work, and for the impact of the man-made and natural environment, it does not by itself indicate whether fluctuations in net nutrition are due to changes in the consumption of food or in the claims on the food intake." See Fogel, "Physical Growth as a Measure of the Economic Well-Being of Populations: The Eighteenth and Nineteenth Centuries," in Frank Falkner and J. M. Tanner, eds., *Human Growth: A Comprehensive Treatise* (2nd edition), vol. III, *Methodology: Ecological, Genetic, and Nutritional Effects on Growth* (New York and London: Plenum Press, 1986), p. 267.

[57] GARF, f. 7676, op. 11, d. 931, l. 16–18.

[58] GARF, f. A-482, op. 47, d. 6347, l. 148 (Moscow oblast'); GARF, f. 9226, op. 1, d. 895, l. 120ob. (Gor'kii).

and 1947.[59] How would this have affected energy needs? According to the World Food Programme, for those living in cold climates who do not have adequate shelter and heating daily calorie intake needs to increase by 100 kcal for every 5° C that the minimum temperature drops below 20° C.[60] Following this formula, adults exposed to the conditions just cited would have needed anywhere from 100 to 700 extra calories a day during the winter months, that is, at precisely the moment when the 1947 food shortages also hit their peak. Finally there is the question of transportation. The restoration of public transport after the war did not happen overnight. People continued to expend a large number of calories walking to and from work – but not just to work, for we should not forget that people often had to walk considerable distances to fetch water, not to mention the calories consumed carrying heavy buckets up flights of stairs. Here, too, these efforts would have been greatest during the winter, when the food crisis was at its worst and people's bodies were less able to cope with the strain.

There is still one further claim on energy that we have not yet discussed, and that is infectious and parasitic diseases, including intestinal worms. These are well known as a major issue for children in third world countries, as intestinal infections and parasites can curb food intake due to loss of appetite, deplete available nutrition through diarrhea, vomiting, and internal bleeding, and compromise the body's ability to absorb those nutrients that it manages to retain. In extreme cases, worms can cause serious damage to internal organs and even cause death. The most dangerous worms are hookworm, *Ascaris*, *Trichuris trichiura* (whipworm), and *Strongyloides stercoralis*. Together they affect more than 3 billion people worldwide, and cost more morbidity, as measured in so-called disability-adjusted life years, than malaria.[61] Parasitic infestations, in the form of intestinal worms, were also a problem in the postwar USSR. Infestations were incredibly common, not just among children and teenagers, as we would normally expect, but also among adults. Moreover, the main infectious agents were the same as we see in the modern third world. Far and away the most common worm was *Ascaris*, which can cause temporary and sometimes permanent growth retardation, place serious limits on physical activity, and lead to acute organ damage. During the late 1940s and much of the 1950s, *Ascaris* accounted for over 80 percent of

[59] GARF, f. 9226, op. 1, d. 798, l. 46; GARF, f. A-482, op. 52s, d. 224, l. 93–4; op. 47, d. 4960, l. 25. The latter reference is to the Kirov Tractor Factory in Chelyabinsk during 1946, where some dormitories suffered through winter temperatures of 4°–9° C.

[60] *Crisis in Mortality, Health, and Nutrition*, Economies in Transition Studies, Regional Monitoring Report, No. 2, August 1994 (Florence: UNICEF, 1994), p. 79.

[61] L. S. Stephenson, M. C. Latham, and E. A. Ottesen, "Malnutrition and Parasitic Helminth Infections," *Parasitology*, vol. 121, Supplement (2000), pp. S23–4.

all worm infestations. The other main agents were various varieties of tapeworm, whipworm, and *Strongyloides stercoralis*.[62] It was only in 1938 that the Soviet Union began to introduce effective measures to identify and treat carriers, but these measures for all practical purposes collapsed during the war. One leading parasitologist estimated that by 1944 over a third of the RSFSR's population was infected – a figure that excluded relatively innocuous infestations of *Enterobiasis* (the common threadworm or pinworm).[63]

The problem remained serious throughout most of the postwar period. Medical examinations of more than 550,000 young workers and Labor Reserve students across the RSFSR in 1950 found an overall infestation rate of 10 percent. Among seven-year-olds entering first grade in the towns of Chelyabinsk oblast' in late 1950, 20 percent had worms. Over half the Labor Reserve students in Leningrad were harboring worm eggs in 1948; more than a third of the city's school children were infested in 1951. The infestation rate among Kazan' school children during 1953 was 39 percent. Examinations of all children, from toddlers through to Labor Reserve students, in Yaroslavl' found infestation rates of between 42 and 47 percent in 1952–1954.[64] As we saw in Chapter 1, the infections spread from the soil – the contaminated soil around outhouses and the soil of sewage farms which was then used as fertilizer on private plots and collective farms – and from there to food, drinking water, and swimming pools. Even in Moscow a quarter of all the city's food handlers were found with worms, and the sand filters in its swimming pools were laden with worm eggs.[65] The question is relevant here because these infestations would have compromised the nutritional status of sufferers through loss of appetite, diarrhea, and poor absorption of nutrients, and to this extent they increased people's demand for calories in compensation. We cannot possibly quantify just how many additional calories people would have needed to neutralize the nutritional damage done by *Ascaris*, tapeworms, or whipworms, because we do not know how many people were infested at any one time or for how long they remained infected before they received treatment. What we can say, however, is that, on top of all the other factors that boosted people's demand for calories, we must remain aware that intestinal parasites also played a role, and that an unknown percentage of

62 Markin, "Gel'mintofauna," pp. 43–4; Bursdorf and Kul'nevich, "O nekotorykh osobennostyakh," p. 154.
63 Z. G. Vasil'kova, "Gel'mintozy v RSFSR v gody otechestvennoi voiny," *Meditsinskaya parazitologiya i parazitarnye bolezni*, vol. 14, no. 4, 1945, pp. 8–11.
64 GARF, f. A-482, op. 52s, d. 285, l. 325 (RSFSR); op. 49, d. 3245, l. 266 (Leningrad, 1951); d. 7324, l. 64–5 (Kazan'); d. 8856, l. 189–90 (Yaroslavl'); GARF, f. 9226, op. 1, d. 897, l. 226 (Leningrad, 1948).
65 GARF, f. A-482, op. 49, d. 3247, l. 78ob.; d. 3249, l. 41. Both reports are from 1951.

the population would have needed to consume extra calories as a result. Thus, if vodka consumption is an imponderable that would have increased daily calorie intake, here we have another imponderable exerting its influence in the opposite direction.

The household budget surveys allow us to take most of these factors into account and make a rough quantitative estimate of gross calorie intake versus calorie requirements. Prewar budget surveys converted figures for physical consumption into what are known as "adult equivalent units." These take account of the different energy and nutritional requirements of people of different ages and genders. Let us suppose we have two families. One family is made up of one working-age male, one working-age female, one thirteen-year-old boy, and one seven-year-old girl. The other family consists of a single mother with two small infants. We know how much of each food item each member of each family consumed on average per day. From this we can calculate the average gross daily per capita calorie intake for each family. Obviously the average consumption of the second family will be lower than that of the first, since adult males and growing children eat more than small babies and toddlers. How do we know if the differences in food consumption and calorie intake were simply down to the makeup of the two families, or if they were due to differences in each family's access to food? We do this by adjusting the gross data to account for each family's age and gender composition, converting them into what each family member would have consumed if they had all been adult males. These are the adult equivalent units, and once we know these values we can compare them with the recommended daily requirements of adult males; in this way we can discover if the two families were receiving proper nutrition.

We can illustrate this with a simple example, using Table 4.4, and using calories instead of grams of food. Soviet statisticians assumed that a baby aged six to twelve months counted as 0.2 of an adult male; an infant aged one to three years counted as 0.3; a child between the ages of three and seven years counted as 0.45; children aged seven to eleven counted as 0.55; children between ages eleven and fifteen counted as 0.7; teenagers aged fifteen to eighteen counted as 0.8; and women up to the age of fifty-nine also counted as 0.8.[66] Looking at Table 4.4, the average per capita

[66] I have calculated these from the recommended daily calorie requirements used by the Soviet Academy of Medical Sciences' Institute of Nutrition in 1951. These do not actually state the deflators they used. Fortunately, Wheatcroft has published the deflators used by the forerunner of the TsSU in the early 1920s. The latter used broader age bands than did the Institute of Nutrition, but they overlap in two groups, from which we can calculate the deflators for the other age categories: Wheatcroft, "Soviet Statistics," p. 539, and GARF, f. 9226, op. 1, d. 1119, l. 52.

calorie consumption of a Moscow worker's family in the winter of 1947 was 2,135 kcal. If we take our hypothetical family of four people in the preceding paragraph, their total calorie intake is 4 x 2,135 = 8,540 kcal. The family consisted of one adult male (1.0 adult males); one adult woman (0.8 adult males); one boy in his early teens (0.7 adult males), and a young girl just entering primary school (0.45 adult males). Adding these together, we find the family consists of the equivalent of 2.95 adult males. If we divide its total calorie intake of 8,540 kcal by 2.95, we have the average daily adult equivalent consumption of each person, which comes out at 2,895 kcal. The questions that immediately arise are: how do we know if this was adequate or not? Against what standard do we measure it? Unfortunately, this is by no means clear cut.

Unlike the prewar surveys, the postwar data sheets did not convert their figures into adult equivalents. We do, however, know the age and gender composition of the average worker household in each region, and can use this to calculate the family's average per capita daily requirement, adjusted for age and gender. In fact, I have used two different measures. First, I compare actual intake to the official Soviet recommendations, which considerably exceeded international standards, both then and now. In fact, as I elaborate in the explanatory note to Table 4.7, there was no single Soviet standard, so even here we have to make some educated guesses as to which is the best to use. Secondly, I have constructed a modified daily standard, which averages the Soviet and Western recommendations, to allow for the fact that Western norms underestimate the needs of adults who perform heavy physical labor, who live in cold climates, or who are coping with a number of health problems, including possible parasitic infections.[67] These results are shown in Table 4.7, which also explains how I have calculated the standards.

This type of conversion is important for at least two reasons. The most obvious is that it provides us with a biological standard against which to measure the adequacy or the inadequacy of the diet. A per capita calorie intake of 2,135 kcal a day has one meaning for a household consisting of two elderly sisters living in southern Spain who spend most of their time reading on the beach. It has quite another meaning for a Moscow worker's family living in one room in a cold communal flat, where one parent works in construction, the other in a foundry, and two teenage sons are working in an iron and steel works. It is also useful if we want to make genuine regional comparisons. Kuibyshev workers in 1947 appear to have consumed slightly more than workers in Gor'kii, but once we take family size,

[67] *Crisis in Mortality, Health, and Nutrition*, p. 79.

Table 4.7 *Daily per capita calorie intake of worker families vs. per capita daily calorie requirement, first half 1947 and second half 1950*

Adjusted for age and gender composition of families in the given region

	1947 (January–June)					1950 (July–December)				
Region	Act.	SR	% SR	MR	% MR	Act.	SR	% SR	MR	% MR
Moscow city workers	2135	3153	67.7	2539	84.1	2776	3122	88.9	2546	109.0
Moscow oblast' workers	1753	3131	56.0	2532	69.2	2708	3019	89.7	2500	108.3
Leningrad city workers	2184	3167	69.0	2516	86.8	n/d	n/d		n/d	
Central Russia										
Gor'kii city workers	1759	3054	57.6	2514	70.0	2618	3038	86.2	2507	104.4
Gor'kii oblast' workers	1720	3085	55.8	2537	67.8	2660	3055	87.1	2508	106.1
Ivanovo oblast' workers	1908	3113	61.3	2497	76.4	2707	3055	88.6	2487	108.8
Yaroslavl' oblast' workers	1794	3162	56.7	2540	70.6	2496	3090	80.8	2514	99.3
Volga region										
Kuibyshev city workers	1771	3151	56.2	2536	69.8	2348	2995	78.4	2465	95.3
Tatariya workers (Kazan' city)	1827	3143	58.1	2511	72.8	2581	3065	84.2	2488	103.7
Urals and Siberia										
Sverdlovsk city workers	2184	3067	71.2	2503	87.3	2628	2985	88.0	2492	105.5
Sverdlovsk oblast' workers	2136	3018	70.8	2510	85.1	2769	2946	94.0	2468	112.2
Molotov city workers	1806	3200	56.4	2540	71.1	2580	3059	84.3	2504	103.0
Molotov oblast' workers	1980	3023	65.5	2509	78.9	2572	2903	88.6	2446	105.2
Chelyabinsk city workers	1796	2950	60.9	2453	73.2	2493	2894	86.1	2441	102.1
Chelyabinsk oblast' workers	1952	3029	64.4	2535	77.0	2648	2956	89.6	2493	106.2
Bashkiriya workers	1627	3018	53.9	2511	64.8	2396	2958	81.0	2467	97.1
Kemerovo oblast' workers	2273	2916	77.9	2470	92.0	2688	2946	91.2	2480	108.4

Note: Act. = actual calories; SR = Soviet requirement; MR = modified requirement.

Actual calorie intake is taken from Table 4.4. Soviet calorie requirements called for a daily adult intake, irrespective of gender, of: 3,208 kcal for those doing non-physical labor; 3,592 kcal for those doing machine-assisted physical labor; 4,112 kcal for workers doing heavy manual labor; and 4,678 kcal for workers performing exceptionally difficult labor, such as logging, digging, and underground miners working without machinery. I have taken the more conservative figure of 3,500 kcal per day for all adults, partly to avoid the risk of overestimating the extent of malnutrition, but mainly to allow for the fact that men and women, even when performing comparable physical labor, do not need the same amount of calories. In their own calculations, whenever the Soviets needed to use a single value for the "typical" adult, they chose 4,112 kcal, that is, a worker doing heavy manual labor. For children and teenagers the Soviets set the following needs: babies up to 12 months, 782 calories; children aged 1–3, 1,315 calories; ages 3–7, 1,871 calories; ages 7–11, 2,291 calories; ages 11–15, 2,940 calories; ages 15–18, 3,340. The budget data list two other categories of household member, pensioners and people from outside the family, effectively lodgers. There were no recommended nutritional standards for these groups, so I have assumed that both needed 3,200 kcal a day, that is, slightly less than a working-age adult – an assumption fully justified by the fact that most pensioners worked.

The "modified" requirements are an average of the Soviet requirements and contemporary Western recommendations. United States recommendations in 1989 were: 1,800 kcal per day for a six-year-old child; 2,000 kcal for a ten-year-old; 3,000 kcal for males aged 15–18; 2,900 kcal for males aged 18–50; and 2,300 kcal for males over 50. The equivalent standards for women were: 2,200 kcal for women aged 11 through to 50; and 1,900 kcal for women over 50. However, these levels are for people doing light to moderate physical activity and living in temperate climates.

In choosing the modified requirements I have used the Soviet recommendations for children up to the age of fifteen, which differ very little from the 1989 US requirements. For adult males I have taken the median between the Soviet standard of 3,500 kcal/day and the US recommendation of 2,900 kcal/day – that is, 3,200 kcal/day. This assumes that the "average" male of working age was doing reasonably, but not excessively, heavy physical labor or factory work. For women I have arrived at a figure of 2,500 kcal/day. The budget surveys show that there were roughly two to three times as many working-age females (that is, over the age of fourteen) per household as there were males, a not very surprising result given the scale of male losses during World War II. I have assumed that half these women were doing relatively heavy physical labor or factory work, and for them I have taken a value roughly halfway between the Soviet recommendation of 3,500 kcal/day and the US recommendation of 2,200 kcal – or 2,800 kcal/day. Since, however, the activity of the other half of the adult females is unknown, for them I have assumed the Western standard of 2,200 kcal/day. Thus, for all working-age females I have used the median between these two figures, that is, 2,500 kcal/day. I have used this same standard of 2,500 kcal/day for pensioners and non-family members eating with the surveyed family, on the assumption that many pensioners were working and those who were not had to cope with poor domestic heating.

We should not automatically assume that the Soviet requirements were vastly inflated. In the Urals and Siberia, which were dominated by coal mining, iron and steel, oil extraction, and construction, it is probable that the true daily requirement was not far below the Soviet recommendation, especially if we use the lower figure of 3,500 kcal/day for all adult workers, as opposed to the 4,112 to 4,678 kcal/day recommended for miners and others doing exceptionally hard physical labor. In regions such as Ivanovo and Yaroslavl', which had high concentrations of textile workers, almost all of whom were women, the calorie demands of women workers would have far exceeded modern-day Western standards of around 2,000 kcal/day, and probably our "modified" Western standard as well. In short, although the Soviet recommendations may exaggerate actual energy needs, given the arduousness of Soviet daily life, our "modified" Western standard is likely to be too conservative.

Sources: See Appendix C.

gender, and age structure into account we see that those in Kuibyshev were actually marginally worse off.

Before proceeding to analyze these data, I should call attention to one other methodological issue. In his definitive study of hunger and starvation, Ancel Keys cautions that dietary studies from the 1930s and 1940s had consistently underestimated real consumption and overestimated the amount of calories needed for different levels of activity. Swiss studies carried out during World War II found that a male weighing 70 kilograms could subsist on 2,160 kcal a day while doing light work and would not lose any weight. We can compare this with the 1936 League of Nations recommendations of 2,400 kcal for a male leading a totally sedentary existence, the Soviet assumption that this same male would need 3,208 kcal a day, or the 2,336 kcal an adult male worker in Gor'kii was consuming in early 1947.[68] The yardstick that Keys was using, however, was weight loss, which in Switzerland set in only in 1945, when food consumption fell so low that it provided an average of a mere 1,800 kcal per day. Nevin Scrimshaw, by contrast, offers a different criterion: the amount of energy needed to allow a human being to work or, as he puts it, "an intake adequate for productive physical activity."[69] Soviet postwar reality was closer to Scrimshaw's conception than to that of Keys. Soviet citizens had to work, and it was this that determined whether or not they had enough to eat.

Let us now examine the data in Table 4.7 in more detail. We see that in 1947, even using the lower, modified standard, daily calorie intake in most localities was between two-thirds and three-quarters of physical requirements. Measured against the Soviet standard, consumption fell to between half and two-thirds of actual need. In either case the picture is quite stark. These families may not have been in danger of dying, but they almost certainly experienced extreme hunger and weight loss. The table also confirms the pattern of regional differences already evident in Table 4.4. Overall, workers in Central Russia and the Volga region were in the most precarious position. Workers in Moscow oblast' were demonstrably worse off than workers in neighboring Moscow. Yet Moscow workers, whom we would ordinarily expect to have the highest food consumption, actually did worse than workers in Sverdlovsk, Sverdlovsk oblast', and Kemerovo oblast', because the latter could supplement their diets with food they grew themselves. Yet the Urals as a region was not

[68] Keys, *et al.*, *Biology*, pp. 340–64, in particular, pp. 344–7. I have calculated the Gor'kii adult equivalent from the family profiles given in the TsSU files and the per capita gross figure of 1,759 kcal per day in the first half of 1947.

[69] Nevin Scrimshaw, "World Nutritional Problems," in Newman, ed., *Hunger in History*, pp. 353–4.

privileged: workers in Molotov and Chelyabinsk faced the same extreme hardship as workers in the Volga region and Central Russia, while workers in Bashkiriya were the most vulnerable of all. Overall, irrespective of what standard of measure we use, workers' families suffered an acute nutritional deficit from late 1946 through to the end of 1947, which, had it persisted, could have led to a serious long-term demographic and health crisis. As it is, it still had an important short-term impact on patterns of mortality and fertility.

The demographic impact of the famine

We know that the 1947 famine exacted a smaller toll on human life than the famines of 1921–1922 or 1932–1933. During these two prewar Soviet famines the burden of fatalities fell upon the peasantry. There were deaths and malnutrition among urban workers, but in both cases the regime acted to insulate the town population from the famines' harshest effects. The 1947 famine followed a somewhat different course, at least within the RSFSR, as urban residents experienced high levels of mortality and morbidity. Although we cannot quantify this claim with any precision, there would have been hundreds of thousands, perhaps millions of urban residents – not just workers, but also low-paid clerical employees – whose state of health just after the war was so fragile that another major nutritional crisis could send them over the edge into serious debility or death.

If the famine wreaked its worst devastation in Moldavia and Ukraine, its effect in Central Russia, the Urals, and Siberia was nonetheless severe. The number of deaths in the industrial centers of Sverdlovsk oblast' in 1947 rose by 54 percent compared to 1946. In the urban centers of Molotov oblast' deaths rose by 58 percent. In the towns of Chelyabinsk oblast' they shot up by 63 percent, including 83 percent in Magnitogorsk. These increases were all far in excess of the 44 percent rise in urban mortality for the RSFSR as a whole.[70] Admittedly, these figures may overstate the magnitude of the death toll because the population in the industrial centers of the Urals was rising due to large-scale in-migration of conscripted and semi-conscripted workers. Therefore, crude death rates – that is, the number of deaths per 1,000 or 10,000 population – almost certainly rose less than the absolute totals. Hypothetically, a sufficiently large and sudden increase in population could even account for the entire increase in the absolute number of deaths. In reality, however, even in the

[70] Local data are from RGAE, f. 1562, op. 329, d. 2230, l. 7, 9–10 (1946), and d. 2648, l. 206, 208, 210 (1947). All-RSFSR figures are from RGAE, f. 1562, op. 329, d. 2229, l. 1, and d. 2648, l. 242.

Urals population growth was not remotely proportional to the increase in the number of deaths. We can confirm this by looking at those cities for which we do have reasonably accurate population data, from which we can estimate a crude death rate. In Ivanovo, deaths per 10,000 population went from 119 in 1946 to 176 in 1947 – an increase of 48 percent.[71] In Kuibyshev deaths per 10,000 rose from 125 to 157, an increase of roughly 25 percent.[72] Even in Moscow, which was far and away the best-provisioned city, there was a significant, though smaller, increase of around 7 percent, from 125 deaths per 10,000 population in 1946, to 134 in 1947.[73]

An even clearer indicator of these trends is infant mortality. Infant mortality is a very sensitive indicator of famines, especially when a nutritional crisis occurs in areas with poor housing and sanitation and with an unsafe water supply. I give a detailed analysis of infant mortality in this period in Chapter 5. However, a forward peek to Tables 5.7 and 5.8 (pp. 282–3 and 291–2) shows a very sharp spike in infant mortality in 1947, when the famine reached its height. Moreover, some of the worst-affected areas were the hinterland regions at the center of our study. In Ivanovo, Yaroslavl', Gor'kii, Sverdlovsk, and Zlatoust one out of every five babies born died in their first year. In Kuibyshev, Kazan', Molotov, Chelyabinsk, and Ufa the death rate was one in six. As I note below, for a regime obsessed with boosting the birth rate and restoring wartime population losses, the famine threatened to become a demographic disaster of major proportions, over and above its costs in human suffering and lost economic output.

The question of famine deaths touches upon a more general question. In his analysis of excess mortality caused by the famine, Michael Ellman notes what appears to be a puzzling phenomenon. Deaths among the urban population rose more sharply in percentage terms than deaths among the peasantry. Yet qualitative accounts of the famine, both in

71 Calculated from mortality figures in RGAE, f. 1562, op. 329, d. 2230, l. 4 (1946), and d. 2648, l. 212 (1947), and population estimates in GARF, f. A-482, op. 47, d. 4925, l. 23.

72 GARF, f. A-482, op. 52s, d. 224, l. 50–1.

73 GARF, f. A-482, op. 52s, d. 224, l. 172. A more accurate assessment would require calculating age-specific death rates, but we do not have the detailed population data to make this possible. In theory, a rapid increase in the infant and elderly populations could account for the surge in mortality. The former may have played some role, but not the latter. The number of infants under the age of one year rose only slightly. In the urban RSFSR, the number of births increased by 6 percent in 1947 compared to 1946; in the city of Sverdlovsk the number of births actually went down: RGAE, f. 1562, op. 329, d. 2229, l. 1, 9, and d. 2648, l. 208, 242. There was, however, a large increase in the cohort of children aged between one and two years, because of the greater number of babies born in 1946 as compared to 1945. See below, n. 82. The elderly population would have been relatively static.

official documents and survivors' reports, give the impression that the countryside suffered the worst. Ellman suggests that the answer to this conundrum may lie in the well-known (and well-documented) underreporting of famine-related deaths in rural areas, although he is careful to caution that this is by no means a certainty.[74]

There are a number of reasons, however, to suspect that this argument, no matter how persuasive it may be in terms of what we know about the frailties of Soviet demographic statistics, is not overly decisive, and that the towns really did suffer disproportionately more than the countryside, at least in the RSFSR. One is infant mortality. In Russia, as in the countries of Western Europe during their rapid urbanization in the nineteenth and early twentieth centuries, there was a distinct trend for urban infant mortality to exceed infant mortality in rural areas, the so-called urban penalty. Infant mortality rose sharply in both town and country during 1947, but the gap did not narrow. On the contrary, it even widened slightly. Total infant mortality in the RSFSR rose by 63.0 percent in 1947 compared to 1946. The rise in urban areas was 67.0 percent; in rural areas 60.3 percent. This is a reasonably significant difference, although we have to allow that rural underreporting could account for much or even all of it.[75] A look at total recorded urban and rural deaths, however, shows an even greater disparity. All deaths in the RSFSR increased by 37.3 percent between 1946 and 1947. The increase in urban deaths, however, was 44.1 percent, against a rise of 32.5 percent in the countryside.[76] This gap is much wider than that between their respective increases in infant mortality. Rural underreporting might explain some of it; population increases due to migration into the towns from the countryside (for example, of mobilized workers and Labor Reserve trainees, most of whom came from rural villages) could explain a bit more. Whether or not these could account for the whole of this disparity is more doubtful. It would certainly be difficult to construct an argument from these data that in the RSFSR, at least, the famine exacted its greatest toll on the peasantry.

There are still other reasons to suspect that the picture suggested by the gross population data is correct. A serious food crisis will reduce the number of pregnancies. Some pregnant women die, as do some women who might have conceived and given birth. Hunger reduces sexual drives, people have less intercourse, and there are fewer conceptions. Starvation and large-scale weight loss cause amenorrhea – women stop menstruating

74 Ellman, "The 1947 Soviet Famine," pp. 614–15.
75 Calculated from Table 5.7, pp. 283–4.
76 Calculated from birth and death figures in RGAE, f. 1562, op. 329, d. 2229, l. 1 (1946), and d. 2648, l. 242 (1947).

and cannot conceive. This being so, we would expect to see a noticeable fall in births in 1948, the year following the famine. Indeed we do, but in the RSFSR the drop was almost exclusively confined to urban areas.[77] A further factor to take into account is the medical evidence. In their reports on the food crisis, doctors took it for granted that the peasantry was better equipped to cope with the food shortages than urban workers, and that peasant youth were simply healthier than young people growing up in cities.[78] Medical examinations of school children also suggest this trend: in Gor'kii oblast' – one of the few localities for which we have direct comparisons between peasant and urban youngsters – those from the countryside, although not taller, showed significantly lower levels of malnutrition and anemia than their urban counterparts in the aftermath of the famine.[79] Finally, there is the dietary evidence in the TsSU's household budget surveys, the contours of which I have already shown. It suggests very strongly that the average peasant household enjoyed a higher calorie and protein intake than did families of industrial workers. Peasants endured extreme deprivation, but in the central and eastern RSFSR they were more likely than workers to have enough to eat. In sum, there are ample reasons to believe that the death registration data which Ellman used to calculate the number of famine deaths are not so badly distorted by reporting errors as to negate the general trend they seem to show.

Of course, peasants and workers were not in competition with each other to see "who suffered worst" during the famine. The famine was a general catastrophe and took a heavy toll on town and countryside alike. It is nonetheless important to clarify what went on in the towns and in workers' families – and not simply because we need to create an accurate historical record of what happened. The experience of the two preceding Soviet famines was that peasants died, while workers went hungry. We tend, therefore, to think of famines as rural phenomena, with peasants as their primary victims. The 1947 food crisis was altogether different. It caused terrible hardship for urban families and cost many of them their lives. Although, unlike World War II, it proved to be relatively short lived, it left in its wake a legacy of chronic undernourishment that persisted for several years afterward.

Where mortality in urban areas is concerned,[80] the famine displayed somewhat different patterns to the starvation in hinterland regions during

[77] See pp. 224–6.
[78] GARF, f. 482, op. 52s, d. 221, l. 80 (Ivanovo oblast'); GARF, f. 9226, op. 1, d. 1119, l. 83.
[79] GARF, f. A-482, op. 47, d. 7656, l. 351, 353.
[80] The Soviet Union did not collect data on cause of death by age and gender for the rural population until the late 1950s.

Table 4.8 *Percentage increase in deaths by age group, urban areas of the RSFSR, 1947 vs. 1946*

Age group	1946	1947	Increase	% increase
All deaths				
RSFSR	1,064,138	1,461,449	397,311	37.3
Urban	441,786	636,569	194,783	44.1
Rural	622,352	824,880	202,528	32.5
Urban deaths by age group				
Ages for which we can calculate mortality rates				
0–1 (infant mortality rate, deaths per 1,000 live births)	91	152	61	67.0
1–2 (deaths per 1,000 population in age group)	44.5	57.6	13.1	29.4
Absolute number of deaths				
0–1	97,358	171,575	74,217	76.2
1–2	27,021	55,772	28,751	106.4
3–4	6,998	6,832	−166	−2.4
5–6	6,897	7,005	108	1.6
7	2,974	3,057	83	2.8
8–9	5,339	5,525	186	3.5
10–14	7,572	8,152	580	7.7
15–19	14,754	15,237	483	3.3
20–24	17,304	22,483	5,179	29.9
25–29	13,726	16,432	2,706	19.7
30–39	42,446	49,034	6,588	15.5
40–49	46,342	60,508	14,166	30.6
50–59	49,180	66,641	17,461	35.5
60–69	50,432	71,443	21,011	41.7
70+	51,875	74,844	22,969	44.3
Total	440,218	634,540	194,322	44.1

Sources: Children under 1 year: RGAE, f. 1562, op. 329, d. 2229, l. 1, and d. 2648, l. 242; children aged 1–2 years: births and infant deaths from RGAE, f. 1562, op. 329, d. 1883, l. 12, and d. 2229, l. 1; deaths for ages 1–2 from RGAE, f. 1562, op. 329, d. 2235, l. 4ob., and d. 2648, l. 35ob. All other age groups are from RGAE, f. 1562, op. 329, d. 2235, l. 4ob., and d. 2648, l. 35ob.

World War II. Then the burden of deaths shifted progressively toward the adult population as the infant and child population fell. Unfortunately we do not have age-specific mortality figures for individual localities for the postwar period, but data for the RSFSR as a whole show that the 1947 food crisis disproportionately affected the very young and the very elderly. As Table 4.8 shows, in absolute terms children under the age of two accounted for 53 percent of all extra deaths in 1947 versus 1946.[81] This is somewhat misleading, because the infant and child population in 1947 was also much larger than in 1946, but if we convert these figures into actual mortality rates, that is, an infant mortality rate for children under the age of one, and a death rate for children aged between one and two, we see that the increase in deaths among babies and small children was still very high: the infant mortality rate increased by 67 percent; the child mortality rate rose by just under 30 percent.[82] Because we do not have age-specific population data, I cannot make the same calculations for other age groups, and must instead draw inferences from the absolute numbers of deaths. Here we see that, after children, the group that suffered the largest percentage increase in the number of deaths was the elderly: among those 60 years old and over deaths rose by over 40 percent, and represented 22.6 percent of all extra deaths compared to 1946. Because it is very unlikely that the size of the elderly population underwent any dramatic increase during this time, we can take the absolute death figures as a reasonable proxy for a rise in the actual death rate.

That the food crisis should have affected such highly vulnerable groups as the very young and the elderly in this way is not surprising. What is less expected is that it had, on the one hand, such a small effect on children above the age of two, and, on the other hand, a measurable impact on adults of prime working age. Where these adults are concerned, this very much repeated the experience of World War II. The pattern of deaths among young children and teenagers, however, did not. We therefore

[81] The figures in Table 4.8 are from two different sources. The total number of births, deaths, and infant deaths are from TsSU files given in Table 5.7 in Chapter 5, which appear to be reasonably complete. The figures for deaths by age group are from TsSU files giving deaths by age and gender. The latter total less than the number of deaths given in Table 5.7. The 1946 data are 98.3 percent complete; the 1947 data are 99.2 percent complete. I have therefore adjusted for this by inflating the deaths in each age group by 1.02 percent for 1946 and by 1.01 percent for 1947. Despite this adjustment, there is still a small discrepancy between the sum of the age-specific data in row 26 of Table 4.8 and the figures for all urban deaths in row 4.

[82] There was a huge increase in the size of the cohort of children aged one to two in 1947 due to a 60 percent increase in the number of births in the urban RSFSR during 1946 versus 1945. Allowing for infant mortality in 1945 and 1946, there were nearly 60 percent more infants surviving into their second year of life in 1947 compared to 1946. Looking only at the absolute number of deaths in this age group in 1946 and 1947 suggests an increase in mortality of 104 percent, but this was among a population 60 percent larger. I have calculated the child mortality rate in the following way. The number of births in 1945 minus the number of infant deaths in that year gives us the number of infants surviving into their second year of life in 1946. Dividing this number into the number of deaths of children aged 1–2 during 1946 gives us the 1946 child mortality rate. I performed a similar calculation for 1947, using the figures for births and infant deaths in 1946, and the deaths of children aged 1–2 in 1947.

need to consider whether a different process was at work here, tied to the Stalinist regime's food distribution policies. We should recall that one of its harshest measures was to deprive child dependants of workers of their ration entitlements. We would therefore expect deaths in these age groups to go up. Trade union and local Party officials, however, reported a somewhat different reality. They claimed that workers, refusing to allow their children to starve, were sharing their rations with the rest of their families, and were themselves starving instead. Some of these reports came from the famine's epicenter, but others came from the hinterland. Party officials on the Perm' Railway in Molotov oblast' claimed that the railway's employees were "driving themselves to emaciation" because they were sharing their rations with their hungry children.[83] Equally eloquent proof of this point came from the iron and steel combine in Magnitogorsk. The factory reported just under a quarter of its single workers with serious malnutrition, and 5 percent with symptoms of starvation during the first three months of 1947. This situation would have been serious enough, but among workers with large families the figures were much higher: 33 percent with malnutrition and 18 percent with starvation.[84] How many of these cases – if any – eventually led to lethal results we do not know, but this might partially explain why fewer small children and more working-age adults died than we might have expected.

A more difficult group to explain is young workers, a term which in Soviet terminology covered the ages from fourteen to twenty. These were probably the most impoverished section of the Soviet workforce, plagued by wages that were so low that they often had to sell off their ration cards for cash.[85] Heavy industry enterprises in Sverdlovsk reported very high percentages of their young workers with malnutrition: nearly half at Uralmash; over one-third at the Stalin works; just under three-quarters at the Kalinin factory; nearly a third at the Elektroapparat electrical engineering factory. Although some of this almost certainly had been accumulated during the war years, the fact was that these young people were simply not receiving enough to eat. They depended exclusively on factory dining rooms for all their meals, the total calorie content of which fluctuated between 2,000 and 2,500 calories a day, not nearly enough to sustain people doing heavy labor.[86] Yet deaths in this age group barely increased at all. One major difference with the war years was that factories

[83] RGAE, f. 1884, op. 31, d. 7199, l. 20–1. See also Filtzer, *Soviet Workers and Late Stalinism*, pp. 58, 62.
[84] GARF, f. A-482, op. 47, d. 6415, l. 54.
[85] Filtzer, *Soviet Workers and Late Stalinism*, pp. 66–7.
[86] GARF, f. A-482, op. 47, d. 6358, l. 92–3, 93a–93b.

Table 4.9 *Major causes of death and their contribution to increased mortality, urban areas of the RSFSR, 1947 vs. 1946*

Cause	1946	1947	% increase	% of all extra deaths
All deaths	441,786	636,569	44.1	
Gastrointestinal infections (including dysentery)	49,813	97,029	94.8	24.2
Of which:				
Dysentery	*9,900*	*27,624*	*179.0*	*9.1*
Other gastrointestinal infections	*39,913*	*69,405*	*73.9*	*15.1*
Tuberculosis of the lungs	56,746	72,084	27.0	7.9
Heart disease (all forms)	57,779	79,722	38.0	11.3
Pneumonia and lung infections	55,813	92,499	65.7	18.8
"Other causes of death"	9,738	32,566	234.4	11.7
Causes not enumerated in standard categories	24,126	46,103	91.1	11.3

Sources: Causes of death: 1946: RGAE, f. 1562, op. 329, d. 2235, l. 3–4ob.; 1947: RGAE, f. 1562, op. 329, d. 2648, l. 35–36ob. Total deaths: 1946: RGAE, f. 1562, op. 329, d. 2229, l. 1; 1947: RGAE, f. 1562, op. 329, d. 2648, l. 242. The data in d. 2235 and d. 2648 add up to smaller figures for total deaths than those given in d. 2229 and d. 2648, accounting respectively for 98.3 percent and 99.2 percent of the total in these latter two files. I have therefore applied the appropriate inflator to each cause of death in each year to try to even out disparities caused by variations in the completeness of the returns. See n. 81.

had access to extra food supplies for those workers whose lives were at risk. At least in heavy industry, they had special dining rooms to which factory physicians could refer those suffering from starvation or serious malnutrition – another indication that the state possessed sufficient food reserves to have forestalled the famine, but simply chose not to use them.[87] However, the extent to which this may have curbed mortality among young workers, and why it seemingly failed to have the same effect among workers in older age groups, I cannot say.[88]

A look at the main causes of death in 1946 and 1947 sheds further light on how the food crisis affected workers above the age of twenty. Table 4.9 shows major causes of death and the contribution that each made to the

[87] Filtzer, *Soviet Workers and Late Stalinism*, p. 67.

[88] Doctors attempted where possible to prescribe special feeding for young workers and Labor Reserve students found to be suffering from malnutrition. Yet their orders were not always carried out. Among Labor Reserve students in the city of Gor'kii in 1947, less than a quarter of those assigned to special high-nutrient diets actually received them, as did only 8 percent of those for whom doctors requested supplemental feeding: GARF, f. 9226, op. 1, d. 798, l. 154.

general increase in urban mortality. I should caution here that, as with almost all other demographic data from this period, the cause-of-death records are far from precise. An exact determination of cause of death can be made only at an autopsy by a qualified pathologist. These conditions were almost never met during the war, as most physicians went to the front, and the scale of deaths and lack of resources would have made it impossible to carry out postmortems in any case. Thus it was frequently left to paramedics to try to guess the cause of death.[89] Although this situation had certainly improved by 1946 and 1947, it would not have done so sufficiently to make the cause-of-death records fully accurate. This is even more true if we remember that those who died often suffered from more than one disease or condition, some of which, for example, tuberculosis and starvation, could mimic the symptoms of each other. Modern practice is to try to determine the underlying cause of death, but in the USSR at this time it is probable that doctors and paramedics would have ascribed death to the condition that was most visible.

The six causes listed here together accounted for 85 percent of the entire absolute increase in mortality during 1947. The first four of these – gastrointestinal infections, tuberculosis, heart disease, and pneumonia – are all famine-sensitive diseases, which also tended to affect different age groups. With the exception of starvation-induced diarrhea, they are not necessarily caused by hunger *per se*, but hunger and malnutrition either heighten susceptibility to them or, as in the case of tuberculosis or heart disease, accelerate the onset of what probably would have been a fatal outcome at some point in the future. Gastrointestinal infections (including dysentery) and pneumonia, for example, were overwhelmingly associated with babies and toddlers, and were two of the three principal causes of infant mortality. I have not shown the figures here, but in urban areas of the RSFSR the infant mortality rate from gastrointestinal infections rose from 23 per 1,000 live births in 1946 to 48 per 1,000 live births in 1947; infant mortality due to pneumonia went from 26 deaths per 1,000 live births in 1946 to 44 in 1947.[90] Roughly 70 percent of the extra deaths from non-dysentery gastrointestinal infections were among children less than a year old; 89 percent of extra dysentery deaths and around 80 percent of the extra deaths from pneumonia occurred among children under the age of two. Tuberculosis disproportionately killed males in their thirties, forties, and fifties, who between them accounted for well over half of all deaths from the disease. Of the approximately 15,000 extra deaths

89 Aralovets and Verbitskaya, "Osobennosti," p. 107.
90 The sources are those cited in Table 4.9. For a more detailed discussion, see Chapter 5, pp. 293–4 and 310–11.

from TB in 1947, around 40 percent were due to increased mortality in the 30 to 59 age group. Coronary artery disease was mainly a disease of the elderly. Seventy percent of the additional deaths officially ascribed to heart disease were among people over the age of sixty.

All of this conforms to what we would expect during a famine. We need to probe further into the remaining two rows in Table 4.9, "other causes of death" and deaths due to causes not enumerated in the officially accepted categories. The TsSU tables on mortality by age and gender listed eighty-four different causes of death. Eighty-two of these were diseases, medical conditions, or events (most notably homicides, suicides, and fatal accidents). They conspicuously did not list cachexia or starvation edema. Following a statistical practice adopted during World War II, deaths from starvation were ascribed to one of the last two rubrics on the table.[91] The first of these, "other causes," we would usually take to mean deaths whose cause either had not been determined, or whose causes were so infrequently encountered as not to warrant a special rubric for recording them. The second is more mysterious. It reads, "Illnesses and causes of death either imprecisely designated or which are not included in the scheme of classification." Both of these categories showed a striking increase during 1947. "Other" causes of death more than tripled; deaths due to causes not included in the normal scheme of classification almost doubled. Together they accounted for just under one-quarter of the entire increase in urban mortality during the famine year, and a full 35 percent of the increase among adults between the ages of 20 and 49.[92] Clearly not all of these deaths were due to starvation; by the same token, however, without a major increase in starvation deaths it is difficult to explain why these two categories showed the dramatic rise that they did. To this extent, we can take them as a barometer of the scale on which starvation-related deaths occurred.[93]

[91] Aralovets and Verbitskaya, "Osobennosti," pp. 106–7. During the war the TsSU instructed physicians to ascribe deaths from starvation to line 83 on the statistical registration form, "other causes of death." However, the sharp increase in the final category, line 84, on deaths due to causes not included in the official scheme of classification suggests that doctors attributed a large number of deaths from starvation to this category, too.

[92] Deaths in the 20–49 age group rose by 28,609 (adjusted figures); deaths due to "other" causes and causes not enumerated rose by 10,114, or 35 percent of the overall increase.

[93] Mortality data from urban areas of the two republics worst affected by the famine, Ukraine and Moldavia, support this assumption. In Ukraine in 1946, the two categories of "other" causes accounted for just 8 percent of all deaths; in 1947 they accounted for 22 percent, and fully 35 percent of the increase in mortality between the two years. In Kishinev, the capital of Moldavia, where famine deaths were already substantial during the whole last quarter of 1946, "other" causes went from 19 percent of all deaths in that year to 41 percent in 1947. The increase in these categories accounted for *two-thirds* of all extra mortality in Kishinev. This is a fairly conclusive illustration of how mass deaths from

We can show this relationship even more clearly if we examine the relative contributions of tuberculosis and "other" and non-enumerated causes of death in the older age groups. For the sake of convenience I shall refer to these two categories taken together simply as "other" causes. This I show in Table 4.10. Tuberculosis was historically the greatest killer of urban males aged 20 to 49 and urban females aged 20 to 39. It remained the second major cause of death among males aged 50–59 and women aged 40–49, being surpassed only by heart disease.[94] Tuberculosis is very sensitive to poor nutrition: during the Leningrad siege there was a surge of cases of highly virulent, fulminating tuberculosis rapidly followed by death.[95] We would therefore expect a substantial increase in tuberculosis deaths in 1947 compared to 1946 and, indeed, this is what we see: in the most TB-prone age groups, deaths from the disease rose by between 13 and 30 percent. It was not, however, the most prevalent cause of extra deaths: that role belonged to the two categories of "other" causes, our proxy for starvation. Table 4.10 shows the increase in the number of deaths from TB and "other" causes between 1946 and 1947, and the contribution that each made to all the extra deaths in each age group during 1947. Although tuberculosis deaths shot up, in most cases the increase was smaller than the increase in deaths from "other" causes. In almost every age and gender group, the percentage increase in TB deaths was the same as, or lower than, the increase in deaths overall. The two categories used to disguise starvation-related deaths present the opposite picture. There was a very sharp rise in the significance of these causes of death among adults of every age. With the exception of the 20 to 24 age group, the rise in "other" causes accounted for a larger share of additional deaths than did the rise in tuberculosis. Among adults aged 25 to 59 it accounted for no fewer than a third of extra deaths in 1947, and in the 30 to 39 cohort it accounted for 46 percent. Put another way, of all the *extra* deaths in these age ranges,

starvation were hidden under these rubrics: RGAE, f. 1562, d. 2235, l. 6ob., 28ob. (1946), and d. 2648, l. 15ob., 33ob. (1947). Zima (*Golod*, p. 66) claims that, being barred from listing starvation as a cause of death, doctors ascribed these deaths instead to gastrointestinal infections. This is a more complicated issue than it appears. Since most of gastrointestinal deaths occurred among babies and young children already prone to die from such infections, it may have been genuinely difficult to separate out the two causes, since the infections themselves will cause malnutrition and emaciation, while starvation will cause diarrhea which could easily be mistaken for an infection. Where adults are concerned, the data do not support Zima's contention.

[94] GARF, f. A-482, op. 52s, d. 245, l. 156.

[95] Brožek, Wells, and Keys, "Medical Aspects," p. 81.

Table 4.10 *Tuberculosis and "other" causes of death as a percentage of adult deaths by age group, 1946–1947*

	1946 deaths			1947 deaths			Increase, 1946–1947			% increase of specific cause			Share of increase in all deaths (%)	
Age group	TB	"Other"	All	TB	"Other"	All	TB	"Other"	All	TB	"Other"	All	TB	"Other"
20–24	6,242	938	13,884	8,118	2,064	18,492	1,876	1,126	4,608	30.1	120.0	33.2	40.7	24.4
25–29	4,622	826	13,725	5,415	1,769	16,430	793	943	2,705	17.2	114.2	19.7	29.3	34.9
30–39	12,914	3,179	42,453	14,601	6,204	49,030	1,687	3,025	6,577	13.1	95.2	15.5	25.6	46.0
40–49	12,252	3,481	46,350	14,563	8,648	60,504	2,311	5,167	14,154	18.9	148.4	30.5	16.3	36.5
50–59	8,473	3,707	49,188	10,456	9,400	66,636	1,983	5,693	17,448	23.4	153.6	35.5	11.4	32.6
60–69	4,024	4,825	50,440	5,114	10,786	71,438	1,090	5,961	20,998	27.1	123.5	41.6	5.2	28.4
70+	1,259	6,410	51,884	1,424	11,599	74,839	165	5,189	22,955	13.1	81.0	44.2	0.7	22.6

Note: "Other" includes "other causes of death" and causes not enumerated in the official list of causes.
Sources: See Table 4.9.

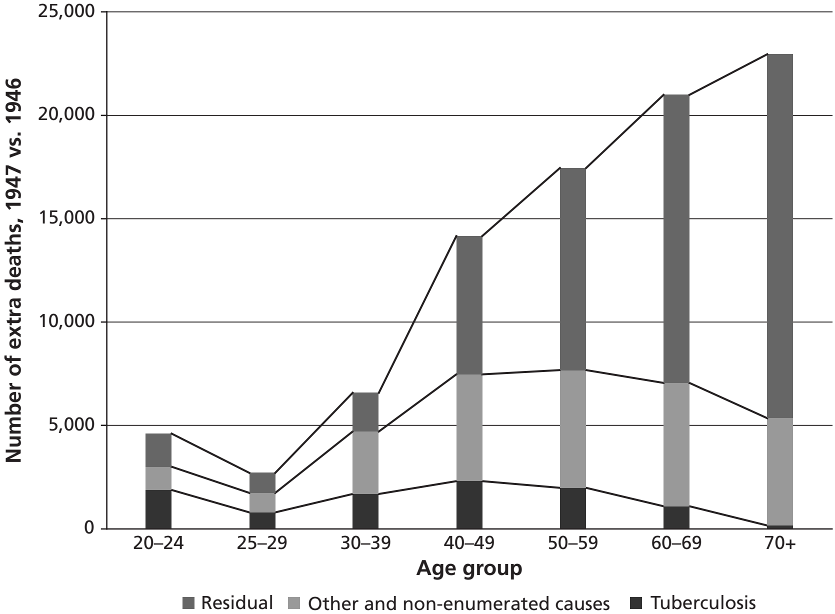


Figure 4.3a Contribution of tuberculosis and "other" causes of death to all extra deaths by age group, 1946–1947

considerably more were likely to have died from starvation than from tuberculosis.[96]

We can show this relationship even more clearly graphically. Figures 4.3a and 4.3b take all extra deaths in 1947 and divide them into three categories: deaths from tuberculosis; deaths from "other" causes; and a residual, which includes all deaths not attributed to TB or "other" causes. The figures show the relative contributions that each category made to the overall total.

There is one final observation we can make. A look back at Table 4.9 reveals another potentially surprising result. With the exception of dysentery, the famine did not cause a sharp increase in deaths from infectious

[96] In reality the situation was probably less clear cut than the above argument suggests. There were relatively few tuberculosis experts in Russia at this time and, given that advanced tuberculosis can resemble cachexia, we have to assume that there was a good deal of misdiagnosis. However, this could also have operated in the other direction: cases of starvation could have been misdiagnosed – or deliberately misidentified – as tuberculosis. We should bear in mind that doctors were under political pressure to minimize the number of deaths attributed to starvation. In such an environment, we might expect to see more starvation deaths certified as "tuberculosis" than the other way around.

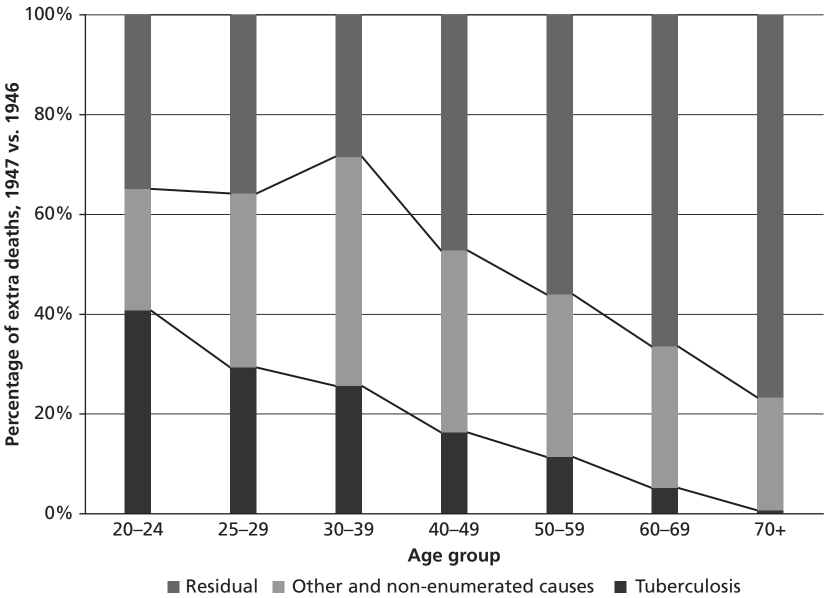


Figure 4.3b Tuberculosis and "other" causes of death as a percentage of all extra deaths by age group, 1946–1947

diseases. This is particularly notable for typhus, which reached epidemic proportions during the famine. The RSFSR, which was by no means the worst republic affected, recorded nearly 97,000 cases of typhus and relapsing fever in 1947, but case fatality was very low, at less than 2 percent.[97] In percentage terms, cities such as Moscow and Sverdlovsk saw an astronomical rise in both cases and fatalities compared to 1946. As we saw in Table 3.2 (p. 157), in Moscow the number of cases went up three and one-half times, from 1,153 to 3,910; fatalities increased elevenfold, from 21 to 234; case fatality more than tripled, from well under 2 percent to 6 percent. Sverdlovsk saw six times the number of cases it had had in 1946 (from 198 to 1,202); deaths went from zero to thirty-eight; and case fatality rose from 0 to 3 percent.[98] The fact was, however, that in absolute terms case fatality remained low, even allowing for such large percentage increases. Although, as we saw in Chapter 3, the typhus epidemic put severe strain on public health authorities, basic controls, including delousing and vaccination, clearly managed to keep deaths

[97] Zima, *Golod*, pp. 173–5; RGAE, f. 1562, op. 329, d. 2648, l. 36.
[98] RGAE, f. 1562, op. 18, d. 361, l. 31, 44 (1946), and d. 418, l. 35, 47 (1947).

down to very small numbers – certainly below a level that would exert any significant influence on the general rise in mortality in 1947.

The famine affected the USSR's demography in another way, by suppressing fertility. The experience of underdeveloped countries suggests that chronic malnutrition does not necessarily reduce fertility. In poor societies women reach menarche later and menopause earlier than in wealthy countries, but birth rates nonetheless remain high. The experience of twentieth-century Europe shows that a sudden collapse in nutrition will lead to an equally sudden fall in fertility. The main factor is amenorrhea. During the Leningrad siege amenorrhea was widespread,[99] but it is difficult to assess the role this played in the collapse of births in the city because of the evacuation of women of childbearing age and the extraordinary death rate. Zena Stein, *et al.*, were able to make a more systematic study of nutritional intake, amenorrhea, and fertility during the Dutch "Hunger Winter." The critical juncture, they found, was when per capita calorie intake fell below 1,500 calories: this led to a very sharp drop in conceptions, beginning approximately two months after the daily diet fell to this level. By contrast, as soon as food supplies improved following liberation, the recovery of fertility was almost instantaneous, even when the daily diet still kept calorie levels below what would have been desirable.[100] We see something similar in the RSFSR in the wake of the 1947 famine. Unfortunately, we cannot make the precise correlations between monthly calorie intake and monthly conceptions that the Dutch data allow, but the picture that emerges from the cruder Soviet data is nonetheless quite clear.

There is an almost total absence of discussions of amenorrhea in the Soviet medical literature. In the period following the October Revolution and the subsequent Civil War doctors identified what they called "wartime amenorrhea," but this they attributed not just to diet, but also to psychological trauma that the affected women had suffered. I know of one similar study of women who suffered from amenorrhea during World War II.[101] Postwar discussions of amenorrhea due to a radical collapse in the energy balance of young women, however, are virtually unknown. The

[99] A. N. Antonov, "Children Born During the Siege of Leningrad," *Journal of Pediatrics*, vol. 30, no. 3 (March 1947), p. 251.

[100] Zena Stein, Mervyn Susser, Gerhart Saenger, and Francis Marolla, *Famine and Human Development: The Dutch Hunger Winter of 1944–1945* (New York: Oxford University Press, 1975), pp. 74–6. The authors found that, for the months during which energy intake was lower than 1,500 calories a day, a change in the diet of 100 calories a day produced a change of 241 in the monthly number of births resulting from conceptions during the months of calorie deprivation. The correlation was very close: changes in calorie intake explained 81 percent of the monthly variance in births.

[101] See Mariya Mikhailovna Kruglova, "Etiologiya i patogenez tak nazyvaemoi amenorrei voennogo vremeni" (Doctor of Medical Sciences Dissertation, Moscow, 1951);

one exception that I came across is a brief but important discussion in E. I. Panteleeva's analysis of the physical development of Ivanovo Labor Reserve students during the period 1945–1948. Panteleeva found that in 1947 a large percentage of those girls who had already reached menarche suffered temporary amenorrhea. In both 1946 and 1948 amenorrhea was negligible: in her study, there was just one girl in each of these years whose periods had just begun and then temporarily stopped. The amenorrhea in 1947 was different. It affected 21 percent of all the girls who had passed menarche, including 38.2 percent of nineteen-year-olds and 26.5 percent of twenty-year-olds. Panteleeva directly attributed it to what she termed "the fall in the calorie content of the diet." It is unlikely that the weight loss incurred during 1947 explains this on its own. These girls had suffered serious malnutrition during the war, and their nutritional status was already clearly borderline. Given that they were performing strenuous physical labor, it would have taken only a small drop in calorie intake to send them into a negative energy balance, and thus trigger amenorrhea.[102] There is no reason to believe that these Ivanovo female Labor Reserve students were somehow exceptional. On the contrary, Labor Reserve students, as badly off as they were, nevertheless received better food rations than young workers already employed in the factories and certainly better than most workers' families. Therefore, if the hunger-induced amenorrhea affected such a large percentage of the girls in Panteleeva's group, we can assume that it must have been a mass phenomenon right across the USSR. If in many hinterland urban areas *average* workers' per capita calorie consumption in 1947 hovered just above 1,700 kcal per day, this means that a significant minority of women would have been consuming less than the 1,500 kcal a day that Stein, *et al.*, identified as having triggered widespread amenorrhea during the Dutch "Hunger Winter." Moreover, female Russian workers would have been doing far more heavy physical labor than the women in Western Holland, and so amenorrhea may well have appeared at a daily calorie consumption higher than 1,500. It seems safe to conclude that amenorrhea, together with the other hunger-related causes of infertility during famine (loss of libido, anovular menstruation), must have played no small role in the dramatic reduction in the number of conceptions in 1947 and the number of births in 1948 – a fall that, as I have already mentioned, was confined almost totally to urban areas.

S. S. Khalatov, "O massovoi amenorree sredi naseleniya gor. Petrograda v svyazi s prodovol'stvennym krizisom i o eya znachenii," *Izvestiya petrogradskogo gubzdravotdela*, no. 7–12 (July–December) 1922, pp. 175–8; F. Il'in, "Amenorreya voennogo vremeni," in K. Skroanskii and F. Il'in (eds.), *Sbornik rabot po akusherstvu i ginekologii,* vol. I (Petrograd, 1920), pp. 10–16; F. Il'in, "Amenorreya golodaniya," in K. Skroanskii and F. Il'in (eds.), *Sbornik rabot po akusherstvu i ginekologii*, vol. I (Petrograd, 1920), pp. 90–102.

102 Panteleeva, "Fizicheskoe razvitie," pp. 310–12. The quotation is from p. 311.

Table 4.11 *Births in the RSFSR and in urban and rural areas, 1946–1950*

	1946	1947	Change	1948	Change	1949	Change	1950	Change
RSFSR	2,372,937	2,575,706	202,769	2,403,724	−171,982	2,956,388	552,664	2,780,396	−175,992
Urban	*1,064,501*	*1,130,519*	*66,018*	*983,815*	*−146,704*	*1,220,936*	*237,121*	*1,197,355*	*−23,581*
Rural	*1,308,436*	*1,445,187*	*136,751*	*1,419,909*	*−25,278*	*1,735,452*	*315,543*	*1,583,041*	*−152,411*

Sources: RGAE, f. 1562, op. 329, d. 2229, l. 1 (1946); d. 2648, l. 242 (1947); d. 3157, l. 2 (1948); d. 3807, l. 1 (1949); d. 4703, l. 7–9 (1950).

A 1949 estimate of births per 1,000 population in the RSFSR claimed that the urban birth rate fell from 30.6 live births per 1,000 population in 1947, to 25.7 live births per 1,000 in 1948, a decline of 16 percent. In rural areas the fall in the birth rate was insignificant, from 20.7 live births per 1,000, to 20.1.[103] Absolute birth totals in the RSFSR show roughly similar percentages. Table 4.11 shows births for the RSFSR as a whole, and for urban and rural areas between 1946 and 1950.

The total number of births in the RSFSR fell by nearly 172,000 in 1948 compared to 1947. Urban centers accounted for 85 percent of the drop, almost twice their 45 percent share of total births in 1946. Put another way, urban births fell by 13 percent over 1947; rural births by just 1.7 percent. This was then followed by a very sharp increase in births during 1949 – among the urban population, 3.5 times the increase seen between 1946 and 1947. This strongly suggests that the drop in births during 1948 had relatively little to do with excess famine deaths among the female population. Women unable to conceive during 1947, or who had conceived and miscarried as a result of the famine, quickly became pregnant as soon as it was biologically and/or financially possible for them to do so.[104] Panteleeva's findings suggest that for many of these women the famine had made pregnancy a physiological impossibility. Given the

[103] GARF, f. A-482, op. 52s, d. 245, l. 149–50.

[104] The drop in births in 1950 was not due to any health crisis, but suggests a societywide shift to a different demographic pattern. The overall number of births dropped as the postwar "baby boom" began to wane, but now the fall was overwhelmingly concentrated in the countryside, not in the towns – a trend that was to continue in 1951. Although I have not shown the data in Table 4.11, in 1951 there were 2,822,543 recorded births in the RSFSR, including 1,242,025 in urban areas and 1,580,518 in the countryside. This represents a modest rise of 42,147 births, all of it in the towns; rural births actually fell by 2,523. This trend was to continue through 1953, and no doubt reflects the increased outward migration from the countryside into the towns and a reduction in the rural female childbearing population. Interestingly, from 1954 to 1956, following Khrushchev's first agricultural reforms, which raised the incomes of collective and state farmers, the number of rural births began to increase, albeit modestly: GARF, f. A-374, op. 14, d. 1702, l. 19, and d. 1540, l. 7, 12.

regime's paranoiac pro-natalism at the time, here was yet another unplanned and totally unwanted legacy of its deliberate decision to let its people starve.

Surviving the crisis: peasant and worker diets

The postwar food crisis lasted no more than eighteen months, from the time of harvest failure in the autumn of 1946, until the spring of 1948. From 1948 onward the diet gradually improved. By 1949 and 1950 calorie intake was hovering around, or slightly exceeding, our modified standard, although it was still far below what the Soviets themselves considered essential. This does not, however, mean that the diet had become adequate, since, as I note below, most calories and protein continued to come from bread and potatoes. To see this more clearly we need to take a more in-depth look at the specific components of urban and rural diets.

In every region for which we have comparative data, peasant households had a clear nutritional advantage over the families of workers, most notably in calorie intake, and to a lesser extent in terms of protein. The 1947 crisis thus was almost the reverse of the famines of 1921–1922 and 1932–1933, during both of which workers fared much better than the peasantry. In 1921–1922 the gap was striking. Stephen Wheatcroft has calculated that workers in Samara (Kuibyshev) in February 1922 were consuming some 600 calories a day more than peasants in the surrounding countryside.[105] In 1933 the gap was probably narrower, but the brunt of deaths still fell on the countryside, largely because most urban workers and their dependants received at least minimal nutrition through the rationing system.[106] The main reason why 1947 was different was peasant access to two foods: potatoes and milk. The importance of milk I discuss below. Peasants grew grain, but, because the state confiscated almost all of it, peasants ate relatively little bread. Unlike the famine of 1932–1933, however, they were able to grow and store potatoes.[107] Workers' families also relied on potatoes as a substitute for bread, but could not grow potatoes in quantities sufficient to compensate for the state-sponsored cut in the bread supply. Tables 4.12 and 4.13 show this clearly. Peasant households consumed vast amounts of potatoes – at least one kilogram a day per family member, and in many oblasti from 1.5 to 2 kg. For all practical purposes potatoes kept the peasantry alive. Compared to bread,

[105] Wheatcroft, "Famine and Food Consumption Records," pp. 164–5, and Wheatcroft, "Soviet Statistics," p. 548.
[106] Davies and Wheatcroft, *The Years of Hunger*, p. 417. [107] *Ibid.*, p. 283.

Table 4.12 *Bread and grain consumption by region, 1946–1950*

Average per capita consumption of members of worker and peasant families in grams per day, by half-year

Region	1946-I	1946-II	1947-I	1947-II	1948-I	1948-II	1949-I	1949-II	1950-I	1950-II
Moscow city workers	648	602	544	590	690	678	639	652	637	643
Moscow oblast' workers	572	526	478	524	679	694	638	673	650	694
Moscow oblast' peasants	394	331	225	327	478	461	448	459	494	491
Leningrad city workers	761	702	615	637	644	638	594	615	n/d	n/d
Central Russia										
Gor'kii city workers	579	516	458	513	741	766	693	706	697	727
Gor'kii oblast' workers	600	533	433	494	691	726	695	742	738	787
Gor'kii oblast' peasants	250	216	114	207	239	216	185	254	301	304
Ivanovo oblast' workers	747	632	533	603	795	760	684	730	688	731
Yaroslavl' oblast' workers	653	594	544	561	703	679	622	644	646	672
Volga region										
Kuibyshev city workers	601	533	510	539	657	675	655	681	653	643
Kuibyshev oblast' peasants	333	265	201	324	328	290	287	346	342	422
Tatariya workers (Kazan' city)	540	498	454	496	654	703	691	710	678	706
Tatariya peasants	247	200	105	249	283	238	185	242	212	301
Urals and Siberia										
Sverdlovsk city workers	718	636	583	629	736	714	650	688	670	686
Sverdlovsk oblast' workers	665	585	535	592	841	779	714	732	720	769
Sverdlovsk oblast' peasants	394	355	289	354	391	452	478	499	477	510
Molotov city workers	650	593	508	575	723	706	632	687	671	694
Molotov oblast' workers	661	645	530	577	717	708	683	712	704	713
Molotov oblast' peasants	406	373	311	455	586	487	445	484	503	509
Chelyabinsk city workers	635	585	556	578	685	680	615	666	660	639
Chelyabinsk oblast' workers	644	606	546	574	641	676	667	676	679	698
Bashkiriya workers	568	518	471	516	676	621	618	671	690	671
Bashkiriya peasants	254	230	203	218	227	215	196	238	243	354
Kemerovo oblast' workers	627	564	527	542	669	678	664	693	683	684

Sources: See Appendix C.

Table 4.13 *Potato consumption by region, 1946–1950*

Average per capita consumption of members of worker and peasant families in grams per day, by half-year

Region	1946-I	1946-II	1947-I	1947-II	1948-I	1948-II	1949- I	1949-II	1950-I	1950-II
Moscow city workers	479	539	517	564	477	448	418	401	351	333
Moscow oblast' workers	687	732	588	781	713	634	618	562	562	491
Moscow oblast' peasants	1309	1523	1595	1526	1346	1325	1284	1171	1063	1002
Leningrad city workers	218	397	358	490	483	455	454	415	n/d	n/d
Central Russia										
Gor'kii city workers	624	803	663	815	575	613	628	537	445	421
Gor'kii oblast' workers	518	690	723	839	605	685	669	642	654	522
Gor'kii oblast' peasants	1620	1960	2070	1790	1821	1951	2177	1780	1541	1554
Ivanovo oblast' workers	321	649	560	809	564	599	601	570	461	429
Yaroslavl' oblast' workers	439	595	417	622	561	609	579	515	496	409
Volga region										
Kuibyshev city workers	517	492	480	490	500	428	552	422	418	349
Kuibyshev oblast' peasants	1174	1223	1292	1075	1251	1331	1438	1112	1150	954
Tatariya workers (Kazan' city)	748	818	751	826	715	778	717	697	556	542
Tatariya peasants	1546	1836	1739	1676	1724	1839	2208	1936	2134	1770
Urals and Siberia										
Sverdlovsk city workers	544	702	591	646	424	591	584	490	383	383
Sverdlovsk oblast' workers	718	782	635	733	499	686	731	571	523	465
Sverdlovsk oblast' peasants	1179	1242	1286	1317	1055	1108	1196	1013	911	883
Molotov city workers	432	508	508	378	308	400	452	393	315	299
Molotov oblast' workers	534	535	683	625	428	621	664	593	524	447
Molotov oblast' peasants	1143	1105	1274	847	719	932	1056	889	719	710
Chelyabinsk city workers	486	380	216	419	270	477	493	442	361	398
Chelyabinsk oblast' workers	627	415	438	658	512	579	560	453	365	418
Bashkiriya workers	732	696	464	681	472	663	652	690	562	504
Bashkiriya peasants	1677	1505	1108	1371	1287	1584	1802	1644	1405	1391
Kemerovo oblast' workers	844	830	866	873	658	754	841	707	686	576

Sources: See Appendix C.

potatoes are a relatively low-calorie and low-protein food source. This vastly understates their nutritional importance, however. Aside from their vitamin C, thiamin, and iron, the protein in potatoes has a high biological value – sufficient to sustain life even where potatoes are the sole source of protein.[108] At the same time, we need to keep in mind that the nutritional content of potatoes is compromised by spoilage, which increases with age and length of storage. The important point here is that, while a diet heavily reliant on potatoes may be monotonous, potatoes contain enough calories, protein, and micronutrients to sustain a population through periods of dearth. In the case of the Russian peasantry, this is precisely what happened in the early postwar years, and to a large extent explains the generally higher daily calorie intake of peasant families versus those of workers during the food crisis.

There was a more or less reciprocal relationship between potato and bread consumption. For both workers' and peasants' families, bread and potato consumption combined provided between 75 and 80 percent of total daily calories, a figure which changed very little from 1946 through to the end of 1950. Total calorie and protein intake may have risen, but the nutritional balance of the daily diet did not improve. Almost all nutrition came from starch, as illustrated in Table 4.14 and Figure 4.4, which show the share of calories and proteins from major food groups for workers and peasants in the Moscow, Gor'kii, and Sverdlovsk regions.

Table 4.14 is significant in two respects. First, it shows that, long after the food crisis had passed, both workers and peasants continued to rely on starch for both calories and protein. This was a long-term structural feature of the Soviet diet which it shared with the industrializing economies of nineteenth-century Europe and modern third world economies. There was a general lack of foods of animal origin, and a serious shortage of fats, which, as I have already noted, can lead to, or at least exacerbate, vitamin deficiency. Secondly, we see just how crucial access to potatoes was to peasant survival. In Gor'kii oblast', where workers suffered especially badly during the first half of 1947, peasants in the region derived a full 70 percent of their calories and virtually half of all protein from potatoes. Put another way, without access to potatoes, the crisis would have resulted in mass deaths, on the order of 1933. Yet for workers, too, the potato crop was crucial. Workers in Gor'kii oblast' were consuming just 1,700 calories a day, over a third of which – nearly 600 calories – came from potatoes. Without potatoes in their diet the outcome would have been a calamity.

[108] J. S. Garrow and W. P. T. James, eds., *Human Nutrition and Dietetics*, 9th edition (Edinburgh: Churchill Livingstone, 1993), p. 290. I am grateful to Mark Harrison for bringing this source to my attention.

Table 4.14 *Percentage of daily calorie and protein intake derived from different food sources, Moscow, Gor'kii, and Sverdlovsk regions, 1946, 1947, 1950*

	Percentage of daily calorie intake								
	Jan.–June 1946			Jan.–June 1947			Jan.–June 1950		
Moscow region	Moscow city workers	Moscow oblast' workers	Moscow oblast' peasants	Moscow city workers	Moscow oblast' workers	Moscow oblast' peasants	Moscow city workers	Moscow oblast' workers	Moscow oblast' peasants
Bread and grains	62.2	58.0	43.4	54.6	55.4	27.9	55.2	54.8	48.7
Potatoes	16.9	28.2	40.4	20.3	28.2	55.5	10.8	18.0	29.2
Vegetables and fruits	1.2	1.4	1.5	1.6	1.3	1.8	1.4	1.2	1.3
Milk and dairy	5.0	3.0	11.5	7.3	4.3	11.1	8.9	7.0	11.7
Meat and fish	4.9	2.8	1.8	5.8	3.1	1.9	7.5	5.5	3.3
Fats and oils	5.3	3.2	0.8	5.4	4.0	1.0	5.2	4.5	1.7
Sugar and sweets	4.5	3.3	0.6	4.9	3.7	0.8	11.1	9.1	4.1
	Percentage of daily protein intake								
Bread and grains	62.0	61.2	44.8	55.1	59.4	30.7	57.3	58.1	46.7
Potatoes	9.9	18.4	24.9	12.4	18.4	36.5	6.5	11.4	16.9
Vegetables and fruits	1.8	2.9	3.0	2.6	2.5	3.6	1.8	1.9	2.3
Milk and dairy	7.5	5.2	18.3	7.1	4.8	18.7	10.1	9.1	17.5
Meat and fish	18.4	12.0	9.0	22.5	14.6	10.3	23.9	19.1	15.8
Fats and oils	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sugar and sweets	0.4	0.3	0.1	0.3	0.2	0.2	0.4	0.5	0.9

Gor'kii region	Jan.–June 1946			Jan.–June 1947			Jan.–June 1950		
	Gor'kii city workers	Gor'kii oblast' workers	Gor'kii oblast' peasants	Gor'kii city workers	Gor'kii oblast' workers	Gor'kii oblast' peasants	Gor'kii city workers	Gor'kii oblast' workers	Gor'kii oblast' peasants
Percentage of daily calorie intake									
Bread and grains	63.3	66.5	30.2	52.4	52.1	13.9	60.9	59.1	33.3
Potatoes	25.5	22.8	54.6	31.7	35.3	70.3	15.0	21.0	47.5
Vegetables and fruits	0.8	1.2	1.5	1.8	1.4	1.6	1.1	0.9	1.8
Milk and dairy	2.6	3.8	12.3	3.8	4.9	12.9	7.2	7.2	14.5
Meat and fish	2.3	1.7	1.1	3.0	2.0	1.1	5.0	3.9	1.5
Fats and oils	2.9	1.8	0.2	4.6	2.2	0.1	2.6	1.4	0.3
Sugar and sweets	2.6	2.3	0.1	2.8	2.2	0.1	8.1	6.4	1.2
Percentage of daily protein intake									
Bread and grains	69.7	70.9	33.4	55.8	55.8	16.4	63.0	61.6	34.6
Potatoes	15.0	13.9	36.3	20.7	23.2	49.7	9.4	13.3	29.9
Vegetables and fruits	1.4	2.3	3.0	3.5	2.8	3.5	1.7	1.3	3.5
Milk and dairy	3.8	5.1	21.2	4.1	6.1	24.0	8.0	9.8	24.0
Meat and fish	9.7	7.3	6.1	15.3	11.7	6.4	17.6	13.6	7.9
Fats and oils	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sugar and sweets	0.5	0.5	0.0	0.6	0.3	0.0	0.4	0.5	0.2

Table 4.14 (*cont.*)

	Percentage of daily calorie intake								
	Jan.–June 1946			Jan.–June 1947			Jan.–June 1950		
Sverdlovsk region	Sverdlovsk city workers	Sverdlovsk oblast' workers	Sverdlovsk oblast' peasants	Sverdlovsk city workers	Sverdlovsk oblast' workers	Sverdlovsk oblast' peasants	Sverdlovsk city workers	Sverdlovsk oblast' workers	Sverdlovsk oblast' peasants
Bread and grains	64.7	56.9	44.3	59.2	55.6	36.1	59.0	58.5	53.7
Potatoes	19.4	24.4	37.1	22.7	25.0	44.9	12.7	16.5	28.7
Vegetables and fruits	0.8	1.0	1.5	1.3	0.8	1.3	0.8	0.8	0.8
Milk and dairy	4.5	9.1	15.0	6.4	9.8	14.6	8.0	9.0	12.2
Meat and fish	4.2	3.3	1.9	3.9	3.4	2.7	5.6	4.0	2.6
Fats and oils	3.0	2.7	0.0	3.6	2.9	0.2	3.7	3.0	0.3
Sugar and sweets	3.4	2.6	0.1	2.8	2.5	0.2	10.1	8.1	1.8
	Percentage of daily protein intake								
Bread and grains	64.3	57.0	43.6	63.2	59.6	35.7	61.1	61.7	51.7
Potatoes	11.7	14.6	21.8	12.9	14.1	26.5	7.9	10.3	16.5
Vegetables and fruits	1.3	1.8	2.7	1.9	1.2	2.5	0.9	0.8	1.5
Milk and dairy	5.8	13.5	22.7	5.0	10.5	22.3	8.2	10.4	17.8
Meat and fish	16.7	12.9	9.2	16.8	14.4	13.0	21.3	16.2	12.2
Fats and oils	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sugar and sweets	0.2	0.2	0.0	0.1	0.2	0.0	0.6	0.6	0.3

Sources: See Appendix C.

Figure 4.4a Percentage of daily calorie intake from different food groups, Moscow region, Jan.–June 1946, Jan.–June 1947, Jan.–June 1950

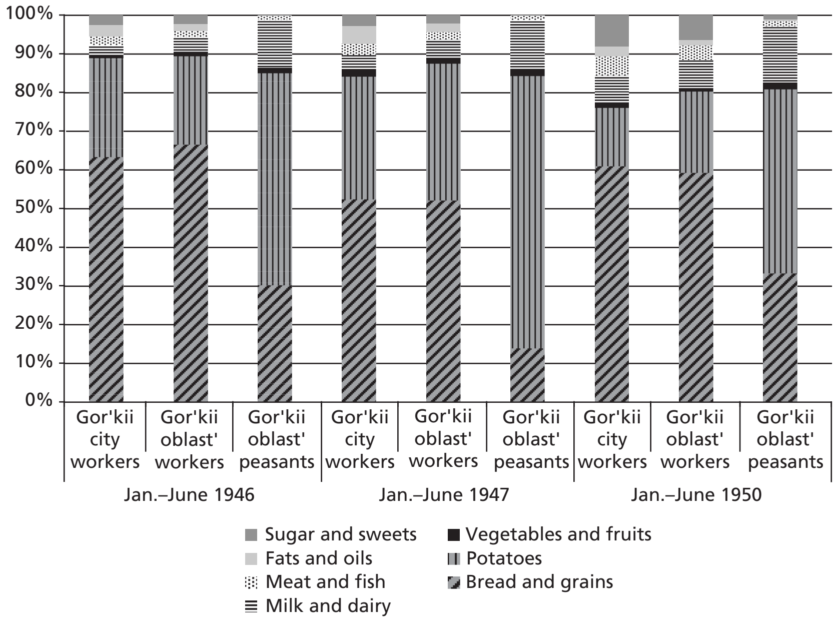


Figure 4.4b Percentage of daily calorie intake from different food groups, Gor'kii region, Jan.–June 1946, Jan.–June 1947, Jan.–June 1950

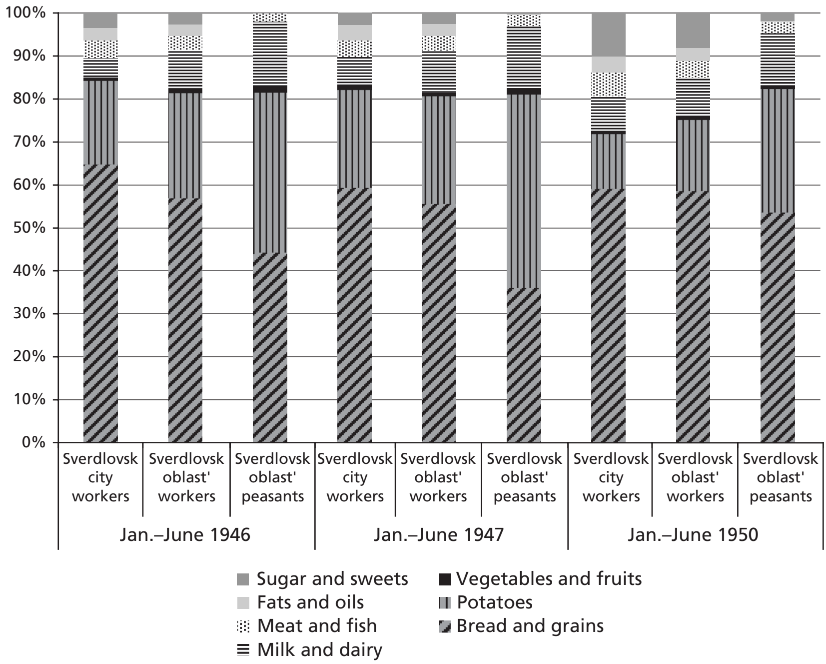


Figure 4.4c Percentage of daily calorie intake from different food groups, Sverdlovsk region, Jan.–June 1946, Jan.–June 1947, Jan.–June 1950

That potatoes played this role is neither surprising nor historically unusual. Even in a society as industrialized as Victorian Britain, bread and potatoes were the main sources of nutrition for both urban and rural laborers up until the very end of the nineteenth century. Potatoes were a vital part of this duo, especially in the families of agricultural workers, for whom, as Wohl notes, "potatoes were a substitute, rather than a supplement for bread." By 1871 average consumption in rural areas was a pound of potatoes (450 grams) a day.[109] An even more famous example, of course, is Ireland, where during the early nineteenth century potatoes supplanted oatmeal as the main source of calories. Clarkson and Crawford have calculated that, prior to the famine of the 1840s, the average Irish laboring family enjoyed a relatively high-calorie diet (ranging from 3,400 to 4,800 kcal per day), but 87 percent of this energy came from carbohydrates – mostly from potatoes. The diet was also reasonably rich in protein, and it was notable that as laboring families moved away from the pre- and post-famine fare of potatoes, oatmeal, and milk during the early 1900s, protein intake dropped

[109] Wohl, *Endangered Lives*, p. 50.

by around 25 percent.[110] In a similar vein, when serious hunger took hold of the German civilian population in the winter of 1917, the drop in calorie intake did not come at the expense of bread consumption, which remained stable, but from the much-reduced consumption of potatoes.[111]

We see a similar urban–rural divide among other food categories. Looking first at meat and fish, Soviet dietary standards called for the average member of a worker's family – adjusted for typical age composition – to consume 167 g of meat and 51 g of fish per day.[112] At no point in the late Stalin period did consumption even remotely approach these levels. The closest were workers' families in Moscow city at the end of 1950, when aggregate consumption of fish and meat reached 133 g a day, but even this was a full 40 percent below the recommended intake. Although I have not shown the figures here, in every one of our case study regions the consumption of animal proteins remained inadequate throughout the late Stalin period. Only in rare cases, such as Moscow (1947 and again in 1950) or Sverdlovsk city (1950), did it provide more than 17 to 20 percent of workers' total protein intake. In peasant families this figure was much lower still (Table 4.14).

It is a different story altogether with milk. Access to milk has special significance for any discussion of the food crisis because of how it influenced infant mortality. This was certainly the view of Soviet medical authorities as they attempted to explain the sudden jump in infant mortality during 1947.[113] It was common practice to wean babies early in Russia, both in town and countryside, and infants were put on cows' milk from the age of three months. We can reasonably assume that this was not simply a question of culture and traditions of mothering. If mothers worked full-time in factory or field, and if they were themselves malnourished, early weaning could be a practical necessity. It did, however, expose infants to a number of obvious risks. One was that it made infant nutrition dependent on the availability of cows' milk. In the towns, as the next table, Table 4.15, shows quite clearly, consumption of milk was already very low and came under further strain in 1947. Milk was virtually unavailable in state shops. As I discuss in Chapter 5, mothers were reliant on urban "milk kitchens," which dispensed readymade formula, but in towns such as Ivanovo these could meet only a quarter of overall demand, yet families

110 Clarkson and Crawford, *Feast and Famine*, pp. 182–4.
111 Keys, *et al.*, *Biology*, p. 1240, citing 1919 estimates by Loewy. According to the latter, average civilian daily calorie intake fell from 2,343 kcal in April 1916 to 1,985 kcal in April 1917. During this period calories from bread, flour, and baked goods actually increased slightly, while calories from potatoes fell from 504 kcal a day to 328 – 50 percent of the total decline.
112 GARF, f. 9226, op. 1, d. 1119, l. 44. 113 GARF, f. A-482, op. 52s, d. 221, l. 77.

Table 4.15 *Milk consumption by region, 1946–1950*

Average per capita consumption of members of worker and peasant families in grams (ml) per day, by half-year

Region	1946-I	1946-II	1947-I	1947-II	1948-I	1948-II	1949- I	1949-II	1950-I	1950-II
Moscow city workers	43	50	53	70	111	115	153	162	171	171
Moscow oblast' workers	67	77	64	79	116	124	152	162	172	150
Moscow oblast' peasants	453	462	392	490	426	486	470	531	486	495
Leningrad city workers	33	34	43	58	88	92	116	120	n/d	n/d
Central Russia										
Gor'kii city workers	60	69	56	58	92	110	146	131	150	129
Gor'kii oblast' workers	83	83	88	97	133	140	144	139	209	177
Gor'kii oblast' peasants	442	528	478	507	507	584	579	573	567	561
Ivanovo oblast' workers	96	114	104	127	174	188	220	227	240	215
Yaroslavl' oblast' workers	75	91	64	97	134	173	188	208	192	183
Volga region										
Kuibyshev city workers	65	70	74	89	91	91	110	116	117	133
Kuibyshev oblast' peasants	657	694	765	795	652	704	616	681	604	674
Tatariya workers (Kazan' city)	63	69	77	81	102	112	132	132	151	136
Tatariya peasants	431	528	447	548	491	547	541	574	518	577
Urals and Siberia										
Sverdlovsk city workers	78	71	80	93	131	139	164	159	149	149
Sverdlovsk oblast' workers	299	279	226	222	230	215	237	233	230	197
Sverdlovsk oblast' peasants	548	615	496	665	495	646	462	556	430	560
Molotov city workers	80	78	58	78	116	128	120	144	135	155
Molotov oblast' workers	141	144	141	158	223	196	206	208	222	217
Molotov oblast' peasants	441	543	394	563	414	577	442	528	402	462
Chelyabinsk city workers	76	83	97	113	160	158	188	163	176	160
Chelyabinsk oblast' workers	232	166	155	195	273	234	291	227	253	225
Bashkiriya workers	100	156	132	165	189	230	147	130	137	128
Bashkiriya peasants	464	486	473	540	519	528	601	489	530	568
Kemerovo oblast' workers	138	133	179	193	214	223	235	221	228	211

Sources: See Appendix C.

were too poor to buy milk at the *kolkhoz* market.[114] Those urban families which, according to Table 4.15, had some reasonable access to milk, namely those in the oblast' towns (but not the regional metropolises) of the Urals and Siberia, had their own cows, as in Kemerovo oblast', and/or were able to supplement what they produced themselves with purchases at *kolkhoz* markets, as in Molotov oblast'. Nowhere did urban families buy significant quantities of milk from state outlets. In Kemerovo oblast', 95 percent of the milk consumed by workers' families during the first half of 1947 came from their own production; in the second half of 1947 the corresponding figure was 88 percent. Between 1946 and 1948 only 2 to 3 percent of milk came from state stores, a figure that had risen to only 10 percent by 1950. The rest of what they consumed came from the *kolkhoz* market. In Molotov oblast' between 75 and 80 percent of milk came from families' own cows; the remainder they purchased at the *kolkhoz* market. Through 1948 they bought no milk whatsoever from the state supply system, and even in 1950 state stores gave them only 2 to 5 percent of what they consumed.[115]

The other danger of early weaning was infection. This was a general problem, especially in the summer, when both towns and countryside witnessed a peak of infant deaths due to gastrointestinal infections. In 1947, however, as mothers made greater use of the urban milk kitchens, and as the kitchens themselves began to dispense lower-quality powdered formula instead of whole milk or pre-prepared formula, the general lack of urban sanitation and access to clean drinking water increased this risk still further. These problems were compounded by the poor state of hygiene in the kitchens.[116] This in large part explains the particular pattern of infant mortality in 1947, which showed a shift away from deaths among very young babies, whom breastfeeding tended to protect against infections, and an increase in deaths from infections – most significantly gastrointestinal infections – among older babies, among whom the death rate usually decreased with age.[117]

If we look again at Table 4.15, we see that milk, even more dramatically than potatoes, was a critical food group where the peasantry had a clear advantage over urban families. During the first half of 1947, average peasant consumption of milk and dairy products – almost all of which was milk, as opposed to cheeses or curds – was five, six, or even ten times

114 See p. 295.
115 For sources, see the list of sources for the household budget surveys in Appendix C.
116 See pp. 297–301.
117 M. Ya. Kassatsier, in GARF, f. A-482, op. 52s, d. 207, l. 34, 35. For a more complete discussion, see Chapter 5, pp. 293–4.

that of workers in the same region. The difference was smaller in the Urals, but still significant. In Sverdlovsk oblast', peasants in early 1947 consumed six times as much milk as workers in Sverdlovsk city and over twice as much as workers in the oblast'. The disparity was even greater in Molotov oblast' and Bashkiriya.

In every region for which we have peasant data, peasant families derived from one-sixth to one-quarter of their daily protein from dairy products. In this sense we can say that just as peasants replaced bread with potatoes relative to workers' households, they also replaced meat and fish with milk as their main animal-based source of protein.

Yet for all its obvious importance in allowing peasant families to withstand the food crisis and long-term rural poverty, we cannot explain the leap in infant mortality in terms of availability of milk alone. Nor can it in all cases account for the generally observed lower rates of infant mortality in rural areas as opposed to the towns. It was in the Urals that workers in the oblasti had better access to milk, yet infant mortality there was no lower than in cities and towns where milk consumption was minimal. What is more, in Sverdlovsk and Molotov oblasti, infant mortality among peasant households was actually slightly higher than in the towns, despite their superior access to milk. Yet for other regions, especially Central Russia, the Volga region, and Moscow oblast', the relationship appears so strong as to cast doubt on any assumption that lower rural infant mortality was simply due to underreporting.[118] Even in the Urals, the data do not necessarily mean that there was no link between infant deaths and milk supplies. Given the dreadful environmental conditions there, we could just as strongly argue that the dismal state of housing and sanitation in the oblast' towns simply overwhelmed any dietary advantage families may have obtained from higher levels of milk consumption. Put another way, it is possible that if the milk situation for workers in the Urals had been the same as in Ivanovo or Gor'kii, the infant death toll there would have been even higher.[119]

[118] Andrei Markevich has suggested to me in a private communication that the key variable here is not necessarily average per capita milk consumption, but milk consumption per child. Since peasant households had more children than workers' families, the advantage of peasant children over urban children would have been less than the figures in Table 4.15 suggest. In towns such as Ivanovo, where milk was simply unobtainable, this would have had little meaning; but in the Urals, where workers could provide their children with at least some milk, this may at least partially explain why peasant infant mortality was higher than for workers.

[119] I have said nothing about the other major food groups for which I have detailed information: fruits and vegetables, and sugar and confectionery. Fruit and vegetable consumption, important not as a source of calories or protein, but as a source of micronutrients, never exceeded a third of recommended requirements, even as late as 1950.

Conclusion

The food crisis of 1947 came at the end of a period of chronic mass malnutrition that affected very large parts of the Soviet population. Millions of people had died of starvation during World War II, and millions of the survivors were left in such a weakened state that they were highly vulnerable to any renewed pressure on their diets. In one sense the 1947 crisis was the final episode in a prolonged nutritional crisis that dated back to the late 1930s. At the same time, however, it was an acute crisis with its own causes and repercussions. It took a high toll in human life and brought millions more people – mainly urban residents – to a point where, had the crisis persisted, it almost certainly would have caused serious, perhaps irreversible damage to health and longevity. However, by early 1948 calorie intake for workers' families – always bearing in mind that our data exclude the very low-paid – had risen to a point where people were malnourished, but their lives were no longer at risk.

Outside the immediate famine areas of southern Ukraine and Moldavia, peasants were better equipped to cope with the crisis than urban workers. The state's depredations of grain substantially reduced the importance of bread in the peasant diet, and peasants compensated primarily by relying on potatoes. But the surveys also show that peasants had far superior access to one vital food source, namely milk, and this may perhaps explain the lower infant mortality in the countryside compared to the towns, a phenomenon observed in almost every industrial oblast'. In some ways the true extent of rural poverty is more accurately revealed not by access to food, but by other data in the household surveys which I do not deal with here, namely the almost total exclusion of peasant families from acquisition of even the most rudimentary consumer goods, such as underwear and shoes.[120]

We also see significant differences in the consumption patterns of workers' families in different regions. The privileged position of Moscow, and to a lesser degree of Leningrad and Sverdlovsk, is immediately obvious. But even Moscow workers suffered during the food crisis and suffered quite

Sugar consumption, by contrast, rose rapidly in 1950, and in many towns (but not among the peasantry) supplied as much as 10 percent of daily calories. It is hard to avoid the suspicion that for the regime this was a relatively cheap and easy way to increase calorie consumption – far easier than expanding supplies of milk, meats, fruits, vegetables, and even grains. See Table 4.14 and the sources listed in Appendix C.

120 As late as 1948, for example, the average member of a peasant household in Moscow oblast' could buy a pair of leather shoes once every two years and a set of underwear once every ten years. In Gor'kii oblast' it took ten years to acquire a pair of shoes and sixteen years to buy a set of underwear. Peasants in Sverdlovsk oblast' were somewhere in between: it took "only" six years to buy a pair of shoes, and twelve years to get hold of a piece of underwear: RGAE, f. 1562, op. 324, d. 2655, l. 97–8.

badly: their bread consumption fell, but meat and fish supplies were essentially protected, and so the decline in their protein intake was less than the fall in calories. Workers in Sverdlovsk and Molotov oblasti were also able to mitigate the impact of the crisis by growing potatoes and providing their families with milk. This was not true of their Urals neighbors in Chelyabinsk or Chelyabinsk oblast'. For reasons that are not clear, the food crisis hit the Chelyabinsk region especially hard, and its workers were unable to augment their diets with homegrown foods. This is in line with adult and infant mortality trends in that oblast', which remained high even after the immediate crisis had passed, as well as with the health reports from Magnitogorsk, which cited a large percentage of workers suffering from starvation.

Yet Chelyabinsk was an exception only when compared to Sverdlovsk. It differed little from most other cities and regions: the autonomous republics of Bashkiriya and Tatariya, the cities and towns of Central Russia (Gor'kii city and Gor'kii, Ivanovo, and Yaroslavl' oblasti), Molotov city, Kuibyshev, even the towns of Moscow oblast'. In all these localities the data on food consumption reinforce the picture already suggested by their infant mortality statistics and the GSI reports. It is for this reason that we can say the crisis was truly general.

Above all, we need to keep in mind that the 1947 food crisis was a brief, acute phase of a much longer period of persistent chronic undernutrition. It had an immediate impact on mortality, including among adults of prime working age, but this was in large part reversed once food supplies had improved. Although we do not have the anthropometric evidence to support this claim, I consider it probable that the crisis did not last long enough to cause more than a temporary interruption to the recovery by children and teenagers of some, if not most, of the physical growth they would have lost during the war. Insofar as a proportion of these children may never have made up this loss or may have suffered health problems in later life, this was because of the protracted period of malnutrition, not 1947 on its own.

What is less well explored are the potential medium- and long-term economic consequences the crisis may have had for the Soviet Union's postwar recovery. It is tempting to see the crisis as the final phase of a period of dearth which began with the German invasion of the USSR in June 1941 and ended when the last consequences of the famine had more or less disappeared late in 1948. We must not forget, however, that Soviet workers and their families continued to receive substandard nutrition well into the 1950s. The evidence here, however, is not clear cut. In 1951 the TsSU began to categorize the food groups into broader, less refined categories. To a significant degree this reflected the improvement in food quality. In the early postwar years it made a great deal of difference if workers ate bread made from coarse, low-grade rye flour or white bread made from wheat. The calorie content of the latter is far higher than that of the former, so that when calculating calorie intake it is important to distinguish the two types of bread. Such distinctions became moot as the years advanced and consumption of poor-quality bread fell to almost zero. The Ministry of Health's Institute of Nutrition acknowledged this reality as well when it worked out and published new tables for the nutritional content of foods.[121]

When we take the 1952 household dietary surveys and calculate daily calorie availability, the results suggest a very marked improvement in nutrition. Note, however, that the regional breakdown of the data is also cruder than in previous years, and the regional metropolises are no longer recorded separately from the surrounding oblasti.

We do not have the age and gender composition of households, so we cannot calculate actual dietary requirements. However, Soviet statisticians took 3,053 kcal a day as a general figure for the per capita daily requirement after allowing for the average number of children and pensioners in a typical household. These figures suggest a great leap in calorie intake between 1950 and 1952, so that by the latter year the average member of a worker's family was very near to what the Soviets considered the biological minimum, and far in excess of what our modified requirement would be were we able to calculate it. It is possible that some of this may be because in doing the calculations I used the revised nutritional values drawn up by the Institute of Nutrition in 1953 but, as Table 4.17 suggests, this would be an issue only really with bread.

For the moment, therefore, let us assume that the increase in calorie intake was genuine. What were the sources of this improvement? Here we can compare the 1952 diets with those of the late 1940s, after the food crisis had abated. Table 4.17 compares average daily calorie consumption derived from specific food items for members of workers' families in three different oblasti from January–June 1949 and January–June 1952. The 1949 figures are for all workers; the 1952 figures are for skilled workers. The 1952 data for Moscow oblast' are complicated by the fact they include the city of Moscow, which enjoyed better food supplies than the towns in Moscow oblast'. For this reason I have chosen two additional oblasti, Ivanovo and Kemerovo, where the survey basis would have been the same in both years.

[121] See n. 46.

Table 4.16 *Estimated calorie intake by region, 1952*

Using 1954 Minzdrav nutritional values, average per capita intake of members of families of skilled and unskilled workers in kilocalories per day, by half-year (excluding alcohol)

	January–June 1952		July–December 1952	
Region	Skilled workers	Unskilled workers	Skilled workers	Unskilled workers
Moscow oblast'	2892	2925	3004	3051
Central Russia				
Gor'kii oblast'	3004	3106	3178	3400
Ivanovo oblast'	3027	2908	3213	3073
Yaroslavl' oblast'	2868	2979	2983	3038
Volga region				
Kuibyshev oblast'	2641	2775	2740	2876
Tatariya	2757	2920	2737	2968
Urals and Siberia				
Sverdlovsk oblast'	2981	3067	3103	3237
Molotov oblast'	2841	2869	2961	3008
Chelyabinsk oblast'	2809	2716	2867	2833
Bashkiriya	2891	2776	2792	2757
Kemerovo oblast'	3107	3120	3101	3214

Sources: See Appendix C.

Table 4.17 *Components of workers' diets in the Moscow, Ivanovo, and Kemerovo regions, calories per day from different food groups, January–June 1949 and January–June 1952*

	Moscow oblast'		Ivanovo oblast'		Kemerovo oblast'	
	Jan.-June 1949	Jan.-June 1952	Jan.-June 1949	Jan.-June 1952	Jan.-June 1949	Jan.-June 1952
Bread and bread products	1395	1617	1467	1822	1523	1766
Potatoes	519	377	505	300	706	425
Vegetables and fruits	28	37	29	34	27	31
Milk, dairy, eggs	142	162	202	197	216	141
Meat and fish	87	134	80	93	88	151
Fats	113	233	95	218	98	309
Sugar and confectionery	215	334	237	363	189	284
Total calories	2499	2894*	2615	3027	2847	3107

Note: *The difference between this figure and the one given in Table 4.16 is due to rounding of the calorie calculations for individual food items.
Sources: See Appendix C.

In the Moscow and Ivanovo regions the increase in daily calorie intake was around 400 kcal per day. In Kemerovo oblast' it was less, at 260 kcal. From where did these extra calories come? Much of the increase came from bread and bread products – not because workers were eating larger amounts of bread (in fact, daily consumption in grams was marginally lower in 1952 in Moscow and marginally higher in the other two oblasti), but because the bread was of better quality and contained more calories. By the same token, workers were eating fewer potatoes, so that the number of calories from potatoes dropped by 140 kcal a day in Moscow, 205 in Ivanovo, and 280 in Kemerovo. In fact, the two more or less balanced each other out: if we take total calories from bread and potatoes, there was an increase of 80 kcal a day in Moscow and 150 in Ivanovo, and a decline of 38 kcal a day in Kemerovo. There was also no notable increase in the aggregate number of calories derived from meat, fish, and dairy products. Moscow showed a moderate increase in calories from these sources, but in Ivanovo the increase was insignificant (around 8 kcal/day), and in Kemerovo the two categories together provided fewer calories in 1952 than in 1949. In fact, the bulk of the increase in calories came from two sources: the consumption of fats, which had been badly lacking in the early postwar diet, and the consumption of sugar. The first, despite its other negative consequences for health, may have improved the synthesis of vitamins; the second was, at least from a nutritional point of view, potentially detrimental to the population's long-term health, but was a cheap and easy way to boost calorie intake.

I need to point out that these estimates of the 1952 diet are not fully consistent with 1955 studies by the TsSU. According to the latter, average per capita consumption for all workers' families in the RSFSR in 1955 was just 2,686 calories per day. This was more than 200 calories less than the average peasant was consuming. There are some regions for which we can make direct comparisons with the data used in this chapter. Average daily calorie intake for workers' families in Kuibyshev in 1955 was 2,470 calories, vs. the 2,348 calories I calculated for them at the end of 1950, and the 2,641 suggested by the 1952 surveys. The comparable figures for workers in Molotov oblast' were 2,570 calories in 1955, vs. 2,572 in 1950 and 2,841 in 1952. If these regions were in any way indicative of the RSFSR as a whole, they suggest that my 1952 calculations exaggerated workers' total calorie intake, but significantly did not distort the picture of the diet's continued poor nutritional balance. The 1955 surveys are significant, because they show that the better harvests to which Khrushchev's early agricultural reforms had led had not yet made a great impact on overall nutrition. The diet

Table 4.18 *Average daily calorie intake and consumption of major foodstuffs (in grams) as a percentage of recommended daily requirements, worker and peasant families, RSFSR, 1955*

	Consumption as % of recommended daily requirement	
	Workers	Peasants
Total calories	88	95
Calories from animal products	47	55
Bread and bread products	127	161
Potatoes	112	189
Vegetables and cucurbits	52	57
Meat and salo (bacon fat)	63	48
Milk & dairy products	39	43
Eggs	27	36

Source: GARF, f. A-374, op. 30, d. 7221, l. 10, 13.

remained heavily dependent on carbohydrates, so much so that their consumption was deemed vastly in excess of the biological optimum. Conversely, it remained poor in vegetables, meat, milk, and eggs. Total calorie intake also remained inadequate.[122] Table 4.18 summarizes the 1955 results.

What this means is that Soviet workers lived through a very long period when calorie intake was inadequate but claims on nutrition were exceptionally high. Studies of chronic undernutrition in third world countries show that persistent nutritional deficits compel people to bring energy intake and energy expenditure into line, either by reducing work effort or by reducing their so-called discretionary activities. In countries where the poor are in employment or working the land, discretionary activity goes first, because people have to earn a living. Insofar as many discretionary activities are also essential to life, the energy shortfall must come at the expense of weight loss and/or reduced labor productivity.[123] In the postwar Soviet Union we know that the ability to curtail non-working activity was decidedly limited. Acquiring

[122] GARF, f. A-374, op. 30, d. 7221, l. 14. I am grateful to Andrei Markevich for bringing the report in this file to my attention.
[123] Scrimshaw, "World Nutritional Problems," pp. 353–5.

food was an enormous undertaking – either growing it yourself while holding down a full-time job, or searching for it in empty state shops or *kolkhoz* markets. But we are not just talking about food. Discretionary activity included hauling water from street pumps up several flights of stairs, trying to maintain basic hygiene when flats had neither toilets, baths, nor hot water, and walking to work when public transport did not function properly and when streets (as was the case in many mining communities and smaller industrial towns) were unpaved and often covered in human excrement. Coping with the urban environment thus placed major demands on nutritional resources. The cold climate, too, was an important drain on energy. The probability is therefore very high that people coped by reducing the intensity of labor at the workplace.

This has potentially important ramifications. From the very beginnings of Stalinist industrialization, Soviet workers had found numerous ways to attenuate the regime's ongoing attempts to increase the intensity of labor and squeeze workers for more production. Lax use of work time, poor internal discipline, resistance to increased output quotas, and outright falsification of production figures all formed part of this arsenal. These practices and the informal bargaining between workers and shop floor managers that institutionalized them as part of the day-to-day functioning of the Soviet enterprise are well described in the histories of Soviet labor and industrial relations. The one period when workers found it difficult to compel managers to engage in this type of effort bargaining was World War II and the early postwar years. The analysis in this chapter suggests that the postwar food crisis placed workers in an especially difficult position: the physiological need to curb work effort occurred in a period when shop floor politics gave workers far fewer opportunities to do so. One can only assume that at some point physiological necessity asserted itself and productivity fell through lower output and/or through time lost off work due to illness and accidents.[124] This would indeed be a great irony of Stalin's last years. What workers could not achieve through the normal give-and-take of Soviet industrial relations, they "achieved" through sheer physical exhaustion.

[124] I discuss these issues more fully in the Conclusion. So-called effort reduction through informal shop floor bargaining between workers and line managers – observed to greater or lesser extent in virtually every industrial society – was one of the defining features of the Soviet economy and played a major role in its long-term decline and eventual collapse. The period 1942–1953, however, saw workers' ability to engage in informal bargaining noticeably attenuated. See Filtzer, *Soviet Workers and Late Stalinism*, chapter 6, and J. Eric Duskin, *Stalinist Reconstruction and the Confirmation of a New Elite, 1945–1953* (Basingstoke: Palgrave, 2001).

APPENDIX A: FOOD GROUPS USED IN THE TsSU HOUSEHOLD SURVEYS PRIOR TO 1951

Flour – rye
Flour – wheat
Bread – rye
Bread – wheat – low-grade flour
Bread – wheat – high-grade flour
Groats
Pasta products
Potatoes
Cabbage
Other vegetables, including canned
Cucurbits (cucumbers, squash, melons)
Fruits and berries – fresh
Fruits and berries – dried
Milk – fresh and fermented
Milk – dried
Butter
Smetana (sour cream)
Cheese and brynza (sheep's cheese)
Tvorog (curd cheese), curds, etc.
Eggs
Beef and veal
Lamb and mutton
Pork
Domestic poultry
Salami and smoked meat products
Other meat and meat products
Herring
Fish and canned fish (excluding herring)
Salo (bacon fat)
Margarine
Vegetable oil
Sugar
Sweets and confectionery
Cookies, cakes and baked goods
Egg powder
Omelette (an omelette-like dish made from powdered eggs)
Mushrooms

APPENDIX B: REGIONAL PER CAPITA CALORIE CONSUMPTION CONVERTED TO ADULT EQUIVALENT UNITS

When constructing Table 4.7 I elected not to convert the calorie values in Table 4.4 into adult equivalent units. Instead, I chose to leave them as family per capita averages and compare them against the recommended daily calorie intake for families in each region, based on the latter's average demographic makeup. Constructing Table 4.8 in this way allows us to compare the Soviet findings with those from other historical surveys which did not convert to adult equivalent units.

If we convert Table 4.4 to adult equivalent units and measure these against the Soviet adult standard of 4,112 kcal a day (which presumed that all adults, male and female, did very heavy labor), and also against our modified standard for adult males – 3,200 kcal per day – the results, as we would expect, come out very much the same.

APPENDIX C: SOURCES FOR THE NUTRITION TABLES

BASHKIRIYA WORKERS

1946:	RGAE, f. 1562, op. 15, d. 2133, l. 11–11ob., 12–12ob.
1947:	GARF, f. A-374, op. 3, d. 2220, l. 2–2ob., 3–3ob.
1948:	GARF, f. A-374, op. 3, d. 2572, l. 2–2ob., 3–3ob.
1949:	GARF, f. A-374, op. 3, d. 2912, l. 4–4ob., 9–9ob.
1950:	GARF, f. A-374, op. 3, d. 3318, l. 1–1ob., 2, 3, 4–4ob., 5–5ob.
1952:	GARF, f. A-374, op. 30, d. 2156, l. 8–8ob., 12–12ob., 16–16ob.

BASHKIRIYA PEASANTS

1946, 1947, 1st half:	RGAE, f. 1562, op. 324, d. 2221, l. 99–100
1946, 1947, 2nd half:	RGAE, f. 1562, op. 324, d. 2222, l. 99–100
1948, 1st half:	RGAE, f. 1562, op. 324, d. 2655, l. 99–100
1948, 2nd half:	RGAE, f. 1562, op. 324, d. 2656, l. 99–100
1949, 1950:	RGAE, f. 1562, op. 324, d. 3707, l. 78–9, 163–4

CHELYABINSK CITY WORKERS

1946:	RGAE, f. 1562, op. 15, d. 2133, l. 209–209ob., 210–210ob.
1947:	GARF, f. A-374, op. 3, d. 2243, l. 2–2ob., 3–3ob.
1948:	GARF, f. A-374, op. 3, d. 2595, l. 2–2ob., 3–3ob.
1949:	GARF, f. A-374, op. 3, d. 2935, l. 2–2ob., 3–3ob.
1950:	GARF, f. A-374, op. 3, d. 3341, l. 1–1ob., 2, 3, 16–16ob., 17–17ob.

Table 4.19 *Daily per capita calorie intake of worker families expressed as adult equivalent units, first half 1947 and second half 1950 (absolute values and as a percentage of Soviet and modified Western requirements)*

	1947 (January–June)				1950 (July–December)			
Region	Actual	Adult equivalent unit	% SR 4,112 kcal	% MR 3,200 kcal	Actual	Adult equivalent unit	% SR 4,112 kcal	% MR 3,200 kcal
Moscow city workers	2135	2766	67.3	86.4	2776	3621	88.1	113.2
Moscow oblast' workers	1753	2285	55.6	71.4	2708	3643	88.6	113.8
Leningrad city workers	2184	2853	69.4	89.2	n/d			
Central Russia								
Gor'kii city workers	1759	2336	56.8	73.0	2618	3498	85.1	109.3
Gor'kii oblast' workers	1720	2263	55.0	70.7	2660	3563	86.6	111.3
Ivanovo oblast' workers	1908	2539	61.7	79.3	2707	3643	88.6	113.8
Yaroslavl' oblast' workers	1794	2330	56.7	72.8	2496	3316	80.6	103.6
Volga region								
Kuibyshev city workers	1771	2296	55.8	71.8	2348	3196	77.7	99.9
Tatariya workers (Kazan') city	1827	2407	58.5	75.2	2581	3460	84.1	108.1
Urals and Siberia								
Sverdlovsk city workers	2184	2898	70.5	90.6	2628	3540	86.1	110.6
Sverdlovsk oblast' workers	2136	2846	69.2	88.9	2769	3770	91.7	117.8
Molotov city workers	1806	2334	56.8	72.9	2580	3418	83.1	106.8
Molotov oblast' workers	1980	2630	64.0	82.2	2572	3546	86.2	110.8
Chelyabinsk city workers	1796	2462	59.9	76.9	2493	3452	83.9	107.9
Chelyabinsk oblast' workers	1952	2585	62.9	80.8	2648	3588	87.3	112.1
Bashkiriya workers	1627	2180	53.0	68.1	2396	3270	79.5	102.2
Kemerovo oblast' workers	2273	3112	75.7	97.3	2688	3626	88.2	113.3

Note: SR Soviet requirement; MR = modified requirement.
Sources: See Appendix C.

CHELYABINSK OBLAST' WORKERS

1946: RGAE, f. 1562, op. 15, d. 2133, l. 200–200ob., 201–201ob.
1947: GARF, f. A-374, op. 3, d. 2242, l. 2–2ob., 3–3ob.
1948: GARF, f. A-374, op. 3, d. 2594, l. 2–2ob., 3–3ob.
1949: GARF, f. A-374, op. 3, d. 2934, l. 2–2ob., 3–3ob.
1950: GARF, f. A-374, op. 3, d. 3340, l. 1–1ob., 3, 5, 18–18ob., 19–19ob.
1952: GARF, f. A-374, op. 30, d. 2189, l. 6–6ob., 10–10ob., 14–14ob., 18–18ob.

GOR'KII CITY WORKERS

1946: RGAE, f. 1562, op. 15, d. 2133, l. 38–38ob., 39–39ob.
1947: GARF, f. A-374, op. 3, d. 2225, l. 2–2ob., 3–3ob.
1948: GARF, f. A-374, op. 3, d. 2577, l. 2–2ob., 3–3ob.
1949: GARF, f. A-374, op. 3, d. 2917, l. 2–2ob., 3–3ob.
1950: GARF, f. A-374, op. 3, d. 3323, l. 1–1ob., 2, 3, 16–16ob., 17–17ob.

GOR'KII OBLAST' WORKERS

1946: RGAE, f. 1562, op. 15, d. 2133, 29–29ob., 30–30ob.
1947: GARF, f. A-374, op. 3, d. 2224, l. 2–2ob., 3–3ob.
1948: GARF, f. A-374, op. 3, d. 2576, l. 2–2ob., 3–3ob.
1949: GARF, f. A-374, op. 3, d. 2916, l. 2–2ob., 3–3ob.
1950: GARF, f. A-374, op. 3, d. 3322, l. 1–1ob., 2, 4, 8–8ob., 9–9ob.
1952: GARF, f. A-374, op. 30, d. 2169, l. 4–4ob., 8–8ob., 12–12ob., 16–16ob.

GOR'KII OBLAST' PEASANTS

1946, 1947, 1st half: RGAE, f. 1562, op. 324, d. 2221, l. 99–100
1946, 1947, 2nd half: RGAE, f. 1562, op. 324, d. 2222, l. 99–100
1948, 1st half: RGAE, f. 1562, op. 324, d. 2655, l. 99–100
1948, 2nd half: RGAE, f. 1562, op. 324, d. 2656, l. 99–100
1949, 1950: RGAE, f. 1562, op. 324, d. 3707, l. 78–9, 163–4

IVANOVO OBLAST' WORKERS

1946: RGAE, f. 1562, op. 15, d. 2133, l. 47–47ob., 48–48ob.
1947: GARF, f. A-374, op. 3, d. 2226, l. 2–2ob., 3–3ob.
1948: GARF, f. A-374, op. 3, d. 2578, l. 2–2ob., 3–3ob.
1949: GARF, f. A-374, op. 3, d. 2918, l. 2–2ob., 3–3ob.
1950: GARF, f. A-374, op. 3, d. 3324, l. 1–1ob., 2, 3, 16–16ob., 17–17ob.
1952: GARF, f. A-374, op. 30, d. 2171, l. 4–4ob., 8–8ob., 12–12ob., 16–16ob.

KEMEROVO OBLAST' WORKERS

1946: RGAE, f. 1562, op. 15, d. 2133, l. 56–56ob., 57–57ob.
1947: GARF, f. A-374, op. 3, d. 2227, l. 2–2ob., 3–3ob.
1948: GARF, f. A-374, op. 3, d. 2579, l. 2–2ob., 3–3ob.
1949: GARF, f. A-374, op. 3, d. 2919, l. 2–2ob., 3–3ob.
1950: GARF, f. A-374, op. 3, d. 3325, l. 1–1ob., 2, 3, 16–16ob., 17–17ob.
1952: GARF, f. A-374, op. 30, d. 2174, l. 4–4ob., 8–8ob., 12–12ob., 16–16ob.

KUIBYSHEV CITY WORKERS

1946: RGAE, f. 1562, op. 15, d. 2133, l. 83–83ob., 84–84ob.
1947: GARF, f. A-374, op. 3, d. 2230, l. 2–2ob., 3–3ob.
1948: GARF, f. A-374, op. 3, d. 2582, l. 2–2ob., 3–3ob.
1949: GARF, f. A-374, op. 3, d. 2922, l. 2–2ob., 3–3ob.
1950: GARF, f. A-374, op. 3, d. 3328, l. 1–1ob., 2, 3, 19–19ob., 20–20ob.
1952: GARF, f. A-374, op. 30, d. 2176, l. 13–13ob., 14–14ob., 15–15ob., 16–16ob.

KUIBYSHEV OBLAST' PEASANTS

1946, 1947, 1st half: RGAE, f. 1562, op. 324, d. 2221, l. 99–100
1946, 1947, 2nd half: RGAE, f. 1562, op. 324, d. 2222, l. 99–100
1948, 1st half: RGAE, f. 1562, op. 324, d. 2655, l. 99–100
1948, 2nd half: RGAE, f. 1562, op. 324, d. 2656, l. 99–100
1949, 1950: RGAE, f. 1562, op. 324, d. 3707, l. 78–9, 163–4

LENINGRAD CITY WORKERS

1946: RGAE, f. 1562, op. 15, d. 2133, l. 92–92ob., 93–93ob.
1947: GARF, f. A-374, op. 3, d. 2231, l. 7–7ob., 8–8ob.
1948: GARF, f. A-374, op. 3, d. 2583, l. 2–2ob., 3–3ob.
1949: GARF, f. A-374, op. 3, d. 2923, l. 2–2ob., 3–3ob.

MOLOTOV CITY WORKERS

1946: RGAE, f. 1562, op. 15, d. 2133, l. 116–116ob., 117–117ob.
1947: GARF, f. A-374, op. 3, d. 2233, l. 2–2ob., 3–3ob.
1948: GARF, f. A-374, op. 3, d. 2585, l. 2–2ob., 3–3ob.
1949: GARF, f. A-374, op. 3, d. 2925, l. 2–2ob., 3–3ob.
1950: GARF, f. A-374, op. 3, d. 3331, l. 4–4ob., 8, 15, 19–19ob., 26–26ob.

MOLOTOV OBLAST' WORKERS

1946: RGAE, f. 1562, op. 15, d. 2133, l. 101–101ob., 102–102ob.
1947: GARF, f. A-374, op. 3, d. 2232, l. 2–2ob., 3–3ob.
1948: GARF, f. A-374, op. 3, d. 2584, l. 2–2ob., 3–3ob.
1949: GARF, f. A-374, op. 3, d. 2924, l. 3–3ob., 6–6ob.
1950: GARF, f. A-374, op. 3, d. 3330, l. 1–1ob., 11, 18, 22–22ob., 29–29ob.
1952: GARF, f. A-374, op. 30, d. 2178, l. 14–14ob., 15–15ob., 16–16ob., 17–17ob.

MOLOTOV OBLAST' PEASANTS

1946, 1947, 1st half:	RGAE, f. 1562, op. 324, d. 2221, l. 99–100
1946, 1947, 2nd half:	RGAE, f. 1562, op. 324, d. 2222, l. 99–100
1948, 1st half:	RGAE, f. 1562, op. 324, d. 2655, l. 99–100
1948, 2nd half:	RGAE, f. 1562, op. 324, d. 2656, l. 99–100
1949, 1950:	RGAE, f. 1562, op. 324, d. 3707, l. 78–9, 163–4

MOSCOW CITY WORKERS

1946: RGAE, f. 1562, op. 15, d. 2133, l. 128–128ob., 129–129ob.
1947: GARF, f. A-374, op. 3, d. 2231, l. 2–2ob., 3–3ob.
1948: GARF, f. A-374, op. 3, d. 2587, l. 2–2ob., 3–3ob.
1949: GARF, f. A-374, op. 3, d. 2927, l. 2–2ob., 3–3ob.
1950: GARF, f. A-374, op. 3, d. 3333, l. 1–1ob., 2, 2a, 3–3ob., 4–4ob.

MOSCOW OBLAST' WORKERS

1946: RGAE, f. 1562, op. 15, d. 2133, l. 125–125ob., 126–126ob.
1947: GARF, f. A-374, op. 3, d. 2234, l. 2–2ob., 3–3ob.
1948: GARF, f. A-374, op. 3, d. 2586, l. 2–2ob., 3–3ob.
1949: GARF, f. A-374, op. 3, d. 2926, l. 2–2ob., 3–3ob.
1950: GARF, f. A-374, op. 3, d. 3332, l. 1–1ob., 2, 3–3ob., 4, 6–6ob.
1952: GARF, f. A-374, op. 30, d. 2179, l. 13–13ob., 14–14ob., 15–15ob., 16–16ob.

MOSCOW OBLAST' PEASANTS

1946, 1947, 1st half:	RGAE, f. 1562, op. 324, d. 2221, l. 99–100
1946, 1947, 2nd half:	RGAE, f. 1562, op. 324, d. 2222, l. 99–100
1948, 1st half:	RGAE, f. 1562, op. 324, d. 2655, l. 99–100
1948, 2nd half:	RGAE, f. 1562, op. 324, d. 2656, l. 99–100
1949, 1950:	RGAE, f. 1562, op. 324, d. 3707, l. 78–9, 163–4

SVERDLOVSK CITY WORKERS

1946:	RGAE, f. 1562, op. 15, d. 2133, l. 173–173ob., 174–174ob.
1947:	GARF, f. A-374, op. 3, d. 2240, l. 3–3ob., 4–4ob.
1948:	GARF, f. A-374, op. 3, d. 2592, l. 2–2ob., 3–3ob.
1949:	GARF, f. A-374, op. 3, d. 2932, l. 2–2ob., 3–3ob.
1950:	GARF, f. A-374, op. 3, d. 3338, l. 1–1ob., 2, 3, 4–4ob., 5–5ob.

SVERDLOVSK OBLAST' WORKERS

1946:	RGAE, f. 1562, op. 15, d. 2133, l. 164–164ob., 165–165ob.
1947:	GARF, f. A-374, op. 3, d. 2239, l. 2–2ob., 3–3ob.
1948:	GARF, f. A-374, op. 3, d. 2591, l. 2–2ob., 3–3ob.
1949:	GARF, f. A-374, op. 3, d. 2931, l. 2–2ob., 3–3ob.
1950:	GARF, f. A-374, op. 3, d. 3337, l. 1–1ob., 2, 3, 7–7ob., 8–8ob.
1952:	GARF, f. A-374, op. 30, d. 2186, l. 3–3ob., 7–7ob., 11–11ob., 15–15ob.

SVERDLOVSK OBLAST' PEASANTS

1946, 1947, 1st half:	RGAE, f. 1562, op. 324, d. 2221, l. 99–100
1946, 1947, 2nd half:	RGAE, f. 1562, op. 324, d. 2222, l. 99–100
1948, 1st half:	RGAE, f. 1562, op. 324, d. 2655, l. 99–100
1948, 2nd half:	RGAE, f. 1562, op. 324, d. 2656, l. 99–100
1949, 1950:	RGAE, f. 1562, op. 324, d. 3707, l. 78–9, 163–4

TATARIYA WORKERS (KAZAN' CITY)

1946:	RGAE, f. 1562, op. 15, d. 2133, l. 182–182ob., 183–183ob.
1947:	GARF, f. A-374, op. 3, d. 2221, l. 2–2ob., 3–3ob.
1948:	GARF, f. A-374, op. 3, d. 2573, l. 2–2ob., 3–3ob.
1949:	GARF, f. A-374, op. 3, d. 2913, l. 2–2ob., 3–3ob.
1950:	GARF, f. A-374, op. 3, d. 3319, l. 1–1ob., 8, 9, 19–19ob., 20–20ob.
1952:	GARF, f. A-374, op. 30, d. 2157, l. 4–4ob., 8–8ob., 11–11ob., 16–16ob.

TATARIYA PEASANTS

1946, 1947, 1st half:	RGAE, f. 1562, op. 324, d. 2221, l. 99–100
1946, 1947, 2nd half:	RGAE, f. 1562, op. 324, d. 2222, l. 99–100
1948, 1st half:	RGAE, f. 1562, op. 324, d. 2655, l. 99–100
1948, 2nd half:	RGAE, f. 1562, op. 324, d. 2656, l. 99–100
1949, 1950:	RGAE, f. 1562, op. 324, d. 3707, l. 78–9, 163–4

YAROSLAVL' OBLAST' WORKERS

1946: RGAE, f. 1562, op. 15, d. 2133, l. 218–218ob., 219–219ob.
1947: GARF, f. A-374, op. 3, d. 2244, l. 2–2ob., 3–3ob.
1948: GARF, f. A-374, op. 3, d. 2596, l. 2–2ob., 3–3ob.
1949: GARF, f. A-374, op. 3, d. 2936, l. 2–2ob., 3–3ob.
1950: GARF, f. A-374, op. 3, d. 3342, l. 1–1ob., 2, 3, 4–4ob., 5–5ob.
1952: GARF, f. A-374, op. 30, d. 2190, l. 1–1ob., 2–2ob., 3–3ob., 4–4ob.

5 Infant mortality

We saw in the previous chapter that available data allow us to make only speculative inferences about the impact on mortality of such major events as the war and the postwar famine. We have a rough idea of how many people died in the urban areas of the RSFSR, their age and gender, and why they died. We cannot, however, calculate standardized, age-specific death rates. Although demographers have attempted to assess yearly changes in the RSFSR population as a whole, once we move down to regional comparisons the data for the early postwar years are almost totally missing. In 1956, the RSFSR Statistical Administration (the republican arm of the TsSU) made local population estimates based on the 1939 census and for the years 1948–1955, but conspicuously absent here are figures for the war years and the years of the postwar food crisis. Even the 1948–1955 data are of limited utility, because they are gross estimates for local populations as a whole, and not broken down by age and gender. Thus, detailed systematic comparisons of regional mortality trends over time remain difficult, if not impossible. There is another measure we can use, however, which does permit such comparisons, namely infant mortality. The Central Statistical Administration tabulated births and deaths, including infant deaths, in each locality. From these we can calculate what percentage of babies born in a given year survived until their first birthday – the standard measure of infant mortality. Because the unit of comparison – deaths per 1,000 live births – is the same, we can compare results from one locality to another. Admittedly, there are problems with the accuracy of the Soviet data, which I shall discuss in a subsequent section, but the distortions are not so great as to hide the basic tendencies at work, and it is on these that I shall concentrate. I should also stress that, although in the Soviet case we may be forced to use infant mortality as a proxy for general mortality, this is not without its risks. The diseases and conditions that kill infants, young children, and adults differ markedly, and historically trends in mortality among the three groups do not necessarily move together or in the same direction. This was certainly true in late Victorian Britain, where infant mortality fell much more slowly than both general mortality and mortality among children aged one to four (so-called childhood mortality).[1]

Having said this, it remains true that infant mortality is generally accepted as one of the standard measures of the state of a society's health and well-being. We tend to associate high rates of infant mortality with so-called developing countries, but it is not so very long ago that rates in the industrialized countries of Western Europe actually exceeded – and exceeded by a large margin – those in modern-day Sierra Leone or Liberia, the two countries with the worst record of infant deaths in the contemporary world.[2] In 2006, for every 1,000 live births Sierra Leone and Liberia each saw nearly 160 of these babies – one out of every six – die within their first year of life. A hundred years earlier Germany, already one of the world's great industrial and military powers, had an infant mortality rate of 199 for every 1,000 live births – a rate of nearly 20 percent. Infant mortality in the old Austro-Hungarian Empire was even higher, at around 215 deaths per 1,000 live births, while the infant mortality rate in Russia was 253 – nearly 60 percent higher than in modern Sierra Leone. In fact, Hungary did not dip below the modern Sierra Leone figure until the mid-1930s. The post-revolutionary RSFSR did not do so until 1943. Table 5.1 summarizes these results.

What this means is that there are still many Russians and Hungarians, and smaller numbers of Austrians and Germans alive today who were born at a time when it was common for families to lose at least one child before the age of one year and who themselves may well remember having lost a sibling, if not their own baby.

None of this should be surprising if we consider the main causes of infant mortality: poverty, poor sanitation, limited access to clean water supply, overcrowded housing, inadequate medical care, and a rudimentary understanding of basic personal and public hygiene. In this chapter I examine the cumulative effect of these various factors on infant mortality

[1] R. I. Woods, P. A. Watterson, and J. H. Woodward, "The Causes of Rapid Infant Mortality Decline in England and Wales, 1861–1921," Part I, *Population Studies*, vol. 42, no. 3 (November 1988), pp. 350–1; Michael R. Haines, "Socio-economic Differentials in Infant and Child Mortality During Mortality Decline: England and Wales, 1890–1911," *Population Studies*, vol. 49, no. 2 (July 1995), p. 297. In contemporary Russia we see the opposite phenomenon: between 1990 and 2006, infant and child mortality (deaths of children under the age of five per 1,000 live births) fell by around 40 percent, while adult mortality increased by nearly the same amount, mainly due to the sharp fall in adult life expectancy among men: World Health Organization, *World Health Statistics 2008* (Geneva: World Health Organization, 2008), pp. 41–2.

[2] Officially Afghanistan, with 165 infant deaths per 1,000 live births, has worse infant mortality than either of these countries, but the reliability of the data is highly uncertain.

Table 5.1 *Infant mortality in selected countries in the early twentieth and early twenty-first centuries*

Deaths of infants up to one year of age per 1,000 live births

Country	1901–1905 (annual average)	2000–2005 (annual average)	Period in which surpassed modern Sierra Leone
Sierra Leone		159	
Liberia		157	
France	139	4	before 1901
Spain	172	4	1906–1910
Italy	167	3	1906–1910
Germany	199	4	1911–1915
Austria	216	4	1916–1920
Czechoslovakia	225	3/7*	1921–1925
Hungary	213	6	1931–1935
Russian Empire/Russian Federation	253**	10	1943 (RSFSR)

Notes: *Czech Republic – 3; Slovakia – 7.
**Russian Empire figure is the annual average for 1902–1906.
Sources: Column 2 – Godelieve Masuy-Stroobant, "Infant Health and Infant Mortality in Europe: Lessons from the Past and Challenges for the Future," in Carlo A. Corsini and Pier Paolo Viazzo, eds., *The Decline of Infant Mortality and Child Mortality: The European Experience, 1750–1990* (The Hague: Martinus Nijhoff, 1997), pp. 30–1 (except Russia); B. B. Prokhorov, "Zdorov'e naseleniya Rossii v proshlom, nastoyashchem i budushchem," *Problemy prognozirovaniya*, no. 1, 2001, pp. 148–63, Table 2 (Russia).
Column 3 – World Health Organization, *World Health Statistics 2008* (Geneva: World Health Organization, 2008), Part 2.
Column 4 – Masuy-Stroobant, "Infant Health," pp. 30–1 (except Russia); GARF, f. A-374, op. 34, d. 1540, l. 1, 29 (RSFSR).

in the RSFSR during late Stalinism. We shall see that the RSFSR, and by inference the Soviet Union, shared many features with the industrializing countries of Western Europe some half a century or more earlier. Yet we shall also see some important differences. Infant mortality persisted at very high levels, higher than Victorian Britain or Wilhelmine Germany, right up to the outbreak of World War II. During the war infant mortality continued to rise up through 1942, but then declined sharply and rapidly, despite the fact that there had been little improvement in urban sanitary conditions, housing, food supplies, or standards of living. What we shall also see, however, is the emergence in the postwar period of very dramatic regional disparities. Essentially, in those areas with the slowest pace of sanitary reform, infant mortality remained stubbornly high, at least until the early 1950s. If in 1945–1946 infant mortality in these regions differed little from rates in Moscow, as the postwar period progressed Moscow began to separate itself off from the rest of the country. Infant mortality in Moscow was markedly lower than in the regions. By the mid-1950s the same inequalities emerged within regions themselves, with the regional capitals showing significantly lower mortality than the towns in their surrounding oblasti.

To understand the sharpness of the postwar transition, let us go back and examine some more detailed data on infant mortality in Europe, pre-revolutionary Russia, and the post-revolutionary RSFSR, as presented in Table 5.2.

I want to concentrate here on Russia's position relative to the other European countries. It is clear that, prior to the Russian Revolution, infant mortality in Russia (which included territories roughly akin to the later USSR, plus regions such as Poland and Finland which became independent after 1917 – that is, much larger than the eventual RSFSR) vastly exceeded that in any other major European country. Its closest "rivals" were the countries that made up the old Austro-Hungarian Empire. What is striking is that, although the revolution and the new Bolshevik regime managed to reduce infant mortality by nearly a third compared to pre-World War I levels, the gap between it and most of the rest of Europe narrowed only slightly, and in some cases (most notably Germany, England and Wales, Austria, and the Netherlands) it even widened. With the end of NEP and the collapse of the standard of living consequent upon collectivization and forced industrialization, the Soviet Union's position relative to Western Europe deteriorated further: infant mortality rose in the RSFSR, while it fell in virtually every other country in Europe, with the exception of Spain, which was both poverty-stricken and caught up in a devastating civil war. Thus during 1928–1930, that is, the start of the First Five-Year Plan, RSFSR infant mortality was comparable only to Hungary, was 1.5 times the rate in Italy, twice that in Germany, despite the latter being in the midst of the depression, and 2.7 times the rate in England and Wales. In the immediate prewar years the RSFSR's relative position had worsened even further. Its infant mortality was now some 50 percent greater than Hungary's; nearly double the rate in Italy; 2.9 times the rate in Nazi Germany; and nearly 3.5 times the rate in England and Wales.

We can perhaps better understand Russia's relative position in terms of time lags. In 1940 the RSFSR was roughly in the same position with regard to infant mortality as Germany in 1900, or England and Wales, France, and the Netherlands in the middle of the nineteenth century. Stalinist Russia thus lagged some forty to eighty years behind these other

Table 5.2 *Average annual infant mortality in Europe, 1901–1950, Russia, 1901–1913, and the RSFSR, 1928–1950*

Deaths of infants up to one year of age per 1,000 live births

Country	1901–5	1906–10	1911–15	1916–20	1921–5	1926–30	1931–5	1936–40	1941–5	1946–50
Denmark	119	108	97	91	82	82	71	60	48	40
England/Wales	135	117	110	90	76	68	62	55	50	36
Netherlands	136	114	99	90	70	56	45	37	50	31
France	139	126	124	120	100	94	74	70	82	62
Belgium	154	148	139	119	106	101	89	85	86	63
Italy	167	152	140	150	123	119	105	103	110	77
Spain	172	159	152	161	143	124	112	119	109	77
Germany	199	174	155	129	119	93	73	66	–	(W) 71(E) 94
Hungary	213	206	207	206	187	172	157	134	126	98
Austria	216	202	191	153	138	117	99	81	92	76
Czechoslovakia	225	205	191	161	156	139	119	127	–	83
Russia/RSFSR*	253	244	273	–	–	183	–	193	183	97

Notes: *Column 2, 1902–1906; column 3, 1907–1911; column 4, 1913; column 7, 1928–1930; column 10, 1942–1945.

Sources: Europe (except Russia) – Godelieve Masuy-Stroobant, "Infant Health and Infant Mortality in Europe: Lessons from the Past and Challenges for the Future," in Carlo A. Corsini and Pier Paolo Viazzo, eds., *The Decline of Infant Mortality and Child Mortality: The European Experience, 1750–1990* (The Hague: Martinus Nijhoff, 1997), pp. 29–30; Russia, 1902–1911, B. B. Prokhorov, "Zdorov'e naseleniya Rossii v proshlom, nastoyashchem i budushchem," *Problemy prognozirovaniya*, no. 1, 2001, pp. 148–63, Table 2; Russia, 1913, RSFSR, 1928–1940 and 1946–1950, E. M. Andreev, L. E. Darskii, and L. T. Khar'kova, *Demograficheskaya istoriya Rossii: 1927–1959* (Moscow: Informatika, 1998), Appendix 2, pp. 161–2; RSFSR, 1941–1945, GARF, f. A-374, op. 34, d. 1540, l. 1, 29. The five-year average for 1941–1945 conceals the very large drop in infant mortality between 1942 and 1943. The figures from Andreev, Darskii, and Khar'kova are TsSU data, not their own recalculations.

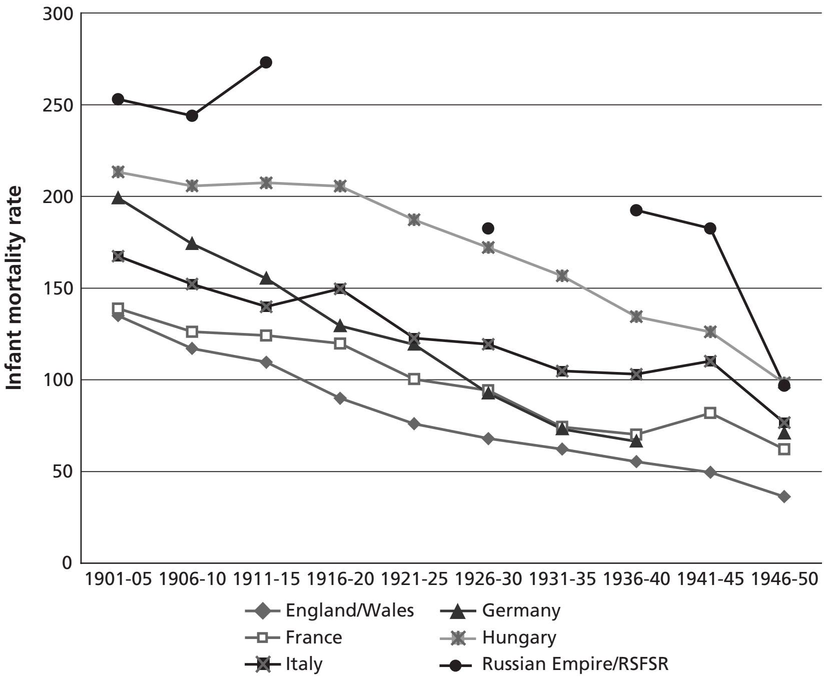


Figure 5.1 Infant mortality, selected European countries, 1901–1950

countries.[3] When we look at the early postwar period, however, we see something quite unexpected. The war, as we already know, took a terrible toll on Russia's civilian population, with infant mortality increasing from its already high prewar level to a staggering 314 deaths per 1,000 live births in hinterland regions in 1942. From 1943 onwards, however, it fell, and fell dramatically: to 159 deaths per 1,000 live births in 1943, 112 in 1944, and 85 in 1945.[4] The annual average during 1946–1950 was only 26 percent higher than in Italy; around 37 percent higher than West Germany's; only marginally above East Germany's; and actually lower than postwar Hungary's. It was still around 2.7 times the level in England and Wales but, if we view it in terms of time lags, the RSFSR had shown a considerable rate of catch-up. It had reduced the gap with Germany from

[3] In fact, the highest annual rate of infant mortality in Victorian England never exceeded 153 deaths per 1,000 live births: Naomi Williams and Chris Galley, "Urban–Rural Differentials in Infant Mortality in Victorian England," *Population Studies*, vol. 49, no. 3 (November 1995), p. 411.

[4] GARF, f. A-374, op. 34, d. 1540, l. 1, 29.

forty years to twenty-five, and with England and Wales from eighty years to around thirty-five. We see this perhaps more clearly if we present it graphically (Figure 5.1, p. 259).

Later I shall have cause to comment on the accuracy of the Soviet data, which probably underestimate the true levels of infant mortality and hence also the time lag with Western Europe. The trend, however, is clear. The data reveal a genuine conundrum, at least in the hinterland regions on which I base this study. Almost all the factors which historians associate with the fall in infant mortality in Western Europe – improved urban sanitation; near-universal access to a safe water supply; housing reform and an easing of overcrowding; access to sterile alternatives to human breast milk; a declining birth rate; and better personal hygiene – were absent, yet infant mortality was falling, and moreover falling either faster than, or at worst no slower than, the speed at which it was falling in more modernized parts of Western Europe.

Infant mortality in nineteenth- and early twentieth-century Europe

To better understand this paradox we should briefly examine the main characteristics of infant mortality in nineteenth- and early twentieth-century Western Europe. Of special importance were urban–rural disparities, a factor directly tied to problems with urban sanitation; seasonal peaks in infant mortality; differential mortality rates depending on class and income; and the role of breastfeeding.

The "urban penalty"

The bulk of infant mortality was due to three sets of factors. (1) Respiratory infections, such as pneumonia, but also those caused by infectious diseases such as scarlet fever, influenza, pertussis (whooping cough), measles, diphtheria, and respiratory syncytial virus. Pneumonia in particular was highly sensitive to living conditions, as cramped housing made babies especially vulnerable to upper respiratory infections during the winter months. (2) Gastrointestinal infections, caused by poor domestic hygiene, unsafe food and water supply, and generally poor sanitation in the larger environment (middens, animal excrement on the streets). (3) Failure of newborns to thrive, due to premature birth, complications during or just after delivery, or general weakness. All three of these were in some way dependent on sanitation, housing conditions, and diet (malnourished mothers were likely to bear underweight and/or premature babies, and to have greater difficulty producing milk). In each and every one of these categories rural areas, irrespective of the ubiquitous nature

Table 5.3 *Urban and rural rates of infant mortality in England and Wales, 1851–1910*

	England and Wales	Rural areas	Small towns	London division	Large towns
1851–1860	151.1	137.7	157.8	154.8	196.0
1861–1870	154.1	137.6	156.5	162.1	192.5
1871–1880	148.8	127.8	154.3	157.9	181.5
1881–1890	141.8	121.9	138.6	151.6	171.7
1891–1900	153.5	128.6	141.4	159.6	191.9
1901–1910	127.3	106.4	117.4	129.5	155.5

Source: Naomi Williams and Chris Galley, "Urban–Rural Differentials in Infant Mortality in Victorian England," *Population Studies*, vol. 49, no. 3 (November 1995), p. 411.

of rural poverty, offered more favorable conditions. Not surprisingly, then, one of the characteristic features of infant mortality in urbanizing and industrializing societies was the so-called urban penalty. This refers to the fact that infant mortality in towns was invariably higher than that in the countryside. As we shall see, infant mortality in the late Stalinist RSFSR also conformed to this pattern, and in fact the long delay in overcoming it is another indicator of the Soviet Union's time lag behind Western Europe. If we look at nineteenth-century Britain, Naomi Williams and Chris Galley[5] have calculated that, for any decade between 1850 and 1910, infant mortality was lower in rural areas than in small towns; it was lower in small towns than in London; and it was lower in London than in other large cities. Their estimates are shown in Table 5.3; mortality is given here as deaths per 1,000 live births.

This same pattern held when comparing towns with their surrounding countryside. This is an important finding, because it eliminates the hypothetical possibility that aggregated nationwide urban–rural differences could have been distorted by extremely low mortality in a few unrepresentative rural regions or by extremely high mortality in a few unrepresentative towns. On the contrary, the pattern holds good both for the country as a whole, and within a given region. Table 5.4, reproduced from Williams and Galley, shows urban and rural infant morality rates in six local districts: Newcastle, Preston, Leicester, Norwich, Cambridge, and Exeter. (The distinction between columns 2 and 3 relates to another feature of infant mortality – its pronounced seasonal fluctuations – which

[5] Williams and Galley, "Urban–Rural Differentials."

Table 5.4 *Infant mortality rates in British towns and their immediate outlying rural areas, by season, 1885–1910*

Deaths of infants up to one year per 1,000 live births

City or district	July–September	January–June and October–December
Newcastle	212	145
Hexham	136	120
Urban/rural ratio	156	121
Preston	274	168
Garstang	73	98
Urban/rural ratio	375	171
Leicester	256	152
Blaby	150	123
Urban/rural ratio	171	124
Norwich	223	148
Henstead	74	109
Urban/rural ratio	301	136
Cambridge	163	120
Chesterton	97	95
Urban/rural ratio	168	126
Exeter	170	145
Crediton	79	98
Urban/rural ratio	215	148

Source: Naomi Williams and Chris Galley, "Urban–Rural Differentials in Infant Mortality in Victorian England," *Population Studies*, vol. 49, no. 3 (November 1995), p. 415.

I address below.) In every case, infant mortality was higher in the regional urban center than in the surrounding countryside. The gap was highest during the summer months, for reasons I shall explain, but even at other times of the year it was still appreciable.

Looking at causes of death, diarrheal diseases killed eight times more urban children than rural; measles, scarlet fever, and other common infectious diseases killed three times as many; tuberculosis killed twice as many. All three of these categories of disease were closely related to sanitary and housing conditions, most notably overcrowding and difficulties maintaining adequate hygiene. The connection with sanitary conditions becomes clearer when we compare neonatal mortality among babies during the first month of life, and post-neonatal mortality. R. I. Woods, P. A. Watterson, and J. H. Woodward have calculated that in late Victorian Britain the difference between urban and rural mortality during the first four weeks of life was relatively modest (42 percent higher in the towns than in the countryside), but after four weeks became very pronounced – urban post-neonatal infant mortality was 2.7 times that in rural areas. This in turn was due to the relative protection that breastfeeding gave to babies irrespective of where they were born. So long as breastfeeding rates were comparable in town and country, the differences in infant mortality would be relatively small. The tendency, however, was for urban mothers to wean their babies early, thus depriving them of this defense, and urban infant mortality shot up accordingly.[6] Here the countryside afforded its residents distinct health advantages. Rural poverty was certainly pronounced in Britain, and sewerage was almost nonexistent. What the countryside did have, however, was clean water, housing with decent ventilation and light, and open spaces. General risk of infection and spreading infection was therefore much lower.

Seasonal peaks

Two of the three major causes of infant mortality – upper respiratory and gastrointestinal infections – followed seasonal patterns. Pneumonia was likely to take its greatest toll during the winter, when the respiratory viruses that can lead to bacterial pneumonia as a complication are more ubiquitous. Gastrointestinal infections were at their worst during the summer, when milk and other foods would rapidly spoil, and flies would spread infection from exposed human and animal excrement. In Victorian Britain the sharp summer spike caused by an increase in diarrheal diseases was primarily a feature of the towns; rural areas tended to avoid it. Looking back at Table 5.4, we see that the gap between rural and urban areas was in fact greatest in the summer months, the most dangerous period for diarrheal diseases; it was much narrower during the other times of the year, although still significant. This suggests that rural infants had fewer advantages in withstanding winter pneumonia than they did in fending off summertime gastrointestinal infections. Later we shall see that the seasonal pattern in the postwar RSFSR deviated slightly from this picture.

[6] *Ibid.*, pp. 413–14; Woods, Watterson, and Woodward, "Causes," Part I, p. 353. William Ogle, the registrar general, had made this observation already in 1892. During the first week of life the excess of urban deaths over rural deaths was 23 percent. This rose steadily with each week of life, so that at four weeks urban deaths were 97 percent above rural deaths, and at six months the gap was 273 percent: Williams and Galley, "Urban–Rural Differentials," p. 414, citing William Ogle, *Fifty-fourth Annual Report of the Registrar General* (London: HMSO, 1892), p. xvi. Urban and rural rates of neonatal mortality would tend to converge for reasons other than breastfeeding. A significant proportion of neonatal deaths will occur because of problems with delivery and birth defects, factors largely independent of variations in social conditions.

Class and income

In Britain, Germany, and other European countries, infant mortality was related not just to location, but also to class. Basically, the children of the middle and upper classes had much better survival rates than the children of workers, both skilled and unskilled. In Paris during the 1890s, infant mortality in the poorer arrondissements was nearly three times that in the richest.[7] Even as late as 1910, after a decade during which infant mortality had been constantly declining among all classes, infant mortality in the families of British coal miners, textile workers, and unskilled laborers was more than double the rate among professional families.[8] Similar patterns are discernable in Wilhelmine Germany from the 1870s right up to the outbreak of the First World War. In 1913 – again, at the end of a period of steady overall decline in infant mortality rates – the families of German skilled workers had nearly twice the infant mortality rate as the families of high-level public officials. The differential between unskilled manufacturing workers and top public officials was 2.4 times, and among unskilled agricultural laborers 2.8 times. Worst off were domestic and other servants, among whom infant mortality was 3.3 times that of public officials.[9] Class might not explain long-term trends in infant mortality (as noted, all classes saw an improvement in both Britain and Germany, although in uneven degrees); what it does help explain are differences in infant mortality rates among different sections of society at any given point in time.[10]

In fact, the relationship between class and infant mortality is not completely straightforward. It was itself dependent on other variables, most notably locality, and also to some extent legitimacy. Alice Reid has noted that, if we break down infant mortality rates by class according to where people lived, we find that, in Britain at least, class differences were far less important in the countryside than in the towns. The rural environment

7 Shapiro, *Housing the Poor of Paris*, p. 81.

8 Robert Woods, Naomi Williams, and Chris Galley, "Infant Mortality in England, 1550–1950: Problems in the Identification of Long-Term Trends and Geographical and Social Variations," in Carlo A. Corsini and Pier Paolo Viazzo, eds., *The Decline of Infant Mortality in Europe, 1800–1950: Four National Case Studies* (Florence: UNICEF, 1993), p. 46. Professionals showed an infant mortality rate of 59 deaths per 1,000 live births, compared to 132 among coal mining families, 127 among unskilled laborers, and 123 among textile workers, giving ratios of 2.24:1, 2.15:1, and 2.08:1 respectively.

9 Reinhard Spree, *Health and Social Class in Imperial Germany: A Social History of Mortality, Morbidity and Inequality* (Oxford: Berg, 1988), p. 196.

10 Alice Reid, "Locality or Class? Spatial and Social Differences in Infant and Child Mortality in England and Wales, 1895–1911," in Carlo A. Corsini and Pier Paolo Viazzo, eds., *The Decline of Infant Mortality and Child Mortality: The European Experience, 1750–1990* (The Hague: Martinus Nijhoff, 1997), p. 152.

was sufficiently less dangerous that laborers and poor farmers could access the minimal resources needed to curb mortality. In the towns, by contrast, class became a crucial variable.[11] The poor had neither the money nor the knowledge to adopt those measures that might insulate a child from the hazards of the urban environment. Malnutrition forced working-class mothers to abandon breastfeeding relatively quickly, thus exposing infants to the dangers of artificial food prepared in unhygienic conditions.[12] The same held true for illegitimacy. In 1902, infant mortality among illegitimate children during the first four weeks of life was around 50 percent higher than among legitimate babies in rural areas, and around 80 percent higher in London. After this neonatal period, however, the differences in the countryside remained more or less the same, but in London they became far more pronounced: after the first month, infant mortality among illegitimate babies was 2.26 times the mortality among legitimate babies.[13] Intuitively one would think that there was a direct correlation between illegitimacy and class, or at least poverty, but evidence from Hannover in Germany before World War I suggests the possibility of a different mechanism. In Hannover the link was not legitimacy itself, but whether or not the mothers of illegitimate children worked outside the home in a factory. For these women, breastfeeding was a near impossibility, and it is this that possibly explains the higher rates of infant mortality among illegitimate babies.[14]

The issue of class points up one of the huge gaps in any analysis of infant mortality in the Soviet Union. Western studies of infant and general mortality are usually able to relate death rates to class by looking at any of a number of indicators: income, occupation, or residential patterns.

[11] *Ibid.*, pp. 140, 150–2.

[12] "A mother suckling her infant requires nourishment, and it is lack of nourished mothers among the poor – many of whom are half-starved – that leads to the inability to provide milk for their offspring. This, in its turn, leads to early weaning, which involves artificial feeding, which is one of the most difficult undertakings in the tenement homes of the poor": Sir George Newman, *Infant Mortality: A Social Problem* (London, 1906), p. 260, cited in R. I. Woods, P. A. Watterson, and J. H. Woodward, "The Causes of Rapid Infant Mortality Decline in England and Wales, 1861–1921," Part II, *Population Studies*, vol. 43, no. 1 (March 1989), p. 120.

[13] Woods, Watterson, and Woodward, "Causes," Part I, p. 353. Again, Germany displayed the same pattern. In large German cities annual average infant mortality during the decade 1901–1910 was far higher among illegitimate babies than among legitimate ones. To cite some examples, the difference was 58 percent in Berlin; 44 percent in Breslau; 70 percent in Cologne; 192 percent in Dortmund; 130 percent in Frankfurt; and 96 percent in Königsberg: Jörg P. Vögele, "Urban Infant Mortality in Imperial Germany," *Social History of Medicine*, vol. 7, no. 3 (December 1994), pp. 412–13. In neither Britain nor Germany did these disparities significantly affect overall infant mortality rates, since the absolute number of illegitimate deaths was tiny compared to the global total.

[14] Spree, *Health and Social Class*, pp. 77–8.

Whatever indicator used, Western studies show that class was a crucial variable in explaining why infant mortality rates varied so greatly within one and the same society. When studying the USSR, however, it is virtually impossible to make comparable correlations. Yet we know that Soviet society was highly stratified, although the contours and causes of that stratification differed from those we see in the West. Because there was no private ownership of the means of production and no private property in land, privilege was not inherited. Because it was a shortage economy, to a large extent privilege was not even monetarized, although there were certainly large gulfs between the incomes of enterprise managers, the higher ranks of state and Party officials, and the upper reaches of the intelligentsia and the incomes of ordinary workers, not to mention the terrible destitution of the peasantry. By and large, privileges were granted in kind and came attached to the post recipients held in the political or professional hierarchy. Those in the elite had guaranteed supplies of food – not just more food, but food of better quality, including imported luxuries; better and larger apartments and the use of country dachas; privileged access to medical care and scarce medicines; and higher (and in Stalin's time probably almost exclusive) ownership of household consumer goods and automobiles. In the late Stalin period they also enjoyed the privilege of being allowed to engage in corruption with only minimal fear of reprisal.[15] In the 1960s and 1970s Soviet sociologists began exploring the morphology of social stratification and the mechanisms through which, in the absence of inheritable wealth, the intelligentsia (discussion of the Party elite was completely out of bounds) was able to reproduce its privileged position from one generation to the next.[16] Prior to that, however, we have almost no reliable data that would allow us to correlate this

15 On the reassertion of the privileges of the managerial and technical intelligentsia after the war, see J. Eric Duskin's thought-provoking book, *Stalinist Reconstruction and the Confirmation of a New Elite*. The classic account of privilege in this period is not by a social historian, but by Vera Dunham, a literature specialist, whose *In Stalin's Time* (Durham, NC: Duke University Press, 1990) remains one of the classic studies of postwar social differentiation. On corruption during late Stalinism, see James Heinzen, "A 'Campaign Spasm': Graft and the Limits of the 'Campaign' Against Bribery After the Great Patriotic War," in Fürst, ed., *Late Stalinist Russia*, pp. 123–41; and Cynthia Hooper, "A Darker 'Big Deal': Concealing Party Crimes in the Post-Second World War Era," also in Fürst, ed., *Late Stalinist Russia*, pp. 142–63.

16 For one of the pioneering Western studies of this literature, see Murray Yanowitch, *Social and Economic Inequality in the Soviet Union* (Armonk, NY: M. E. Sharpe, 1977). This is a book that retains its validity to this day, some thirty years after its original publication. In general, present-day historians of the Soviet period make insufficient use of what were then contemporary Soviet and Western studies of the USSR's social structure. These studies have many methodological flaws, but the picture they paint of the emergence of a reproducible class structure is absolutely unambiguous.

wealth and privilege with health, disease, and mortality. Yet the existence of these privileges is undeniable.

In fact, privilege and the *in natura* disbursement of rewards permeated every aspect of Stalinist society. During the hungriest years of the early 1930s the regime used the promise of scarce foodstuffs and consumer goods to motivate workers to become "shock workers" – workers who overfulfilled their production targets, so that managers could use their rate-busting performance to push up the targets for everyone. After rationing ended in 1935 a similar scheme was launched offering huge monetary rewards, the famous (or infamous) Stakhanovism movement.[17] Factories in heavy industry received better supplies of foodstuffs than those in light industry. Large cities of key industrial importance were better supplied than smaller towns. It is this, for example, that explains why school children in Gor'kii right after the war were several centimeters taller than school children in neighboring Dzerzhinsk and in the textile center of Ivanovo. Gor'kii's strategic importance ensured it better wartime supplies. Children from Gor'kii emerged from the war hungry and malnourished, but less so than their counterparts from cities the regime considered less important.[18]

Our main concern here, however, is class, perhaps the most difficult variable for which to find hard evidence. There is one piece of indirect evidence, however, from which we can draw some tentative conclusions. The same anthropometric studies of school children in Gor'kii and

[17] On shock work and Stakhanovism, see Don Filtzer, *Soviet Workers and Stalinist Industrialization: The Formation of Modern Soviet Production Relations, 1953–1964* (Cambridge: Cambridge University Press, 1992), pp. 70–81, 97–100, and chapter 7, as well as Lewis H. Siegelbaum *Stakhanovism and the Politics of Productivity in the USSR, 1935–1941* (Cambridge: Cambridge University Press, 1988).

[18] The difference in heights is striking for all age groups and for both boys and girls. Eight-year-old boys in Gor'kii in 1946 were roughly 5 centimeters taller than eight-year-olds in both Dzerzhinsk and Ivanovo. The gap among fifteen-year-old boys was approximately 4 centimeters. Among eight-year-old girls the difference was very small, but among nine-year-olds it was 6 centimeters, the same as for girls aged fifteen: GARF, f. A-482, op. 47, d. 7656, l. 381 (Gor'kii, 1937–1938 and Dzerzhinsk, 1946); N. A. Matveeva, Yu. G. Kuzmichev, E. S. Bogomolova, O. L. Kabanets, and N. V. Kotova, "Dinamika fizicheskogo razvitiya shkol'nikov Nizhnego Novgoroda," *Gigiena i sanitariya*, no. 2, 1997, p. 27 (Gor'kii, 1946); GARF, f. A-482, op. 47, d. 4925, l. 484–5 (Ivanovo). The privileged position of Gor'kii school children was purely relative. During the 1944–1945 school year the city organized special dining rooms to provide extra food for those school children whom doctors had diagnosed to be in need of supplemental nutrition. During their first year of operation, 89 percent of all school-age children in the city received a medical referral to use them. In 1945–1946 this dropped significantly, but the dining rooms still catered for 40 percent of the city's school children – nearly five times the number diagnosed with anemia and malnutrition. The number receiving medical referrals to the dining rooms fell to just 12 percent in the autumn of 1946 – not because the need had eased, but because government ration cuts had deprived the dining rooms of the extra food supplies they needed to feed the children: GARF, f. A-482, op. 47, d. 4923, l. 352–6.

Ivanovo were also carried out on young workers and students in Labor Reserve schools. Cohorts of school children in the older age groups would have contained a large element from the more well-off sections of the Soviet population: the children of Party and state officials, white-collar employees, and the varied ranks of the intelligentsia. Workers' children tended to leave school at age fourteen or fifteen and either enter a Labor Reserve school or go straight into a factory. In both Gor'kii and Ivanovo, young workers and working-class trainees in the Labor Reserve schools were considerably shorter than children of the same age and from the same city still in secondary school. In 1946, a fifteen-year-old male RU student in Gor'kii was a full 11 centimeters shorter than a fifteen-year-old school boy; among fifteen-year-old girls the corresponding difference was 12 centimeters. In Ivanovo, Panteleeva's large-scale study of Labor Reserve students in the local textile industry showed that, in 1946, fifteen-year-old boys were 10 centimeters shorter than fifteen-year-old Ivanovo school boys; for girls the difference was much smaller but still noticeable, around 3 centimeters.[19] There is, in fact, good reason for this discrepancy, as well as for the observation that young workers right after the war appeared to suffer from higher rates of malnutrition and anemia:[20] they were performing heavy physical labor. Their energy needs were enormous: they required energy for growth and for work. Before and after the war the regime attempted to recognize this fact by giving them relatively high-calorie diets. During the war, however, with food scarce, they were placed on the same ration as adult workers, which we have already seen was far below daily biological requirements.[21]

I have embarked on this long digression on class and inequality in order to show that class almost certainly was a determinant of health and well-being, and equally certainly must have affected infant mortality rates. Workers' families were more likely to live in dormitories and barracks,

[19] Matveeva, *et al.*, "Dinamika," p. 27; GARF, f. 9226 (Gossaninspektsiya), op. 1, d. 798, l. 103ob., 104 (Gor'kii); GARF, f. A-482, op. 47, d. 4925, l. 484–5, and Panteleeva, "Fizicheskoe razvitie," p. 27 (Gor'kii, 1946); GARF, f. A-482, op. 204, 212, 216 (Ivanovo). I have deliberately compared school children with students in RU, as opposed to the FZO. The FZO contained large numbers recruited from agriculture who, as we saw in Chapter 4, had a different, and in many ways superior, nutritional background. RU students came overwhelmingly from the local urban population.

[20] GARF, f. 9226, op. 1, d. 798, l. 100, 100ob., 101, 101ob., 102, 102ob.

[21] GARF, f. 9226, op. 1, d. 1119, l. 67–9. A 1945 change in the dietary allowance of Labor Reserve students, intended to increase their daily calorie intake, did little to help them, since the extra calories all came from carbohydrates and their diets remained badly deficient in protein. The nutritional situation of some Labor Reserve students began to improve only in 1948, with the end of rationing, not because their diets were better, but because those who were locally recruited and came from the same town where they were training could supplement the food they received at the schools with meals taken at home.

in workers' settlements without sewerage and good water supply, and in smaller industrial towns with few amenities. They were also less likely to have access to soap, a good knowledge of the basics of personal hygiene, or access to a doctor when their children fell ill. In the absence of good data, however, this is one part of the story of infant mortality that may never be properly told.

Breastfeeding

As the preceding discussion has already shown, whether or not mothers could breastfeed their babies played a large role in determining their vulnerability to disease. The issue was not breastfeeding *per se*, which ensured infants adequate nutrition and protection against infection via the mother's antibodies, but the nexus of breastfeeding, poverty, poor access to sanitation and clean water supply, and ignorance of basic hygiene. Even if they did not work outside the home, working-class mothers were unlikely to be able to breastfeed for the whole of infancy. Poverty and poor nutrition encouraged early weaning. Early weaning exposed children to unbelievable risks, for it was almost impossible to provide clean substitutes for human milk. Even if mothers had access to uncontaminated cow's milk (a rarity even in Britain until after World War I), it would soon become contaminated due to poor storage and the general absence of hygiene. One of the most dangerous practices in Victorian Britain was to feed infants using long-tube bottles. These were very difficult to clean, but were inexpensive and unbreakable, and so working-class mothers persisted in using them. Popular attitudes about feeding practices substantially increased the risk. Working-class parents in both Britain and Germany rarely cleaned bottles after feeding. In addition to milk, they fed babies meal pap, sugar water, scraps from their own plates, and sips of gin, beer, and no end of hazardous patent medicines, including castor oil and opiates.[22] It should not be surprising, therefore, that as late as 1904 a city such as Salford should report infant mortality rates of 129 per 1,000 births among breastfed babies; 264 deaths per 1,000 among babies reared on cow's milk; and a staggering 439 deaths per 1,000 among babies fed primarily on other foods, including the low-grade condensed milk favored by the poor because it was cheap and its sweetness made it appealing to babies.[23]

[22] Thompson, "Infant Mortality," pp. 143–4; Vögele, *Urban Mortality*, pp. 82, 179.
[23] Marilyn E. Pooley and Colin G. Pooley, "Health, Society and Environment in Victorian Manchester," in Robert Woods and John Woodward, eds., *Urban Disease and Mortality in Nineteenth-Century England* (London: Batsford Academic and Educational, 1984), n. 38 (p. 232).

As the above discussion should already make clear, high infant mortality was the product of multiple and mutually interacting causes. This makes its eventual decline more difficult to explain than it might at first seem. Sanitary reform, while it may have been a *sine qua non* of any long-term improvement, was not in itself sufficient. Factors such as the degree of overcrowding in housing, fertility rates (which affected overcrowding), mothers' ability and willingness to breastfeed, readiness to accept (or, conversely, to resist) new teachings on personal and domestic hygiene, the financial capacity to implement these teachings even if accepted all influenced the size and rate of mortality decline, however difficult it may be to measure their specific contributions.[24] The most notable area in which sanitary reform directly influenced infant mortality was in the decline in deaths from gastrointestinal infections, an impact that was particularly pronounced in Germany during the first decade of the twentieth century.[25] Yet even here Vögele is reluctant to credit it with actually causing this decline, as opposed to facilitating and helping to sustain it.[26] All this is relevant to my discussion of the postwar RSFSR to follow, where we shall see that those regions which enjoyed significant sanitary improvements had lower infant mortality than those regions which did not, but that overall infant mortality fell, even in the absence of those factors that had acted, albeit in a complex fashion, to bring it down in Britain and Western Europe.

The war years: the anomaly of infant and childhood mortality

The war caused a devastating rise in infant and child mortality, just as it did among the population at large. Infant mortality in hinterland regions of the RSFSR, taking the urban and rural populations together, jumped from 196 deaths for every 1,000 live births in 1941, to 314 deaths per 1,000 live births in 1942 (Table 5.5 and Figures 5.2a–g). The summer months were especially disastrous: for every 1,000 babies born alive in June of that year, 448 infants under a year old died; this rose to a staggering 555 in July and 611 in August, before falling back to 441 in

[24] Woods, Watterson, and Woodward, "Causes," Part II, pp. 129–32.

[25] Vögele, *Urban Mortality*, pp. 66–73. Its importance was negatively demonstrated in Britain, where the long-term secular decline in infant mortality, which began in the 1880s, was momentarily reversed by a series of hot, dry summers during the 1890s, which led in turn to a sharp rise in infant deaths, especially in the towns: Williams and Galley, "Urban–Rural Diffentials," p. 411, and Woods, Watterson, and Woodward, "Causes," Part II, p. 130.

[26] Vögele, *Urban Mortality*, p. 213.

Table 5.5 *Infant mortality in major hinterland regions of the RSFSR, 1939–1944*

Deaths of infants up to one year of age per 1,000 live births

	1939	1940	1941	1942	1943	1944
RSFSR	188	214	196	314	159	112
Urban	191	224	206	345	173	113
Rural	187	209	191	296	150	111
Moscow region						
Moscow oblast'	176	231	165	327	180	83
Urban	194	256	185	393	194	82
Rural	159	206	144	265	165	84
Moscow city	154	179	112	286	168	104
Central Russia						
Yaroslavl' oblast'	171	216	195	357	205	107
Urban	187	239	225	444	243	119
Rural	159	199	173	339	174	96
Ivanovo oblast'	205	240	202	424	201	104
Urban	231	246	235	503	209	93
Rural	176	232	167	348	193	118
Gor'kii oblast'	221	247	222	402	157	127
Urban	239	278	227	416	141	111
Rural	217	239	220	398	163	134
Gor'kii city	196	271	206	384	176	134
Volga region						
Kuibyshev oblast'	207	224	178	277	129	90
Urban	303	257	228	320	147	88
Rural	190	217	167	266	123	91
Kuibyshev city	245	290	273	325	197	123
Tatariya	201	230	189	296	157	129
Urban	261	295	235	420	173	139
Rural	188	214	176	260	150	124
Urals						
Sverdlovsk oblast'	240	274	234	389	155	150
Urban	219	269	226	364	136	144
Rural	259	278	245	417	182	161
Sverdlovsk city	221	252	192	339	201	134
Molotov oblast'	260	362	280	473	203	168
Urban	248	289	251	439	138	136
Rural	265	396	294	488	237	188
Molotov city	218	219	218	403	180	177
Chelyabinsk oblast'	216	222	218	286	170	104
Urban	214	237	225	303	171	108
Rural	218	207	211	266	169	97
Chelyabinsk city	231	255	244	331	227	143
Bashkiriya	186	229	179	212	140	86
Urban	203	278	209	270	175	107
Rural	184	220	172	199	130	79

Table 5.5 (*cont.*)

	1939	1940	1941	1942	1943	1944
Siberia						
Kemerovo oblast'	194	204	200	286	132	83
Urban	190	196	193	278	131	81
Rural	200	213	209	298	133	87

Source: GARF, f. A-374, op. 34, d. 1540, l. 1, 29.

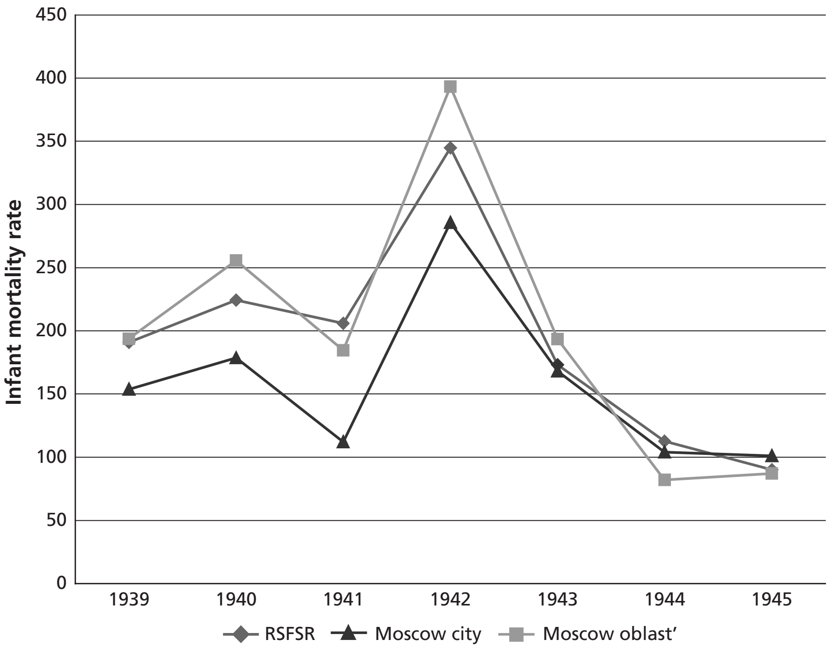


Figure 5.2a Urban infant mortality rate, Moscow region, 1939–1945

September.[27] There were some localities where levels of infant mortality simply defy our capacity to comprehend them. In the urban parts of Ivanovo oblast' one out of every two babies born died. Rural villages in Molotov oblast' were nearly as bad, with 488 deaths per 1,000 live births.

[27] V. A. Isupov, "Demograficheskie protsessy v tylovykh raionakh Rossii," in *Naselenie Rossii v XX veke*, vol. II, *1940–1959*, pp. 88, 96.

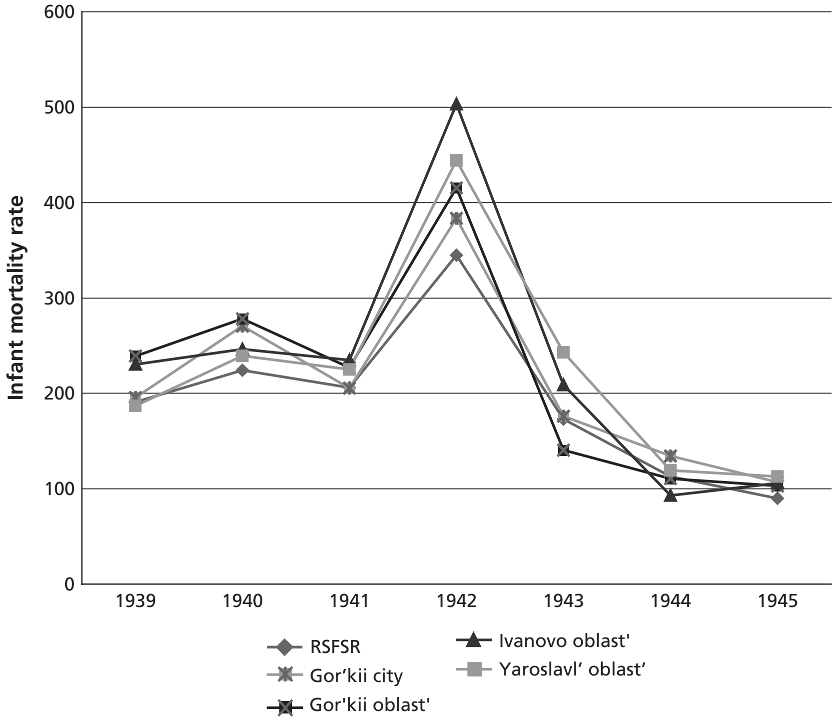


Figure 5.2b Urban infant mortality rate, Central Russia, 1939–1945

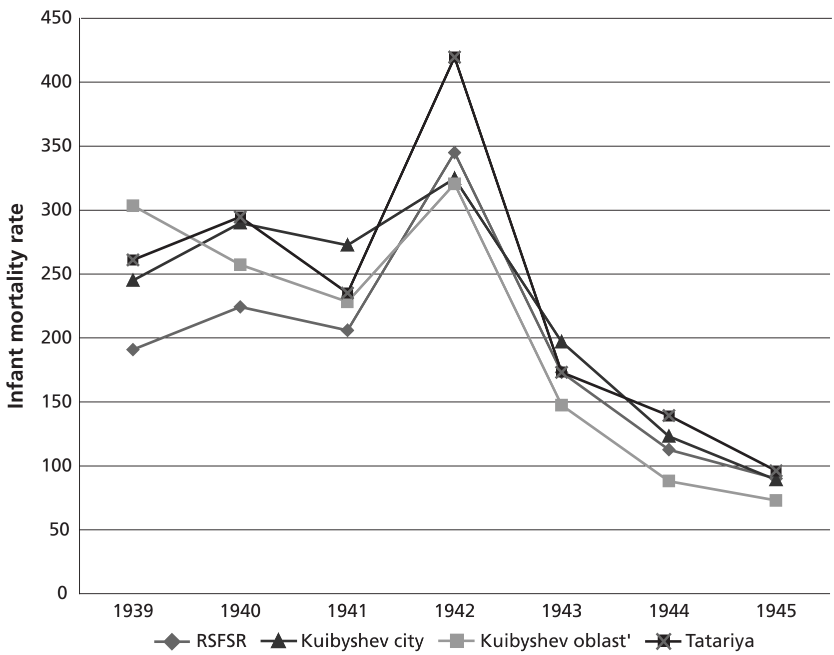


Figure 5.2c Urban infant mortality rate, Volga region, 1939–1945

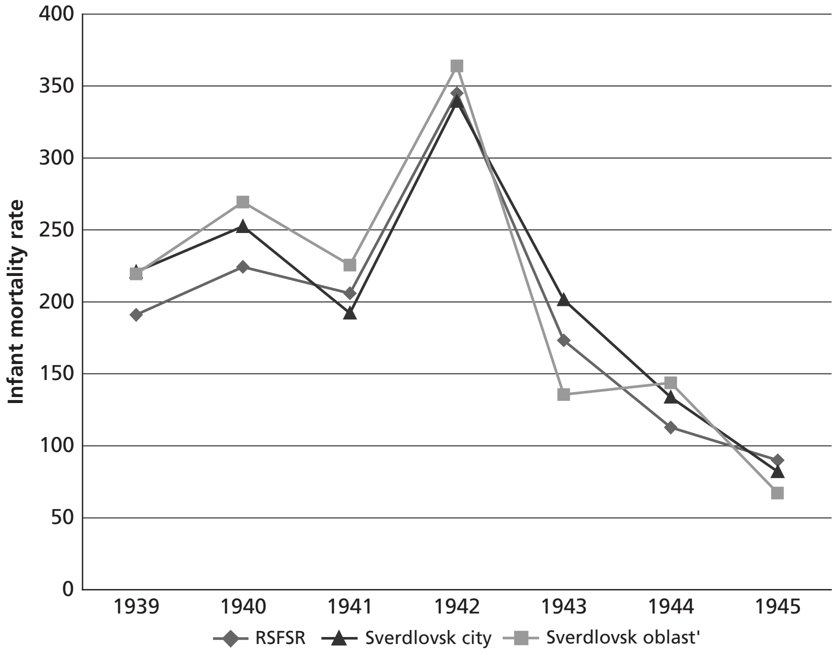


Figure 5.2d Urban infant mortality rate, Sverdlovsk region, 1939–1945

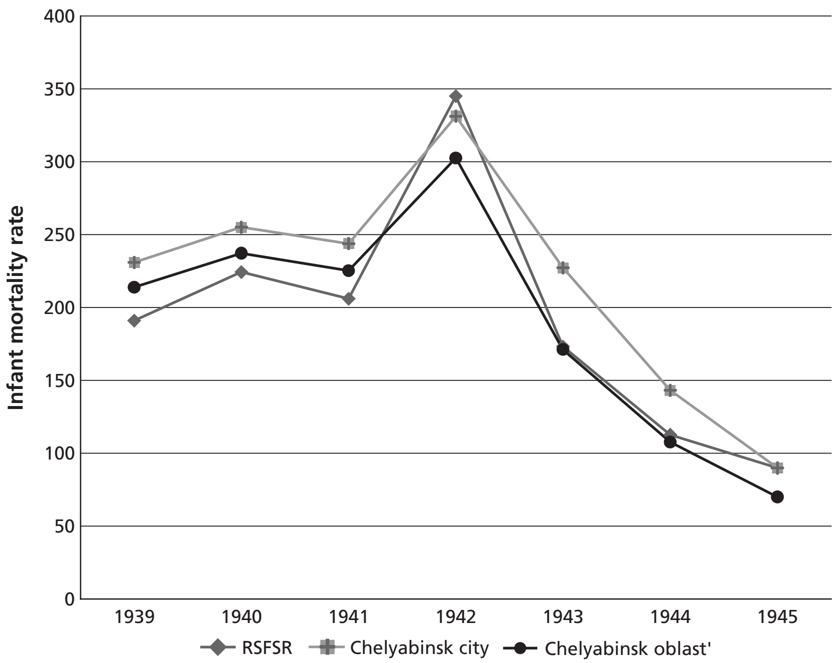


Figure 5.2e Urban infant mortality rate, Chelyabinsk region, 1939–1945

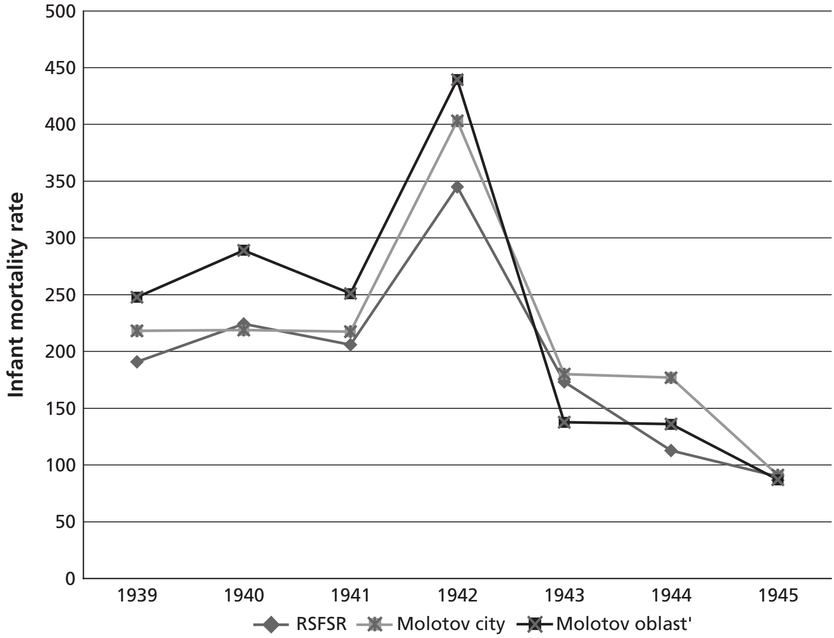


Figure 5.2f Urban infant mortality rate, Molotov region, 1939–1945

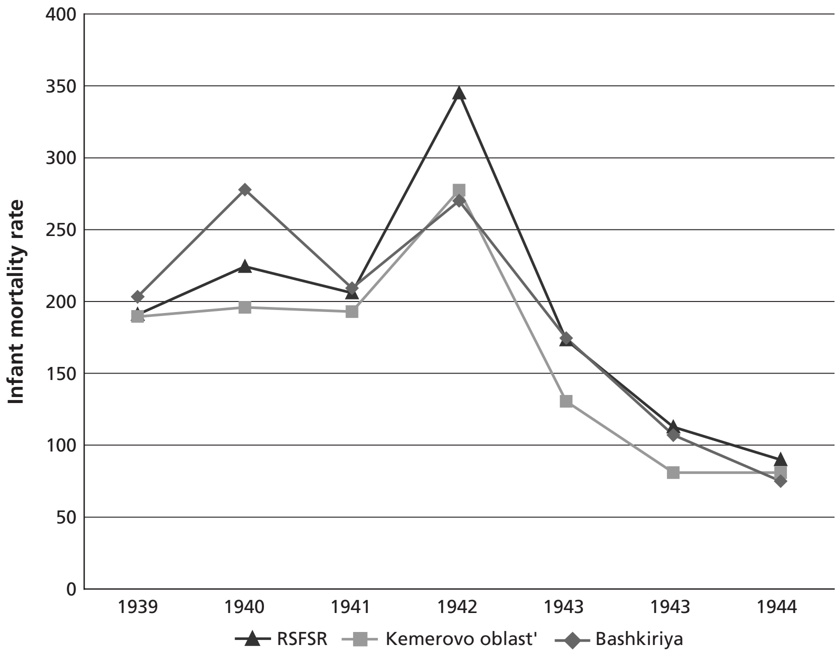


Figure 5.2g Urban infant mortality rate, Bashkiriya and Kemerovo oblast', 1939–1945

There then followed a whole slew of regions in whose towns (and in some cases also the countryside) the infant mortality rate (IMR) exceeded 400: Tatariya, Molotov city, the urban centers of Yaroslavl', Gor'kii, and Molotov oblasti, and the villages of Sverdlovsk oblast'.

What happened after that, however, was most unexpected. Infant mortality in the non-occupied regions dropped to 159 deaths per 1,000 live births in 1943, and 112 deaths per 1,000 live births in 1944. The 1944 figure was barely more than half that of 1940, the last full prewar year. Urban areas of the RSFSR showed this same trend: deaths per 1,000 live births went from 206 in 1941, to 345 in 1942, but then fell to 173 in 1943 and 113 in 1944.[28] With the exception of 1947, the famine year, infant mortality never again approached its prewar levels.

Why this was so is difficult to explain. N. A. Aralovets and O. M. Verbitskaya attribute the fall in 1943 and 1944 to improvements in hygiene, sanitation, and medical care,[29] but this is an overly general explanation and, besides, tells us nothing about how or why the improvements were sustained during the postwar years. It is possible that during the last two war years the dramatically lower birth rate played a part since, with so many fewer children being born, those who were could receive better attention and medical care. The improved food situation may have meant that mothers were healthier, less likely to give birth to badly underweight babies, and had more strength to look after them. A phenomenon observed during the Dutch famine may also have been at work. There the birth rate fell massively, as most women either were unable to conceive or, if they became pregnant, were unable to carry their babies to term or to produce a healthy infant if they did. The women who conceived and produced a live birth were disproportionately from the upper sections of society and had better access to food, and perforce were also better able to ensure the survival of the child.[30] Something similar may have occurred on the Soviet home front, although precisely which sections of the population would have enjoyed such nutritional privilege is impossible to determine. All of these explanations are little more than conjecture at present, and will remain so until historians are able to make detailed studies of wartime local living conditions, diets, and the organization and delivery of health care, as well as inequalities in their distribution.

We know slightly more about the factors influencing childhood mortality in these years, but how far this is applicable to infant mortality is open to question. Childhood mortality rose in 1942. Although it is impossible to

[28] GARF, f. A-374, op. 34, d. 1540, l. 1, 29.
[29] Aralovets and Verbitskaya, "Osobennosti smertnosti," p. 113.
[30] Stein, *et al.*, *Famine and Human Development*, pp. 77–82.

demonstrate conclusively, many of these deaths must have been hunger-related. Another factor, however, was a sudden deterioration in case fatality rates (that is, deaths per 100 cases of infection) for the major infectious diseases of measles, whooping cough, scarlet fever, and diphtheria. Of these, the main killer before the war had been measles; mortality from the other three diseases had largely been brought under control. Even where measles was concerned, during the 1930s the Soviet Union had attempted to adapt and apply methods being developed in the West to contain measles epidemics. These involved strict rules for the identification and quarantine of carriers and the administration of human immune serum to anyone exposed to the disease. Western scientists had recognized the use of immune serum – serum extracted from the blood of recovered measles patients and which contained anti-measles antibodies – to immunize children exposed to the disease in the late 1890s, although it was not until the period just after World War I that the science received wider experimentation and application. Despite its general effectiveness at either preventing or attenuating measles infections, the treatment had numerous limitations. It was not a vaccine, but provided only temporary protection. It had to be administered in very large doses and had a limited storage life. Thus efforts in the West concentrated on finding low-dosage substitutes. A major breakthrough occurred in 1933, when Charles Fremont McKhann and F. T. Chu, experimenting with the use of placenta extract, managed to separate out immune globulin. Subsequent refinements by other scientists eventually led to the purification of gamma globulin in 1944. Although it worked on exactly the same principle as immune serum, gamma globulin had a number of advantages. It was easier to store and more stable, could be administered in lower doses, caused fewer adverse reactions, and had an equal, if not superior, success rate.[31]

In whatever form, the efficacy of human immune serum depended on a well-functioning system of epidemiological controls: early diagnosis and detection of measles cases, quick action to track down contacts, isolation and quarantine of carriers, and prompt administration of serum to those exposed. In the prewar Soviet Union this must have been an enormous

[31] Lidiya Ignat'evna Kolesnikova, "Novyi preparat dlya profilaktiki kori–gamma-globulin" (Dissertation for Candidate of Medical Sciences, Moscow, 1948), pp. 2, 5–8, 13–39, 40–9, 50–3, 121; M. G. Danilevich, "Gammaglobulin i ego primenenie v profilaktike kori," *Voprosy pediatrii i okhrany materinstva i detstva*, vol. 14, issue 3, 1946, pp. 54–9; C. W. Ordman, C. G. Jennings, Jr., and C. A. Janeway, "Chemical, Clinical, and Immunological Studies on the Products of Human Plasma Fractionation, XII: The Use of Concentrated Normal Human Serum Gamma Globulin (Human Immune Serum Globulin) in the Prevention and Attenuation of Measles," *Journal of Clinical Investigation*, vol. 23, no. 4 (July 1944), pp. 541–9.

Table 5.6 *Measles case fatality rates in Moscow, Leningrad, and eight other RSFSR cities, 1936–1945 (deaths per 100 cases)*

City	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945
Moscow	4.3	3.8	3.9	3.8	3.5	3.6	5.9	3.9	2.4	1.6
Leningrad	1.9	2.3	2.4	2.6	2.2	–	–	4.6	1.0	1.5
Eight RSFSR cities	–	–	11.6	13.3	12.0	8.4	12.7	2.6	1.2	1.3
Kazan’	–	–	21.0	16.0	17.0	14.0	21.0	5.3	1.3	–

Sources: O. A. Rikman, “Detskie infektsii v gody velikoi otechestvennoi voiny,” *Mediko-sanitarnye posledstviya voiny i meropriyatiya po ikh likvidatsii* (Moscow: USSR Academy of Medical Sciences Publishing House, 1948), p. 153 (Moscow, Leningrad, RSFSR); GARF, f. A-482, op. 47, d. 2328, l. 36 (Kazan’).

task, as was the production of immune serum in all but the very largest Soviet cities. The fact that blood from donors had to be placed and transported in sterile test tubes and then kept under refrigeration[32] must have been a serious challenge in a country with very few refrigerators and where bumpy roads and poor-quality vehicles (many doctors still traveled by horse before the war) would have made it difficult to keep the tubes steady and avoid the blood becoming contaminated by non-sterile corks or stoppers. It is therefore not surprising that there were huge regional variations in prewar measles case fatality rates. Table 5.6 shows case fatality as deaths per 100 cases, in Moscow, Leningrad, eight unspecified RSFSR cities, and Kazan’ between 1936 and 1945.

Even before the war, measles case fatality rates in the eight Russian urban areas outside Moscow and Leningrad were some three to three and one-half times higher than in Moscow and roughly five times the rate in Leningrad. In Kazan’ the gap was even larger: four to five times the rate in Moscow, and seven to eight times that in Leningrad. Although there may have been other factors at work which might help explain such a huge difference,[33] it seems safe to assume that at least part of the gap was due to the difficulties of applying proper epidemic controls and administering immune serum.

32 Narkomzdrav SSSR, Protivoepidemicheskoe upravlenie, *Organizatsionno-metodicheskie materialy – vypusk 1, seroprofilaktika kori* (Tula, 1941), pp. 17, 21.

33 Until recently there was an assumption that nutritional status was a key determinant of case fatality in measles. More recent work by Peter Aaby, *et al.*, has questioned this hypothesis. Their work in Guinea-Bissau, where during the course of their study general nutritional status deteriorated yet case fatality rates improved, found that a far more important factor was lack of clustering of cases and reduced intensity of exposure: Peter Aaby, Jette Bukh, Ida Maria Lisse, and Maria Clotilde da Silva, “Decline in Measles Mortality: Nutrition, Age at Infection, or Exposure?,” *British Medical Journal*, vol. 296, April 30, 1988, p. 1227.

As Table 5.6 suggests, the war at first saw a substantial rise in measles case fatality. In Moscow, where case fatality had been roughly stable from 1937 to 1941, there was a 64 percent increase in 1942. In the cities of the RSFSR and in Kazan', the pattern was slightly different: 1941 had shown a marked decline relative to previous years, and the surge in 1942 brought these cities back to where they had been before the improvement.

The figures for 1942 and 1943 are not difficult to explain. Leningrad, of course, had its own peculiar circumstances due to the blockade, and in fact Rikman's table provides no figures for Leningrad during either 1941 or 1942. In Moscow living conditions deteriorated badly, despite the fall in the city's population due to evacuation. In the other urban areas of the RSFSR, the mass evacuation of civilians, including small children, caused severe overcrowding, which, following the argument of Peter Aaby, *et al.*, would have increased the clustering of cases and intensity of exposure. Such circumstances would have made it almost impossible to effect proper epidemiological controls. The whole essence of the anti-measles policy depended on the isolation of both carriers and exposed children, and this became extraordinarily difficult to accomplish when so many children lived in barracks and dormitories, and when so many mothers (who would otherwise have had to take leave from their jobs to nurse them) were engaged in war work and growing food. Recognizing this problem, during 1943 doctors in Moscow oblast' attempted to set up special pediatric inpatient units in towns, state farms, and workers' settlements. They circumvented the difficulties of quarantine by turning nurseries and kindergartens into inpatient units as soon as doctors discovered a case of measles, and housed both sick and exposed children in them until the disease had run its course. For children in the so-called unorganized contingent, that is, not attending a nursery, kindergarten, or school, the medical authorities set up special measles inpatient clinics. In this way they kept the children out of the dormitories and mothers at their jobs. The results of the Moscow oblast' experiment are of interest for two reasons: first, where they were able to implement it, sickness rates and case fatality were very low; secondly, the oblast' did not have the resources during wartime to make this practice universal. Despite the good results wherever it was tried, it made almost no impact on general sickness rates for measles within the oblast' as a whole.[34]

Why, then, did 1943 see such a sharp drop in measles deaths? The reason seems to be a combination of demographics and greater effort to

[34] G. A. Piskunova, "Opyt shirokoi gospitalizatsii korevykh bol'nykh," *Trudy Moskovskoi oblastnogo Instituta epidemiologii, mikrobiologii, i infektsionnykh boleznei imeni Mechnikova*, vol. III (Moscow: Medgiz, 1947), pp. 135–42.

improve medical practice (the Moscow oblast' experience notwithstanding). Infant mortality in 1942 had been catastrophically high. The birth rate also fell. There were therefore far fewer very young children surviving into 1943. Where outbreaks of measles occurred, the pool of potential sufferers was older, and doctors had long known that the older the child when contracting the disease, the better the chances of a non-lethal outcome.[35] For this reason alone case fatality from measles had to fall. Another factor reinforcing the first one was the nature of the evacuation. Once evacuees had arrived at their destination, population movements slowed down considerably. When the epidemic of 1942 had finally run its course, there were few potential carriers of the disease coming into cities from outside to start a new epidemic. This would have lowered infection rates and, combined with the older age structure of the child population, also lowered case fatality. This was illustrated most dramatically in besieged Leningrad. Following World War II, Western medical experts noticed what they considered to be a strange phenomenon, that children in the Warsaw ghetto and other localities where children had suffered extreme malnutrition seemed to be virtually immune to certain infectious diseases, most notably measles; even if they did contract them, the course of the illness tended to be attenuated.[36] The same occurred in Leningrad, where the major infections virtually disappeared at the height of the siege, and even common streptococcal and staphylococcal infections became rare. As soon as the siege eased and the population began to resume something approaching normal nutrition, these infections returned.[37] All this, together with some more modern observations, have led medical experts to speculate that starvation itself offers some form of protection against many, but not all, infectious diseases.[38] In fact, such speculation about the relationship between hunger and immunity began during the

[35] O. A. Rikman, "Detskie infektsii v gody velikoi otechestvennoi voiny," *Mediko-sanitarnye posledstviya voiny i meropriyatiya po ikh likvidatsii* (Moscow: USSR Academy of Medical Sciences Publishing House, 1948), p. 163.

[36] Keys, *et al.*, *Biology*, p. 27 (Gor'kii, 1946); GARF, f. A-482, op. 1011–13. Keys, *et al.*, cites the experiences of Budapest and the Warsaw ghetto, but point out that Austrian physicians in 1945 observed the opposite phenomenon, namely that during the worst of the postwar food shortages measles became especially virulent.

[37] Svetlana Magaeva, "Physiological and Psychosomatic Prerequisites for Survival and Recovery," in Barber and Dzeniskevich, eds., *Life and Death in Besieged Leningrad*, p. 145.

[38] John D. Post, "Nutritional Status and Mortality in Eighteenth-Century Europe," in Newman, ed., *Hunger in History*, pp. 241–5. In his summary of the modern medical literature, much of it based on the study of impoverished children in underdeveloped countries, Post noted the need to distinguish those groups of diseases which clearly had a synergistic relationship with malnutrition, most importantly tuberculosis and respiratory and diarrheal infections, from those that malnutrition either seemed not to influence or even perhaps discouraged – among which were measles, polio, and hepatitis.

Leningrad siege itself. At least two Leningrad physicians who worked in the city during the siege specifically rejected the idea in favor of the epidemiological explanation. Between 1942 and 1944 there were indeed no cases of measles in Leningrad, but this, they argued, was due to the specific circumstances of the siege: the infant and child population had been decimated and no carriers of disease were coming into the city. The resurgence of measles in 1944 they attribute not to refeeding and the resumption of normal nutrition, but to the reentry into Leningrad of child evacuees. The sheer numbers – over 16,000 young children returned to Leningrad between February and June 1944 – simply overwhelmed all epidemic control systems, and a major outbreak of measles occurred.[39]

What is striking, however, is that while the demographic argument may help explain the sharp fall in case fatality from measles and the other childhood infections during 1943, it does not explain why such a low case fatality rate was sustained more or less permanently afterwards. Leningrad was not alone in seeing a dramatic rise in the number of measles cases during 1944 and 1945. Measles cases per 10,000 population in Kazan' went from 72.2 in 1940, to 38.3 in 1942, 13.3 in 1943, and then saw an almost eight-fold rise to 100.5 in 1944. Yet case fatality, as we saw in Table 5.6, fell from 21 percent in 1942 to just 1.3 percent in 1944.[40] In fact, throughout the non-occupied territories of the USSR, 1944 and 1945 saw a very pronounced rise in the number of measles cases compared to 1943 – yet case fatality, at least in Russia, in 1945 was around a tenth of what it had been in 1942.[41] As we shall see, the principal childhood infectious diseases ceased to be major killers for the whole of the postwar period.

As with other aspects of disease control, the efforts to contain typhus being the most obvious example,[42] it is probable that the sheer scale of the crisis of 1942 prompted health officials, both local and national, to take what steps they could to reorganize the implementation of basic public health policies. For the infectious diseases – and not just measles – this meant attempting to press doctors to make early diagnoses, to hospitalize promptly, and to attempt to control the spread of epidemics through isolation and, where medical science made it possible, through vaccination

[39] I. M. Ansheles and B. E. Kaushanskaya, "Epidemiologicheskaya kharaktera detskikh kapel'nykh infektsii v Leningrade za voennyi i poslevoennyi period," *Trudy Leningradskogo instituta epidemiologii i mikrobiologii im. Pastera*, vol. X (Leningrad, 1948), pp. 190–4; B. E. Kaushanskaya, "Ugasanie kori v period blokady Leningrada i ee vozniknovenie posle snyatiya blokady," *Trudy Leningradskogo instituta epidemiologii i mikrobiologii im. Pastera*, vol. X, pp. 344–52.

[40] GARF, f. A-482, op. 47, d. 2328, l. 35, 36.

[41] Isupov, "Demograficheskie protsessy," p. 99.

[42] See Chapter 3, pp. 149–56, 158–61.

or temporary immunization. One has to presume that the implementation of these measures was locally variable and haphazard, yet in aggregate they seem to have borne results – not just with the four main communicable diseases, but also with sanitation-dependent diseases such as dysentery and typhoid fever.[43] Unlike the common childhood infections, however, the sanitary diseases bounced back with a vengeance after the war, most notably among infants.

The crisis of 1947

The 1947 famine caused a dramatic, if temporary, halt to the downward trend in infant mortality. Once the crisis had passed, infant mortality, at least in the towns, did not immediately return to its 1944 or 1945 levels; on the contrary, it was to be several years, roughly around 1952 or 1953, before this occurred. What is more, the recovery was highly uneven between industrial regions. Table 5.7 shows the data for infant mortality in the RSFSR between 1945 and 1951. As with Table 5.5, for each region or oblast' it gives total infant mortality (expressed as deaths in the first year per 1,000 live births), followed by separate figures for urban and rural areas within each oblast'.

This is a dense table, but I hope what it shows will become clearer in the course of further elaboration. The first comment I need to make is methodological. The table uses TsSU data on births and infant deaths which, for a number of reasons, probably underestimate the true level of infant mortality. In 1949, the medical statistician M. Ya. Kassatsier, noted that there was a sizable discrepancy between the number of births and infant deaths recorded by health officials (both inpatient facilities and by medical personnel – doctors or midwives – attending home births), and the births and deaths officially registered at the ZAGS, the official registry office (Otdel zapisei aktov grazhdanskogo sostoyaniya). One source of distortion was the fact that a certain percentage of rural women gave birth in hospitals or clinics in towns. Such births were listed on the books of urban medical facilities; for the purposes of demographic statistics, however, these births needed to be counted as rural. If any babies of these mothers died during the first days of life, while the mothers were still inpatients, they, too, would be recorded as "urban" deaths. Again, statistical accuracy required that they be re-recorded as rural deaths. To complicate things still further, not all births took place with a doctor or midwife in attendance. Therefore the true numbers of births would be

43 Isupov, "Demograficheskie protsessy," p. 99; GARF, f. A-482, op. 47, d. 2328, l. 33 (Kazan').

Table 5.7 *Infant mortality in hinterland industrial regions of the RSFSR, 1945–1951*

Deaths of infants up to one year per 1,000 live births

	1945	1946	1947	1948	1949	1950	1951
RSFSR	85	81	132	95	86	89	91
Urban	90	91	152	102	92	102	94
Rural	81	73	117	90	81	79	90
Moscow region							
Moscow oblast'	84	88	136	87	76	78	81
Urban	87	99	154	96	83	88	87
Rural	79	74	113	75	66	67	73
Moscow city	101	85	126	88	69	66	53
Central Russia							
Yaroslavl' oblast'	107	96	167	104	83	87	99
Urban	113	109	196	118	89	106	105
Rural	100	82	137	91	77	69	92
Yaroslavl' city	121	119	205	125	95	116	106
Ivanovo oblast'	103	103	152	108	83	92	101
Urban	106	108	177	117	88	106	103
Rural	99	97	114	96	77	72	98
Ivanovo city	118	125	214	135	91	110	95
Gor'kii oblast'	97	88	122	102	78	83	94
Urban	103	97	144	98	74	96	96
Rural	95	84	114	103	79	81	93
Gor'kii city	107	117	190	106	78	91	85
Volga region							
Kuibyshev oblast'	68	60	102	81	81	65	76
Urban	73	75	128	97	84	74	93
Rural	67	56	93	76	81	61	68
Kuibyshev city	89	99	162	105	111	95	83
Tatariya	84	79	121	92	87	85	85
Urban	96	105	149	104	90	97	91
Rural	78	67	108	87	86	79	82
Kazan'	104	116	160	114	95	103	94
Urals							
Sverdlovsk oblast'	74	85	166	128	103	113	118
Urban	67	80	157	124	101	118	117
Rural	87	93	181	137	109	104	121
Nizhnii Tagil	49	76	166	121	105	142	123
Sverdlovsk city	82	115	193	121	106	134	86
Molotov oblast'	112	111	179	147	128	132	151
Urban	87	96	169	123	118	141	138
Rural	132	121	186	163	136	124	161
Molotov city	91	98	174	110	108	111	93
Chelyabinsk oblast'	72	79	156	114	107	113	109
Urban	70	83	166	121	113	121	109
Rural	78	71	138	101	95	97	110

Table 5.7 (*cont.*)

	1945	1946	1947	1948	1949	1950	1951
Magnitogorsk	78	69	176	148	157	165	97
Zlatoust	62	102	207	111	97	125	106
Chelyabinsk city	90	105	186	120	113	116	90
Bashkiriya	57	53	105	96	85	88	85
Urban	75	79	133	114	99	108	91
Rural	50	43	95	90	80	79	83
Ufa	93	88	163	127	112	118	92
Siberia							
Kemerovo oblast'	79	83	133	102	99	117	113
Urban	81	90	141	112	106	124	116
Rural	74	69	117	85	84	101	107
Kemerovo city	66	102	160	111	117	145	125
Stalinsk	73	89	133	120	107	136	124
Prokop'evsk	85	92	130	106	97	123	128

Sources: 1945–1950: RGAE, f. 1562, op. 329:
1945: d. 1883, l. 3–11;
1946: d. 2229, l. 1, 4–11, and d. 2230, l. 3–12;
1947: d. 2648, l. 196–8, 204–13, 242;
1948: d. 3157, l. 2, 27–35, 37;
1949: d. 3807, l. 1, 24–33;
1950: d. 3806, l. 32–4, 36–7, 41–2, 46–7, 49–55, 58–61, 65, 66, 68, 69, 71, 72, 74, 75, 77, 80, 81, 84, 85, 86, 94, and d. 4703, l. 7–9, 181–4, 186–90;
1951: GARF, f. A-374, op. 14, d. 1702, l. 9–19.

larger than those listed in clinic or hospital records. However, statisticians claimed that they had a rough idea of what percentage of births did not receive medical attendance. This made it a relatively simple matter to extrapolate the actual number of births, infant deaths, and early neonatal deaths in both town and countryside. The problem arose when statisticians compared the hospital and clinic figures with actual ZAGS registrations. They found that ZAGS underestimated the number of infant deaths during the first nine days of life by roughly 30 percent in the towns and 35 percent in the countryside. Allowing for the weight of these early deaths among all infant deaths, the ZAGS data implied an overall underestimation of infant deaths up to one year by around 3.7–3.8 percent in both urban and rural areas.[44] In fact, the TsSU began to adjust the figures to

[44] Kassatsier, *Detskaya smertnost'*, l. 19–22, 26–27, 34–35, 38, 92. By way of example, health authorities in Ivanovo during early 1947 discovered twenty-two cases of babies who died just days or even hours after birth. The parents had not wanted to bury them themselves, and the maternity homes where the births took place did not report the deaths to ZAGS: GARF, f. A-482, op. 52s, d. 204, l. 89. The problem did not necessarily become less

reflect this disparity from 1947 onwards. This means that the all-RSFSR data for 1945 and 1946 in Table 5.7 need to be adjusted upward by around 3.7 percent simply to make them consistent with TsSU statistical practice after 1946.

This, however, is only one possible difficulty. In the late 1990s, the Russian demographers E. M. Andreev, L. E. Darskii, and L. T. Khar'kova recalculated infant mortality in the RSFSR for the years 1928–1959, and concluded that, for the years we are dealing with here, the TsSU data underestimate the real total by around 26–27 percent.[45] Aside from the fact that they do not make clear how they actually do the recalculations, we cannot use their corrected figures as a basis for our own analysis. They do not break infant mortality down into urban and rural components, and so we have no way of knowing whether the alleged distortions in the TsSU data affected town and countryside uniformly, or whether, as is often claimed, the underestimation of rural infant mortality is more severe.[46] Equally important from our point of view, in order to make local comparisons we would need to know the extent of statistical error in each specific oblast' and city.

To add further to our problems, there is the simple fact of underreporting. There has always been a suspicion that, when registering infant deaths during the first day of life, many were classified as stillbirths and in this way kept out of the infant mortality statistics altogether. How widespread this practice may have been we have no way to know. What we do know is that underreporting, not just of stillbirths but also of older infant deaths, was arbitrary and varied from one locale to another, and from month to

opaque over time. A 1951 sampling of births and deaths as recorded by medical personnel and those registered with ZAGS found sometimes huge but irregular discrepancies, with the ZAGS figures being considerably lower. In Kemerovo oblast' they found a 14.8 percent underregistration of births and a 5 percent underregistration of infant deaths. In Kuibyshev, by contrast, there was no disparity at all between the medical and ZAGS records. In some cases the underregistrations appear to have been local; in Leningrad, by contrast, almost all the non-registered births were among outsiders who happened to give birth in Leningrad, because they either came into the city to do so or happened to be caught there when they went into labor. Whatever the cause, there was no consistency whatsoever between localities in the size of the distortions: GARF, f. A-374, op. 14, d. 1730, l. 13, 66; d. 1732, l. 12; d. 1735, l. 34–5.

45 E. M. Andreev, L. E. Darskii, and L. T. Khar'kova, *Demograficheskaya istoriya Rossii: 1927–1959* (Moscow: Informatika, 1998), pp. 161–2; they elaborate the methodology behind the recalculations in chapters 4–6.

46 One of the more obvious reasons for assuming this was that, especially in the early postwar period, the countryside was very poorly served by medical facilities, and parents who lost a child right after birth might simply bury it without bothering with registration. It is interesting to contrast this example with that in n. 44. Here we have two seemingly contradictory forms of behavior – failing to bury the baby, on the one hand, and burying the baby, on the other – both of which led to the same result: failure to record the babies' deaths.

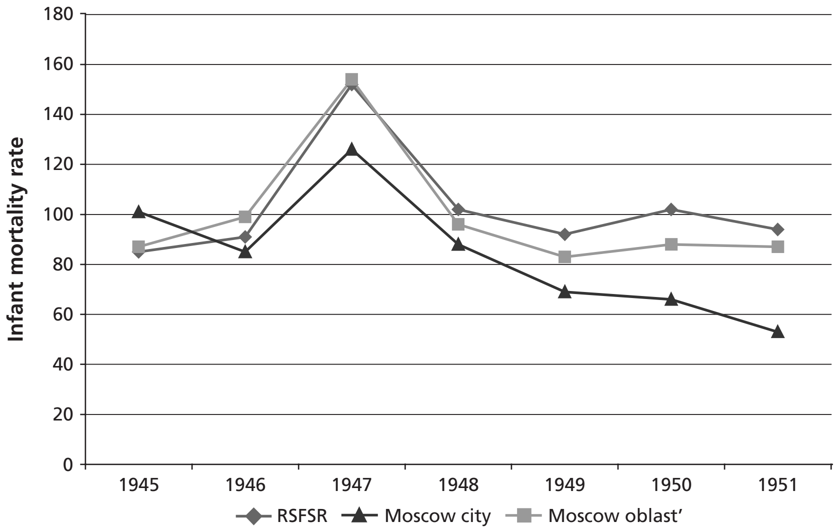


Figure 5.3a Urban infant mortality rate, Moscow region, 1945–1951

month. In other words, it was not systematic and is therefore impossible to quantify, both locally and on aggregate.[47]

We therefore have no choice but to accept the TsSU data as the best we have at our disposal. If not totally accurate in detail, they at least give a true picture of the general contours of infant mortality, its variations from one year to the next, and disparities between regions.

I save for the next section the discussion of the longer-term trends after 1947. What I want to do here is to analyze the specific impact of the famine on infant deaths, especially in the towns. If we convert Table 5.7 into charts for each region, we can see just how serious this impact was for the country's urban population.

In 1945 and 1946 – even allowing for the fact that these data are uncorrected and should be increased by between 3 and 4 percent – infant mortality in the RSFSR had fallen to levels roughly comparable to those that had prevailed in England and Wales, the Netherlands, and Denmark

[47] I distinguish between underregistration and underreporting. By underregistration, I have in mind the discrepancy between the number of births and infant deaths of which the medical authorities had definite knowledge, but which were not registered with ZAGS. After 1947, at least, the TsSU statisticians attempted to capture this divergence and correct the figures accordingly. Underreporting I take to mean those deaths either deliberately excluded from the mortality figures (as in the example of stillbirths) or simply concealed from the authorities by the parents.

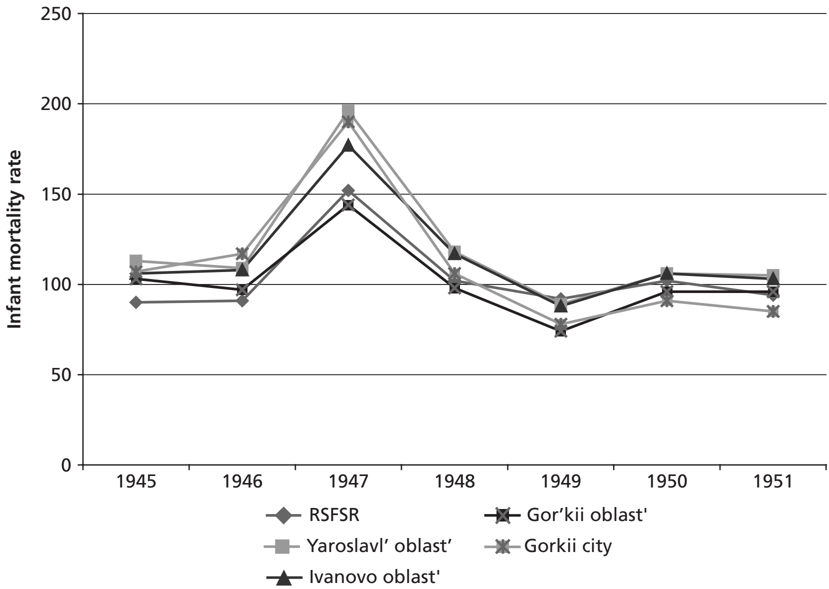


Figure 5.3b Urban infant mortality rate, Central Russia, 1945–1951

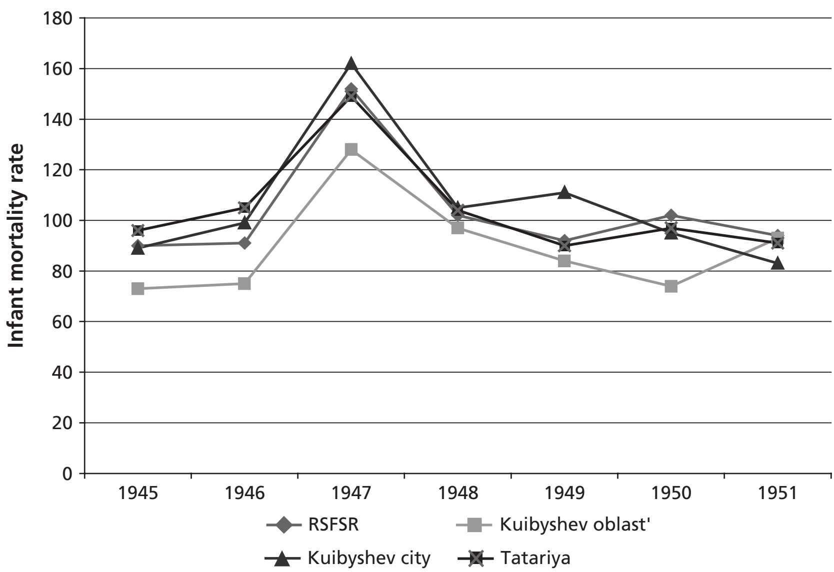


Figure 5.3c Urban infant mortality rate, Volga region, 1945–1951

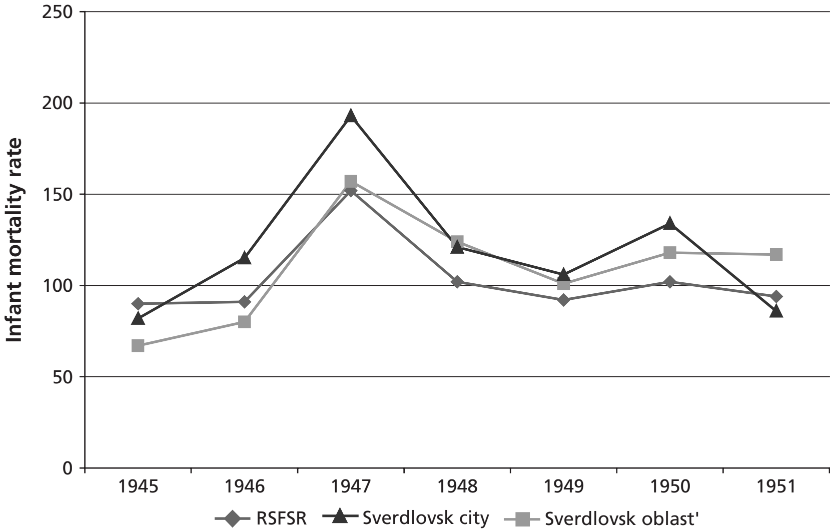


Figure 5.3d Urban infant mortality rate, Sverdlovsk region, 1945–1951

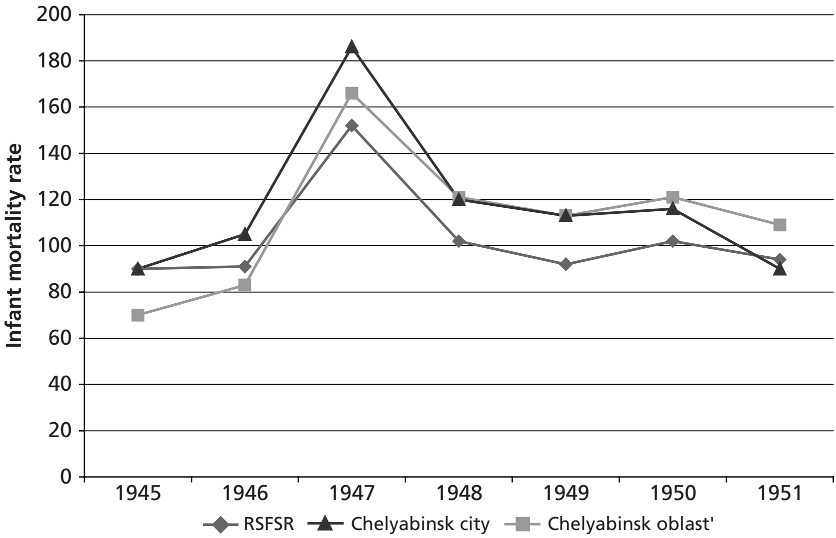


Figure 5.3e Urban infant mortality rate, Chelyabinsk region, 1945–1951

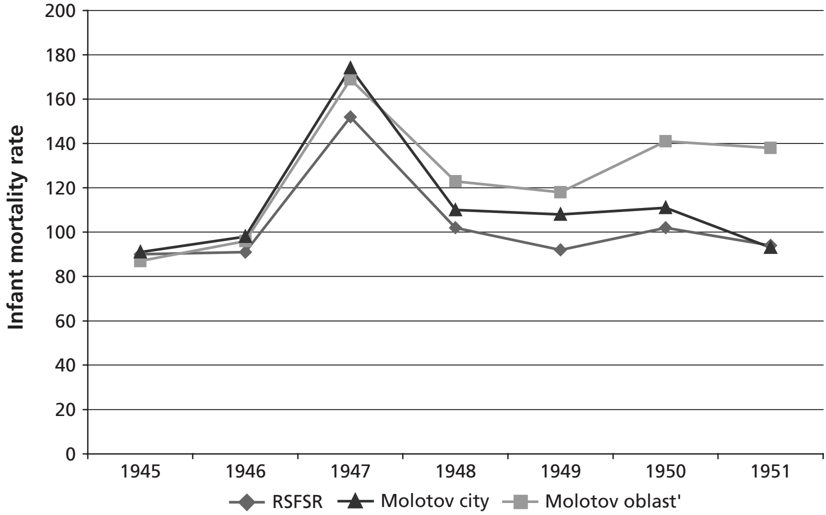


Figure 5.3f Urban infant mortality rate, Molotov region, 1945–1951

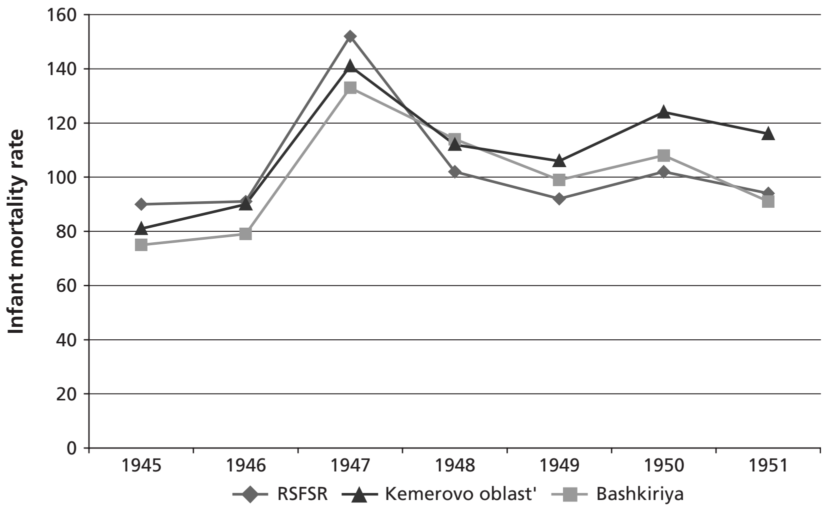


Figure 5.3g Urban infant mortality rate, Bashkiriya and Kemerovo oblast’, 1945–1951

(the three European countries with the lowest infant mortality rates) twenty-five to thirty years earlier. In 1947 infant mortality for the RSFSR as a whole rose by 63 percent. The increase was slightly larger in the towns than in the countryside: 67 percent versus 60 percent, a phenomenon consistent with the persistence of the urban penalty. There were some rural areas, however, which in terms of percentage increases in mortality suffered nearly as badly, if not worse, than towns in the same region: most notably in Kemerovo, Sverdlovsk, and Chelyabinsk oblasti, and Bashkiriya and Tatariya (see Table 5.8). If we want a point of comparison, urban infant mortality in England and Wales between 1889 and 1891, the start of a very bad decade when adverse weather conditions made infant mortality especially high, averaged 218 infant deaths per 1,000 live births.[48] Several Russian cities in 1947 showed infant mortality on this same order of magnitude: roughly 160 deaths per 1,000 live births in Kemerovo, Kuibyshev, Kazan', and Ufa; 174 in Molotov and 176 in Magnitogorsk (Chelyabinsk oblast'); 186 in Chelyabinsk; 190 in Gor'kii and 193 in Sverdlovsk; 205 deaths per 1,000 live births in Yaroslavl', 207 in Zlatoust (Chelyabinsk oblast'), 214 in Ivanovo, and 222 in Shcherbakov (Yaroslavl' oblast', not shown in Table 5.7). We can compare these with the infant mortality rate of 200 deaths per 1,000 live births in Bradford in the 1860s (which fell to 170 by 1900), or the 190–200 typical of Manchester during the entire second half of the nineteenth century.[49]

It is worth looking at regional variations, in particular at the size of the increase in the infant mortality rate in different oblasti. These I show in Table 5.8. The average increase for urban areas across the RSFSR was, as noted, 67 percent. There were two main regions where the rise in the urban infant mortality rate was above average. One was the textile centers of Central Russia: the cities of Ivanovo and Yaroslavl' and the towns of Yaroslavl' oblast'. The other was the Urals (although not, interestingly enough, Kemerovo oblast'). The towns of Molotov oblast', as well as Molotov city itself, saw a leap in excess of 75 percent. In Sverdlovsk oblast' the urban infant mortality rate nearly doubled, and in Nizhnii Tagil, the oblast's largest town, it more than doubled, with a rise of 118 percent. In Chelyabinsk city the infant mortality rate rose by 77 percent, but in the towns of Chelyabinsk oblast' it doubled, including a rise of 103 percent in Zlatoust and 155 percent in Magnitogorsk. Moreover, a glance back at Table 5.7 shows that in the Urals, and to a lesser extent in Yaroslavl',

48 Woods, Watterson, and Woodward, "Causes," Part I, p. 353.
49 Thompson, "Infant Mortality," pp. 137–9; Pooley and Pooley, "Health," p. 157.

Table 5.8 *Percentage increases in infant mortality, hinterland industrial regions of the RSFSR, 1946–1947*

	1946 IMR	1947 IMR	percentage increase
RSFSR	81	132	63.0
Urban	91	152	67.0
Rural	73	117	60.3
Moscow region			
Moscow oblast'	88	136	54.5
Urban	99	154	55.6
Rural	74	113	52.7
Moscow city	85	126	48.2
Central Russia			
Yaroslavl' oblast'	96	167	74.0
Urban	109	196	79.8
Rural	82	137	67.1
Yaroslavl' city	119	205	72.3
Ivanovo oblast'	103	152	47.6
Urban	108	177	63.9
Rural	97	114	17.5
Ivanovo city	125	214	71.2
Gor'kii oblast'	88	122	38.6
Urban	97	144	48.5
Rural	84	114	35.7
Gor'kii city	117	190	62.4
Volga region			
Kuibyshev oblast'	60	102	70.0
Urban	75	128	70.7
Rural	56	93	66.1
Kuibyshev city	99	162	63.6
Tatariya	79	121	53.2
Urban	105	149	41.9
Rural	67	108	61.2
Kazan' city	116	160	37.9
Urals			
Sverdlovsk oblast'	85	166	95.3
Urban	80	157	96.3
Rural	93	181	94.6
Nizhnii Tagil	76	166	118.4
Sverdlovsk city	115	193	67.8
Molotov oblast'	111	179	61.3
Urban	96	169	76.0
Rural	121	186	53.7
Molotov city	98	174	77.6
Chelyabinsk oblast'	79	156	97.5
Urban	83	166	100.0
Rural	71	138	94.4
Magnitogorsk	69	176	155.1

Table 5.8 (*cont.*)

	1946 IMR	1947 IMR	percentage increase
Zlatoust	102	207	102.9
Chelyabinsk city	105	186	77.1
Bashkiriya	53	105	98.1
Urban	79	133	68.4
Rural	43	95	120.9
Ufa	88	163	85.2
Siberia			
Kemerovo oblast'	83	133	60.2
Urban	90	141	56.7
Rural	69	117	69.6
Kemerovo city	102	160	56.9
Stalinsk	89	133	49.4
Prokop'evsk	92	130	41.3

Note: IMR = Infant mortality rate.
Source: Table 5.7.

infant mortality persisted at high levels until 1951, an issue I take up in more detail in the next section.

The famine saw a significant change in the causes of infant deaths, as well as in the age composition of the babies who died. When infant mortality fell after the war, the decline affected all age groups, both neonatal and post-neonatal; the biggest gains, however, were in the post-neonatal group. The infant mortality rate among babies less than one month old dropped by 22 percent between 1940 and 1946, but in the 9–12 month age range the fall was over 55 percent.[50] There is nothing unusual about this development, which reflected a trend observed in other industrialized societies. The reasons behind it are also instructive. In Western Europe and the United States, most of the progress in curbing post-neonatal deaths was due to the near-eradication of deaths from infectious diseases, in particular from gastrointestinal and respiratory

[50] Calculated from Kassatsier, *Detskaya smertnost'*, l. 34–5. These figures are far from precise. Kassatsier's figures for total infant mortality for the years 1940–1946 diverge markedly from those recalculated by the SU RSFSR in 1956, with no consistent pattern to the discrepancies. His estimates of both urban and rural IMR for 1940 are notably lower than the SU RSFSR figures; his estimates for 1946 are considerably higher. His data imply a drop in overall infant mortality of 46.7 percent, versus a fall of 59.4 percent indicated by the SU RSFSR. It is therefore probable that the improvement in neonatal mortality was more marked than he calculated.

infections.[51] Something similar was happening in late Stalinist Russia, as infant deaths from gastrointestinal infections and pneumonia, not to mention from the major childhood infections (most notably measles), were dramatically lower in 1945 and 1946 than they had been in 1940, although in absolute terms they remained high until the early 1950s.

In Russia, 1947 saw a temporary reversal of this trend, with a pronounced deterioration in post-neonatal infant mortality. Infant mortality among babies under one month old changed hardly at all between 1946 and 1947: moving from 29.0 deaths per 1,000 births to 30.7. Post-neonatal mortality, however, almost doubled, from 62.0 deaths per 1,000 births to 121.3.[52]

This change was reflected in the causes of death during 1947. Deaths from pneumonia and other respiratory infections as a share of all infant deaths remained almost unchanged. So, too, did deaths from the major childhood infections, measles, whooping cough, diphtheria, and scarlet fever. The percentage of infant deaths from the various factors affecting neonatal mortality declined (prematurity, "weakness at birth," unspecified illnesses affecting newborns, and birth defects). The truly sharp increase was deaths from the range of gastrointestinal infections: dysentery, "toxic dyspepsia," and what the mortality tables listed as severe gastroenteritis, which in 1947 must surely have included starvation diarrhea (Table 5.9). We need to remember that these diagnoses could be very imprecise. It was very easy to misdiagnose (either in error or deliberately) starvation diarrhea and attribute it to dysentery or gastroenteritis.

Note, too, that the "other" causes of death – the category under which medical authorities and statisticians had to hide deaths from starvation – played a very minor role in the increase in infant mortality during 1947, in sharp contrast to its importance in explaining the rise in mortality among adults.

All of these observations are perfectly logical. Food supplies very probably affected neonatal mortality only indirectly, rather than directly. Malnourished mothers were more likely to have premature and/or low-weight babies with poorer chances of survival. They were also more likely

[51] P. O. D. Pharoah and J. N. Morris, "Postneonatal Mortality," *Epidemiological Review*, vol. 1 (1979), pp. 170, 173. Looking at England and Wales in the mid-1970s, the authors noted that post-neonatal mortality rates were closely associated with class, the number of children, and the relative youth of the mother. The babies of mothers under the age of 25 with three or more children in the lowest two social classes were over seven times more likely to die between the ages of one and twelve months than the babies of mothers aged 25–29 with only one child in the upper two social classes (*ibid.*, pp. 176–7).

[52] Calculated from RGAE, f. 1562, op. 329, d. 2229, l. 1; d. 2235, l. 4ob.; and d. 2648, l. 35ob., 242.

Table 5.9 *Causes of infant death as a percentage of all infant deaths, urban areas of the RSFSR, 1946–1947*

Cause of death	1946	1947
Pneumonia and other respiratory infections	29.7	30.0
Gastrointestinal infections*	26.9	32.8
Major infectious diseases**	5.2	5.2
Tuberculosis (all forms)	3.6	3.9
Meningitis	2.2	1.8
Failure of newborns to thrive***	20.2	11.9
"Other" causes of death and causes not in the official enumeration of causes	6.1	8.8

Notes: *Includes dysentery, "toxic dyspepsia," severe gastroenteritis, "other" gastrointestinal infections.
**Includes measles, diphtheria, whooping cough, scarlet fever (scarlatina), and unspecified acute infections.
***Includes "weakness at birth," "illnesses affecting newborns," prematurity, and birth defects.
Sources: Calculated from RGAE, f. 1562, op. 329, d. 2235, l. 3, 3ob., 4, 4ob. (1946); d. 2648, l. 35, 35ob., 36, 36ob. (1947).

to abandon breastfeeding early. So long as they could sustain breastfeeding, however, their babies would remain more or less protected from serious gastrointestinal infections. Indeed, even in 1947, neonatal mortality from gastrointestinal infections was extremely low. The main risks to neonatals remained the same as before: failure to thrive and pneumonia.[53]

Where babies became vulnerable during a famine was after weaning, when they became trapped in a nexus of poor availability of alternatives to breast milk and poor sanitation and hygiene. In Chapter 4, I analyzed the milk shortage that afflicted all urban areas in the RSFSR during 1947. With the exception of the towns in the industrial oblasti of the Urals and the Kuzbass (Kemerovo oblast'), average per capita milk consumption in workers' families was on the order of 50 to 80 milliliters a day. Nowhere was milk sold in state shops. Factory farms sometimes provided milk to their staff, but this did not always go to the workers, since top officials might appropriate most of it for themselves.[54] For most workers,

[53] Kassatsier, *Detskaya smertnost'*, l. 66.
[54] The massive Dneprostroi construction site in Ukraine had 814 specialists who between them usurped 40 percent of the site farm's milk production, while workers' children in nurseries and pioneer camps received virtually no milk at all. Between them these specialists consumed more fats than all the site's workers put together. The site had mass malnutrition among its workers, and some of these died as a result: Filtzer, *Soviet Workers and Late Stalinism*, p. 74. Although this example is from Ukraine, it is highly unlikely that it was an isolated case.

if families did not have their own cow, they had to buy milk on the *kolkhoz* market, where it was prohibitively expensive. The situation in 1947 became so critical that a number of cities (including Molotov and Kuibyshev) had to resort to offering donors of breast milk 30 or 40 rubles per liter, plus an extra ration card (although, significantly, not a ration card for bread).[55] Mothers therefore relied on public milk kitchens for milk and formula, but these, too, could not meet the full extent of need. In Ivanovo the milk kitchens could satisfy only 25 percent of total demand. Since mothers could not afford to buy milk on the private market they went without, and one in five newborn babies in Ivanovo died during that year.[56]

A similar situation arose in Kuibyshev, but there the story was more tragic, because it showed that the milk shortage was not simply the result of structural factors – inadequate dairy herds and a shortage of fodder following the 1946 drought – but was, at least in part, the product of deliberate regime policy. As we have seen in Tables 5.7 and 5.8, the infant mortality rate in Kuibyshev in 1947 was 162 deaths per 1,000 live births, an increase of around two-thirds over 1946. During 1947, over 37 percent of all infant deaths in the city were due to gastrointestinal illnesses.[57] Infants' homes, nurseries, and other children's establishments had only 30 percent of the milk they needed during the summer months and only 15 percent during the rest of the year. Private families were finding milk equally unobtainable, a fact which the chair of the Executive Committee of the city soviet blamed directly for the huge rise in infant mortality. The city's main dairy (the Kuibyshev City Milk Factory) had the responsibility to provide milk to pregnant women and nursing mothers, children's institutions, maternity homes, medical facilities, teenagers in the city's Labor Reserve training schools, and workers whose jobs exposed them to hazardous substances. To meet this demand, the dairy relied on milk deliveries from fourteen rural districts outside the city. In 1946 – that is, before the crisis hit – these deliveries had totaled 18,316 tons of milk (around 18.3 million liters). In theory all of this milk could have gone directly to consumers. In fact, very

[55] GARF, f. A-482, op. 47, d. 6770, l. 13, 14. Even here the scheme ran into difficulties because the money allocated to finance it was insufficient. It cost between 20 and 25 rubles a day to feed a child on donated breast milk, versus the 9–10 rubles a day the authorities actually had at their disposal.

[56] GARF, f. A-482, op. 52s, d. 221, l. 76. The city was also plagued by a fuel shortage during a very cold winter, so pneumonia took a heavy toll as well. Infant mortality in Ivanovo, at over 21 percent, was among the worst in the RSFSR in 1947: 35 percent of these deaths were from pneumonia, 32 percent from gastrointestinal infections or diarrhea, and nearly 5 percent were attributed to starvation. Ivanovo is practically the only example I have found where the authorities listed starvation as a specific cause of infant deaths.

[57] GARF, f. A-482, op. 52s, d. 224, l. 53–4.

little of it did. The RSFSR Ministry of the Milk and Dairy Industry ordered the Kuibyshev dairy to divert 64 percent of its total milk supply to the manufacture of butter, and another 2 percent to the manufacture of ice cream – or two-thirds of its milk stocks overall. This left it with less than half the milk it needed to meet its various commitments to the general population. In fact, the only milk products it could deliver were soured-milk products brought in from rural districts or dairy products that were fat-free and totally unsuitable for infants. In early 1947, and despite appeals to the RSFSR Council of Ministers, the situation deteriorated, rather than improved. The city had only 7.3 percent of its allocation of whole milk and 11 percent of its allocation of full-fat dairy products, while its plan for butter was being overfulfilled by nearly 80 percent. In the words of the chair of the city soviet, the overfulfillment of the butter plan was coming at the expense of milk.[58] We do not know for whom the Kuibyshev dairy was producing this butter. It certainly was not going to the workers of Kuibyshev, whose average daily consumption of butter in 1947 was just 5.8 grams a day, and whose per capita daily consumption of milk was a mere 74 ml.[59] At the risk of overinterpreting the sources here, it is hard to avoid the conclusion that the infants of Kuibyshev were dying so that the elite in Moscow and elsewhere could have butter on their tables.[60]

The shortage of milk posed a real danger to infants. If mothers could not breastfeed they had to rely on cow's milk. If cow's milk was unavailable, parents had to find other foods to use as substitutes. The risk here was twofold. First, in a time of famine alternative foods were likely to be

[58] GARF, f. A-482, op. 47, d. 6769, l. 17, 21–3, 26–30, 187.

[59] For butter, see GARF, f. A-374, op. 3, d. 2230, l. 2–2ob., 3–3ob. For milk, see Table 4.15.

[60] The Stalinist regime's distribution policies exacerbated infant mortality in another way as well. Many infants died because, once they fell ill, their parents did not immediately seek treatment for them. They feared that if they hospitalized their children they would have to surrender the child's ration cards to the hospital – without which the hospital could not receive an allocation for the child's food. But this meant that the families would do without, which in a time of famine they were reluctant to do: GARF, f. A-482, op. 47, d. 6770, l. 4.

The situation in the RSFSR was similar to the milk crisis that gripped Budapest during the winter of 1944–1945, when the city was under effective siege by German troops who had recently evacuated it, taking with them the city's dairy cattle and most of its food reserves. Most mothers of young babies were too feeble to breastfeed, and cow's milk was unavailable. Parents thus had to resort to various colloidal and crystalloid carbohydrates to fashion makeshift formula. Because sanitation systems had completely broken down, it was almost impossible to observe basic rules of hygiene when preparing food for infants. Dysentery, which was endemic to Budapest, spread rapidly. There was an upsurge in infant deaths, most notably from starvation and diarrheal diseases: E. Kerpel-Fronius, "Infantile Mortality in Budapest in the Year 1945: As Reflected by the Material of the Children's Clinic of the University," *Journal of Pediatrics*, vol. 30, no. 3 (March 1947), pp. 244–9.

insufficient in quantity and in essential fats and nutrients. The infant could well die of starvation. Secondly, given the general absence of urban and domestic hygiene, the preparation of these foods increased the likelihood of the baby catching, and dying from, an intestinal infection. Public milk kitchens existed to prevent, or at least to minimize, precisely this outcome. We know from the case of the Crimea, for example, that a large (but unspecified) proportion of visits to pediatric clinics during 1947 were parents asking doctors to write them prescriptions for formula or baby foods from these kitchens.[61] There is no reason to presume that this was not common elsewhere.

The idea of milk kitchens, where mothers could go to receive safe supplies of milk or baby formula, was not unique to the Soviet Union. The safety of milk supplies had long been a cause of concern in Western Europe. We tend to think of the main problem being tuberculosis, but in fact the hazards were many, including the infantile diarrhea that was one of the main causes of infant mortality. Certainly in Victorian Britain the farms that produced milk were generally in an appalling state. Fresh milk was regularly contaminated by cow dung, bacteria from storage in unsterilized milk pails, bacteria from diseased udders, and the mixing of fresh milk with milk that was old and stale. Added to this were the risks of spoilage during the time it took to cart milk from the farms to the cities. One solution was the ubiquitous urban cowsheds – here the milk was certainly fresher, but their small size made it almost impossible to maintain them hygienically, and the huge volume of cow dung they produced exacerbated problems of urban sanitation. Bacteriological analyses of milk in London's St. Pancras area in 1899 found less than a third of samples to be biologically "clean." The rest contained bacteria, leukocytes, pus from infected udders, and tuberculosis bacilli. These results were not untypical. Samples of the Manchester milk supply in the same period found 48 percent classed as of "doubtful" quality and another 12.5 percent as "dirty." Of course, once analytical techniques had progressed to the point where scientists could measure the presence of *E. coli* (an intestinal bacterium) in milk, the results could be horrifying. Tests in Liverpool in 1901 and 1902 found over three-quarters of milk from the countryside contaminated with *E. coli*, as well as two-thirds of milk being supplied to hospitals. Early attempts to "purify" milk by adding chemical agents were not successful. The chemical additives were themselves dangerous and of dubious bacteriocidal efficacy. Tinned milk, which became a favorite of working-class mothers after 1870, spoiled quickly once opened and was nutritionally deficient.

[61] GARF, f. A-482, op. 52s, d. 245, l. 24.

It was in response to these problems that British cities opened up milk depots, beginning with one in St. Helens near Liverpool in 1899, followed soon thereafter by Liverpool, Ashton-under-Lyne near Manchester, Battersea in London, Leith near Edinburgh, Bradford, Burnley, Glasgow, and Dundee. The depots produced sterilized milk and something called "humanized" milk, which was cow's milk chemically treated to make it more closely resemble human milk. Both products were expensive and out of reach of the very working-class mothers for whom they were intended. The need for mothers to travel daily to the depots, to wash bottles before their return, and to pay for any breakage also discouraged uptake. Sterilized milk had the additional drawback that the sterilization method destroyed many of the nutrients. As a result, after an initial success (Liverpool's depots provided for 11,900 infants during 1910), demand both in Britain and in Germany (where a similar movement grew up between 1904 and 1907) soon started to fall. Despite tighter regulation of milk safety, pasteurization did not become standard practice until the interwar period, that is, well into the twentieth century. The method was expensive and, at least in the late nineteenth century, not universally accepted as effective. As a result, even in the 1920s milk in Britain continued to carry a number of pathogens.[62]

The milk kitchens in the Soviet Union at this time operated on a vastly larger scale than anything in nineteenth- or early twentieth-century Europe. In Gor'kii oblast', the kitchens provided over 4 million portions of milk, formula, and prepared baby foods to some 273,000 children during 1947.[63] In theory they, together with infants' homes, nurseries, and children's homes, should have enjoyed priority allocation, but the shortage was so severe right across the country that they did not receive nearly as much as they required. In Chelyabinsk, Gor'kii oblast', and presumably elsewhere, the kitchens had to dilute their whole milk with water and make their formulas using water, instead of milk – a fact which the Chelyabinsk GSI claimed contributed to the increase in rickets, starvation (*distrofiya*), and dysentery among the city's infants.[64]

62 P. J. Atkins, "White Poison? The Social Consequences of Milk Consumption, 1850–1930," *Social History of Medicine*, vol. 5, no. 2 (August 1992), pp. 207–27; Vögele, *Urban Mortality*, pp. 181–5; Evans, *Death in Hamburg*, pp. 172–5. One of the main aims of Atkins's article is to show that improvements in milk safety could not – as some earlier historians had claimed – have played a role in the decline in infant mortality. The fall in infant mortality began at least three decades before milk was generally safe to drink. If it fell, this was despite the persistent threat posed by milk supplies.

63 GARF, f. A-482, op. 47, d. 6335, l. 216.

64 GARF, f. A-482, op. 47, d. 6363, l. 10 (Chelyabinsk city); d. 6335, l. 216. The contribution to dysentery might have come from two quarters. Dilution risked spreading any infection that might have been in the water; some of the cases diagnosed as "dysentery" may in fact have been starvation diarrhea.

The shortcomings of the kitchens went beyond their inability to obtain milk. They had serious problems maintaining safe hygiene. In the kitchens in Gor'kii oblast' inspectors found utensils, allegedly clean dishware, and the hands of employees all contaminated with bacteria. Kitchens did not routinely sterilize food before dispensing it, nor did they sterilize dishware. One particularly hazardous practice was to issue food in parents' own vessels without first cleaning them. This was not something unique to this oblast'. The milk kitchens in Moscow came in for the same criticism with regard to donors of breast milk, who were allowed to express milk at home into their own, unclean containers.[65]

When rationing ended in December 1947, the kitchens, as with public catering in general, had to shift to commercial methods of operation, that is, they had to cover their operating costs through revenues rather than state subsidies. In Molotov oblast' forty-six of eighty-one milk kitchens found themselves "unprofitable" and had to close. They had become "unprofitable" because once they began setting prices on a commercial basis mothers could no longer afford their formula and baby food and stopped buying them. As with any case when a socially necessary good is allocated on market principles, it was precisely the children most in need of the kitchens who now had to go without their services.[66]

The longer-term role of the kitchens was mixed. In Tatariya most of the kitchens had closed their doors by 1953 – they existed on paper, but did not in fact operate. They had become extremely unpopular with the population for two basic reasons: they remained far too expensive for ordinary citizens, and hygiene in them was still primitive. They operated

65 GARF, f. A-482, op. 47, d. 6335, l. 216–17 (Gor'kii oblast'); d. 6352, l. 57 (Moscow). According to a 1948 circular issued by the USSR Ministry of Health to officials in charge of sanitary education, "Observations have shown that milk kitchens frequently disburse milk and milk formulas in insufficiently clean vessels. It is also the case that those receiving the milk or milk formulas carry them home in uncovered containers. The contamination in this way of infant food can serve as one of the etiological factors causing children to contract dysentery or other intestinal infections … In addition to this, parents do not always store the formulas acquired from the milk kitchens in a cold place. These facts are indicative of the poor state of sanitary-educational work in the milk kitchens and distribution stations": "O sanitarno-prosvetitel'noi rabote na profilaktike kishechnykh infektsii u detei rannego vozrasta," (undated mimeographed circular; published in *Sbornik metodologicheskikh materialov po sanitarnomu prosveshcheniyu* [Barnaul, 1949]), p. 7.

66 Nurseries – which catered for vulnerable infants and young children already in poor health – also went onto a commercial footing at this time, with the same result. Low-paid and single mothers, that is, the parents of the most vulnerable children, now had to withdraw them. The summer "health improvement campaigns" followed the same path – they began charging for participation and parents stopped sending their children: GARF, f. A-482, op. 52s, d. 244, l. 241–5. On the commercialization of public catering and its consequences, see Filtzer, *Soviet Workers and Late Stalinism*, pp. 83–4.

from makeshift premises, with no refrigeration and little basic equipment, and still transported milk in open buckets and flasks so that it was vulnerable to contamination.[67] In Moscow, by contrast, they still played a significant role in infant nutrition – a somewhat surprising fact given that Moscow had far better food supplies than anywhere else and we might therefore expect that parents were in less need of their services. Yet in 1953 the city still had twenty-two milk kitchens, almost all of which were working at two or three times their planned capacity. This gives us some idea of the demand for their products. It also reflects the poor physical and sanitary state they were in. Most were housed in makeshift buildings, with insufficient and badly worn equipment and inadequate workspace. Almost inevitably, kitchens found it difficult to observe basic rules and procedures for the sterilization of their products. For example, kefir, a sour yoghurt-style drink, should have been fermented in individual, pre-sterilized bottles; instead, kitchens prepared it in a large, non-sterile vat and then poured the potentially contaminated mixture into bottles. As late as 1951, only three of twenty-two kitchens had refrigerators, although this increased to twelve kitchens by 1953. Most had no storage rooms. Empty bottles, preparation vessels, and equipment were stored in open-air courtyards; clean glassware was kept alongside dirty dishware. Some did not even have toilets for their staff. Shockingly, even as late as 1951 kitchens still did not have enough bottles for dispensing milk and formula – parents had to bring their own containers from home. Worse still, kitchens did not have corks or stoppers (not to mention sterile corks). Allegedly clean and sterile preparations were sealed with non-sterile cotton plugs and shipped to other parts of town in open trucks, virtually guaranteeing contamination of the contents. After all this it comes as a surprise to learn that levels of bacterial contamination were actually quite low – but only because in 1950 the chief of the RSFSR GSI had issued new, more lax standards for bacterial contamination, increasing the permitted general bacteria count per milliliter of liquid by a factor of ten and the amount of intestinal bacteria per milliliter threefold. Yet tests showed that between 1947 and 1951 some 23 percent of all pasteurized or boiled milk products failed the old, more stringent tests for general bacteria; 6 percent failed the tests for intestinal bacteria. For soured-milk products the results were rather worse: nearly 40 percent failed the old test for intestinal bacteria. All in all, this constituted a major health risk. We need also to bear in mind that these were tests in the kitchens themselves – samples taken at distribution points showed much higher levels of

[67] GARF, f. A-482, op. 49, d. 7325, l. 39–40.

contamination, some of which occurred during bottling and storage, and some at the distribution centers because they did not have refrigeration.[68]

The situation in the early 1950s was, however, fundamentally different from 1947. More milk was available in state shops, and more families could afford at least some milk purchases on the private market. The 1950s reports are significant for a rather different reason. If this is what the safety of the milk kitchens was like in Moscow in the 1950s, what must it have been like during 1947 in the towns and cities where we know that milk supplies were more precarious and general sanitation was much worse? In 1947 the problem was twofold. First, the kitchens did not have adequate milk supplies to nourish those babies whose mothers could no longer breastfeed and who could not buy milk on the open market. Secondly, what milk and other baby foods the kitchens did provide could themselves be so contaminated that they might cause a potentially lethal infection to the infant.

The decline of infant mortality after 1947

In Table 5.7 we saw that infant mortality in 1947 shot up to levels close to those of the prewar period. As the famine abated, infant mortality again returned to the levels that had been achieved toward the end of the war. The downward tendency proved permanent. In this sense 1947 was an aberration; never again did the country see infant mortality rates of prewar orders of magnitude. A closer look at that table, however, reveals that this process of recovery was neither uniform nor straightforward. There were very large regional variations. In the Urals, especially the industrial cities and towns of Chelyabinsk oblast' (Magnitogorsk, Zlatoust), infant mortality did fall after 1947, but not all the way back to where it had been in 1945 or 1946. Instead, it stayed high until the early 1950s, falling only toward the middle of that decade. In this section I want to explore two questions. First, what factors caused the secular fall in infant mortality across the RSFSR's hinterland industrial regions? Secondly, how was this connected with very sharp regional disparities in the speed and depth of this process?

[68] GARF, f. A-482, op. 49, d. 3247, l. 94ob.–100ob., 101–2 (1951); d. 7373, l. 182–185ob. (1953). The latter report claimed that bacteriological tests in the kitchens in 1953 showed much better results than in past years, although the distribution points were still a problem. The report does not say whether they were using the tighter, pre-1950 standards, or the later, more liberal standards, against which the Moscow SES had strongly protested.

The withering away of the "urban penalty"

If we look at the history of Western Europe, the point at which urban infant mortality falls below that in the countryside is a useful indicator of a society's progress in improving urban public health. In Germany this crossover occurred sometime around 1907.[69] In England and Wales, where infant mortality rates were much lower, the gap nonetheless persisted considerably longer. In the RSFSR's hinterland industrial regions the urban penalty was evident for almost the entire late Stalin period. During the late 1940s, the only industrial oblasti where rural infant mortality consistently exceeded mortality in the towns were Sverdlovsk and Molotov oblasti, and this was a testimony to the appalling state of rural life there, not to the healthiness of their urban areas. By the early 1950s, however, the urban–rural gap was beginning to close. This I show in Table 5.10.[70]

For the RSFSR as a whole, urban infant mortality dropped below that in the countryside in 1952. In the hinterland industrial regions the timing varied. In Gor'kii oblast' and Tatariya the switchpoint was 1953. In Yaroslavl' oblast' it occurred in 1954, while in Kemerovo oblast' the two figures began to converge in 1953, with urban areas showing a permanent advantage in 1955. In Chelyabinsk oblast' the towns overtook the villages as early as 1951, but like their Urals neighbors, Sverdlovsk and Molotov oblasti, this was only because rural infant mortality was so persistently high, not because the towns had made great progress. That came later, in 1954, the first year in which urban areas of Chelyabinsk oblast' began to approximate the RSFSR urban average. Finally, I should note that the towns of Ivanovo oblast' were still lagging behind the countryside in 1956.

Aside from the reversal of the "urban penalty," two other notable features emerge from this table, which I show in Figure 5.4. First, we begin to see a sharp gulf between infant mortality in the metropolises of hinterland regions and in the towns of the outlying oblast'. This trend was most pronounced in the Urals, although Gor'kii and Kuibyshev also fit this pattern, albeit to a milder degree.[71] In 1947, infant mortality in the cities of Sverdlovsk, Molotov, and Chelyabinsk differed little from the infant mortality in the towns of their surrounding oblasti. By the early

69 Vögele, *Urban Mortality*, pp. 72–3.

70 The table deliberately reproduces the data for 1950 and 1951 from Table 5.7. The purpose there was to show the geographical and temporal unevenness of the post-1947 recovery. In Table 5.10 I use 1950 and 1951 as a reference against which to measure the sharp reduction in infant mortality after 1952.

71 Unfortunately, for the years after 1951 we do not have local data for other cities included in Table 5.7: Yaroslavl', Ivanovo, Kazan', Nizhnii Tagil, Magnitogorsk, Zlatoust, Ufa, Kemerovo, Stalinsk, and Prokop'evsk.

Table 5.10 *Infant mortality in hinterland industrial regions of the RSFSR, 1950–1956*

Deaths of infants up to one year per 1,000 live births

	1950	1951	1952	1953	1954	1955	1956
RSFSR	89	91	78	73	71	62	50
Urban	102	94	77	69	64	57	46
Rural	79	90	78	76	76	66	53
Moscow region							
Moscow oblast'	78	81	65	61	58	48	40
Urban	88	87	68	62	58	49	40
Rural	67	73	61	61	58	48	40
Moscow city	66	53	43	42	37	35	35
Central Russia							
Yaroslavl' oblast'	87	99	68	71	67	54	45
Urban	106	105	69	72	65	51	41
Rural	69	92	67	69	70	58	49
Ivanovo oblast'	92	101	75	70	79	60	48
Urban	106	103	80	71	77	62	50
Rural	72	98	67	67	83	57	46
Gor'kii oblast'	83	94	75	74	75	58	50
Urban	96	96	76	70	74	52	46
Rural	81	93	75	77	76	62	52
Gor'kii city	91	85	55	58	61	42	40
Volga region							
Kuibyshev oblast'	65	76	72	71	70	50	42
Urban	74	93	73	72	72	56	41
Rural	61	68	72	70	67	57	43
Kuibyshev city	95	83	71	68	55	49	36
Tatariya	85	85	82	85	81	66	57
Urban	97	91	87	79	69	58	50
Rural	79	82	80	87	88	70	61
Urals							
Sverdlovsk oblast'	113	118	92	78	74	70	52
Urban	118	117	90	72	68	64	48
Rural	104	121	97	89	88	81	58
Sverdlovsk city	134	86	74	59	60	46	40
Molotov oblast'	132	151	103	107	95	78	66
Urban	141	138	99	98	83	69	58
Rural	124	161	107	114	104	85	72
Molotov city	111	93	76	71	59	54	36
Chelyabinsk oblast'	113	109	99	83	72	71	55
Urban	121	109	98	78	67	64	51
Rural	97	110	101	94	82	81	62

Table 5.10 (*cont.*)

	1950	1951	1952	1953	1954	1955	1956
Chelyabinsk city	116	90	79	68	59	59	46
Bashkiriya	88	85	85	85	86	74	58
Urban	108	91	98	88	92	76	57
Rural	79	83	79	84	83	72	59
Siberia							
Kemerovo oblast’	117	113	93	81	66	76	50
Urban	124	116	94	80	67	75	48
Rural	101	107	91	82	65	79	53

Sources: 1950–1951, as in Table 5.7; 1952–1956, GARF, f. A-374, op. 34, d. 1540.

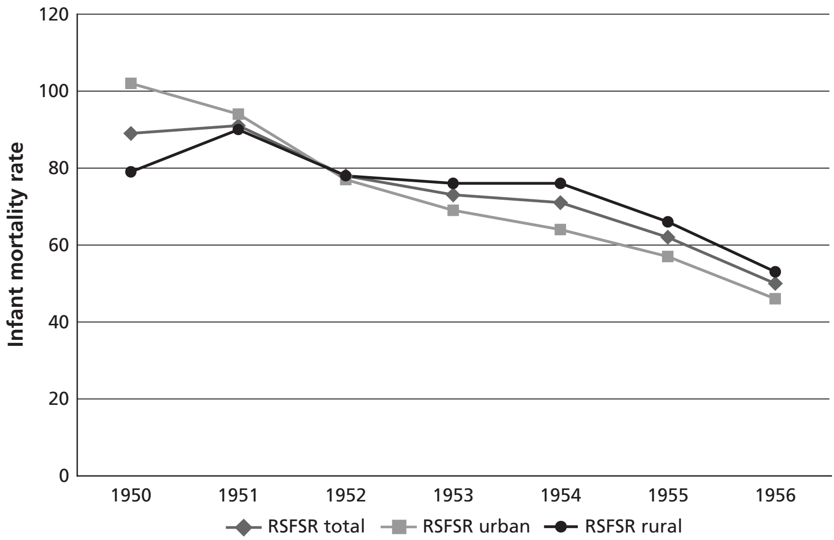


Figure 5.4a Urban and rural infant mortality, RSFSR, 1950–1956

1950s this was no longer the case. The large cities began to make rapid progress reducing infant mortality, while the towns in the oblasti did not. The towns did eventually record significant reductions in infant mortality, but with a time lag of a few years, and even then almost nowhere did they match the levels in the metropolises. This leads to the second observation, which is that almost everywhere, whether in large cities or smaller towns, at some point there was a sudden drop in infant mortality levels, in some

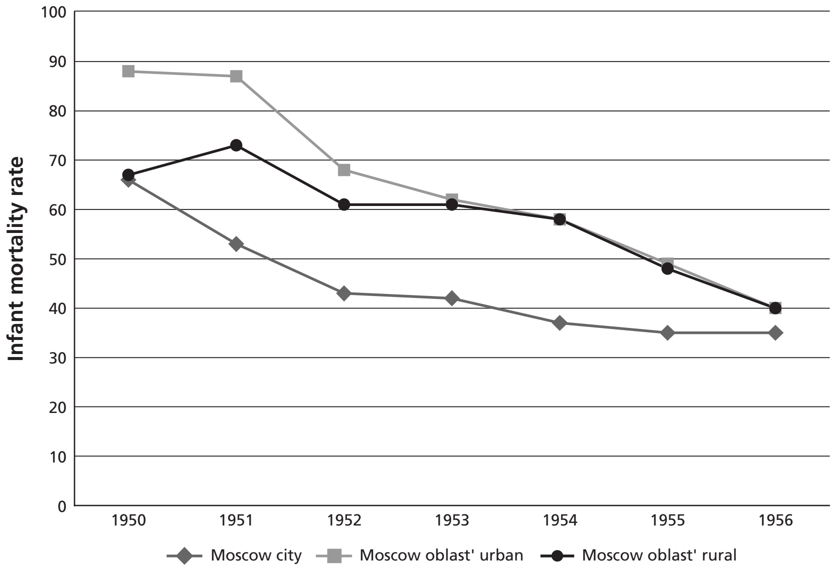


Figure 5.4b Urban and rural infant mortality, Moscow region, 1950–1956

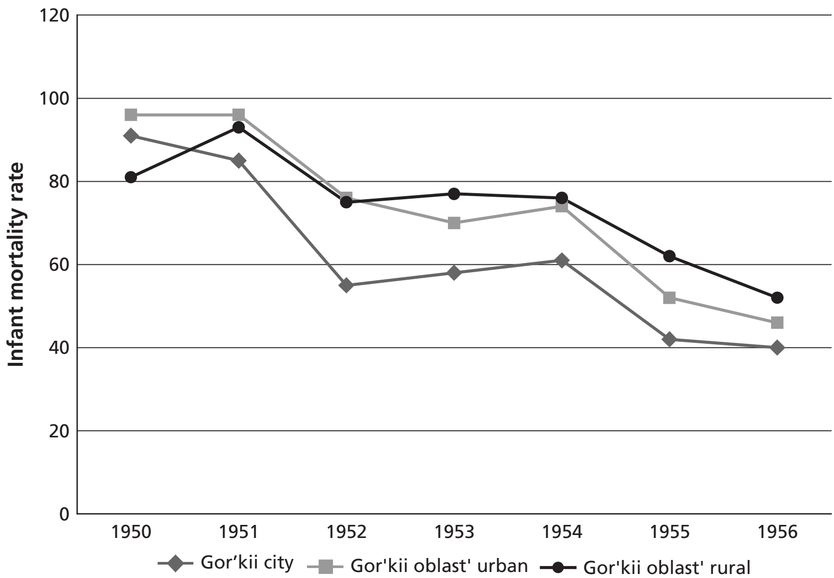


Figure 5.4c Urban and rural infant mortality, Gor'kii region, 1950–1956

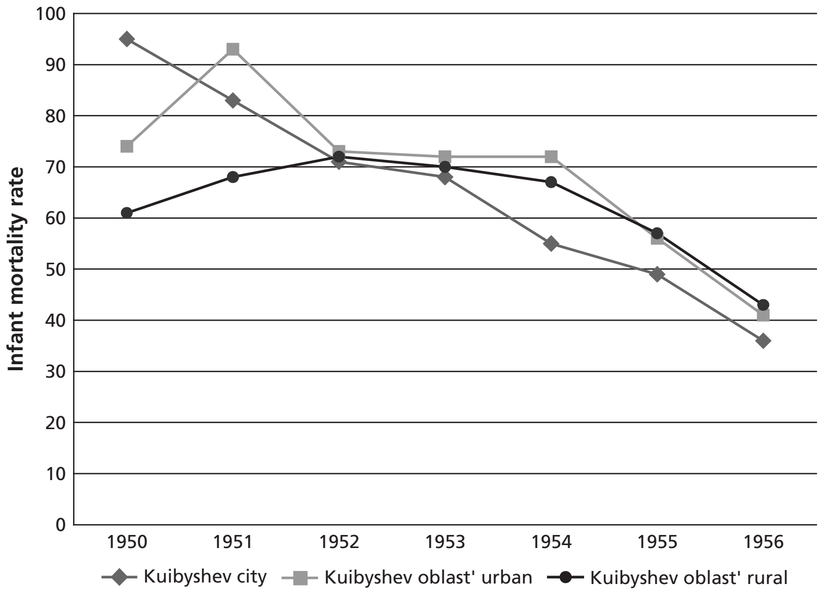


Figure 5.4d Urban and rural infant mortality, Kuibyshev region, 1950–1956

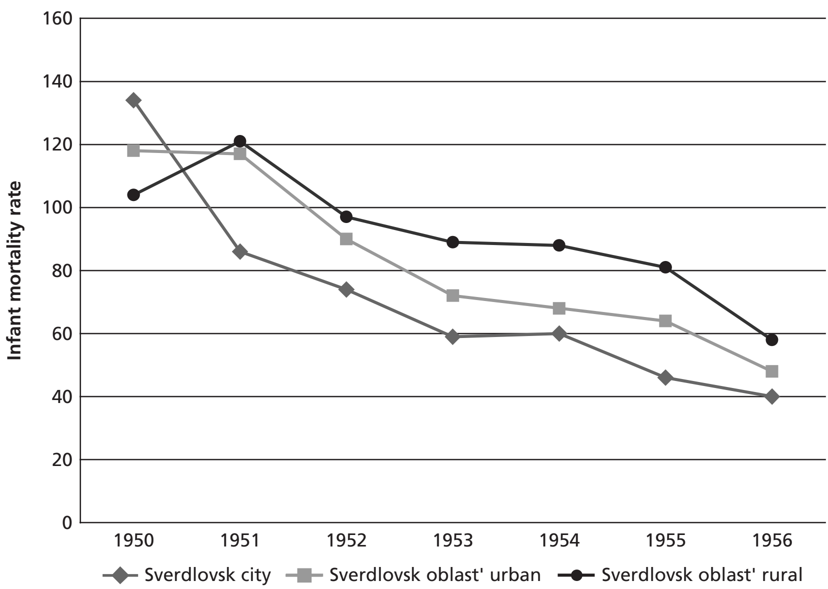


Figure 5.4e Urban and rural infant mortality, Sverdlovsk region, 1950–1956

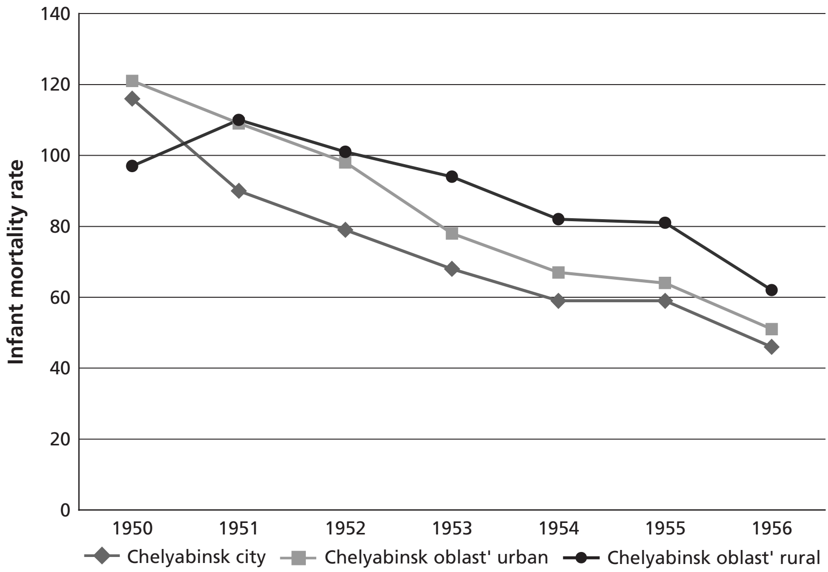


Figure 5.4f Urban and rural infant mortality, Chelyabinsk region, 1950–1956

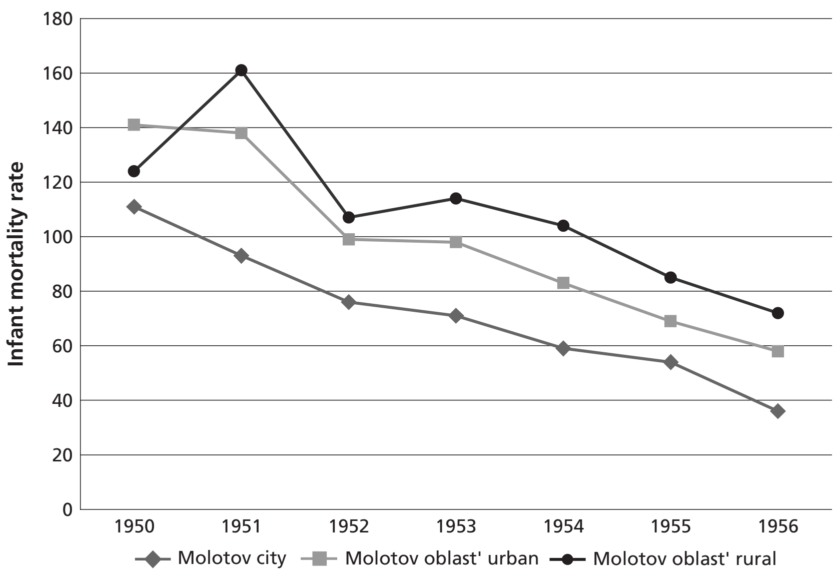


Figure 5.4g Urban and rural infant mortality, Molotov region, 1950–1956

cases over the course of a single year. Perhaps the most dramatic fall was in Sverdlovsk, where the IMR went from 134 deaths per 1,000 live births in 1950 to just 86 deaths per 1,000 births in 1951. Admittedly, 1950 may be a poor choice for a comparison, because throughout the RSFSR there was a mini-spike in infant mortality in that year, but even if we compare 1951 with 1949, the change would still catch the eye. These two phenomena – the rapid progress in curbing the IMR and the fact that it took place first in the large cities which previously had been danger areas for infants – are closely related, and very probably have their roots in a combination of factors, including the advent of antibiotics, the increase in the number of doctors (who, alas, were not especially well trained), improved nutrition, and the diffusion of basic knowledge about hygiene and infant safety.

Factors behind the decline of infant mortality

When preparing a first draft of this chapter I had originally approached this question as follows. Three factors – gastrointestinal infections; pneumonia and related respiratory infections; and what we may loosely term failure of newborn babies to thrive due to prematurity, low birth weight, complications associated with delivery, and birth defects – together accounted for between 70 and 78 percent of all infant deaths between 1945 and 1955. Which of these categories was likely to have exerted the greatest influence on bringing down mortality? Gastrointestinal infections are closely associated with urban hygiene and the safety of water supplies, areas in which progress during the postwar years was painfully slow. They are also not amenable to drug therapy. The only gastrointestinal infection that responded to chemotherapy was dysentery, which during the early postwar years Soviet physicians could treat with sulfonamides (sulfa drugs). Sulfa drugs, however, were ineffective in infants under one year of age.[72] Their toxicity was too high and infants' intestinal tracts are too short to retain the drug for the length of time necessary for it to kill the shigella bacterium which causes the disease. It was not until the mid-1950s that the Soviet Union had access to the modern generation of antibiotics that could cure infant dysentery.[73] Infant pneumonia, on the other hand, did respond to chemotherapy. Soviet doctors had begun to use sulfa drugs to treat infants with pneumonia even before the war. After

72 G. Ya. Shul'man, "O maloi effektivnosti sul'famidnoi terapii pri dizenterii u detei pervogo goda zhizni," *Referaty nauchno-issledovatel'skikh rabot po akusherstvu, ginekologii i pediatrii* (Sverdlovsk, 1949), pp. 70–2.

73 *Kishechnye infektsii u detei: diagnostika, lechenie i osnovnye protivoepidemicheskie meropriyatiya. Metodicheskie ukazaniya* (Leningrad, 1958), pp. 11–12, 14.

the war they began to supplement, and increasingly to replace, sulfa drugs with the new wonder drug, penicillin.[74] My presumption, therefore, was that the secular fall in infant mortality would be mainly due to improvements in the treatment of pneumonia, with much slower improvements in deaths from gastrointestinal infections. It was difficult to test this hypothesis, however, because, although I had found data on how many infants had died from each major cause in each locality for the years up to 1955,[75] I had not yet found local demographic data giving the number of births or the total number of infant deaths for the years after 1951.[76] This date is crucial, for it is after 1951 that the major fall in infant mortality took place. Only by knowing the number of births and infant deaths would it be possible to calculate general infant mortality rates and disease-specific infant mortality rates in each of our case study regions after 1951, and in this way assess where the improvements had occurred.

When eventually I found the necessary demographic data it produced an unexpected result. In fact, the RSFSR and the hinterland industrial regions at the core of this study made very slow progress reducing infant mortality from pneumonia, but made unexpectedly good progress tackling mortality from gastrointestinal infections, so much so that the reduction in deaths from gastrointestinal infections proved to be the second most important reason behind the overall improvement in infant mortality during the late Stalin and early post-Stalin periods. Table 5.11 and Figure 5.5 show changes in the major causes of infant mortality in urban areas of the RSFSR for the years 1945–1955. The table lists the overall infant mortality rate and the infant mortality rates for each of its major components: pneumonia, gastrointestinal infections, problems associated with newborn babies (excluding congenital birth defects), and a residual category made up of all remaining causes. It then shows the relative contribution that each made to the overall fall in infant mortality taking different years as the base year.

[74] I. R. Gershenovich, "Penitsillinoterapiya detskikh pnevmonii," *Voprosy pediatrii i okhrany materinstva i detstva*, vol. 15, issue 5, 1947, pp. 46–51; E. Z. Chernyak, "Penitsillinoterapiya nekotorykh zabolevanii u detei grudnogo vozrasta" (Candidate of Medical Sciences Dissertation, Leningrad, 1947).

[75] Local cause-of-death data for the towns of the RSFSR in 1948 and 1949 are for some reason missing from the archives. They exist for other republics, but not the RSFSR. I tried inspecting the local returns of the individual oblast' statistical administrations for these years, but the entries were mostly blank. Why this should be is a mystery.

[76] The local birth and death data exist, but the TsSU files containing demographic data for the years after 1951 are still secret. The data are, however, available in the files of the SU RSFSR, but their location was not immediately obvious. It was only through sheer luck that I managed to find them.

Table 5.11 *Infant mortality by major cause, urban areas of the RSFSR, 1945–1955*

	Total IMR	Gastrointe-stinal IMR	Pneumonia IMR	New-born IMR	Residual causes IMR	Gastrointestin-al, pneumonia, ailments of newborns as % of IMR
1945	90.0	17.8	29.2	16.5	26.4	70.6%
1946	91.0	23.2	25.7	16.0	26.0	71.3%
1947	152.0	47.9	43.6	16.2	44.3	70.9%
1948	102.0	24.4	35.2	13.6	28.8	71.8%
1949	92.0	24.0	29.6	13.2	25.2	72.6%
1950	102.0	28.0	34.5	13.1	26.5	74.1%
1951	94.0	27.6	31.6	12.6	22.2	76.4%
1952	77.0	17.9	28.8	11.9	18.4	76.1%
1953	69.0	15.9	24.8	12.4	15.9	77.0%
1954	64.0	16.0	22.7	11.8	13.6	78.9%
1955	57.0	12.4	21.1	10.6	12.9	77.4%
Contribution to fall in IMR from 1946	100.0%	31.8%	13.5%	15.9%	38.5%	
Contribution to fall in IMR from 1949	100.0%	33.1%	24.3%	7.4%	35.1%	
Contribution to fall in IMR from 1951	100.0%	41.1%	28.4%	5.4%	25.1%	

Note: IMR = infant mortality rate.
Sources: GARF, f. A-374, op. 30, d. 6856, l. 7–8ob., 15–16ob., 23–24ob., 35–36ob., 41–42ob; op. 34, d. 1540, l. 5, 10, 31, 37.

How we interpret these data in part depends on which year we choose as the basis of comparison. I have deliberately not taken 1945, because the country was still putting its data collection systems back in place following the war, and the demographic data may well be incomplete. It is possible to choose 1946, but here we have the problem that the TsSU did not begin to adjust the data for possible distortions in birth and death registrations until 1947. Using 1946 as the base year suggests that reductions in gastro-intestinal diseases accounted for just under one-third of the overall decline in infant mortality, versus just a 13.5 percent contribution made by improvements in mortality from pneumonia. Here the largest single

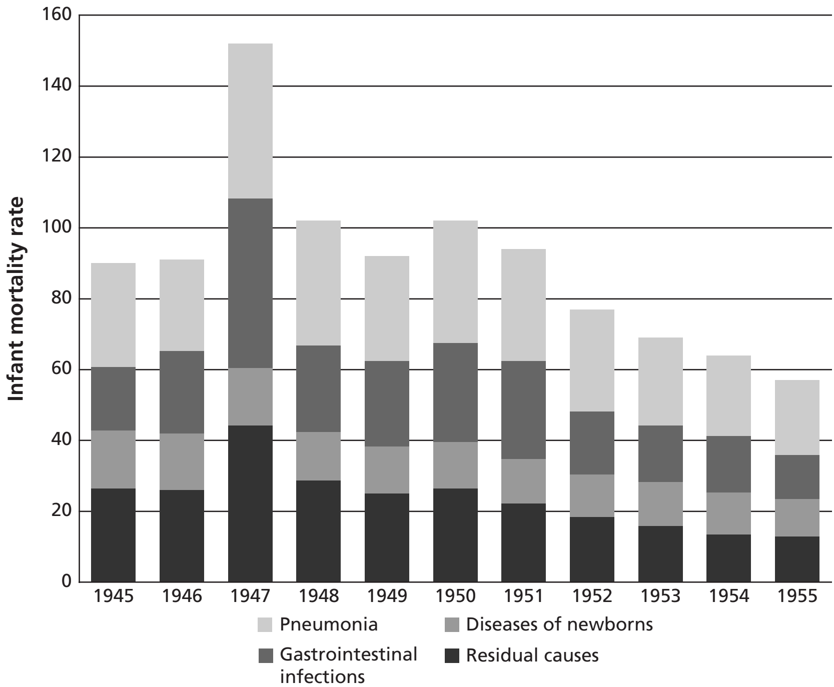


Figure 5.5a Infant mortality rates by major cause, urban RSFSR, 1945–1955

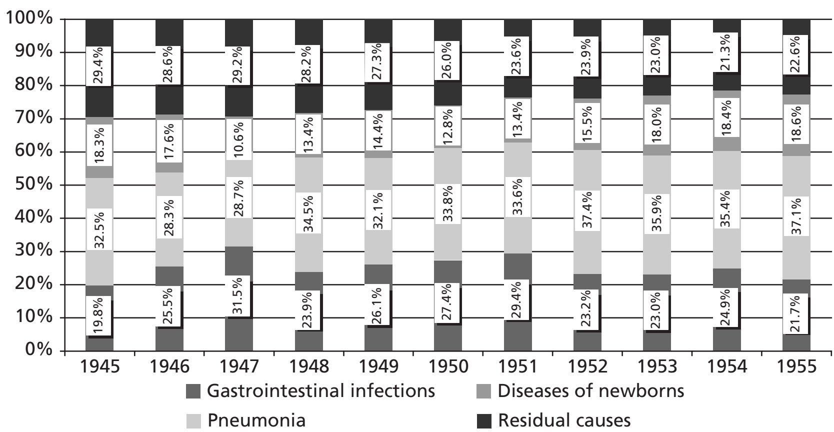


Figure 5.5b Infant mortality by major cause: causes as a percentage of total IMR, urban RSFSR, 1945–1955

factor was the reduction in the numerous diseases and conditions that made up the residual category – something I shall comment upon shortly.

If we want to choose a year after 1946 as a base year, the obvious choice might be 1949. Nineteen forty-seven was the year of the famine, and we could plausibly argue that both that year and 1948, when the country was still recovering from the famine's aftereffects, are not fully representative of longer-term trends. In 1949 both the total infant mortality rate and the rates for its individual components were roughly similar to those in 1946, but it does yield a significantly different picture, because improvements in cutting early neonatal deaths and the fact that the infant mortality rate from pneumonia was higher in 1949 than in 1946 both act to increase the relative contribution of pneumonia to the long-term fall in total infant mortality. Finally, we might choose 1951 as a base year. We need to exclude 1950 because, for reasons that are not clear, there was a mini-spike in infant mortality during 1950, with sharp rises in deaths from both gastrointestinal and respiratory infections. Nineteen fifty-one, on the other hand, is the last year which is roughly consistent with the other postwar years. In 1952 infant mortality fell very sharply, mostly due to a dramatic drop in deaths from gastrointestinal infections. Here, too, however, moving the base year to 1951 causes a pronounced shift in the relative contributions to the fall in total mortality. It augments the role played by improvements in mortality from gastrointestinal diseases, slightly enhances the contribution played by pneumonia, and greatly reduces the contribution from residual causes.

These uncertainties notwithstanding, the larger picture concerning the relative positions of gastrointestinal and respiratory infections is quite clear, irrespective of which base year we choose. Despite the continued unsatisfactory state of urban sanitation and despite the fact that Soviet medicine had limited means to intervene if an infant contracted dysentery or an acute gastrointestinal infection, the country still succeeded in reducing infant mortality from this cause. Conversely, despite the existence of antibiotics capable of reducing infant deaths from pneumonia, the rate of pneumonia deaths fell much more slowly.

Before I move on to try to explain this observation, we should first examine the diseases and medical conditions that made up the "residual" category, a category which also accounted for much of the improvement in infant mortality. Analysis of this category is complicated by the fact that the archives give access to detailed data for all causes of death only until 1950. The documents I uncovered for later years list only major causes of death. However, the years 1945–1950 already display a definite pattern that sheds some light on why this category was so important in the effort to reduce infant mortality. In 1946 over 60 percent of this residual category was made up of just five sets of diseases: tuberculosis; the main childhood infections (measles, whooping cough, diphtheria, scarlet fever, and "other" acute infections); meningitis; influenza; and the two rubrics of "other" and non-enumerated causes of death which I discussed in Chapter 4 (see pp. 218–21). In 1947 these five groups acquired still greater importance, thanks to the very sharp increase in "other" and non-enumerated causes, that is, the rubrics used to conceal deaths from starvation: the five together accounted for just under 70 percent of all residual causes. By 1950, however, and despite the fact that 1950 saw a sudden resurgence in infant mortality, deaths from these five factors had fallen to very low levels. Excluding the "other" and non-enumerated rubrics, the infant mortality rate from tuberculosis, childhood infections, meningitis, and influenza had stood at roughly 10.6 deaths per 1,000 live births in 1946, and 17.4 deaths per 1,000 live births in 1947. In 1950 it was just 8.8 deaths per 1,000 live births, and accounted for less than half of all residual infant mortality.[77] What this suggests is that improvements in the residual category probably occurred in two stages. First, there were improvements in reducing deaths from tuberculosis, childhood infections (which since 1943 had been low in any case), meningitis, and influenza. After this there was a second wave of improvements which saw reductions in deaths from literally dozens of minor causes, each of which when taken on its own was of barely measurable statistical significance, but when aggregated together produced a major impact on overall infant mortality.[78]

Let us now turn back to the three factors for which we have consistent local data all the way through to 1955. The relatively small reduction in deaths among newborn babies is perhaps easiest to explain. In other industrialized countries neonatal deaths after World War II tended to converge toward a common, low level, with the major component being congenital abnormalities.[79] The figures I have used here for the RSFSR, however, already exclude congenital birth defects. They represent deaths due to prematurity, low birth weight, and unspecified "diseases" of newborns. Therefore improvements in this area would depend primarily on better obstetric provision, including more and better-trained midwives

[77] Calculated from RGAE, f. 1562, op. 329, d. 2235, l. 3, 3ob., 4, 4ob. (1946); d. 2648, l. 35, 35ob., 36, 36ob. (1947); and d. 4703, l. 382, 382ob., 383, 383ob. (1950).

[78] Although I do not have definitive data to confirm this, there is evidence to suggest that by the early 1950s childhood infections had virtually ceased to be an issue. The city of Omsk recorded just six infant deaths from diphtheria and one from scarlet fever during the whole of the five-year period 1951–1955: Z. G. Mirovaleva, "Prichiny detskoi smertnosti po gorodu Omsku po dannym za 1951–1955 gg.," *Trudy Omskogo meditsinskogo instituta im. M. I. Kalinina: sbornik nauchnykh rabot, avtoreferatov i tezisov*, no. 21 (Omsk, 1957), p. 191.

[79] Pharoah and Morris, "Postneonatal Mortality," p. 173.

and doctors, and improved maternal diets, which would reduce the incidence of premature and low-birth-weight babies. These were factors that under Soviet conditions would change only gradually. The country had already reduced infant mortality among newborns by one-third between 1946 and 1955, but compared to the two other main causes of death the rate of progress was very modest.

Explaining the improvements in infant mortality from gastrointestinal infections also requires a good deal of conjecture. Here it is possible that small changes in a number of areas compounded each other, so that when combined together they produced a measurable reduction in infant deaths. We know from our discussion of urban sanitation that outside Moscow improvements in this area were small and slow to take place. Cities lacked equipment and financial resources to extend sewerage systems, purify drinking water, and introduce regular and comprehensive removal of garbage and human waste. This does not mean, however, that cities in 1953 looked the same as they had in 1945. Even small improvements in the frequency and comprehensiveness of cleaning, in protecting the safety of water supplies, and in purifying drinking water could reduce the risk of infections, especially in the context of other factors that I shall now review.

The first of these were improvements in the quality and breadth of medical care. It may have been true that sulfa drugs were ineffective for infants under one year, but insofar as it was possible to treat older children and adults with the disease this would have reduced the overall number of carriers who could spread the disease to babies. Thus improvements in the identification, isolation, and treatment of dysentery sufferers would have had an indirect, but nonetheless positive, effect on dysentery deaths among infants. This is, of course, just a hypothesis, but it might receive some indirect support from the fact that the fall in infant mortality from dysentery, that is, the death rate among those for whom no treatment existed, fell only slightly less rapidly than the overall death rate from dysentery among children and adults over the age of one year – that is, among those who could be treated for the disease. It is therefore possible that improvements in treatment of non-infants provided at least an indirect benefit for infants as well.[80] Even harder to assess is the possible impact of postwar increases in

[80] In the urban areas of the RSFSR the crude mortality rate from dysentery among the population older than one year fell from 2.02 deaths per 10,000 population in 1949 to 1.31 deaths per 10,000 population in 1954, a decrease of 35 percent. For this same period infant mortality from dysentery fell from 9.3 deaths per 1,000 live births to 7.0 deaths, a drop of 24.7 percent. This was, however, smaller than the 33 percent decrease in infant mortality for all gastrointestinal infections, including dysentery in these same years. These figures are calculated from GARF, f. A-374, op. 30, d. 6856, l. 7–8ob., 19–20ob., and op. 34, d. 1540, l. 5, 10, 31, 37, 83, 84ob.

the number of doctors and pediatric hospital beds. We know that these increases were substantial, and in theory this should have meant that some children (but only some, as we soon shall see) received treatment earlier and their lives might have been saved. The early postwar years had seen a dire shortage of doctors trained in pediatrics and a generally poor grasp of basic diagnostics among doctors as a whole. In the very worst instances, such as the mining towns of Molotov oblast' at the end of 1948, all house calls to sick children were made by paramedics, so bad was the shortage of even inadequately trained physicians.[81] Therefore, as medical institutes turned out more doctors and as the capacity and quality of hospitals and clinics improved, so, too, would infant mortality rates. The problem here is that these factors should have had an impact across the board, and not selectively among children with dysentery or gastroenteritis. In other words, they help explain the overall decline in infant mortality, but not necessarily the faster decline in gastrointestinal deaths.

There were two other factors, however, that almost certainly did have a noticeable impact in this area. One was the improved diet. It may have remained deficient in calorie content and nutritional balance, but the bottom line is that people had more to eat. After 1948 more mothers would have been able to nurse their babies and nurse them for longer periods, thus reducing babies' exposure to pathogens and improving their resistance. Where they gave babies solid foods, these would have been of better quality and were probably also safer to consume.

Yet by far the most important development in reducing deaths from gastrointestinal infections was government health education campaigns and better training of local health workers responsible for identifying and controlling outbreaks. In Chapter 1 I cited campaigns waged by factory newspapers to teach workers rudimentary rules of personal hygiene.[82] This was part of a much larger public health effort that focused on identifying and preventing the spread of pediatric gastrointestinal infections, including combating parental prejudices and superstitions.[83]

[81] GARF, f. A-482, op. 52s, d. 244, l. 240. [82] See Chapter 1, p. 58.

[83] "O sanitarno-prosvetitel'noi rabote." The document does not specify what these prejudices were, but the experiences of Western Europe in the late nineteenth and early twentieth centuries cited on p. 269 show that this was not a Russian or "peasant" phenomenon. Even today one of the most common parental responses in the third world to children suffering from nausea, vomiting, and diarrhea caused by intestinal infections and worm infestations is to withdraw food until after the symptoms abate. The resulting reduction in nutritional intake can have catastrophic consequences for a child's survival and long-term health: Stephenson, Latham, and Ottesen, "Malnutrition and Parasitic Helminth Infections," pp. S27, S30. Yet on the surface to most of us who are not medical professionals the actions of these parents probably appear as reasonable and common sense.

Health workers were tasked with explaining to parents a host of essential measures. Specifically, parents were instructed to:

- Maintain breastfeeding, especially during the summer months.
- If feeding artificially, boil milk before giving it to a baby, and thoroughly wash containers and pacifiers.
- Avoid giving babies ice cream, pastries, *kvas* (a fermented drink made from bread), or other foods that could be contaminated with bacteria.
- Take the child to a doctor at the first sign of a gastrointestinal illness.
- Isolate and thoroughly launder all soiled clothing and bed linen.
- Wash a baby's hands with soap if the child contaminates them with his or her own feces.
- Wash their own hands with soap after handling a sick baby.
- Maintain strict hygiene within the home: in the toilet and the kitchen, and when laundering or hanging out linen.
- Notify the health authorities immediately if a baby has contact with another family member or neighbor suffering from a gastrointestinal infection.[84]

Staff working in children's homes and nurseries received similar instructions, including the need to isolate any children with dysentery or gastrointestinal infection, to disinfect all chamber pots, to spray toilets with chlorine several times a day, and to wash their own hands with soap, disinfectant, and a nail brush.[85]

In fact, such instructions were in no way new. The Bolsheviks had understood the importance of sanitary education almost from the very beginning of the Soviet Union's existence. It was a recognized subspecialism within Soviet medicine, and sanitary educators, like sanitary inspectors, were physicians.[86] It was the war, however, that brought about a major turning point in the orientation, scale, and probably also the long-term effectiveness of sanitary education, as the latter was called

[84] "O sanitarno-prosvetitel'noi rabote."

[85] G. N. Lyalina, "Profilakticheskie meropriyatiya po bor'be s kishechnymi infektsionnymi zabolevaniyami v detskikh uchrezhdeniyakh," *Fel'dsher i akusherka*, no. 6, 1951, pp. 30–3.

[86] Many of the prewar educational materials were quite imaginative. A 1939 handbook for sanitary educators, for example, offered a text of a model radio broadcast about infant mortality, for use in factories and residential buildings, where it was common to have "closed-circuit" radio programs piped in (from *Sbornik ofitsial'nykh materialov po sanprosvetrabote: spravochnik sanprosvetrabotnika* [Moscow, 1939], p. 101):

For the Attention of Parents:
Comrades:

On hot days there might be an increase in the number of cases of gastrointestinal infections, especially among children. However, with correct and skillful care it is possible to spare your child from these diseases. Note down the advice of your doctor on how to look after a nursing baby during hot weather. The most important points are these:

upon to play a substantial role in the regime's efforts to contain the mortality crisis of 1942 and forestall a similar crisis crippling the country's military.

In the late 1930s, as war in Europe looked increasingly likely, sanitary education became closely tied to military preparedness, in particular civil defense. Civilians, and especially school children, were encouraged to train for the badges, "Ready for the Sanitary Defense of the USSR" ("Gotov k sanitarnoi oborone SSSR," or GSO) and "Be Ready for the Sanitary Defense of the USSR" ("Bud' gotov k sanitarnoi oborone SSSR," or BGSO). The GSO program was for adults and older school children; the BGSO for school children, with the first lessons starting at ages nine and ten. Training for these badges, at least on paper, was intensive and, at the higher levels, quite sophisticated. Those earning the full badge were expected to know how to differentiate between different types of chemical weapons,[87] how to administer first aid and care for the wounded in the wake of a chemical attack, and how to prevent wounds from becoming infected. To this end they had to understand the principles and use of different types of disinfectants and how to distinguish the symptoms of different epidemic diseases, including typhus, typhoid fever, plague, cholera, measles, and influenza. Given that Soviet doctors often misdiagnosed these very same illnesses, this was expecting GSO badge

Don't take the baby off the breast during the summer. Remember, breast milk is the best food for small children, and there is nothing that can take its place. You should give solid baby food to a nursing baby only with permission of a doctor.

Store the baby's food in a cold place – this is essential.

Give children frequent drinks of cooled boiled water. During hot weather a baby sweats a lot and his organism loses a lot of fluid. You restore the lost fluid by giving him water to drink.

Dress the baby in light clothes; don't wrap him up. During hot weather let the baby spend the whole day in the fresh air, but in the shade – not in the sun. Don't carry the baby about in the sun with his head uncovered. Remember, overheating dramatically weakens the baby's organism.

Keep your baby clean. Bathe him every day. Clean skin helps the baby's breathing. Don't touch the baby with dirty hands. Before feeding it is essential to wash your hands with soap.

Protect the baby's food from flies. Flies are the main spreaders of infection. If your baby develops diarrhea or vomiting, go immediately to the doctor and strictly carry out all of his instructions.

You need to obey these simple rules in order to safeguard your baby from gastrointestinal illness.

[87] The prewar GSO and BGSO programs make it obvious that at the time the Soviet leadership saw the main threat to the civilian population coming from chemical weapons. It clearly did not occur to them that an enemy might launch a successful land attack, and certainly not one with the destructive force of the Nazi invasion.

holders to master a fair amount of medical knowledge, not to mention a sound grasp of personal hygiene.[88]

Following the German invasion of June 1941 and the Soviet Union's disastrous early losses, sanitary education acquired still greater urgency. With hundreds of thousands, and eventually millions, of soldiers being wounded, with mass troop movements and mass migrations vastly increasing the risk of major and highly costly epidemics, with infant mortality in overcrowded hinterland towns reaching almost unimaginable levels, and with medical services underresourced and badly overstretched providing care for the front, the health authorities realized that only the actions of the population itself could fend off a full-scale catastrophe. They were right to be alarmed. If the infant mortality figures were not warning enough, 1942 saw large-scale outbreaks of both typhus and typhoid fever, which required considerable effort to contain.[89]

In October 1941 the USSR Commissariat of Public Health and the Executive Committee of the Soviet Red Cross/Red Crescent issued an order to train the entire population for the GSO. This was clearly an impractical aim, but by the war's end some 13 million adults and 5.5 million children had earned either the GSO or BGSO badge. Three million school pupils joined the Red Cross/Red Crescent.[90] Schools and school children played a crucial role in the dissemination of basic health messages in ways beyond training for the BGSO or working with the Red Cross, namely as a conduit for passing essential health information to parents. If local health authorities had to transmit an urgent public health message to the population, they often did it by asking teachers to dictate the message to their classes, who would then copy it down in their notebooks, take it home, and read it aloud to their parents.[91] All public places,

88 *Sbornik ofitsial'nykh marerialov* (1939), pp. 46–76.

89 GARF, f. A-482, op. 52s, d. 54, l. 5, 9–34, 36–45.

90 The order to expand the GSO is in *Sbornik ofitsial'nykh materialov po sanprosvetrabote: spravochnik sanprosvetrabotnika* (Moscow, 1944), p. 46. The figures for those completing the GSO and BGSO are from L. P. Zabolotskaya and I. S. Sokolov, "Sanitarnoe prosveshchenie v gody Velikoi Otechestvennoi voiny. (Po materialam 1 Ob"edinennogo plenuma Sovetov po sanitarnomu prosveshcheniyu Narkomzdrava SSSR i Narkomzdrava RSFSR, iyul' 1944 g.)," in *Sanitarnoe prosveshchenie: sbornik posvyashchennyi voprosam sanitarnogo prosveshcheniya v gody Velikoi Otechestvennoi voiny* (Moscow, 1948), p. 43; for school pupils in the Red Cross, V. S. Ershov, L. O. Kanevskii, and I. N. Yakovlev, "Sanitarnoe prosveshchenie i likvidatsiya mediko-sanitarnykh posledstvii voiny," also in *Sanitarnoe prosveshchenie*, p. 14.

91 I. I. Mil'man, "Sanitarnoe prosveshchenie v shkole v gody Velikoi Otechestvennoi voiny," in *Sanitarnoe prosveshchenie*, pp. 61–62. Mil'man cites an incident in the town of Kirov (Kirov oblast') where the technique allegedly helped stem an outbreak of scarlet fever. Teachers throughout the city dictated to their pupils a short text, "What You Need to Know About Scarlet Fever," and in this way managed to circulate it more quickly, and

be they schools, factories, railway stations, or river boat terminals, were inundated with leaflets, posters, and public address announcements reminding people to be careful about personal hygiene.[92]

What is striking about this material is that it presumed virtually zero prior knowledge on the part of the general population. Thus training for Labor Reserve students and for wounded soldiers recovering in military hospitals began by explaining what microbes were, how they cause infections, and why washing your hands with soap or going through "sanitary processing" was necessary to fight disease.[93] The actual aim of these instructional programs was to teach soldiers how to treat their own wounds or the wounds of their comrades, and to persuade workers to go to the first aid station to have a wound or a burn properly dressed so that it did not become infected and keep them off work. To achieve this, however, people had first to internalize a rudimentary consciousness of cleanliness and why it was necessary. The mass mobilizations of the civilian population to clean the towns of their accumulations of feces and trash probably had a similar long-term educational effect.

Of course there were basic contradictions in all this. No matter how extensive the propaganda and education, it would take a while before this translated itself into fundamental changes in behavior. In part this is because radical changes in culture take time to percolate through a population. Mainly, however, it was because the Soviet state had given people knowledge of hygiene but almost no means to put that knowledge into practice. If factories and households had no soap and no hot water, if factory showers did not work, if houses had no toilets, but just cesspits which were almost never cleaned, then it was monumentally difficult to

probably more effectively, than through the simple distribution of a leaflet. I say more effectively, because children tend to internalize these types of messages and many no doubt would have constantly reminded (or, perhaps more accurately, nagged) their parents about the need to observe its prescriptions in a way they would not have done had they just passed them a printed sheet of paper.

92 River boat terminals, for example, were to broadcast some kind of hygiene message every five to ten minutes over their intercoms throughout the day: *Sbornik ofitsial'nykh materialov* (1944), pp. 75–7. I should also mention here the training of several hundred thousand "sanitary activists," who trained as "public sanitary inspectors" (*obshchestvennye sanitarnye inspektory*, or OSI). These were lay people, many of them shop floor workers, who worked under the guidance of sanitary physicians and state sanitary inspectors, carrying out basic tasks around sanitary education and the enforcement of health regulations at the workplace or factory dormitories. By the end of 1942 there were 170,000 OSI in the RSFSR; by the end of 1943 their ranks had more than doubled, to 370,000. The importance of their contribution varied from one locality to another, but this was still a substantial number of civilians who received advanced training in the essentials of public health. On the OSI, see Zabolotskaya and Sokolov, "Sanitarnoe prosveshchenie," pp. 51–3; Ershov, Kanevskii, and Yakovlev, "Sanitarnoe prosveshchenie," p. 23; GARF, f. A-482, op. 52s, d. 54, l. 31ob.–32; and *Sbornik ofitsial'nykh materialov* (1944), pp. 24–9.

93 *Sbornik ofitsial'nykh materialov* (1944), pp. 66, 92–3.

observe all the new rules you had learned. The other side of this, however, was that as conditions improved, soap supplies began to normalize, bathhouses and factory shower rooms increased their operating capacity, waste removal became a bit more efficient, and health workers became better able to identify, isolate, and hospitalize those falling ill or simply carrying a disease, the wartime lessons would have started to have an impact: at that point people could begin to act on the knowledge they had accumulated.

Crucial here, in my view, would have been the millions of wartime school children who studied for the BGSO, worked in the Red Cross, or simply listened to the messages on hygiene imparted by their teachers. Children absorb new knowledge and habits in ways that adults often find difficult. A child who was ten years old in 1942 was a young adult by 1952 and may already have had children. A child who was thirteen or fourteen in 1942 was almost certainly bringing up a family by the early 1950s, either as part of a married couple or as a single parent. It was these new parents who would have most deeply absorbed the wartime messages of sanitary education and would have actualized their knowledge in the way they raised their own children. It is my contention – an unverifiable hypothesis, to be sure – that in this indirect way the war played a major, although admittedly unquantifiable, contribution to the fall in infant mortality, especially from gastrointestinal infections, that we see in the early to mid-1950s.

Let us now turn to the question of why infant deaths from pneumonia declined so slowly. The Soviet Union had been using sulfa drugs to treat childhood and infant pneumonia since the late 1930s, and more commonly since the end of the war. The country successfully manufactured its own version of the Western preparation sulfapyridine, which they called sulfidine, and the drug had proven effective in reducing case fatality rates. One Moscow physician claimed that pneumonia case fatality among infants under the age of one year had fallen from around 53 percent in 1937 to 25 percent in 1946. Sulfa drugs did, however, have important limitations. They had to be administered in large doses and had serious side effects. Nausea and vomiting could be so severe as to require suspension of treatment, and in extreme cases the drugs could cause a dangerous fall in the white blood count (leukopenia, agranulocytosis). Relapses were common. By the mid-1940s it was also becoming obvious that a number of bacteria were developing resistance to the drugs. Moreover, although the drugs had reduced case fatality rates, these nonetheless remained high. The discovery of penicillin offered a new and far more effective weapon to cure pneumonia, although during the early postwar years Soviet doctors were quite cautious in its application. They tended to use it only in cases where sulfa drugs had proven totally ineffective, or to use it in combination with sulfa drugs, not as an alternative.[94]

There appear to be three reasons why these drugs did not cause the dramatic fall in infant pneumonia deaths that they should have. First, the drugs were not generally available, at least not before the mid-1950s. During the early postwar years there was little difference between cities and towns in pneumonia infant mortality. Beginning in the early 1950s, when antibiotics, in particular penicillin, were beginning to become more widely available, we see a sharp fall in infant pneumonia deaths everywhere. The decline is steeper, however, in Moscow, Sverdlovsk, and Molotov, cities with large and, at least by Soviet standards, modern research hospitals and medical institutes. In all three cities pneumonia deaths dropped far below the RSFSR urban average, and even further below the urban average for the Urals and Kemerovo oblast' taken as a whole. I show this in Figure 5.6.

In 1945 pneumonia infant mortality was higher in Moscow than the urban RSFSR average, and far worse than in Sverdlovsk, Molotov, and what for the sake of convenience I refer to as "Urals–Kemerovo."[95] Note also that in 1945 and 1946 the cities of Sverdlovsk and Molotov had worse death rates from infantile pneumonia than the Urals–Kemerovo oblast' towns; in 1947, Molotov's pneumonia IMR was marginally better than the oblast' towns, Sverdlovsk's slightly worse. In 1946 and 1947, Moscow showed marked improvement from 1945, but what is striking is that all regions were clustered very close together. At some point between 1948 and 1950 (remember, we are missing local cause-of-death data for 1948 and 1949), Moscow made huge strides forward in reducing pneumonia

[94] R. D. Vainer, "Techenie bronkhopnevmonii lechennykh sul'fidinom u detei rannego vozrasta" (Candidate of Medical Sciences Dissertation, Saratov, 1946), p. 515; Chernyak, "Penitsillinoterapiya," p. 75; Gershenovich, "Penitsillinoterapiya," p. 51. The Moscow case fatality data are reported in Chernyak, "Penitsillinoterapiya," citing the work of Turovskaya. The Railway Children's Hospital in Sverdlovsk reported a lower prewar case fatality rate among infants with pneumonia, ranging between 20 and 37 percent, depending on age. Sulfa drugs had allowed them to reduce this to below 10 percent: F. I. Ratnikov-Dmitriev, "Vliyanie vozrastnoi reaktivnosti na techenie pnevmonii u detei pri sul'fonamidnoi terapii: po materialam detskoi dorozhnoi bol'nitsy Sverdlovskoi zheleznoi dorogy za 1940–1946" (Candidate of Medical Sciences Dissertation, Sverdlovsk, 1948), pp. 110, 249–50.

[95] In this and the next subsection of the chapter I analyze the three Urals industrial oblasti and Kemerovo oblast' as a single entity. Geographically this seems to make little sense, since Kemerovo oblast' and the Kuzbass (Kuznetsk) mining and industrial basin of which it is the heart are separated from the Urals by some distance. The major cities of Omsk and Novosibirsk lie between them. The rationale for treating them here as a single entity is due to their industrial importance for the USSR's postwar reconstruction and their social and economic similarities as rapidly expanding centers of heavy industry whose infrastructure was badly neglected by the government in Moscow.

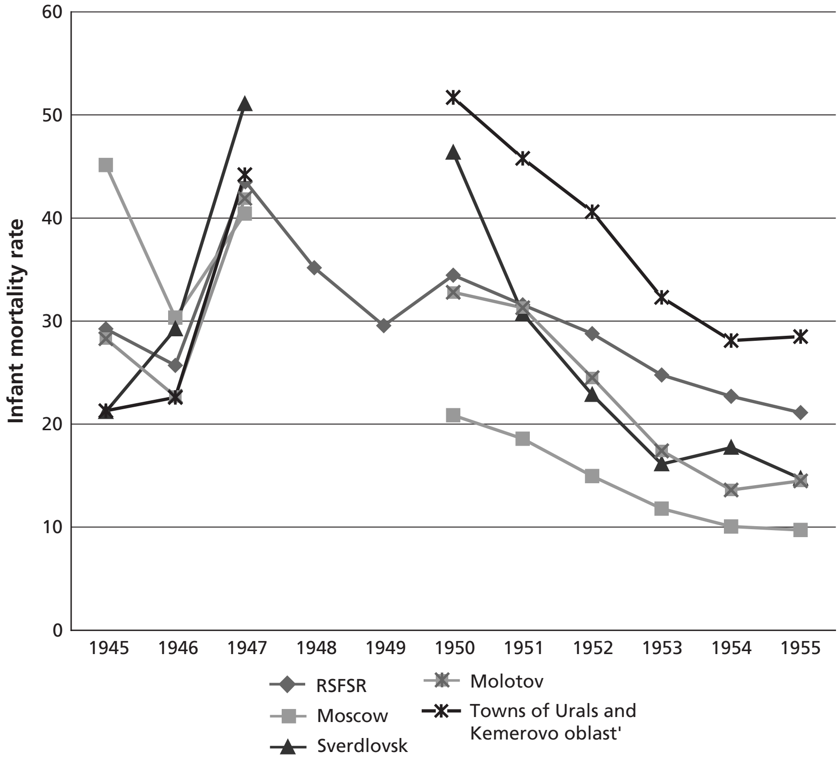


Figure 5.6 Infant mortality from pneumonia: urban RSFSR, Moscow, Sverdlovsk, Molotov, and towns of Urals and Kemerovo oblasti, 1945–1955

deaths. So, too, did Molotov, although this more or less mirrored progress made in the urban RSFSR as a whole. Sverdlovsk and the Urals–Kemerovo oblast' towns, however, continued to show high rates of pneumonia infant mortality through 1950: the 1950 pneumonia IMR in Sverdlovsk was only marginally lower than in 1947, and in the Urals–Kemerovo towns it was actually worse. At this point a dramatic shift took place. Pneumonia deaths in the oblast' towns of Urals–Kemerovo remained well above the RSFSR urban average, while those in Sverdlovsk and Molotov began to converge toward the rates in Moscow. The fall in Sverdlovsk city was the most remarkable: within three years pneumonia infant mortality had fallen by two-thirds, twice the average rate of fall for the urban RSFSR. In 1950, infant mortality from pneumonia in Sverdlovsk had been 2.2 times the rate in Moscow; by 1953 the gap was just 36 percent. By the mid-1950s rates in Molotov were even lower. This is not to deny that the oblast' towns had also made progress, but the decline in pneumonia deaths was slower, and the numbers continued to linger well above the Russian urban average: in 1955 it was virtually double the pneumonia IMR in both Sverdlovsk and Molotov. I shall explore this issue in greater detail when I discuss regional inequalities in infant mortality, but for the moment I wish to stress one point: the USSR had limited supplies of modern antibiotics, and priority in their distribution and use went in the first instance to Moscow, the capital, and then to the country's major regional centers. It is only toward the middle of the 1950s that we begin to see convergence between the regions, with the gap between the metropolises and the oblast' towns closing. Of course access to antibiotics is only one part of a larger story. Cities with large hospitals and medical schools now began to show a decided advantage in reducing infant deaths, an advantage they had not demonstrated until the early 1950s. How much of this was due just to preferential access to antibiotics and how much to general improvements in medical care I cannot say.

A second reason why it was so difficult to reduce pneumonia deaths had to do with the condition of the children themselves. The statistics cannot convey just how sick these infants were or the trauma that their illnesses must have caused their families. Throughout the 1940s infants hospitalized with pneumonia arrived already suffering from a host of other infections and complications – dysentery and other gastrointestinal infections, anemia, suppurative ear infections, and, most common of all, severe malnutrition – which greatly worsened their chances of survival. Whether or not the malnutrition preceded their disease or resulted from the fact that they had become too ill to feed properly is unclear. Not only were these babies underweight and physically underdeveloped, a very large percentage also had rickets, especially during the war, but afterward as well. With such an array of illnesses and complications, the survival chances of these children were not good, and even with sulfa drugs or penicillin many of them died.[96] Herein may also lie part of the answer as to why pneumonia deaths eventually did fall, as well as why they fell faster in the large cities. Independently of whether or not hospitals had access to antibiotics, insofar as hospitals were able to treat, or at least attenuate, some of the diseases and conditions which accompanied or even precipitated the pneumonia, including providing proper nutrition, they improved the child's chances of surviving the pneumonia itself.

[96] Chernyak, "Penitsillinoterapiya," pp. 78, 83, 85, 94; Vainer, "Techenie," pp. 53–5; Ratnikov-Dmitriev, "Vliyanie," pp. 93–7.

Finally, babies with pneumonia were at risk because local doctors were too slow to recognize their condition and to refer these children to the hospital. Either they died at home, or by the time they reached hospital the pneumonia had progressed to such an advanced stage that their prognosis was poor, even with drug treatment. In Omsk even in the mid-1950s, by which time pneumonia death rates among infants had fallen considerably, nearly 70 percent of all the babies who died of the disease died at home because doctors had failed to hospitalize them.[97]

Local differences in combating infant mortality

The geographic inequalities between Moscow and the large regional industrial centers on the one hand, and the rest of the urban RSFSR on the other, were not confined simply to deaths from pneumonia. General infant mortality rates showed the same pattern. The roots of these inequalities lay far deeper than preferential access to antibiotics and better hospitals. They reflected major differences in general living conditions. I explore this by examining opposite ends of the spectrum: the disadvantages suffered by the Urals–Kemerovo regional complex, and the privileged status of Moscow.

The special position of the Urals and the Kuzbass

There appears to be a close connection between the persistence of high infant mortality from pneumonia and gastrointestinal infections and these diseases' geographical distribution. The late 1940s and early 1950s saw an important shift in the RSFSR's demography. The three Urals industrial regions of Sverdlovsk city–Sverdlovsk oblast', Molotov city–Molotov oblast', and Chelyabinsk city–Chelyabinsk oblast', plus Kemerovo oblast' in the Kuznetsk Basin (Kuzbass) in Siberia, by 1950–1951 accounted for 19.2 percent of all urban live births in the RSFSR, versus 16 percent in 1946. Nearly one in five babies born in the RSFSR was born in these regions. Thus, what happened in just these four industrial regions in terms of public health had enormous importance for the RSFSR as a whole. What really stands out, however, is that in 1950 and 1951 they accounted for a far higher proportion of all infant deaths, and of infant deaths due to the two major environmental groups of diseases (gastrointestinal infections and pneumonia), than their share of total live births.

This we see clearly in Table 5.12 and Figure 5.7.

[97] Ratnikov-Dmitriev, "Vliyanie," pp. 104–5; Mirovaleva, "Prichiny," p. 190.

Table 5.12 *Live births and infant deaths in urban areas of Urals and Kemerovo oblasti as a percentage of all urban RSFSR live births and infant deaths, 1946–1955*

Gastrointestinal infections, pneumonia, and all infant deaths

Year	% of all births	% of all pneumonia deaths	% of all gastrointestinal deaths	% of all deaths
1945	16.8	13.1	15.9	14.6
1946	16.0	14.9	14.8	15.9
1947	17.0	17.9	17.3	18.2
1948	17.5	n/d	n/d	20.3
1949	19.2	n/d	n/d	22.6
1950	19.3	28.2	22.2	23.5
1951	19.2	26.7	22.4	23.2
1952	19.0	25.3	21.9	22.1
1953	18.8	22.9	21.7	21.3
1954	18.1	21.2	17.9	19.1
1955	18.0	22.9	21.5	20.5

Sources: Calculated from the sources for Tables 5.7 and 5.10 and GARF, f. A-374, op. 30, d. 6856, l. 7, 7ob., 8, 8ob., 19, 19ob., 20, 20ob., 31, 31ob., 32, 32ob., 35, 35ob., 36, 36ob.

What is striking is that in 1945 and 1946 these four industrial regions (including their oblast' metropolises) had accounted for a smaller share of infant deaths and gastrointestinal and pneumonia deaths than their share of urban live births. In 1945, the infant mortality rate in what I call Urals–Kemerovo taken as a whole and in the smaller towns of their respective oblasti (that is, excluding the large metropolises) was lower than the urban RSFSR average and lower than in Moscow. In 1946, the IMR in Urals–Kemerovo, the urban RSFSR, and Moscow were roughly the same. Even in the crisis year of 1947 the mortality rates in Urals–Kemerovo exceeded its share of live births only by an insignificant amount. By 1950, however, Urals–Kemerovo began to account for a measurably larger proportion of total and environment-linked infant deaths, a trend that carried on right up to 1955, the last year for which we have data. In 1950 almost three out of every ten of the urban RSFSR's infant deaths from pneumonia and nearly one out of every four of its infant deaths from any cause occurred here.

We also know that these regions had among the most backward sanitary conditions and the worst housing in the country. Moreover, the water safety in these oblasti was probably worse than elsewhere. It is perhaps extrapolating too far from the evidence to propose that this was the only

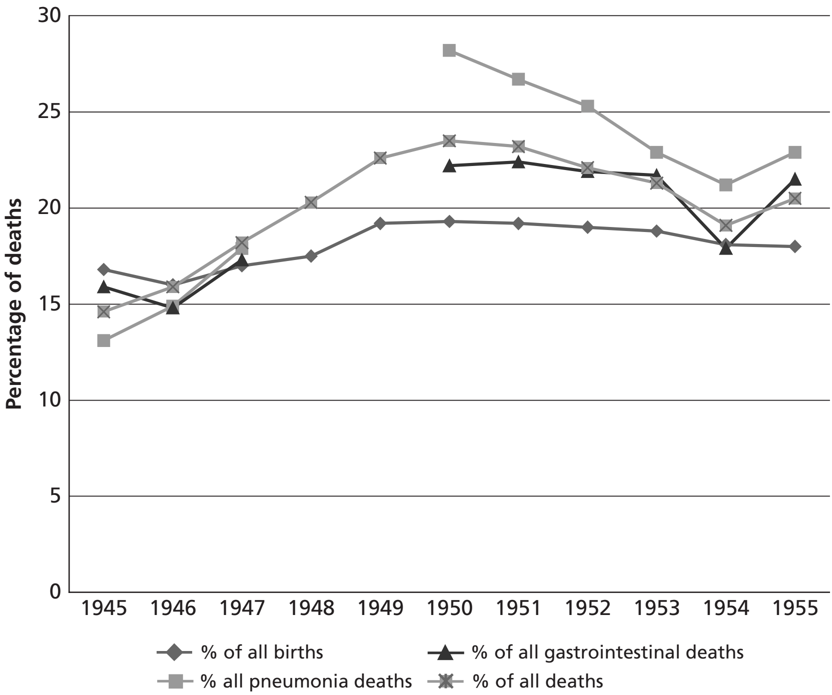


Figure 5.7 Live births and infant deaths in urban areas of Urals and Kemerovo oblasti as a percentage of all urban RSFSR live births and infant deaths: gastrointestinal infections, pneumonia, and all infant deaths, 1946–1955

explanation for these mortality figures, given that, as we have already seen, these regions' record on pneumonia deaths was even worse than their record on deaths from gastrointestinal infections. Other factors, such as supplies of food and heating fuel, or the number of physicians, must also have played a role. Pediatric care in Molotov oblast', for example, was notoriously bad.[98] Yet looming large over everything was the region's extremely backward physical and social urban infrastructure.

[98] See the report of the First Plenum of the Sanitary-Epidemiological Council of Molotov Oblast', September 2–6, 1948, in GARF, f. 9226, op. 1, d. 892; and GARF, f. A-482, op. 52s, d. 244, l. 234–52 (a report on the state of pediatric provision by the deputy head of the Molotov Oblast' Department of Health, dated January 12, 1949).

The special position of Moscow

The Urals and Kemerovo oblast' were, in fact, a special case of a larger pattern in the late Stalin period, namely the growing gap between infant mortality in Moscow city and virtually every other hinterland industrial region – including neighboring Moscow oblast'. Improvements in infant mortality and in the factors that assisted these improvements were weighted preferentially in the direction of Moscow. A gap between Moscow and the rest of the country began to emerge in 1946 and 1947 and was to grow far wider in ensuing years. By 1951, Moscow accounted for 5.2 percent of all urban live births in the RSFSR, but only 2.9 percent of urban infant deaths.[99]

We can, in fact, work out a Moscow index for infant mortality, and it reveals a truly striking picture. I show this in Table 5.13 and Figure 5.8. The table takes infant mortality in Moscow as 100 in any given year, and shows the extent to which other urban localities deviated from it. Those with lower infant mortality rates than Moscow will have an index figure less than 100; those that exceeded it will have an index figure above 100.

In 1945 and 1946 infant mortality in all hinterland industrial cities and regions was clustered within a very narrow band. As we have already had cause to note when tracing regional changes in pneumonia deaths, infant mortality in Moscow was actually higher than the RSFSR urban average and, more surprisingly, higher than in the Urals. In 1946, Moscow's relative position improved slightly, but infant mortality still exceeded that in the industrial towns and workers' settlements of Sverdlovsk and Chelyabinsk oblasti, regions which we know had truly awful sanitary and housing conditions. The situation really started to change during the famine, as Moscow received preferential food supplies. At the same time the regime had undertaken efforts to accelerate sanitary improvements in the city. These included new water treatment plant to protect Moscow's water supply, improvements in waste collection and the state of outhouses and outdoor toilets, new housing construction, and the project of "gasification," which allowed more people to boil water and wash in their own homes on a regular basis.[100] These steady sanitary improvements, although they could not fully cope with the ever-growing volumes of

[99] I have calculated these figures from the sources cited for Tables 5.7 and 5.10. Although I have not shown the data here, the same was true to a slightly lesser extent of Leningrad. I have not studied whether the Leningrad trend is typical or atypical of other cities that underwent extensive reconstruction following wartime destruction. Moscow's declining share of total births is itself noteworthy, because boundary changes meant that the city was expanding. This suggests that its birth rate was falling, a factor that itself could have assisted lower infant mortality.

[100] See pp. 51–3 and 141–2.

Table 5.13 *Infant mortality index, RSFSR and major hinterland industrial oblasti, 1945–1956 (Moscow = 100)*

	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956
RSFSR	89.1	107.1	120.6	115.9	133.3	154.5	177.4	179.1	164.3	173.0	162.9	131.4
Moscow city	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Moscow oblast’	86.1	116.5	122.2	109.1	120.3	133.3	164.2	158.1	147.6	156.8	140.0	114.3
Yaroslavl’ oblast’	111.9	128.2	155.6	134.1	129.0	160.6	198.1	160.5	171.4	175.7	145.7	117.1
Ivanovo oblast’	105.0	127.1	140.5	133.0	127.5	160.6	194.3	186.0	169.0	208.1	177.1	142.9
Gor’kii city	105.9	137.6	150.8	120.5	113.0	137.9	160.4	127.9	138.1	164.9	120.0	114.3
Gor’kii oblast’	102.0	114.1	114.3	111.4	107.2	145.5	181.1	176.7	166.7	200.0	148.6	131.4
Kuibyshev city	88.1	116.5	128.6	119.3	160.9	143.9	156.6	165.1	161.9	148.6	140.0	102.9
Kuibyshev oblast’	72.3	88.2	101.6	110.2	121.7	112.1	175.5	169.8	171.4	194.6	160.0	117.1
Tatariya	95.0	123.5	118.3	118.2	130.4	147.0	171.7	202.3	188.1	186.5	165.7	142.9
Sverdlovsk city	81.2	135.3	153.2	137.5	153.6	203.0	162.3	172.1	140.5	162.2	131.4	114.3
Sverdlovsk oblast’	66.3	94.1	124.6	140.9	146.4	178.8	220.8	209.3	171.4	183.8	182.9	137.1
Molotov city	90.1	116.5	138.1	126.1	159.4	169.7	173.6	176.7	169.0	159.5	154.3	102.9
Molotov oblast’	86.1	112.9	134.1	139.8	171.0	213.6	260.4	230.2	233.3	224.3	197.1	165.7
Chelyabinsk city	89.1	123.5	147.6	136.4	163.8	175.8	169.8	183.7	161.9	159.5	168.6	131.4
Chelyabinsk oblast’	69.3	97.6	131.7	137.5	163.8	183.3	205.7	227.9	185.7	181.1	182.9	145.7
Bashkiriya	74.3	92.9	105.6	129.5	143.5	163.6	171.7	227.9	209.5	248.6	217.1	162.9
Kemerovo oblast’	80.2	105.9	111.9	127.3	153.6	187.9	218.9	218.6	190.5	181.1	214.3	137.1

Sources: Calculated from the sources for Tables 5.7 and 5.10.

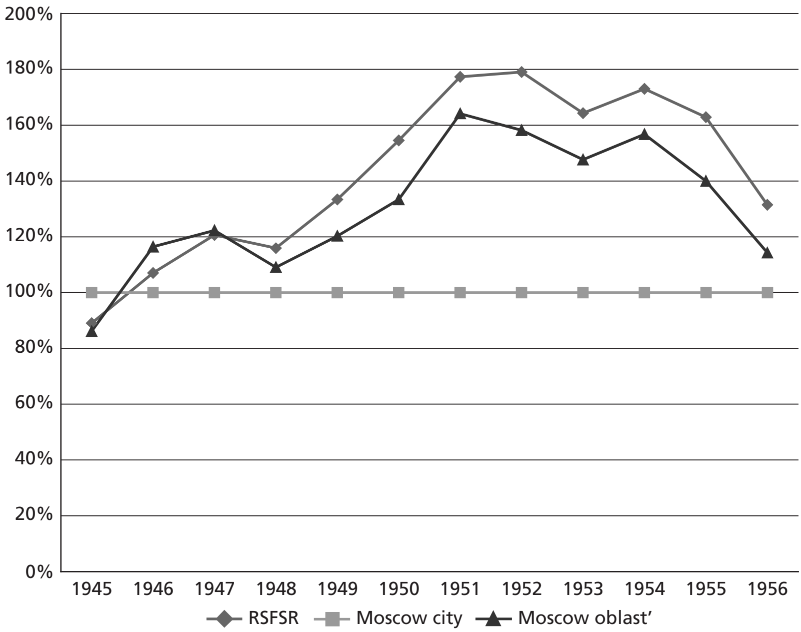


Figure 5.8a Infant mortality index, RSFSR and Moscow region, 1945–1956 (Moscow = 100)

sewage and river pollution either entering Moscow or generated by the city itself, nonetheless gave Moscow a marked advantage in the sanitary conditions over other industrial cities and oblasti. At the same time, it is almost certain that Moscow residents, including its workers, enjoyed superior medical care relative to other localities. All of this acted to create a huge gap in the life chances of babies born in Moscow compared to those born almost anywhere else.

A close look at Table 5.13 and the accompanying figures shows that the gulf became extremely wide. As late as 1954, a baby born in Moscow oblast' – right next to Moscow city – had a 57 percent greater chance of dying in the first year of life than a baby born in Moscow. In urban areas of Yaroslavl', Sverdlovsk, Chelyabinsk, and Kemerovo oblasti and Tatariya, the chances of an infant death were 75 to 90 percent higher. For babies born in Kuibyshev, Gor'kii, Ivanovo, and Molotov oblasti the likelihood of an infant dying was twice as high, and in Bashkiriya two and one-half times as high. Only after 1954 did this inequality in survival chances start to narrow, although once convergence began it appears to have been very rapid.

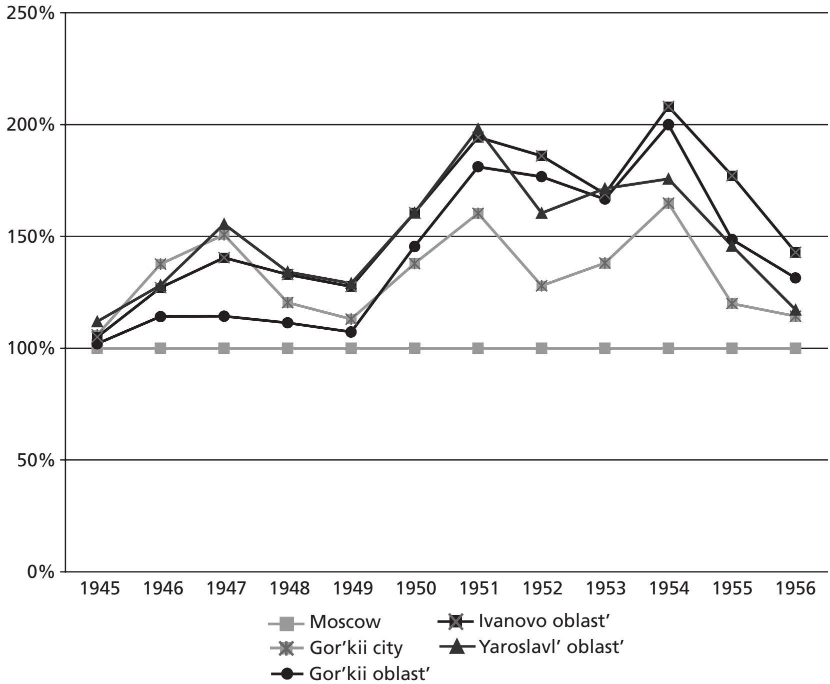


Figure 5.8b Infant mortality index, Central Russia, 1945–1956 (Moscow = 100)

Conclusion: the Soviet Union and the "Preston curve"

During the 1920s and 1930s infant mortality in the Soviet Union was at levels comparable to the more industrialized parts of Western Europe some forty to eighty years earlier. The emergency caused by the German invasion caused a breakdown of already inadequate urban sanitary systems and housing provision; this, together with mass hunger, saw infant mortality increase still further. Yet counter to expectations, after 1942 infant mortality declined, not simply to where it had been before the war, but much lower. Moreover, the improvement was sustained. The postwar famine brought another spike in infant mortality during 1947, but after the famine had eased infant mortality settled back to the levels of 1945 and 1946. This process was highly uneven, however. Not all regions made a full recovery: the Urals did not return to its pre-1947 infant mortality levels until the early 1950s. The process of recovery and improvement was most intense in Moscow, which showed vastly lower infant morality rates than all other hinterland industrial regions.

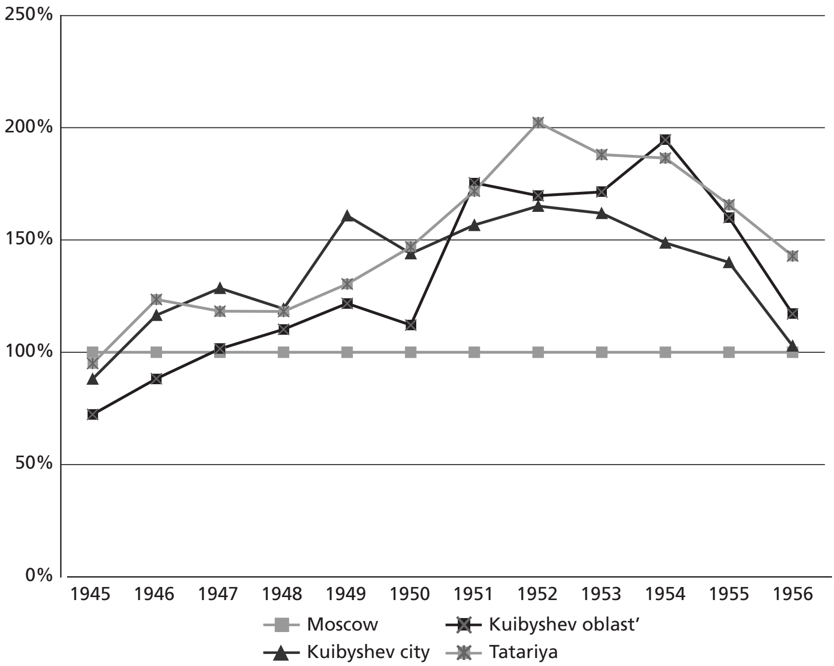


Figure 5.8c Infant mortality index, Volga region, 1945–1956 (Moscow = 100)

Despite its unevenness, this fall in infant mortality appears to be counterintuitive. We know that improvements in infant mortality in Victorian and Edwardian Britain or in Wilhelmine Germany had no single cause. Rather, they resulted from a conflux of factors, including better sanitation and housing, a fall in the birth rate, and cheaper food. Yet none of these factors operated in the postwar USSR. There was acute overcrowding, the birth rate was rising rapidly, improvements in urban sanitation were breathtakingly slow (and in some localities virtually nonexistent), there was a chronic shortage of soap and bathing facilities, and the population suffered from systematic, ongoing undernourishment. For all these failings, we need to remember that the Soviet Union was not Victorian Britain or Wilhelmine Germany. Its sanitary infrastructure, like its rates of infant mortality, appeared to lag some forty to eighty years behind Western Europe. This was not an illusion – it is an accurate picture of what most non-combat zone Russian cities looked like after the war. At the same time, however, the Soviet Union was able to benefit and borrow from some of the medical advances made in the West. It could immunize against, and treat, diphtheria and typhoid fever. It began to apply, albeit in

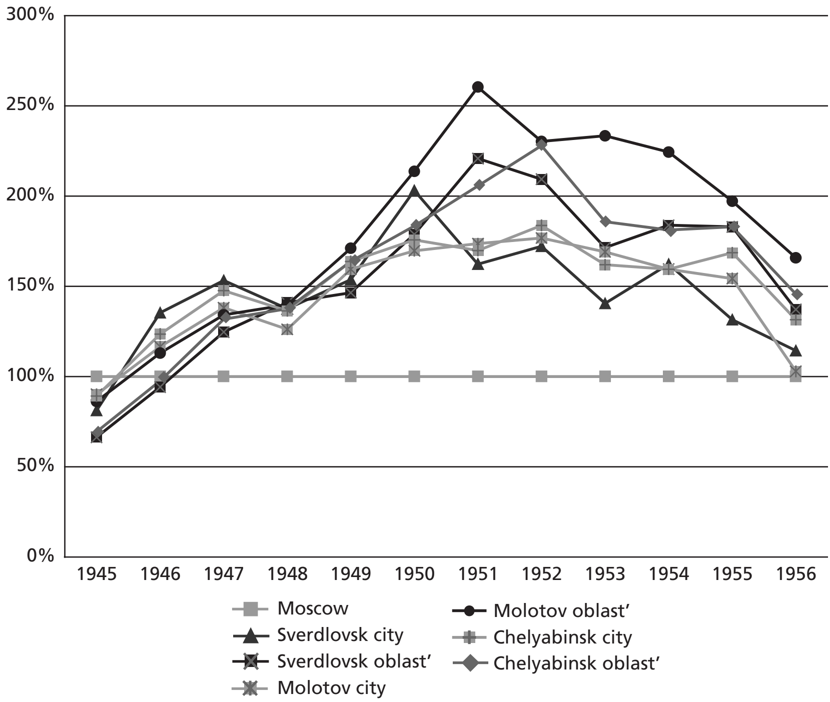


Figure 5.8d Infant mortality index, Sverdlovsk, Molotov, and Chelyabinsk regions, 1945–1956 (Moscow = 100)

rudimentary form, Western-style epidemiological controls and immunization techniques to bring down infection rates and case fatality rates of measles among infants and young children. During the war it attenuated typhus deaths through the use of a primitive but relatively effective vaccine. During the 1930s it had begun immunizing children against tuberculosis. After the war it began limited use of antibiotics, including sulfa drugs to treat dysentery and penicillin to treat pneumonia. Yet it applied these techniques among a population which, because of dire housing and sanitary conditions, faced constant exposure to disease.[101]

[101] Nor should we forget that the country also invested vast resources in some quite hopeless schemes, one of the most notable being the mass administration of oral doses of bacteriophage to try to combat dysentery and other diseases. Bacteriophage are viruses that attack bacteria, and the country had a range of institutes devoted to researching and producing bacteriophage targeted at specific diseases. The phage were administered as tablets on a truly mass scale against typhoid fever and dysentery. In Molotov oblast' during 1948 health authorities gave out more than 30 million tablets against dysentery

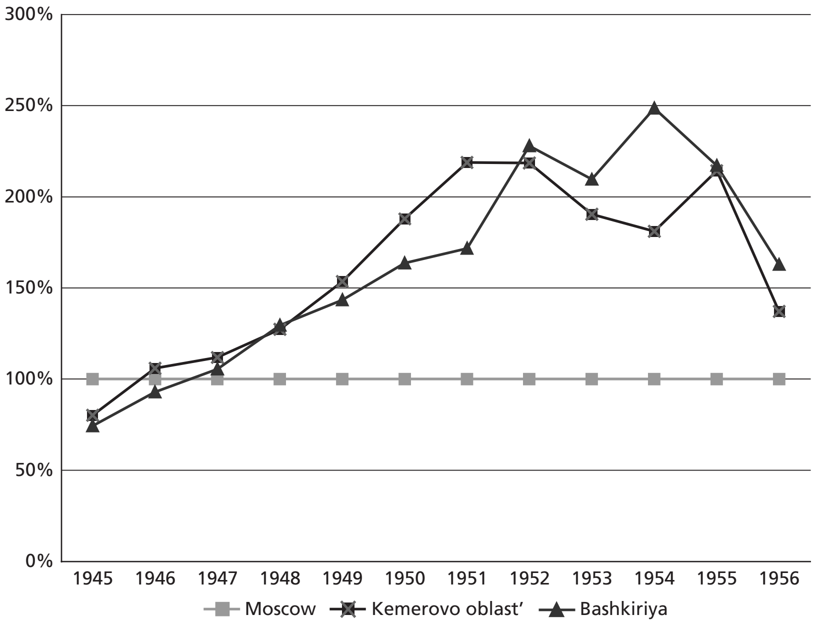


Figure 5.8e Infant mortality index, Bashkiriya and Kemerovo oblast', 1945–1956 (Moscow = 100)

In following this path the Soviet Union was far from unique. On the contrary, its experience mirrored that of countless poorer countries during the middle third of the twentieth century. The key to understanding this is the work of Samuel Preston, whose seminal 1975 article examined

alone: GARF, f. 9226, op. 1, d. 899, pp. 100–1 (this file is a typescript of the Molotov oblast' annual GSI report and has page numbers rather than sheet numbers). The problem was that the treatment did not work (the phage are destroyed in the stomach before they can reach the lower bowel or bloodstream), but because this was official policy and so many scientists had built their careers around it, no one could admit this. Instead, they proposed a range of answers for the treatment's lack of success. As an example, see the three articles by S. I. Didenko in the 1955 collection, *Materialy po obmenu opytom* (Moscow: USSR Ministry of Health, Department of Institutes for Vaccinations and Serums, 1955), in particular "Otsenka diziruyushchei aktivnosti dizenteriinykh monofagov zonne i n'yukestlya po sravneniyu s polivalentnymi bakteriofagami," pp. 219–26. Didenko acknowledged the basic failure of the program to yield results, but blamed this on the work of rival laboratories which, he claimed, had been producing inferior strains of the anti-dysentery bacteriophage because they had been using outdated cell lines. His strain, however, would prove far more effective. Interestingly, epidemiologists remained unimpressed. They considered that the treatment might work well enough in a petri dish, but in real life it had no impact whatsoever on dysentery infection rates. See V. Ya. Pekhletskaya, *et al.*, "Izuchenie epidemiologicheskoi effektivnosti profilakticheskogo fagirovaniya pri dizenterii," in Krestovnikovaya, ed., *Voprosy*, pp. 38–44.

the relationship between national wealth and life expectancy.[102] Preston made two key observations. The first was that, not surprisingly, there was a direct relationship between per capita levels of national income and life expectancy, but that the curve representing this relationship was rather steep. That means that for poor countries relatively modest increases in national income would produce fairly substantial improvements in life expectancy. Beyond a certain point, however, the curve flattened, so that the extra wealth of very rich countries did not translate into significant rises in longevity. The second and more important observation was that over time the curve – what became known as the Preston curve – shifted upward. If during the 1930s life expectancy in the very poorest countries was just over thirty years, by the 1960s countries at this same low level of development had pushed life expectancy up to over forty years. Even more significant, the slope of the curve had become even steeper than it had been in the 1930s. In other words, very poor and moderately poor countries required far smaller increases in national income in order to achieve very large improvements in life expectancy – so much so, that countries with a per capita national income of around just $200 (in 1963 US prices) in the 1960s enjoyed the same life expectancy as the very richest countries had enjoyed in the 1930s. Put another way, to attain a life expectancy in the range of forty to sixty years required a per capita national income 2.6 times higher in the 1930s than was needed in the 1960s.

How did these poorer societies record such progress? Preston argued that only a small percentage of the average gain in life expectancy was due to growth in income. The overwhelming proportion of these health gains came from exogenous factors, that is, factors that had little or no connection with a country's level of economic development. The early twentieth century already gave examples of how this process worked. Early twentieth-century Japan, which measured by national income was a poor country, had an "unusually high life expectancy," attained, Preston believed, because of the society's emphasis on personal cleanliness and the state's intervention in public health, both of which acted to counter the effects of poverty. Some colonial administrations during the 1920s effected similar outcomes through anti-malarial campaigns, immunizing against smallpox, and taking measures to curb the incidence of diseases such as cholera and plague. More generally, even in the absence of drugs that could cure diseases (which were not developed until the 1930s), societies could reduce mortality by understanding the principles of antisepsis and the need to quarantine and isolate infectious patients, by

[102] Samuel H. Preston, "The Changing Relation Between Mortality and Level of Economic Development," *International Journal of Epidemiology*, vol. 36 (2007), pp. 484–90.

ensuring clean food and water, by improving the ways infants were fed, and by educating their populations about personal hygiene. If prior to the 1930s such instances were still the exception, they do show how in later decades poor societies could emulate these results.[103]

Ironically, Preston considered that the Soviet Union and the post-World War II Soviet bloc were exceptions to his theory. Preston had noted that within the group of countries clustered at the bottom of the income table only some, rather than all, registered large gains in life expectancy. His view was that for these countries levels of income inequality were a key explanatory variable. Poor countries with very large disparities in wealth did much worse than those where inequalities were more muted. It was this that led Preston to conclude that the USSR did relatively badly, with levels of mortality higher than those he would have expected from the size of its national income. His mistake here was that he presumed that income inequalities were fairly small in the Soviet Union, and this in turn should have led it to record higher levels of life expectancy than it did.[104] In fact, as we have long known, inequalities in the Soviet Union were very wide, far wider than those registered by just comparing wages and salaries of different social groups. Access to such vital, health-determining factors as decent housing, proper food, and competent medical care had little or nothing to do with money income, and everything to do with the *in natura* distribution of privileges according to position and status. A fairly low-level section chief in a factory in the 1970s probably earned less than the skilled workers under his (and occasionally her) command, but there is no question as to who was more likely to live in a single-family flat, own a vacuum cleaner and washing machine, and ensure their children's passage to higher education.[105]

What we have seen in this chapter, however, is that Preston very probably underestimated – because he would not have had the data – the progress that the Soviet Union had actually made, especially during the early postwar years. It was precisely through the application of those exogenous factors central to Preston's theory that it did this. If prior to World War II the country's public health system had not been able to implement the basic measures that might have counteracted the lethal impact of its poverty, after the war this was no longer so. In part this was due to the war itself, which forced the public health authorities to devise methods and systems for dealing with the sharp rise in mortality caused by the rapidly deteriorating urban environment. These survived after the war, and were then supplemented by expansion of the health care system, the development and limited use of antibiotics, and, probably most vitally

[103] *Ibid.*, pp. 486–9. [104] *Ibid.*, p. 489.
[105] On this, see Yanowitch, *Inequality*, chapter 2.

of all, better public awareness about personal hygiene. Some of these measures West European countries had applied at the start of the twentieth century. Others were more modern developments which the Soviet Union could copy and borrow.[106]

By the same token this process of borrowing was highly uneven. The Soviet Union may have developed a rudimentary pharmaceutical industry and understood the principles of isolation and quarantine and the need for good public education about personal hygiene, but it was very bad at making its streets, courtyards, houses, and water supplies safe and disease-free. The root to really tackling infant mortality, and disease in general, was to make improvements in precisely these areas: housing, urban sanitation, provision of clean water, adequate supplies of soap, and a good general diet. The Stalinist regime showed signs of doing this only at the very end of Stalin's life. More rapid progress had to await the general reforms that Khrushchev introduced in housing and social welfare. In the meantime the regime compensated for its failure to provide an adequate urban infrastructure by relying on intensive public education campaigns and stringent measures to identify and contain outbreaks of disease.

What this chapter also highlights is that the country's success in reducing mortality did not follow the same trajectory everywhere in the country. Among the hinterland regions, Moscow modernized, at least in relative terms, but the industrial heartlands of the Urals and Kemerovo oblast' lagged behind. Improvement was painfully slow, and we now know with hindsight that eventual "modernization" of these regions brought modern miseries and modern diseases in its wake.[107] In the postwar period, however, life was extraordinarily grim. It is neither emotive nor unscientific to posit that, as long as people had to live surrounded by their own excrement, a tragically large percentage of their children were going to die.

[106] I do not wish to underestimate health innovations that the Soviet Union itself may have made, but to a large extent these still depended on its access to knowledge about medical practice in the West. When reading the early postwar medical literature, in particular medical dissertations, it is striking, given the high degree of censorship and the state's menacing stance against the adoption of Western ideas, including Western science, how familiar many doctors were with the medical literature in the West. Many Soviet medical inventions were really attempts to replicate under their own means drugs invented and manufactured in Europe or the USA.

[107] During *perestroika* Soviet newspapers claimed that in the smokestack towns of the Urals and Kuzbass (Kemerovo oblast') factories annually belched out between 600 and 1,500 kilograms of pollutants *per resident*. In Novokuznetsk, which during Stalin's time was the city of Stalinsk, the heart of the mining and metallurgical industries in Kemerovo oblast', between 1975 and 1990 the rate of cancers rose 26-fold, and cases of bronchial asthma increased sixfold. In 1990 a staggering 23 percent of all babies born in the city were born with some form of illness: *Trud*, April 28 and 29, 1990; *Izvestiya*, April 29, 1990; *Rabochaya tribuna*, November 26, 1991.

Conclusion

The preceding chapters have painted a picture of urban life in late Stalinist Russia that raises a number of questions about how we conceptualize the process of the USSR's industrialization and modernization. Let me first summarize what we have seen thus far.

First, most Russian hinterland industrial cities and towns lacked basic sanitation. The large cities had limited sewerage systems, but they did not extend to the majority of the population. Most smaller industrial towns had virtually no sewerage at all, other than the restricted systems installed by individual factories for their own use. The problem was complicated, of course, by traditional housing patterns, where even Moscow had a large percentage of its population living in single-story wooden buildings with no amenities. Yet the nature of the housing stock on its own did not explain why the population was so badly served. The main stumbling block was lack of investment in sanitary infrastructure. This infrastructure had been inadequate even before the launch of Stalinist industrialization in the late 1920s. With the five-year plans it became overwhelmed. Millions of new workers and their families poured into towns and cities, but the state made almost no effort to erect the housing, sanitary facilities, or water supply that such population shifts demanded. World War II turned this chronic inadequacy into a sanitary crisis. Even in those regions which did not suffer any physical destruction, the war temporarily ended any possibility of modernizing sanitation where it already existed or installing it where it did not. Funds even for basic upkeep and maintenance were lacking, and so these systems fell into varying degrees of disrepair. This would have created serious public health problems even if the populations of these towns had remained the same. When hundreds of thousands of evacuees, refugees, and mobilized workers flooded into cities such as Sverdlovsk or Chelyabinsk, the gulf between the amount of garbage and human waste being generated and the ability of localities to remove it became acute. Despite emergency measures (burying the waste, burning it, flushing it into local rivers, or hauling it out beyond town boundaries), the end of the war left most cities with huge accumulations of uncollected rubbish and excrement. Given the limited capacity of most sewerage systems, postwar towns could keep their courtyards and streets clean only by carting the wastes away. Here, too, however, the resources were lacking. Vehicles, horses, and labor power were all in short supply. Regular cleaning was impossible. Cities and towns alike relied on semi-annual cleanup campaigns to empty cesspits and remove the mountains of waste. These achieved some temporary success, but they still meant that for most of the year urban residents had to wend their way through streets that were almost permanently dirty and foul.

Secondly, there was the problem of water supply. The large cities and many smaller industrial towns had centralized water supply serving the bulk of their populations. This is deceiving, however, because very few people lived in buildings with indoor plumbing. People had to fetch water from street pumps and then haul it in buckets back to their flats. Supplies were also unreliable. Buildings with running water suffered from periodic cutoffs and lack of pressure. Street pipes could freeze up in winter. Thus accessing water became a major domestic burden. The effort was not just fetching and carrying, but also heating water for cooking, washing clothes, and personal hygiene in flats, dormitories, and barracks equipped with only wood or kerosene stoves. Access to water was just one aspect of the problem, however. Even where cities possessed sewage treatment plants – and many cities and most small towns did not – these lacked equipment, spare parts, and chemicals to treat the full volume of liquid wastes passing through them. Vast amounts of raw sewage therefore went untreated (or at best, undertreated) into rivers, lakes, and ponds. This might have posed less of a problem if local water systems had had pumping stations to purify the water before putting it into the local supply, but these suffered from the same difficulties as sewage treatment works: if they existed at all, they did not have sufficient capacity to put water through a full cycle of treatment, and so the safety of local water supplies was compromised. An even greater hazard were industrial wastes, most of which factories discharged untreated into open bodies of water. Even if local drinking water was unaffected by this, factories were simply shifting the problem downstream to other localities. The problem of industrial pollution became so great that the regime passed laws in both 1937 and 1947 ordering factories to install anti-pollution equipment. Few of them did so, and the reasons why tell us a great deal about the nature of Stalinist "planning." Even if enterprises did not seek deliberately to circumvent the law (although many of them did), they came up against the fact that the country did not have standard designs for anti-pollution systems, did not manufacture the required equipment, and did not train enough engineers and mechanics to run the systems or keep them in good repair. The signs of what commentators of the late Soviet period termed "ecocide" were already visible here: mass fish kills and damage to industrial equipment caused by the chemical pollutants in local rivers.

Thirdly, there was the problem of personal hygiene. Given the difficulties most urban residents had in accessing clean water and the general dirtiness of the environment, people relied heavily on the traditional Russian bathhouse to keep themselves clean. Here, too, however, facilities could meet only a small fraction of overall need. Most people could bathe just once or twice a month. Toward the end of the late Stalin period many – but by no means the majority – found alternative facilities at workplace shower rooms. A few people moved into houses with bathrooms. Others could at least wash on a regular basis after local authorities installed gas water heaters in their flats. During the early postwar years, however, few such possibilities existed. The situation was compounded by an acute shortage of soap. Understandably, given the state of the housing stock and the limited facilities and supplies that were available, what concerned officials was not the comfort of the population, but the risk of spreading disease, most notably lice-borne typhus and relapsing fever. Official policy was to prioritize access to bathhouses and "sanitary processing stations" among those who posed the greatest public health risk of harboring and spreading lice, most notably young workers or students living in crowded dormitories, who received regular "sanitary processing" of both themselves and their clothing. "Sanitary processing" was just one element of a much more ambitious set of public health controls designed to identify, isolate, and treat lice carriers or those already suffering from typhus. Many of these measures had been developed during the war as a response to the enormous health problems that arose from mass evacuations and troop mobilization. During the postwar period these risks found new carriers, namely the millions of indentured laborers (Labor Reserve trainees, workers mobilized via organized recruitment, and seasonal workers) who traveled vast distances from their homes to the factories, construction sites, or peat fields to which they had been mobilized. This aspect of Stalinist public health policy proved successful. With the exception of the famine of 1947, when waves of spontaneous refugees overwhelmed the anti-epidemic control apparatus, the regime managed to maintain its reliance on forced and semi-forced labor without the eruption of major epidemics.

The fourth element of the urban environment I analyzed was nutrition and food supplies. The fiasco of collectivization in the late 1920s and early 1930s had caused a sizable fall in living standards, culminating in the famine of 1932–1933. Although the main victims of this famine were peasants, urban workers also suffered extreme hardship. The country had barely had time to recover from this demographic shock when the war ushered in a new period of dearth. Hinterland cities saw a surge in mortality not just among the very young and the very elderly, the two most vulnerable groups, but also among adults of prime working age. Some of this was due to disease, but many people died of starvation. The end of the war saw a small recovery in food supplies, but in 1946 a harvest failure caused a famine. Unlike the famine of 1932–1933, the famine of late 1946 to early 1948 took a heavy toll among urban residents, including workers. In fact, outside the famine's epicenter in Moldavia and southern Ukraine, urban workers suffered proportionately higher mortality than peasants. An analysis of worker and peasant diets helps explain why this was so: in the Russian hinterland, at least, peasants proved able to sustain their calorie and protein intake through access to potatoes. Workers were less able to resort to this strategy, and so many of them died. Peasants had one other dietary advantage over workers, namely milk. This helps explain why in most regions rural infant mortality was lower than that in the towns and cities, even during the famine year of 1947, when infant mortality rates soared. After 1948 there was a moderate recovery in nutrition, but even in the mid-1950s Russia's workers were still consuming fewer calories than they needed to carry out heavy manual labor and cope with the cold climate, poorly heated buildings, and inadequate public transport.

Finally, we examined the phenomenon of infant mortality. The death of a small child is a terrible personal tragedy for parents and relatives, and to this extent the phenomenon also tells us something about the general quality of life of Soviet citizens. From an analytical point of view infant mortality is a reliable barometer of a society's general state of welfare and well-being. Infant mortality in the late Stalin period confronts us with a basic paradox. In the early twentieth century tsarist Russia had one of the highest infant mortality rates in Europe. After a small decline following the Bolshevik Revolution, infant mortality went up again as living standards fell and urban sanitation worsened in the 1930s. The real crisis came during the war, as infant mortality attained almost unimaginable levels in 1942. From 1943 onward, however, it declined. At first glance this might seem an artifact of the specific demographics of the war years: with so few children being born in 1943 and 1944, it would have been easier for parents to shield babies from the diseases that normally might have killed them. Yet the decline persisted during the whole of the postwar period. The exception to this pattern, of course, was 1947, the famine year, when infant mortality in hinterland regions soared to prewar levels and reached heights typical of British cities in Victorian times. As food supplies improved from 1948 onward, infant mortality again fell and continued its downward trajectory until the 1970s.

This general picture conceals serious regional imbalances. The fall in infant mortality was greatest in Moscow, which was the only hinterland city to carry out fundamental sanitary reform. With a time lag of a few years, it also showed a rapid decline in the large cities, probably because of a combination of factors that had been absent during the early postwar years: reduction in infection risks via small improvements in sanitation, better medical facilities, and more effective education on the requirements of personal hygiene. By contrast, in the industrial oblast' towns of the Urals and Western Siberia, where the progress of sanitary improvements was extremely slow, infant mortality remained significantly higher. Eventually the smaller towns also began to make substantial progress, although they still lagged behind the large centers. In 1954, a baby born in Moscow oblast', just outside Moscow city, was almost 60 percent more likely to die during the first year of life than a baby in Moscow. In the Urals oblast' towns a newborn was 80 to 100 percent more likely to die than in Moscow. Nevertheless, the secular trend was clearly in a downward direction, and by 1956 the worst-off regions were beginning to converge toward the infant mortality rates in more privileged areas.

Here lies the paradox. In the Soviet Union virtually all the factors that had contributed to the decline in infant mortality in Western Europe – better housing, urban sanitation, clean water supply, a fall in the birth rate, and better nutrition – were absent, yet infant mortality went down. This in itself is not as unusual an outcome as it might seem for, as Samuel Preston showed, during the middle of the twentieth century many poor and developing societies achieved significant gains in mortality through the importation and application of medical advances developed in the industrialized West. In the Soviet case far more detailed research is required in order to identify the precise factors that made the fall in mortality possible, but on the evidence we have here it appears to have come primarily from three sources: strict public health measures to identify and isolate potential carriers of disease; better treatment of those who fell ill; and better sanitary education. In each of these realms the Soviet Union was replicating (or perhaps presaging) the experience of societies much poorer than itself, by copying and applying Western treatments, medicines, and scientific knowledge. In other words, rather than eliminating health risks by investing in major reconstruction and expansion of the sanitary infrastructure and other improvements in the urban environment, the Stalinist regime chose to deal with the risks through epidemiological controls and medical intervention (antibiotics, more rapid diagnosis and hospitalization, and immunization).

If we evaluate all of this information taken together, one thing stands out: the success of the regime, or at least of its public health system, in preventing outbreaks of serious epidemics and reducing mortality. This was a country with a badly underdeveloped and inadequate urban infrastructure. Its public health system was underfinanced and lacked enough trained, competent doctors, nurses, and paramedics. Its sanitary inspectors had few enforcement powers, were in many cases young and inexperienced, and overall were no match for factory managers, industrial ministries, or Gosplan, with their political power. Yet for all these weaknesses, the country managed to embark on a trajectory where its mortality would begin to approach Western levels. When, during the Brezhnev period, mortality again rose and health indicators began to deteriorate, this was not due to the reemergence of sanitation-related diseases, but to factors associated with the way the country had modernized: bad diet, excessive tobacco and alcohol consumption, too many people carrying out arduous manual labor in unsafe conditions, and exposure to truly massive amounts of environmental pollutants.

This early postwar success, however, also contained within it the core of at least some of these long-term problems. The country's approach to disease prevention did not fundamentally change. It still relied on disease control, rather than creating conditions that would have allowed improvements in health and longevity comparable to those enjoyed in industrialized – but, I must stress, not the non-industrialized – capitalist countries.

Looking specifically at the late Stalin period, the question is: why did the Stalinist regime pursue this approach? Why did it systematically underinvest in urban infrastructure? Of course, without a detailed study of key decision-making processes within Stalin's inner circle, the Council of Ministers, Gosplan, or the Ministry of Health, we cannot propose definitive answers, but there is much that we can infer from the empirical evidence presented in this book, especially if we analyze it in the larger context of what we know about the political economy of the Stalinist system. Here we must differentiate between conjunctural and long-term structural factors. If we look at conjunctural factors, we could pose three hypotheses. First, we could attribute to the lack of investment to Stalin's indifference to the welfare and well-being of ordinary people. Stalin's contempt for the peasantry is well known, but his contempt for the working class was no less important. For him both were little more than sources of labor power, the exploitation of whom was necessary in order to finance his particular vision of industrialization, irrespective of the human and economic costs. A second hypothesis, also based on conjunctural factors, is that the lack of investment resulted from a larger imperative imposed by the USSR's underdevelopment. Given the inherent weakness of the country's industrial and agricultural base during the 1920s, industrialization, at least in the semi-autarkic form that it was carried out under Stalin, required a sizable shift of resources from consumption to investment. If we accept that housing, adequate sewerage, safe water, clean streets, and decent public baths are vital constituents of overall consumption, then these areas, too, would have to be neglected in favor of investments in heavy industry.[1] A third hypothesis, in some ways a more short-term and acute version of the second, is that the country needed to restore heavy industry as quickly as possible following the massive destruction of World War II, and this, too, required at least a temporary suppression of consumption.

Each one of these hypotheses contains a significant element of truth. Nor are they mutually exclusive. In fact, all had a bearing on the evolution of policy during the 1930s, the war, and the early postwar period. At a deeper level, however, these explanations only partially answer the question. They establish the political and economic context that shaped leadership decisions, but even had these factors not been present, there still would have existed underlying structural, as opposed to conjunctural, reasons why the Soviet Union found it so difficult to modernize its urban infrastructure and improve the general standard of living. The argument here is somewhat abstract and roundabout, and will at times seem divorced from the main contents of this book, but I urge the reader to bear with it. We shall get there in the end.

The essence of the argument is that the specific way in which the Soviet Union industrialized – and this includes not just its economic policies, but the class relations that emerged out of this process – imparted to the Soviet system a long-term tendency toward declining efficiency that made it

[1] It was because of what he saw as the impossibility of semi-autarkic industrialization within a peasant country that the Left Opposition economist E. A. Preobrazhensky (an advocate of an accelerated pace of industrialization but a firm opponent of coercion), among others, argued that Stalin's project of "socialism in one country" was doomed to failure. In 1927, he pessimistically concluded that a country as poor as the Soviet Union was in the 1920s could industrialize only with assistance from wealthier countries. Given Western capitalism's hostility to the USSR, such aid would be forthcoming only if there were a revolution in at least one advanced capitalist country. See E. A. Preobrazhensky, "Economic Equilibrium in the System of the USSR," in Preobrazhensky, *The Crisis of Soviet Industrialization* (London: Macmillan, 1979), pp. 229–30. Later Preobrazhensky, despite his political capitulation to Stalin and reentry into the Communist Party, was to criticize the hypertrophy of heavy industry during the First Five-Year Plan. He did this indirectly in his book *The Decline of Capitalism* (Armonk, NY: M. E. Sharpe, 1985). This was a highly original analysis of the capitalist crisis that resulted in the Great Depression, but the argument, that the structural roots of the crisis lay in capitalism's overinvestment in fixed capital, was also a concealed critique of Stalinist industrialization, which had set targets for the expansion of fixed capital that were wildly ambitious, badly outstripped the country's available resources, and placed intolerable pressure on popular consumption. After the book's publication, he attacked Stalin's policy more directly in an unpublished manuscript, and called for a reallocation of resources back toward consumption. See Preobrazhensky, *The Crisis of Soviet Industrialization*, Introduction, pp. xlii-xlvii.

extremely difficult for the system to raise levels of consumption. Consumption here should be understood in the broader context in which I have used it throughout this book, to include not just issues of income and real wages, and not just purchases of food and basic consumer items, but also the larger ensemble of conditions under which people carried out their lives.

We begin at the beginning, so to speak, with Stalinist industrialization. There are several elements here. One was the creation of an elite which was to base its power on the hypertrophic development of heavy industry and the production of means of production. The second was the elimination of the market and market relations. This meant that the elite, unlike the bourgeoisie under capitalism, could not exercise control over the economy through titles to ownership over the means of production and could not extract its privileges from the sale of a privately owned expropriated surplus product. Instead, the means of production were state property, and decisions over the use of the social product – what to invest, what to allow the population for consumption, what to divert to the elite's own privileges – were made by the state. In other words, the elite could ensure its control over the economy only through its political control over the state. Without such control the elite had no other mechanisms for ensuring its dominance over society and the continued extraction of privileges. This was a major, fundamental difference with capitalism and explains the severity of the Stalinist police state, for only a police state could guarantee the elite's continuance in power as the precondition of its receipt of privileges.[2] It also explains the reluctance within the elite to grant even limited political reforms, because of the fear that these would fatally undermine the elite's hold on power. There is nothing new or novel about these observations – numerous critics of Stalinism of varying political persuasions, from pro-market conservatives to critics on the far left, have cited them.[3]

[2] It is vital here to differentiate between the individuals who at any given time made up the elite, and the elite itself as a social group or "ruling class." The Terror of the 1930s, and to a lesser extent also the early postwar purges, eliminated a huge number of the elite's individual members (as well as hundreds of thousands of ordinary citizens), but the elite itself as a social group remained and continued to reproduce itself, irrespective of the specific people within it. Put another way, it was the emerging *class structure* of Soviet (Stalinist) society that required an authoritarian police state for its preservation and reproduction.

[3] For an especially elegant exposition of the argument from a pro-market perspective, see Paul R. Gregory *The Political Economy of Stalinism: Evidence from the Soviet Secret Archives* (Cambridge: Cambridge University Press, 2004). Gregory is one of the few to understand that it was the liberalization of the Soviet system under Gorbachev that caused the system to unravel, and not Gorbachev's reluctance to introduce capitalism, as many journalists and Sovietologists asserted at the time.

In social terms the elite was able to assert and consolidate its position only by doing battle with two separate social forces. On the one hand, it had to do away with market relations and assert political control over those social groups politically and economically rooted in those relations who might have clamored for a restoration of capitalism, that is, private traders and the peasantry.[4] On the other hand, it had to put down opposition and resistance from the traditional working class. Such opposition was widespread, but because it was almost totally uncoordinated and lacked any clear political aims, it in fact posed no real danger to the regime. It did, however, possess enough strength and force to have shipwrecked Stalinist industrialization.[5] The elite, therefore, had to erect a system that was neither market nor plan. It had eliminated the market with collectivization and the end of NEP. By suppressing democracy and workers' involvement in political decision-making and enterprise management, it eliminated any possibility of genuine planning, for planning, as I implied in Chapter 2,[6] can succeed only if those who draw up the plan and those who execute it are one and the same. Only this can ensure a free flow of accurate information from the bottom upward and a willingness on the part of the executors to fulfill the plan conscientiously and successfully. On the contrary, the elite had to remove the working class from any contact with decision-making and, in fact, had to eliminate the working class *as a class* altogether, a process it accomplished through a combination of outright repression, dilution of the old pre-revolutionary working class with millions of new recruits from the countryside, and the fact that the (largely unintended) collapse of the standard of living made the struggle for individual and family survival paramount and in this way undermined collective action. For this reason we can with some justification say that the working class became "atomized," although "molecularization" is probably a more accurate description of the process. Politically and socially workers were not totally "atomized" and isolated from one another. They were able to rely

[4] Here, too, we have to be clear about what this means. The regime eliminated the private economy in the countryside through collectivization, but collectivization itself had never been one of the original intentions of industrialization and the First Five-Year Plan. Stalin and the leadership stumbled into it through a series of reactions to events that were increasingly flying out of control. There were, however, reasons why collectivization presented itself as the most likely choice of policies, and not other, market-oriented alternatives. Reliance on the market carried the constant danger of growing pressure for the restoration of capitalism, something which, if achieved, would have undermined the basis of the Bolsheviks' hold on power.

[5] On workers' protests, see Jeffrey J. Rossman, *Worker Resistance Under Stalin: Class and Revolution on the Shop Floor* (Cambridge, MA: Harvard University Press, 2005); and Wendy Z. Goldman, *Terror and Democracy in the Age of Stalin: The Social Dynamics of Repression* (New York: Cambridge University Press, 2007).

[6] See pp. 105–6.

on narrow family and friendship groups, and small acts of solidarity within the workplace were not unknown. Irrespective of our choice of terminology, the fact remains that while Stalin was alive even within these circles workers could not risk trusting anyone with their true opinions, much less take the risk of acting upon them.

This political relationship took on a particular expression within the industrial enterprise, where workers, deprived of any collective means of asserting their influence or redressing the imbalance of power between the state and themselves and between themselves and management, had to resort to individual, largely depoliticized, reactions, in the form of high turnover, absenteeism, and haphazard fulfillment of orders and instructions, and, most important of all, by exploiting the chaos intrinsic in Stalinist bureaucratic industrialization to usurp a significant degree of control over the individual labor process in order to neutralize official policies of speedup and ongoing intensification of labor. Losses of work time in Soviet factories were massive, as late arrival of supplies and the frequent breakdown of faulty (and often misused) equipment allowed workers ample opportunity to slow down the pace of work. This in turn shaped the specifically Stalinist (or Soviet) nature of shop floor relations. Managers, under their own intense pressures to meet impossible plan targets, became reliant on workers to minimize these disruptions to production and even to assert their own ingenuity to make good faults and disruptions caused by the system itself.[7] Managers, especially line managers on the shop floor, therefore granted numerous concessions, such as turning a blind eye to labor discipline violations, attenuating officially decreed rises in output quotas and cuts in wage rates, and accommodating workers' partial control over the intensity and speed of work. These actions were not resistance on the part of workers. They were exactly the opposite – they were the reactions of a workforce which had no means to change its situation through collective action and had lost contact with most residues of class consciousness. Perhaps the most salient feature of the system of industrial relations that emerged out of Stalinist industrialization was that it became reproducible and independent of the specific views and attitudes of the individuals involved. It was perfectly possible for workers to see themselves as loyal Soviet citizens and even admirers of Stalin, and still contribute to the huge losses of work time, the slow growth

[7] We should not underestimate the importance of this. There were countless occasions – faulty or simply missing drawings and blueprints; shortages of the correct tools and materials; last-minute plan changes – that required workers to intervene directly in the production process, to figure out how to adapt to the existing circumstances in order to keep production going.

of productivity, and the production of massive amounts of defective output. This is true because workers were responding to what in effect confronted them as objectively given conditions within the enterprise: constant shortages of parts and materials; defective or low-grade parts and materials which they had to expend a great deal of time making usable for production; faulty equipment that frequently broke down and was badly repaired; and irregular production rhythms (slack periods alternating with "storming" at the end of the month or quarter). In reacting as they did, with high absenteeism, slacking on the job, and disregard for the quality of what they were producing, workers reproduced these very same conditions, if not for themselves, then for all other links in the chain of production that depended on their output. Thus by responding subjectively (but logically) to what confronted them as objective conditions, workers recreated these same objective conditions for other workers in other stages of production, who then responded in the same subjective, but equally logical, manner, creating new objective conditions for another set of workers further down the chain. In this way, shortages, poor quality, and general waste and inefficiency circulated, and were reproduced, throughout the economy.[8]

This gave rise to the phenomenon that Hillel Ticktin called "waste,"[9] and what I have called here the process of self-negating or self-consuming growth. By this I mean the process by which the consumption of means of production and labor power failed to translate itself into the production of a commensurate quantity of use values. On paper, plans could be fulfilled

[8] The Left Oppositionist Khristian Rakovsky, writing from internal exile and having nothing but the Soviet press to go on, identified this feature of the Stalinist system as early as mid-1930: "We are dealing not with individual defects, but with the *systematic production of defective products* ... It is clear in such a situation that wherever the product passes through several stages of manufacture or through several branches of industry, poor quality in one branch becomes multiplied by the poor quality of all the others" (Rakovsky, "The Five-Year Plan in Crisis," *Critique*, no. 13 [1981], pp. 19–20 [italics in the original]). This deterioration in quality made a mockery of the regime's claims that the five-year plan was leading to vast increases in output and lower production costs. Such claims were true on paper, but they failed to take account of the large amounts of production that were being lost due to bad quality. "One can produce any figures one likes, but this will not increase the amount of real values. A rail is a rail; and if, let us say, its formal production cost goes down by several percent, this does not mean that the economy has benefited by this same amount. The fact that this rail looks outwardly just like a pre-war rail deceives no one; nor does it eliminate the fact that our contemporary rail lasts not even five years, while a pre-war rail lasted forty. And this is happening not only with rails. Whole factories are being erected out of defective construction materials and equipped with machines made from defective metal. Today's decline in production costs will turn into tomorrow's (and tomorrow is already upon us) colossal losses for the national economy." See *ibid.*, p. 24.

[9] Hillel Ticktin, "Towards a Political Economy of the USSR," *Critique*, no. 1 (1973), pp. 24–36.

and overfulfilled, but this did not mean that the economy received all of the useful objects that it required in order to sustain or expand production. There were two main aspects to this phenomenon. The first was that, because quality was generally poor, Soviet industry, construction, and transport required far larger quantities of inputs – metal, coal, electric energy – to produce a given quantum of finished output than did Western industry. This in turn had three main causes: (1) the original quality of the inputs was poor, so production processes needed to use larger quantities in order to compensate, whether it be coal for blast furnaces or low-grade metal to build machines. (2) The quality of tools and equipment was also poor, and so the economy needed more of them to produce the same amount of output. Rakovsky cited a 1930 article from the industry newspaper, *Za industrializatsiyu*, which noted that drills manufactured during the First Five-Year Plan worked at only half the cutting speed of earlier drills. In order to achieve the same amount of output from them, the country would need to double its stock of drilling machines. These in turn would have to be manufactured and then subsequently maintained. In short, the inferior quality of drills necessitated a huge expansion of machine production in order to provide the economy with the same end result.[10] (3) The labor process itself tended to waste inputs through basic negligence. Disregard for production protocols led to overconsumption of raw materials and semi-finished components, or to whole batches of production being ruined. Careless storage meant that large quantities of raw materials and metal degraded to the point where they could no longer be used. Their original production was literally wasted, and in order to complete any production process for which they were needed the country would have to produce them all over again.

The second aspect of "waste" or self-negating growth was that a large percentage of what industry produced was either totally defective, so that it had to be discarded and remanufactured, or of such poor quality that it required the diversion of substantial amounts of labor time to rectify or adapt these products so that they could be used. You only have to study the Soviet engineering industry to see how this worked: machine-tool operators routinely had to take time out to refashion castings and parts because they came into the shop in the wrong shape or size. A huge amount of metal wound up on the floor as shavings – and not all of these were recovered for resmelting.[11] Factories had huge machine shops devoted

[10] Rakovsky, "Five-Year Plan in Crisis," p. 20, citing *Za industrializatsiyu*, July 16, 1930.

[11] The Gor'kii Motor Vehicle Works generated enough scrap metal each year to meet the needs of the nearby milling-machine factory for nine years: *Promyshlenno-ekonomicheskaya gazeta*, February 28, 1958.

to nothing but remaking defective parts or making spare parts because the original machine manufacturers did not supply them (and even then the new parts often did not work because the machinists had no drawings). This also explains why Soviet industry had such a huge repair and maintenance sector. Machinery was badly made and/or released to the receiving factory with essential parts still missing. Already at this stage it was likely to break down. Once installed in a factory careless handling by machine operators would cause further breakdowns. Finally, the repairs themselves would invariably be poorly done, partly because the mechanics doing the repairs would not have the correct parts, and partly because they themselves carried out their jobs haphazardly. This explains why Soviet industry in the mid-1960s had nearly as many people repairing machines as it did manufacturing them.[12]

It is this process of self-negating growth that helps explain the continued dominance of heavy industry within the Soviet economy. Advocates of "interest group theory" tried to explain this phenomenon by reference to the overriding political power that the commissars (later ministers) and managers in heavy industry held within the top leadership, power which they exercised in order to claim an inordinate share of resources for their own factories. This observation was certainly true, but it had an objective foundation. The waste of inputs was of such a scale that it required an overblown heavy industry sector just to keep the economy standing in place. If you waste 10, 20, or more percent of the coal that comes out of the ground, either because it is lost in transit, is overconsumed by poorly designed and poorly made blast furnaces, or has a high ash content and so production requires more of it, you need more coal mines to mine more coal. This requires more coal mining equipment, more rails, more coal carts, more rolling stock on the railways, and more locomotives to take it to its final destination. If you produce too much substandard steel, construction sites and machine-building factories have to use more steel to build buildings or make machines. And so you need more steel mills, which in turn requires the manufacture of all the inputs that go into putting up and equipping a steel mill. If window glass is so thin that it breaks almost immediately as soon as you glaze the windows in a new building, you need a much larger number of glass factories to produce replacement window glass – which then also breaks and needs replacing. I could go on, but the idea is already clear. The Soviet Union's hypertrophy of heavy industry was not only an ideological fixation of Stalin and his planners (and all subsequent generations of Soviet planners), and it

[12] *Trud v SSSR: Statisticheskii sbornik* (Moscow, 1968), p. 83.

was not only the result of resource wars between the commissariats or ministries. It was the automatic result of an economic system that could not put to productive use a large part of what it produced. Waste, or self-negating growth, became the driving force of the Stalinist system, the force that drove forward extensive economic growth. At the same time, however, it was a major cause of that system's long-term instability and eventual stagnation.

We can view the problem from a different perspective. For Marx the antagonistic relationship between wage labor and capital expressed itself in the contradiction between use value and exchange value. Labor power was a use value, an object of use, which performed the useful task of labor, which transformed means of production into commodities for sale on the market, that is, it created value. In this act the useful properties of specific forms of labor were effaced, and labor became abstract, or homogeneous labor: the labor power of one worker was interchangeable with the labor power of another, just as the commodities they produced were equally interchangeable on the market place as possessors of (abstract) exchange value. Commodities, of course, were useful objects, use values, but under capitalism their use could not be realized unless they achieved sale on the market, that is, unless their exchange value could be realized on the market and the commodities transformed into money. If they failed to find a sale, their useful properties were lost, wasted. We see this particularly at times of acute capitalist crises, such as the Great Depression or the crisis that erupted with collapse of the Western banking system in 2007–2008. During the 1930s people went hungry while farmers had to slaughter livestock and bury them in mass graves because their price on the market could not cover the cost of feeding them. Factories and construction sites lay idle, while people desperately needed clothing, shoes, and housing. Nearly eighty years later we see much the same scenario repeating itself today.

In the Soviet Union, by contrast, industry did not produce goods for sale on a market, and they possessed no exchange value. Goods were produced and distributed through the system strictly for their useful properties: as timber, steel, coal, peat, cloth, footwear, cement, or what have you. The contradiction lay not between use value and exchange value, but within use value itself. If under capitalism the commodity – a good produced for sale on the market in order to permit the realization of its embodied exchange value – is the social form of the product that emerges from production, in the Soviet system industry produced what I would term the deformed product. This deformed product was the social form of the product within the Stalinist system. It was a product that appeared to possess useful properties, but in fact only partially satisfied the needs for which it was intended, and in many cases could not be used at all. Individual consumers acquired shoes or clothing because they needed to be shod and clothed, but the goods were of atrocious quality and often totally defective. They either wore out prematurely or proved wholly unusable.[13] Within production, enterprises acquired metal, raw materials, machinery, and fuel, but these, too, could not function as planned or designed. Insofar as the origin of the waste that created this type of product lay in the specifically Soviet system of production, we can say that the deformed product was the social expression of the antagonistic relationship between the elite and the Soviet workforce.

The contradiction inherent in waste, or self-negating growth, was also expressed at a political level. The elite required an atomized (or molecularized) workforce in order to protect its hold on power and the continued maintenance of its privileges. This atomization expressed itself in the specific form of the labor process within Soviet production, which in turn gave rise to the deformed product and waste (self-negating growth). Yet waste was not a "positive" expression of workers' discontents. Workers themselves found it profoundly frustrating and demoralizing, as interviews during *perestroika* made abundantly clear.[14] To this extent, self-negating growth contained within it a profound social contradiction. On the one hand, it formed part of the larger political context that acted to perpetuate workers' demoralization and atomization, which in turn were a political precondition for the elite's ability to stay in power (witness what happened under *perestroika* when demoralization and atomization temporarily evaporated). At the same time, however, the process of self-negating growth eventually sent the system into a period of long-term contraction, ending in its collapse and unraveling the elite's domination. In other words, the very precondition of the elite's retention of power – an atomized working class – became also a condition of the system's disintegration.[15]

[13] Under Khrushchev and Brezhnev you had the curious situation where the population suffered from a serious shortage of shoes, but shoes – large numbers of them – remained unsold in the shops. The reason was not because of lack of effective demand, that is, because there was no market for shoes, but because the quality was so bad that people simply saw no point in buying them. Commenting on the quality of the footwear received from the Skorokhod footwear factory in Leningrad, a trade organization in Voronezh refused to pay its central supplier, noting: "We have already informed you that boots made by Skorokhod lie as dead freight in the warehouses of the depot. Instead of glutting the trade network with these shoes, you would do better to stop accepting them from the factory": *Leningradskaya pravda*, May 13, 1960.

[14] *Sotsialisticheskaya industriya*, September 9 and November 7, 1989.

[15] The sheer futility of much of Soviet production is perhaps best illustrated by agriculture in the Brezhnev era. Unlike under Stalin or even Khrushchev, under Brezhnev the Soviet Union pumped vast investment resources into agriculture, but received back only the most modest increase in food production. Most of the investment was simply wasted.

How does this analysis help us better to understand the empirical material we have covered in this book?. First of all, it places the question of why the Soviet Union under Stalin neglected its urban infrastructure in the larger context of a problem the Soviet Union never solved: the balance between production and consumption. From the beginning of the First Five-Year Plan until the collapse of the USSR, the Soviet system showed a consistent pattern: production of means of production always took precedence over production of means of consumption; and within industry production shops had priority over auxiliary shops. Soviet leaders, at least after Stalin, were well aware of the problems this caused. Low levels of consumption lowered popular morale and eroded the legitimacy of the regime, and by doing this also reduced labor productivity. Within factories, the fact that production shops received the bulk of investment while auxiliary operations continued to be done largely by hand meant that the latter's inefficiency placed a serious brake on overall plan fulfillment. From Khrushchev onward there was no shortage of efforts to redress these imbalances, yet they utterly failed.

When, in Chapter 2, I detailed how the industrial ministries consistently refused to allocate funds to clean up the discharges coming from their factories, this was not necessarily the result of indifference or ill will, but a logical response to the demands of the Stalinist planning system. When Gosplan adopted similar behavior and failed to fund local projects to extend sewerage systems or to construct waste or water treatment works, this, too, was consistent with the internal logic of the system. When local soviets and industrial enterprises could not acquire boilers for their bathhouses or keep the boilers they had in good repair, this was yet another of the system's natural outcomes. This is not to deny that in the immediate postwar period such behavior was at least in part a response to the scarcity of resources at the country's disposal and the need to restore the production of means of production, without which rapid future improvements would have been even slower. The point is, however, that the way the system functioned, with its tendency toward self-negating growth, resources, in particular means of production, *were always in short supply and would always be in short supply*. The calculus that influenced investment decisions regarding urban hygiene in the late 1940s was no different from the calculus that discouraged industrial managers from installing ventilation systems and safety guards on machinery or from mechanizing backbreaking labor-intensive operations, whether it was in 1948 or 1991. The forces at work – and the outcome – were exactly the

Specifically, between 1966 and 1985 agricultural investment increased by 280 percent; output in the same period increased by a mere 30 percent: Zhores A. Medvedev, *Soviet Agriculture* (London: W.W. Norton, 1987), p. 343.

same. If for Stalin this may have been largely a matter of indifference, it was certainly not a matter of indifference to public and occupational health officials, workers in the Procuracy responsible for implementing safety legislation, trade union inspectors, and probably even the industrial ministries themselves. Yet all proved incapable of doing anything about it.

A further issue is what this meant for the nature of labor power within the Soviet system. As under capitalism, it was labor power that produced the surplus product which allowed the economy to expand and the elite to enjoy its privileges. Labor power was the force that created all value within the system. One of the essential features of capitalism is that it is constantly eroding the value-creating capacity of its labor power by restricting consumption and subjecting its workers to working and living conditions that jeopardize their health and productivity. This is true of the slum proletariats of 21st-century Africa, Asia, and Latin America just as it was true of nineteenth- and early twentieth-century Europe and North America, a fact that the relative prosperity enjoyed since the 1950s by Western societies, including the working class, has tended to obscure. Just how much this has depressed surplus creation is probably impossible to quantify, but there is no question that it is an essential feature of modern capitalism. What we have seen in this book is that this was equally true of the Soviet Union. It was most pronounced under Stalin, but it also applies to later periods of Soviet history and post-Soviet Russia. The period from the last years of Stalin's life until the Soviet Union's collapse saw undoubted improvements in health care, diet, housing, and working conditions. Improvement, however, is not the same as adequacy and, except for a brief period under Khrushchev, the health and longevity of the Soviet population lagged badly behind the West, with the gap becoming wider with each decade. More important, the Soviet urban environment was not adequate to the needs of the system itself, as living conditions further constrained the value-creating capacity of Soviet labor power over and above the limitations imposed by workers themselves. This was the ultimate contradiction of self-negating growth. It was not just inanimate material resources whose utility was constantly being negated, but the useful properties of the value creators themselves. Not many years ago this might have seemed an overly abstract proposition. Today, as it becomes increasingly clear that modern industrial capitalism may be rendering our planet unfit for future long-term human habitation, it is frighteningly concrete.

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Index