



Reopke Lecture in Economic Geography: Notes from the Underground: Why the History of Economic Geography Matters: The Case of Central Place Theory

Trevor J. Barnes
Department of Geography
University of British
Columbia
1984 West Mall
Vancouver
BC V6T 1Z2
CANADA
tbarnes@geog.ubc.ca

Key words:
history of economic
geography
central place theory
Edward Ullman
Walter Christaller

abstract

The discipline of Anglo-American economic geography seems to care little about its history. Its practitioners tend toward the “just do it” school of scholarship, in which a concern with the present moment in economic geography subordinates all else. In contrast, I argue that it is vital to know economic geography’s history. Historical knowledge of our discipline enables us to realize that we are frequently “slaves of some defunct” economic geographer; that we cannot escape our geography and history, which seep into the very pores of the ideas that we profess; and that the full connotations of economic geographic ideas are sometimes purposively hidden, secret even, revealed only later by investigative historical scholarship. My antidote: “notes from the underground,” which means a history of economic geography that delves below the reported surface. This history is often subversive, contradicting conventional depictions; it is antirationalist, querying universal (timeless) foundations; it seeks out deliberately hidden and buried economic geographic practices, relying on sources literally found underground—personal papers and correspondence stored in one subterranean archive or another. To exemplify the importance of notes from the underground, I present an extended case study—the 20th-century development of central place theory, associated with two economic geographers: the German, Walter Christaller (1893–1969), and the American, Edward L. Ullman (1912–76).

Acknowledgments

I thank Yuko Aoyama for honoring me with the invitation to give the 2011 Roepke lecture. Allen Scott was always my first choice to be a discussant for the article, and I am both flattered and grateful that he accepted the invitation. The main research for the article was undertaken when I held a fellowship from the Peter Wall Institute of Advanced Studies (2009–2010), University of British Columbia, to which I am indebted. The support and encouragement of Joan Seidl made it all possible.

2

The archives [a]re an arsenal of sort (Stoler 2009, 3):

I am inclined to believe that the “Central Place” theory is full of dynamite. (Ullman Papers, Eugene Van Cleef to Edward Ullman, 1941)

I am dynamite. (Nietzsche 1979 [1888], 1)

Economic geography has often been reluctant to take on its past. Its attitude toward history has been like that of one of the people it has studied, Henry Ford: “We want to live in the present, and the only history that is worth a tinker’s damn is the history we make today,” he said to the *Chicago Tribune* in 1916. In contrast, my guiding text for this article is from a contemporary of Henry Ford, George Santayana (1905, 284), among other things a Harvard pragmatist philosopher: “Those who cannot remember the past are condemned to repeat it.”

For almost 15 years I have been trying to remember the past of economic geography. It began with recording 36 separate oral histories by economic geographers over a five-year period beginning in 1997 (Barnes 2004).¹ All the interviewees were in one way or another involved in economic geography’s quantitative revolution that began in the late 1950s (Barnes 2011a). They included a few original pioneers like Chauncy Harris and William Garrison, as well as many second-generation followers, such as Allen Scott. I first met Allen at the November 1978 annual meeting of the Regional Science Association in Chicago when I was a first-year graduate student. At that point, he still half believed in the quantitative revolution. Most of the other conference participants were full-on believers, especially the founder of the Regional Science Association, Walter Isard (1979), who gave the opening plenary address that explained the world in a single flow diagram and three equations.

¹ I recorded oral histories from the following 36 economic geographers between October 1997 and March 2002: John S. Adams, Brian J. L. Berry, Larry Bourne, Larry Brown, Patricia Burnett, Ian Burton, William A. V. Clark, Kevin Cox, Michael Dacey, Michael Dear, Roger Downs, William Garrison, Arthur Getis, Reginald Golledge, Michael Goodchild, Peter Gould, Susan Hanson, Chauncy Harris, Geoffrey Hewings, John Hudson, Walter Isard, Leslie King, James Lindberg, Fred Lukermann, Richard Morrill, Gunnar Olsson, Richard Peet, Forest R. Pitts, Phillip Porter, Allan Pred, Richard Preston, Gerard Rushton, Allen J. Scott, Edward Taaffe, Waldo Tobler, and Michael Woldenberg.

By the time I interviewed Allen in 1998, he was not even a half believer, but his funny and astute stories, told with perfect recall and vocal mimicry, and, most impressive of all, spoken in grammatically impeccable complete paragraphs, were a highlight of the entire project.

My reasons for collecting the oral histories were partly personal. I wanted to understand my own academic biography that began in the mid-1970s as an undergraduate and was irrevocably shaped by mathematical equations, multivariate inferential statistical techniques, dog-eared SPSS (Statistical Package for the Social Sciences) computer manuals, and compulsory reading lists for courses that included works by Walter Isard and Allen Scott. But there was an intellectual motivation as well: to write the history of economic geography from the perspective of science studies. In line with Henry Ford's position, few histories of economic geography had ever been written. And those that existed tended toward rationalism. They depicted an earlier descriptive regional economic geography as prescientific, which changed only in the late 1950s when pioneers adopted rationalist theories and methods. At that point, economic geography became a proper science, spatial science (Barnes 2011b). In contrast, science studies was avowedly antirationalist. Originating in the 1970s, it was an approach that insisted that the origins of knowledge were social, and that applied even to abstract, formal knowledge written as mathematical equations and in SPSS code. The social went all the way down. There was no hermetically sealed, privileged realm where knowledge was pure and simple. The complicated social character of knowledge could be best appreciated, suggested science studies, by carrying out empirical, often historical, case studies, focusing on the detailed practices of producing knowledge. That was precisely the end to which my 36 oral histories were directed.

I quickly realized, though, that oral histories alone were insufficient. First, the information they provided was partial, sometimes thin, subject to gaps, and occasionally unreliable. The oral histories needed supplementation, triangulation with other sources—with published texts, certainly, but also with unpublished material that could be found only in archives. Second, in listening to the interviewees, I often felt that I came into their stories halfway through. Although the interviewees were scrupulous in telling me their stories from the beginning, no one reflected on the historical conditions that enabled their narratives to begin as they did. I am not blaming anyone, but those beginnings needed to be told partly by secondary sources and again partly by going into the archives.

The institutional archives included Walter Isard's immaculately groomed regional science collection at Cornell University, as well as the slipshod and scattered papers of the Office of Strategic Service housed at the National Archives and Records Administration (NARA) in Washington, D.C. And the personal archives included Edward Ullman's, located at the University of Washington, Seattle; Edward Ackerman's, lodged in the spectacular space of the American Centennial Center, Laramie, Wyoming; John Q. Stewart's, found in the strangely cramped Dickensian Rare Books and Special Collections Division at Princeton University; and Richard Hartshorne's, stored at the globe-filled American Geographical Society's library, Milwaukee, Wisconsin. The Richard Hartshorne papers were especially riveting and included a separate box on Hartshorne's (1995) dispute with Fred Schaefer (1953), generally recognized as a starting point for the quantitative revolution (see Richard Hartshorne Papers). Even more gripping was Hartshorne's 25-year correspondence with one of William Garrison's graduate students, Bill Bunge (a "space cadet"; Barnes 2004, 572), at the Department of Geography, University of Washington. Bunge was originally a doctoral student at the University of Wisconsin, Madison, but Hartshorne, one of his examiners, failed him at his comprehensive examinations in 1957. Bunge neither forgave Hartshorne nor ever let him forget it. Hell hath no fury than like Bill Bunge scorned.

4 The purpose of this article is to continue in the track of understanding the history of economic geography from the perspective of science studies. But I intend to go back before the immediate quantitative revolution, disclosing some of the historical conditions that enabled my interviewees to begin their oral histories as they did. The article is divided into three unequally sized parts. First, I unpack my Dostoevsky-inspired main title, elaborating my framework and general argument: that the history of the discipline matters. We are all, to paraphrase Keynes (1936, 383), “slaves of some defunct” economic geographer. We cannot avoid history. The past is passed on. It enters into the very pores of the ideas that we profess. Furthermore, following science studies, historical inquiry of those ideas must be critical, if not subversive, scraping away surface obfuscations to expose the conjuncture of social forces lying beneath. These ideas include even supposed universals that are found in logic and rationalist epistemologies. I claim that ideas become true only in history and are not born true outside history. “Time will tell but epistemology won’t,” as Richard Rorty (1979, 4) tersely put it. Second, I suggest that particularly potent periods for the transformation of ideas in economic geography is during war. War produces not only enormous material effects but immaterial ones as well. During wars, ideas are melted down, recast, drawing in a multitude, and mobilized for ends both noble and heinous. Here I make use of concepts elaborated in science studies (although not all originated there): first, the notions of hailing and interpellation, discussed by Donna Haraway (1997) (albeit by way of Louis Althusser 1971), and second, the idea of the mangle, suggested by Andrew Pickering (1995). I deploy these concepts to understand the remoulding of ideas and their take up, sometimes secretly, in the underground histories of war and economic geography. But secrets seep out. In the last and longest section, I discuss one of those secrets: central place theory.² Central place theory was crucial to geography’s quantitative revolution. Marie-Claire Robic (2003, 387) wrote that “owing to its spatial oriented view, its theoretical aim, and its focus on urban issues, [central place theory] became during the 1960s the central point of reference for the ‘new geography.’ ” I argue that the origins and deployment of central place theory are uncompromisingly social, found in the historical underground of economic geography, and the hailing, interpellating, and mangling occurring there. To understand central place theory requires historical excavation, bringing it up to the surface into the critical light of day.

Notes from the Underground

Dostoevsky’s (1974) novella, *Notes from the Underground*, originally published in 1864, bears on the investigation of the history of economic geography that I want to practice in a number of different ways. As I already suggested, I quickly found out that any such investigation needs literally to draw on “notes from the underground,” on archives stored typically in one library’s basement storage facility or another’s. Since Foucault (1972), an enormous amount has been written about archives and their relation to history (the “archival turn,” as Stoler 2009, 44, called it). First, while an archive may appear dry as dust, and, in some cases, be turning to dust (Barnes 2010), its contents can be animated, startlingly alive. What was “‘left’ [in the archives] was not ‘left behind’ or obsolete”

² Although central place theory is a focus of this article, I do not provide a systematic explication of it or a substantive literature review, partly for reasons of brevity, partly because the literature is so well known, and partly because I want to deflect attention from a familiar topic, the theory’s exposition, to an unfamiliar one, the theory’s intellectual history. There are many excellent reviews of central place theory. Berry’s (1967) and Beavon’s (1977) are my two favorites in a vast literature. The intellectual history, at least, in English is much rarer. Formal and often formalized histories in English are found in Müller-Wille (1978), Blaug (1979), Ponsard (1983), and Funck and Kuklinski (1986).

(Stoler 2009, 3). Stoler (2009, chap. 2) talked about the “pulse of the archive,” by which she meant its vitality, its will, its potential for a life of its own. That said, no archive is completely articulate, comprehensive, or unambiguous. Its contents typically stammer and blurt, are spotty and piecemeal, and are vulnerable to contradictory interpretations. Second, an archive is also a site where it is possible to see the world shifting gears. This shift may be apparent in precious first-edition tomes that rest on foam-rubber book pads and are handled with white gloves or in seemingly tossed-off one-liners, as in Eugene van Cleef’s hastily written note to Edward Ullman (see Ullman Papers, Eugene Van Cleef to Edward Ullman, 1941): “I am inclined to believe Central Place Theory is full of dynamite.” In each case, as Foucault (1972, 31) put it, the statement “emerges from its historical irruption . . . However banal [the statement] may be, however unimportant its consequences may appear to be, however quickly it may be forgotten after its appearance, . . . a statement is always an event.” As I suggest later, there was nothing banal, unimportant or forgotten about central place theory as an event or of van Cleef’s appreciation of its explosive potential.

Second, Dostoevsky’s novella is antirationalist. Its nameless antihero, the Underground Man, is driven partly to a subterranean existence to avoid “be[ing] classified according to natural laws” that are “mathematical” (Dostoevsky 1974, 24). “Two times two equals four . . . is no longer life,” Underground Man says, “but the beginning of death” (Dostoevsky 1974, 33). Through science studies, antirationalism is a persistent theme in my own notes from the underground. By antirationalism, I mean the rejection of the idea of a single pure logic of scientific inquiry. Antirationalism would claim that the logic of inquiry is never single or pure, but messy and contaminated, unavoidably infused by the wider context, by social and political interests, by local cultural practices, by bodily acts and responses. I could have seen the truth of antirationalism at that November 1978 Regional Science meeting if I had known to look. The various speakers, including Walter Isard, who came to the lectern to present their papers were not spectral creatures of rationality. They remained all too human, bringing with them an underground geography and history that entered into their overheads; sometimes scribbled messy equations; and diagrams, flow charts, and images. But although the underground can be repressed, it can never be fully erased. The performances of rationality at the overhead projector at the 1978 Regional Science conference were just that. Over the past 40 years, in a series of detailed historical case studies, science studies has been dogged in its unmasking of such apparent rationality. These case studies show that beneath the stage of rational performance is the underground. My intention is also to dig beneath the surface rationality of central place theory to uncover its subterranean elements.

Third, the central theme of Dostoevsky’s *Notes from the Underground* is concealed lives below the surface, “beneath the floor boards” (Dostoevsky 1974, xxvi). As possibly the first existentialist novel ever written, the book is about the hidden, interior psychology of Underground Man as he struggles to define meaning in his life. That life is led physically and socially in the underground, in a hovel, with little money, no job, and no friends. The Underground Man keeps his life veiled, secret, rarely exposing himself, and when he surfaces, it can be traumatic, scary, even disastrous. Similarly, my intention is to plumb below the exterior of central place theory, to bring back stories from its historical underground. Sometimes those stories were not told because they were officially secret, stamped “CONFIDENTIAL,” locked away. Other times, they were not told because no one wanted to hear them. When they surface, like Underground Man, they can be disturbing, even shocking.

Finally, Dostoevsky’s writings were subversive. They were so subversive that in 1849 Dostoevsky was charged with treason and condemned to death. On the day he was waiting

in the prison courtyard to be shot, his sentence was commuted. Not that he got off lightly. He was still sent to a Siberian prison labor camp for five years, followed by another five years of compulsory military service in a Siberian regiment based in Kazakhstan. This article is not that subversive. And it is not subversive either in the same sense that David Harvey's (2011) brilliant Roepke lecture in 2010 was subversive in demanding the replacement of capitalism. But historicizing does subvert. Mary Hesse (1980, 30), writing about work in the history of science, said it has been "a notorious black spot for fatal accidents." The fatal accidents she had in mind were mostly the overturning of universal scientific claims about truth. Similarly, Ian Hacking (2002), drawing on Foucault, argued that history always subverts. Ideas are never "constants, freestanding . . . that are just there timelessly," he wrote (p. 8). They emerge only in the sticky materiality of human practices of a given time and place. Ideas must come into being, and "what is that," Hacking (2002, 2) noted, "if not historical." Certainly central place theory was an idea that came into being in sticky circumstances, produced and elaborated under specific historical conditions that deeply colored and stained it, denying it universality.

6 By pursuing a historical approach to economic geography, then, I mean one that is archival, antirationalist, delves below the surface, and is critical and subversive. There are other ways to do history. Tory and Whig histories, for example, organize the past so that it leads ineluctably to the present. But this is another form of forgetting, and if we really want to follow Santayana, we need another way. We need to go underground.

War and Geography

One of the sites of the discipline of geography's underground is the military and war. Scholarly knowledge has been used by the military to fight wars and to occupy enemy spaces ever since there has been scholarly knowledge. Archimedes in 200 BCE in Syracuse used his knowledge as a mathematician, physicist, and engineer to design siege engines, devise heat rays that turned enemy warships into smoking charcoal hulks, and invent clawed lifts that overturned hostile Roman triremes sailing the Mediterranean (Gardner 1965). And it continued for the next 2,000 years or so as knowledge was deployed to devise ever more efficient and systematic means for killing and suppressing an enemy. Perhaps the culmination was World War II's Manhattan Project, which developed the ultimate weapon—the atomic bomb—that could end life as we know it. But to build the bomb required enormous intellectual resources, combining the brain power of the leading physicists in the world. Consequently, World War II was dubbed the "physicists' war" (Baggott 2010). But earlier, World War I was called the "chemists' war" because of that discipline's importance in developing other weapons of death, specifically, poisonous gas and various kinds of high explosives (Haber 1986).

It was not only the physical sciences that entered war. Once the human sciences were invented, they were involved as well, including human geography. Academic geographers contributed from the moment their discipline was institutionalized. The first flush of chairs in the discipline followed the end of the Franco-Prussian conflict in 1871, when it was realized, as Charles P. Daly, the late 19th-century president of the American Geographical Society, put it, that "war was fought as much by maps as by weapons" (quoted in Hudson 1977, 13). Later, during World War I, from September 1917, American geographers participated in President Woodrow Wilson's Inquiry, an organization of 150 professionals in the human sciences, that was convened to assist America's war effort and later peace negotiations, including overseeing the redrawing of Europe's boundaries. Significantly, the Inquiry was housed at the American Geographical Society, New York,

with Isaiah Bowman, “Roosevelt’s geographer,” prominent (Heffernan 2000, Smith 2003). In France, it was the Comité d’Etudes with Vidal de la Blache central (Heffernan 2000, 2001).

The larger point is that knowledge and academic disciplines are not divorced from war and occupation but are intimately involved and have always been involved. War may be “pure cruelty,” as Ulysses Grant said (and he should have known), but the pursuit of war and subsequent military occupation have increasingly drawn on ideas worked out by scholars, including those in the human sciences. And that includes geography. Knowledge of and the ability to manage, manipulate, and strategize space have been and remain central to military operations (see Gregory’s 2010 brilliant review in the context of contemporary military campaigns). The crucial relation of geography to military operations is also found in the substance of Foucault’s work, although it took a persistent interviewer from the journal *Hérodote* for Foucault explicitly to recognize the point (Foucault 1980, chap. 4). The interviewer was likely the founder of that journal, the French geographer, Yves Lacoste, who wrote in the same year of the interview that geography “serves, first and foremost, to wage war” (quoted in Farish 2010, xviii; see also Bowd and Clayton, forthcoming). In this sense, as Matt Farish (2010, xviii) argued, Lacoste went beyond Foucault, “suggesting . . . that despite its emergence as a valid intellectual field, geography was still primarily a military idea and tool, a strategic form of knowledge about the world.” Such a conclusion manifestly held during World War II, and its aftermath, the cold war, and if Gregory (2010) was correct, its grip continues to the present. In particular, during World War II, geographic knowledge directly provided by geographers was incorporated into the military, into wars and occupation, and on each warring side, both by the Allies and by the Axis powers. One element of geographic knowledge that was mobilized was central place theory, which had proponents, even rival claimants to its invention, on opposite sides of the conflict.

Hailing, Interpellation, and Mangling

In making this argument about the tangled relationship among geographers, their geographic knowledge, and war, I draw upon a set of concepts that originated in science studies. The first is Donna Haraway’s (1997, chap. 2) notion of a wartime technoscientific assemblage possessing the Althusserian (1971, 173) power to “hail” and to “interpellate,” that is, the ability to draw people and things into it and to make them work together creatively and productively to generate new knowledge. This assemblage, as Haraway (1997, 50, 68) wrote, is a “sticky” mixture of “material, social, and semiotic technologies.” It first formed during World War II but continued to develop in the cold war. Throughout, it has had the critical Althusserian ability to call out, to hail, to attract, and to interpellate all kinds of different entities that lie outside it. It is not only humans who are converted into subjects by hailing, but also material entities, institutions, even academic disciplines, as well as ideas, including theories, models, and mathematical techniques. Once these different entities are recruited, they are integrated, becoming elements within the larger wartime technoscientific assemblage, and taking on its wider purpose.

The second concept is Andrew Pickering’s (1995) notion of the “mangle,” which he applied to the relationship between scientific knowledge and war. By mangling, Pickering meant the process by which knowledge is changed through alterations in practices, techniques, and institutions that produce knowledge, but that are then themselves changed by the resulting knowledge. There is never any final resolution; there is only the continuous turn of the mangle. World War II, Pickering argued, was an unprecedented period of

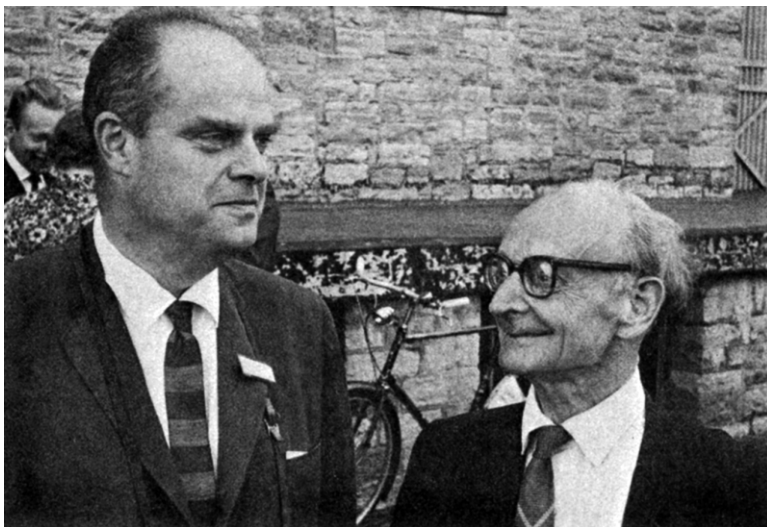
mangling, “macro-mangling” (239), when the state intervened to achieve a set of particular military ends using science. The wartime state brought together an assortment of people, things, and ideas, pressing them, mangling them, into novel combinations. The result was the production of new entanglements, objects, institutional forms, and knowledge that the state hoped would remake the world in a way that best met its interests. Mangling, however, was often unpredictable, an experiment, frequently producing unanticipated consequences, and which, as I suggest later, eventually included changing the discipline of geography.

My larger argument is that the developers of geography’s central place theory were hailed and interpellated by World War II’s technoscientific assemblage, with central place theory one of the things that was mangled. The important tasks are to retrieve the processes of hailing, interpellating, and mangling from economic geography’s underground, bringing them to the surface, remembering them.

Secrets Seep Out: Central Place Theory

8 I begin the remembering with Photograph 1, of two men standing outside a lecture hall at the University of Lund, Sweden, on a Monday morning, August, 15, 1960. The frail, aged-looking man on the right is the renowned German geographer Walter Christaller, although at that moment he was not as renowned as he would be by the time he died nine years later. The much more robust-looking man to the left is the American geographer, Edward Ullman, a professor of geography at the University of Washington, Seattle. Christaller had just given the plenary lecture at the International Geographical Union (IGU) Symposium in Urban Geography, and Ullman was the principal discussant (for the proceedings of the symposium, see Norborg 1962).

Maybe it was predestined that these two men would meet and have this photograph taken of them. Over the previous 30 years or so, there were uncanny parallels between their lives. Both claimed to have invented central place theory, the origins of which in each case were early encounters as boys with maps and gazetteers; both were employed as



Photograph 1. Edward Ullman (left) and Walter Christaller (right) at the IGU Symposium in Urban Geography, Lund, Sweden, 1960 (taken from Eyre 1978, 10).

geographic experts during World War II; and both worked on top-secret wartime projects. In addition, both wrote against the grain of their respective dominant national disciplinary traditions of regional geography, striving instead for theory, rational systematicity, prediction, and intervention. Furthermore, both had trouble with postwar academia, but both unflinchingly continued to proselytize central place theory, which, by the end of their respective lives, had become the discipline's most famous, if not its only, indigenous formal theory, yielding each man a clutch of honors, awards, and medals.³

The IGU symposium at Lund at which Christaller and Ullman met marked a sea change in human geography. For the first time, there was a concerted international effort to practice human geography as a hard science. Consequently, the participants talked formal theory, engaged in the quantitative testing of abstract models, attempted scientific prediction, and even walked the walk of laboratory-like interventions. No more fuss and flannel in poorly constructed and researched regional economic geographic descriptions. The discipline was turning an intellectual corner.

The reason Christaller was invited to give the opening plenary and Ullman was invited to go next is that they were both associated with the development of a crucial theory in the emergence of the “new geography,” central place theory. This theory was the jewel in the crown. But where had that jewel come from? Underground. And that is where we need to go.

In the Beginning . . .

Like so many things, it goes back to childhood. In separate autobiographical reflections, Christaller (1972) and Ullman (1980) suggested that their idea of central place theory began when they were boys poring over gazetteers and maps. When Christaller was eight, his aunt gave him an atlas as a Christmas present, with which he quickly became “bewitched” (Christaller 1972, 601; see also Binder Johnson 1978, 97). As Christaller remembered, and eerily mimicking what he was later to practice as an adult: “I drew in new railroad lines, put a new city somewhere or other, [and] changed the borders of the nations, straightening them out or delineating them along mountain ranges . . . I designed new administrative divisions and calculated their populations” (602). He broke down into tears, he wrote, only when his father refused to purchase a statistical handbook to add greater reliability and information to his cartographic amendments. In contrast, it was a version of the statistical handbook, the “ten cent store diary,” which included a list of cities and their populations and was bought by his mother in Iowa City that was the equivalent spur for Christaller’s American *doppelgänger*, Edward Ullman (1980, 217). The dime store calendar subsequently prompted Ullman to ask for a wall map of the United States as a Christmas present the following year (Ullman 1980, 217). Unfortunately, though, there are no comparable childhood stories to Christaller’s of Ullman filling in Iowa with hexagons. That would have to wait for another 40 years.

³ The American Association of Geographers named Ullman a “Distinguished Geographer” (1972), the Italian Geographical Society gave him a “Citation for Meritorious Contributions” (1959), and he was also a Fulbright Research Professor (1956–57) and president of the Regional Science Association (1961) (Eyre 1978, appendix, 144–58). Christaller was given the “Outstanding Achievement Award” of the Association of American Geographers (1964), the golden Anders Retzius Medal (1967) by the king of Sweden, and the Victoria Medal by the Royal Geographical Society (1968). His home region of Hesse also awarded him in 1968 a small monthly honorarium for his contributions, although that amount never compensated for the postwar years of penury he endured (Hottes, Hottes, and Schöler 1977).

Born in 1893, Christaller was 19 years older than Ullman. Consequently, he got to central place theory first. His early academic career, though, was intermittent. His undergraduate education began in 1913, and, over the following 17 years, involved studies in several universities before he finally received his Diploma in Economics at the University of Erlangen in 1931 (Hottes et al. 1977, 11; Rössler 1989, 431). Hottes et al. (1977, 11) suggested that Christaller's intention at Erlangen was to continue to study economics, but because he "found no response from the economists," he went back to his childhood interests and asked the biogeographer and regionalist Robert Gradmann in the Geography Department to supervise his doctoral dissertation. Gradmann accepted, but perhaps revealingly only on the conditions that Christaller provide neither "a definite title" nor "plan of layout for the work" (Christaller 1972, 607). Somehow it worked, and his thesis was written in nine months, completed in 1932 (Christaller 1972; Hottes et al. 1977, 11–12). The thesis was published the following year in Jena as *Die zentralen Orte in Süddeutschland* (later translated into English as *Central Places in Southern Germany*; Christaller 1966).

- 10 Ullman (1962, 157–58) said throughout his life, including perhaps uncharitably at the IGU symposium at Lund in front of Christaller, that Christaller beat him to the invention of central place theory. He claimed independent discovery in 1938 as a beginning doctoral student at the University of Chicago. As he put it in a 1972 Geographers on Film interview with Preston James, "suddenly the idea came to me," as well as the realization that "this was going to be my life's work" (Dow 1972, 3). When Ullman said that he invented central place theory, he meant that he had an idea, but one that was never comprehensively or formally developed. In the interview he gave to Preston James in 1972, he provided a few more details about his Pauline experience:

When I was a graduate student at Chicago a boy came in who was writing a Masters thesis on towns in Northern Indiana and he said: "Ed, I can't find any reason for this town. There's no mountain, there's no valley, there is no river, there's no nothing." I looked at the map and sure enough it's was just a featureless plain. Then suddenly the idea came to me that every so often you needed a place for a farmer to come in and buy a soda or something like that. That started me off on making frequency counts through the Middle West and this was going to be my life work. (Dow 1972, 3)

In the "Ullman Papers" deposited at the University of Washington, Seattle, there is a five-page, double-spaced typed essay, "A theory of Abstract Place and Space Concepts as Applied to Settlements" (Box 76, folder 5). A handwritten note says, "Written Oct 1937, idea first in June 1935." After defining geography as the study of "space relationships" (p. 1), Ullman provided in one paragraph on p. 4 (possibly) the beginnings of central place theory:

By way of illustration . . . let us limit the theory to one fundamental problem, settlements, starting with the single country house and working up to larger agglomerations. With a given soil fertility, climate, market, pressure of population, state of arts, etc., . . . we would expect farms to be located at certain intervals, hamlets serving the area at further intervals and villages, towns, and cities at ever widening distances in the hinterland. When these settlements did not show a uniform spacing we should have to look for a reason and this would be occasioned, of course, by some situation, site or accidental factor. The location of the unit would then represent the compromise between the pulling power of our supposedly logical space center and the attractiveness exerted by some particular site, situational or accidental, and its accumulated momentum, factor.

In 1938 Ullman visited Harvard University, where he was previously an assistant and master's degree student in geography. "Everybody" there told him to see a visiting German professor of spatial economics, August Lösch, and on the eve of Lösch returning to Germany, Ullman did so (Dow 1972, 3). Lösch had received a Rockefeller Fellowship to travel around the United States and Canada to gather data for what would be his own version of central place theory, published in 1940 as *Die räumliche Ordnung der Wirtschaft* (translated as *The Economics of Location*; Lösch 1954). As Ullman told the story: "I described my idea to [Lösch] and a strange light came in his eyes—that's the only way I can describe it. And he wrote down on a piece of paper, 'You should see Walter Christaller in Deutschland.' I had run into the classic thing of a German scholar having thought of it before I did" (Dow 1972, 3). Chauncy Harris (interview with the author, November 1997) said that Ullman kept that piece of paper in his wallet for much of his life, taking it out at opportune moments. Ullman followed up Lösch's tip but not until the following year. On November 30, 1939, Ullman wrote a letter to Harris saying, "I just read Christaller's book, which I borrowed from Wisconsin" (Harris 1978, 74, fn. 9). Ullman subsequently translated Christaller's book. Louis Wirth, the urban sociologist at the University of Chicago, heard of the translation, and, according to Ullman, said, "I'll publish that in the *American Journal of Sociology*" (Dow 1972, 2). In 1941, as a 29-year-old geography graduate student, Ullman saw perhaps his most successful paper "The Theory of Location of Cities," a condensed summary of Christaller's book, appear in the flagship journal of the American Sociological Association.

Not that many American geographers read it. One reason was the dominance of Richard Hartshorne's (1939) *The Nature of Geography* published two years earlier, which presented an opposing conception of geography. Inspired by German scholarship, albeit not of the Christallerian kind, Hartshorne believed that because of the uniqueness of the region, the object of investigation of geography, no lawlike generalities of the form given by the "natural" or "exact" sciences was possible. As Hartshorne (1939, 449) wrote, geography was "essentially a descriptive science concerned with the description and interpretation of unique cases." Consequently, we cannot explain or predict or knowingly intervene, merely describe. Ullman and Christaller, however, were concerned precisely with explanation, prediction, and, above all, knowing intervention, embodied in central place theory.

There was another reason why few American geographers read Ullman's paper. Within six months of its publication, the United States entered World War II following the December 7, 1941, Japanese attack on Pearl Harbor. On December 8, Ullman was invited by Captain Hart at the Office of the Co-ordinator of Information (OCI), the predecessor to the Office of Strategic Services (OSS), and, in turn, the predecessor of the Central Intelligence Agency (CIA), to accept a research position in military intelligence. Given "yesterday's events," Captain Hart wrote, "it would be highly desirable for you to come as soon as you possibly could" (see Ullman Papers, Captain Hart to Edward L. Ullman). Ullman would not be seeing Christaller in Deutschland any time soon, especially given the fact that on July 1, 1940, Christaller had joined the Nazi Party and was working for Heinrich Himmler's SS.

Walter Christaller, Central Place Theory, and War

It is not entirely clear why Christaller joined the Nazis. He had been a socialist and member of the Social Democratic Party, and had even fled to France briefly in 1934 after Hitler banned his political party (Binder Johnson 1978, 97). And immediately after the war ended Christaller became a communist, remaining a Party member until 1953 (Hottes

et al. 1977, 12). But during the war, he was a Nazi and explicitly engaged in projects to further the realization of the Third Reich, including its perverted vision of racial purity and expanded empire (*Lebensraum*) involving expropriation, expulsion, exclusion, and extermination.

To use my earlier terms, Christaller was hailed and interpellated. Götz Aly and Susanne Heim (2002, 113) reported that Christaller was lured back from France in 1934 by the offer of work from Konrad Meyer, professor of agronomy at the University of Berlin from December 1934, and an SS member from June 1933, who worked directly under SS-Obergruppenführer Heinrich Himmler.

12 **Konrad Meyer and the General Plan for the East.** Konrad Meyer was a key academic administrator for the Nazis, at the center of multiplicitous ventures. In 1936 he was made head of the Reich Association for Area Research (*Reichsarbeitsgemeinschaft für Raumpforschung*) for which Christaller, along with many other German geographers, undertook work (in Christaller's case, it was research on the *German Atlas for Living Spaces [Atlas des deutschen Lebensraumes]*). Perhaps even more important for Christaller, Meyer was also appointed chief of the Planning and Soil Department (*Hauptabteilung Planung und Boden*) under the Himmler-led Reichs Commission for the Strengthening of Germandom (*Reichskommissariat für die Festigung deutschen Volkstums*, RKFDV). Christaller worked in the Planning and Soil Department in Meyer's main Berlin office. He assisted in planning Germany's newly acquired Eastern territories, culminating in the General Plan for the East (*Generalplan Ost*).

Meyer was the principal architect of the General Plan for the East, a top-secret plan, produced and overseen by the SS, with much of its documentation deliberately destroyed just before the end of the war because of its incriminating character.⁴ In spring 1941, Meyer's office had planned the Polish territories annexed by Germany (Madajczyk 1962, 3–4). After Germany invaded and occupied Poland on September 1, 1939, the trigger for World War II, Poland was partitioned into three areas: western Poland was annexed and became part of the Third Reich, consisting of the provinces of Wartheland (later known as Warthegau) and Danzig West Prussia; central Poland became a German military occupied province known as General Government (*Generalgouvernement*); and eastern Poland (*Galicia*) was ceded to the Soviet Union as part of the secret Molotov-Ribbentrop Pact signed a week before Germany's assault on Poland. Himmler was pleased by Meyer's Polish planning efforts, and, trying to impress again, Meyer submitted to Himmler three weeks after the German invasion of the Soviet Union in June 1941 an even more expansive plan that applied not only to Poland, but to all subsequent German Eastern conquests (Madajczyk 1962, 4).⁵ Himmler approved, ordering Meyer in January 1942 to set out the full legal, political, and geographic foundations necessary “for the ‘reconstruction of the

⁴ There is a large English-language literature (original and translations of works in German) both printed and on the Worldwide Web, about the General Plan for the East. I have drawn especially on Koehl (1957), Kamenetsky (1961), Burleigh (1988), and Aly and Heim (2002). For a web page devoted to the plan linked to a number of useful sources, see <http://www.worldfuturefund.org/wffmaster/Reading/GPO/gpo%20sources.htm>. The *Deutsche Forschungsgemeinschaft* recently produced an online exhibit on the plan, focusing especially on Meyer but also discussing Christaller: http://www.dfg.de/aktuelles_presse/ausstellungen_veranstaltungen/generalplan-ost/ (the associated exhibit catalog is also available online; Heinemann et al., 2006). For German geographers who were involved in the plan, see Rössler (1989, 1994, 2001).

⁵ Various versions of *Generalplan Ost* existed from 1940 onward, but after some wayward arithmetic in earlier incarnations, “the more practiced Meyer” got the job (Burleigh 2000, 547).

East' including the Crimea and Leningrad" (Himmler, quoted in Madajczyk 1962, 4). On May 28, 1942, Meyer submitted to Himmler, "General plan: legal, economic, spatial foundations for the development in the East" (Burleigh 2000, 547).

Generalplan rested on twin strategies of colonization and evacuation. Colonization meant Germanization, importing to newly acquired Eastern regions people of Aryan heritage, so-called *Völkische* (Berger 1994), who would be drawn from such places as the Baltic States, Romania, and the Netherlands. To fulfil the *Generalplan's* anticipated expansion of Germany's territories, it was calculated that an additional 4.5 million Germanized colonizers were required over a 30-year period (later raised to 10 million). In contrast, the fate of most of the original inhabitants of the East, Slavs and Jews, who did not fit the Nazi Germanic racial type was evacuation. But evacuation was a euphemism, the opposite of rescue and safety. Evacuation meant eviction and incarceration often in a slave labor, concentration, or death camp. The numbers of planned evacuees varied from a low of 30 million to a high of more than 65 million (Burleigh 2000, 547).

The "Rule of Experts" under National Socialism. The involvement of Meyer as a university professor was no anomaly. The National Socialist project relied crucially on academic labor. Although the ends of Hitler, Himmler, Goebbels, and other top Nazi leaders were malevolently irrational, they were frequently implemented by a scrupulous rational logic and knowledge often provided by advisers from the German academy (Renneberg and Walker 1994, Szöllösi-Janze 2001). Admittedly, some Nazi academic projects, such as at Himmler's *Das Ahnenerbe* ("ancestral heritage") institute, were madcap (Szöllösi-Janze 2001, 1–3). But generally, the work of ordinary, everyday academics—scientists, social scientists, and assorted technocrats—was "largely rational, and result oriented . . . [and] not ideologically dogmatic" (Szöllösi-Janze 2001, 12).

The National Socialist reliance on academics also coincided with a larger nationalist sentiment about the general superiority of German scholarship and intellectualism. If any group could achieve Nazi goals, it would be the German professoriate. Consequently, as Aly and Heim (2002, 3) wrote: "the National Socialist leadership sought to maximize the inputs for scientific policy advisors and used their research findings as an important basis for their decisions—including the decision to murder millions of human beings."

Burleigh (1988) presented an illuminating case study of German academics at work during the war, and germane to Christaller, the conduct of research on the newly colonized Eastern territories (*Ostforschung*—"Eastern research") particularly in Poland, Czechoslovakia, and later the Soviet Union. In this regard, he wrote:

Exponents of the view that academics were without influence have to explain why hard-headed SS managers thought and acted otherwise. Rightly or wrongly the latter recognised that the domination of conquered populations . . . could be achieved through research institutes in Berlin or Breslau . . . As scholarly experts in the East, the *Ostforscher* had a distinctive contribution to make to the accurate "data base"—the statistical and cartographic location of persons—upon which all aspects of Nazi policy in the East, as elsewhere, ultimately rested. Deportations, resettlements, repatriations and mass murder were not sudden visitations from on high, requiring the adoption of some commensurate inscrutable, quasi-religious, meta-language, but the result of the exact, modern, "scientific" encompassing of practices with card indexes, card sorting machines, charts, graphs, maps and diagrams . . . This was why [*Ostforschung*] received generous funding. (p. 10)

From this perspective, Christaller was simply another *Ostforscher* who "voluntarily and enthusiastically put their knowledge at the disposal of the Nazi regime" (Burleigh 1988,

8). With his “maps and diagrams,” Christaller was concerned with western Poland, or at least what had been western Poland, and to be planned according to his principles of central place theory. As such, Christaller’s Eastern “research,” as Richard Preston (2009, 6) wrote, “contributed directly to plans facilitating German *Lebensraum* (search for living space) policy, on the one hand, and Himmler’s RKFDV [strengthening of Germandom], on the other.”

Christaller as an *Ostforscher*. One may think that Christaller had no choice but to become an *Ostforscher*. Threats of imprisonment and violence were close to the surface, and governmental employees were required to be Nazi Party members. Recall, however, that Christaller *chose* to return to Nazi Germany after he fled to France in 1934. Moreover, he came back not anonymously, to slip invisibly into the background, but instead to work in the belly of the beast for Konrad Meyer and the SS. In contrast, August Lösch, the other German deviser of central place theory, the one whom Ullman met before the war at Harvard, managed to work in a governmental institute throughout the war but neither joined the Nazi Party nor contributed to “*Drang nach Osten*” (“the drive toward the east”) (Kuklinski 1986). This is not to demonize Christaller, only to contend that he was forcefully hailed and interpellated.

Burleigh (1988, 155) argued that hailing and interpellation were pervasive among the *Ostforschers*, partly as a result of the “hubristic desire to be close to decision-making and the march of events [and of] the need to make the work appear ‘relevant’ and ‘vital to the war effort,’ to secure government funds” (Burleigh 1988, 155). But there was another reason. Key Nazi power holders may have been irrational, but they provided large-scale opportunities for science and technocracy to remake the world. Such Promethean ambition also hailed. Aly and Heim (2002, 6), again writing explicitly about *Ostforschers*, contended that under Nazism, “young, career-minded technocrats and academics . . . regarded Europe . . . as a drawing board on which to work out their grand designs. For them Eastern Europe was one vast wasteland crying out for ‘readjustment’ and ‘reconstruction.’ ” More generally, while there were certainly cases of compulsory enrollment of academics in the Nazi project, Szöllösi-Janze (2001, 10) concluded that the “numerous examples of self-*Gleichschaltung* [stepping into line]” were more common—cases in which “scientists appear as proactive subjects who understood how to use the new political conditions for their own ends.”

All this applies to Christaller. Christaller’s academic career had not been successful. Economists were not interested in his proposed doctoral work, which explains why Christaller sought out Robert Gradmann in a Geography Department. But even in geography, the responses to Christaller’s work were muted. Christaller’s theoretical bent and deductive inclinations, his talk of laws, regularities, and mathematics, were antithetical to the prevailing Germanic tradition of regional geography.⁶ It was precisely that regional tradition, of course, that Hartshorne (1939) documented so assiduously in his *The Nature*. Hartshorne made the German regional tradition the disciplinary blueprint for American geography (Barnes 2011c). But in spite of Hartshorne’s (1939) encyclopedic reference list, many items of which were in German, Christaller’s *Central Place Theory in Southern Germany* never made it into his bibliography, even though we know that the University of Wisconsin, where Hartshorne taught, had a copy of the book. One group

⁶ Christaller (1966, 3–4) was most explicit about the search for laws in the Introduction to his book: “there are economic laws which determine the life of the economy, and . . . there are also, consequently, special economic geographical laws, such as those which determine the sizes, distribution, and number of towns. Therefore, it does not seem senseless to search for such laws.”

responded favorably to Christaller, however. This group recognized the potential of central place theory, and consequently hailed him, offered him an opportunity to be “relevant,” to be close to the action, to treat Eastern Europe as a drawing board: Konrad Meyer and the Nazis.

Christaller’s central place theory was attractive to Meyer and the Nazis partly because it contained within its very structure National Socialism’s oxymoronic combination of rationalism and irrationalism (what Jeffrey Herf 1984 labeled Nazism’s “reactionary modernism”). Although the larger ends of Nazism were horrendously regressive, based on a mythic history, cultural essentialism, dogma, bigotry, and much worse, those ends were to be realized through the application of science; rationality; new technology; cutting-edge management; and logistical, organizational, and planning techniques. It was central place theory’s ability to inhabit this oxymoron that, in part, made it amenable to the Nazi project of reconstructing the East (Fehl 1992).

Central place theory was rationalist in that it traded in the vocabulary of laws, logical deduction, and calculated intervention. Christaller (1966, 4) said at the beginning of his dissertation that he was concerned “not with descriptive statements,” but “with a general and purely deductive theory.” From that theory, he developed three well-known planning principles for urban organization: the $K = 3$ marketing, $K = 4$ traffic, and $K = 7$ administration principles (Christaller 1966, 53–82). These principles proved that central place theory was scientific, variously achieving rational political administration, enhanced economic productivity in the provision of services, industrial and agricultural production, and the superior delivery of transportation.

Central place theory, though, could also be bent toward a reactionary politics, and exactly the political inflection that Christaller gave it when he worked in Meyer’s Dahlem head office. The key point here was that “Christaller’s system of planning regions rested on a foundation of farms and rural neighbourhoods” (Preston 2009, 16). This emphasis was critical because it allowed central place theory to connect directly with the countryside and, in turn, to the Nazi reactionary ideology of *Volk* traditionalism (discussed by Rössler 1989, Preston 2009, and Fehl 1992). As Preston (2009, 16) noted:

The concept of community used by Christaller in his earlier administrative and regional planning studies evolved from a vague functional-municipal governance based idea to one based on the Nazi concept of “*Volksgemeinschaft*.” *Volksgemeinschaft* emphasised the strengthening of German nationalistic feeling within territories of planning units by idealizing comradeship, “swallowing up” of the individual in the party movement and self-sacrifice.

As the planner Gustav Langen wrote in a 1937 Nazi planning exhibition at Dusseldorf, for the the Nazi demand of *Volksgemeinschaft* to be met, it was necessary that “territorial order would be identical with folk [*volk*] order” (quoted in Fehl 1992, 95). That is exactly what the implementation of Christaller’s central place theory could realize in the newly German-occupied territories.

Christaller’s central place theory in Warthegau and Beyond. Achieving a homology between territorial and folk orders was the Nazi aspiration for annexed Poland, specifically, Warthegau. The region was to be the test case, the “workshop,” as the Nazi planner Joseph Umlauf put it, for central place theory, and the “raw material in need of being remoulded,” as Ewald Liedecke, governor of Danzig, West Prussia, said (quoted in Fehl 1992, 96). That seemed Christaller’s view, too. Writing in 1940, Christaller noted: “Because of the destruction of the Polish state and the integration of its western parts into the German Empire, everything is again fluid. . . . Our task will be to create in a short time

all the spatial units, large and small, that normally develop slowly by themselves . . . so that they will be functioning as vital parts of the German Empire as soon as possible” (translated and quoted in Preston 2009, 23).

Consequently, the urban hierarchy of Warthegau was to be redesigned according to central place theory. Where “it seemed absolutely essential . . . that a new town of at least 25,000 inhabitants” be built, wrote Christaller (1940), a new town would be “created from scratch” (quoted in Aly and Heim 2002, 97). Or if “Posen . . . has the power and potential to develop into a town of 450,000 [from 350,000],” it should (quoted in Aly and Heim 2002, 97). Furthermore, and going to the argument about the importance of *Volksgemeinschaft*, Christaller planned 36 new lowest-tier rural towns, *Hauptdorfs*, and the geographic bases for realizing national “comradeship.” Each *Hauptdorf* would come with a “National Socialist celebration hall, buildings for the Hitler Youth or a central parade square” (Rössler 1994, 134).

Another example is Christaller’s extended metropolitan model focused on Posen (see Figure 1) in central Warthegau. As a plan, it required Germanization and its obverse, the removal of non-Germans. Officials calculated that, in Warthegau, for every one new German to be introduced, two to three Poles would be evacuated (Aly and Heim 2002). Although 1.1 million of the existing Polish population living in the annexed territories were counted as Germanized enough to stay, but for the Christallerian hierarchy to work, especially if new cities the size of a Dusseldorf or Cologne were to be made from scratch, an additional 3.4 million Germans were required. In Figure 1, drawn by Christaller when he was working in Meyer’s office, centers are identified as requiring

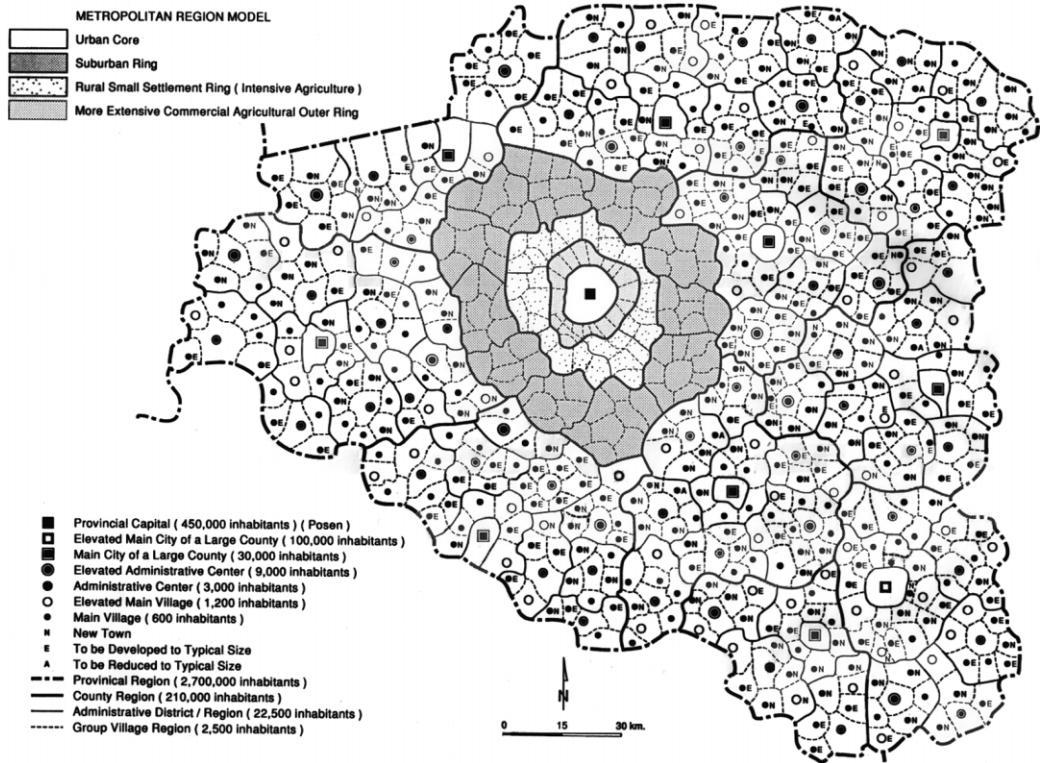


Figure 1. Christaller’s metropolitan central place model for Posen, west-central Warthegau (redrawn from the original and used by permission from Preston 2009).

either more population or less to meet the strictures of central place theory. The map also shows new towns to be constructed, which, as Christaller (1942) noted, “is urgent in order to give settlers roots so they can really feel at home” (quoted and translated by Preston 2009, 23). In contrast, non-Germans—560,000 Jews and 3.4 million Slavic Poles—were to be deported from the annexed territories to *Generalgouvernement* and subject to a very different fate than the *Völkisch* culture of the *Hauptdorf*. *Generalgouvernement* was not organized according to the rationality of central place theory. Its logic turned on segregation and erasure, containing the Warsaw ghetto and four Nazi death camps.

Coda

After World War II was over, Konrad Meyer was tried for war crimes at Nuremberg, Case 8 (the RuSHA trial). Christaller provided one of the so-called white wash papers (*Persilschein*) used in Meyer’s defense. The argument at Nuremberg turned on, as Rössler (1989, 427–78) summarized, whether *Generalplan Ost* was ever implemented. The judges concluded that it was not: “there is not a single syllable of evidence,” they said, to support such a charge (Nuremberg military tribunal, volume 5, 156).⁷ *Generalplan*, instead, was pronounced “a strictly independent scientific study” (Rössler 1989, 427). Consequently, Meyer was convicted of the least serious charge with which he was indicted, belonging to a criminal organization (the SS), and released at the end of his trial for time served. He was later made professor of land planning at the University of Hanover in 1956.

Christaller, in contrast, was never offered an academic job, failing to be interpellated into postwar academia. In large part, he was not because in 1945 he became a member of the German Communist Party and accused in 1953 of working for the East Germans. This situation was ironic, possibly poignant, given that central place theory emerged from the war favorably mangled such that it was a proved planning tool, conforming to a new social scientific sensibility turning on theory, prediction, and practical intercession. After the theory was sufficiently mangled with the emerging spatial science movement in North America, to which Ullman significantly contributed, Christaller was finally called back from the wilderness and invited to present the inaugural paper at the 1960 IGU symposium in Lund.

Edward L. Ullman, OSS, JANIS, and Harvard

War, the OSS, and JANIS. Ullman never planned any new cities while he served in the OSS, although the information he gathered and the techniques he applied might have contributed to the “downgrading” of some of them. The OSS reported directly to the president and the Joint Chiefs of Staff, with its founding charter “to collect and analyze all information and data which may bear upon national security” (quoted in Troy 1981, 423).

Almost immediately, a Research and Analysis (R&A) branch was established at OSS with at one point 900 staff members, many of whom drawn from the *crème de la crème* of American and European émigré social scientists and humanists (Katz 1989). As in Germany, the United States mobilized academic labor for military purposes. In the first

⁷ Selected transcripts of the Nuremberg trials are accessible online at the Mazal library: <http://www.mazal.org/NMT-HOME.htm>. They are available in full at the National Archives and Record Administration, Washington, D.C.: <http://www.archives.gov/research/captured-german-records/war-crimes-trials.html>

incarnation, R&A's internal divisions were disciplinary, but in January 1943, they became regional, with Ullman assigned chief of the Transport Section of the Europe-Africa Division (Barnes 2006).

The modus operandi of R&A was interdisciplinary teamwork, especially when R&A's organization changed to a regional basis. For example, Edward Ackerman (1945), commenting on the Topographic Intelligence Subdivision, Europe-Africa Division, said: "this new subdivision was not composed of geographers alone, but in reality it represented the first significant attempt to get a number of geographers and people in other disciplines to work closely together. The problems we dealt with were primarily geographic, but there were nevertheless contributions from others who had been trained in fields other than our own." To use the earlier terms, interdisciplinary teamwork was a form of mangling. Geographers were thrown together with economists, psychologists, political scientists, and sociologists and directed to solve instrumental ends. It was this mangling that was the beginning of a different postwar American geography that influenced at least a cadre of the younger R&A geographers, including Edward Ackerman, Chauncy Harris, and Ullman himself.

18 Ullman (1980, 219) said that at OSS, "geography unfortunately did not have too good a reputation." His Europe-Africa Division chief, Sherman Kent "father of modern intelligence," as the CIA web site dubbed him,⁸ called geographers "unemployables" (Ullman 1980, 219). Consequently, Ullman (1980, 219) felt "he had to prove himself to other disciplines." That task was especially pressing once he became chief of the Transport Subdivision. To show that he was worth employing Ullman deliberately practiced a more analytical, a more systematic approach. His duties "consisted of planning and directing transportation research . . . including railroads, roads, ports and shipping inland waterways, and air facilities; devising research techniques, such as estimating rail and road capacities; and directing enemy capability studies" (Eyre 1978, 4). Ullman added the use of simple statistics and projection techniques. None of this was rocket science, but at least it made him employable.

Ullman's inclinations were even more apparent when he became a member of the Joint Intelligence Studies Publishing Board in January 1944, becoming the director for six months from December 1945. Ullman was especially concerned with reformulating the Joint Army and Navy Intelligence Studies (JANIS), saying later it was "in this capacity [that] I made my greatest practical contribution" (see Ullman Papers, Edward Ullman to Donald Hudson 1950).

The mandate of JANIS was "to make available in one publication . . . all the necessary detailed information upon which may be based a war plan . . . in a given area" (National Archives, Memo: War and Navy Department, 1943; National Archives, Edward Ackerman to Edward L. Ullman 1944). Early versions of the publication were little more than serried lists of regional facts. Ullman recast the reports along new mangled lines. The problem was that the old reports focused on "knowledge of an area," which created a "product [that] was poorly organized, unbalanced and of preliminary value" (National Archives, Edward Ullman, Notes on Rganization of Topographical Intelligence 1944). As he wrote in a 1945 memo, "A port for example is a port, and a beach is a beach anywhere in the world" (National Archives, Edward Ullman, Notes on Organization of Topographical Intelligence 1944). Time should not be wasted describing a port or a beach that are the same everywhere but instead, JANIS reports should draw on specialized systematic

⁸ <https://www.cia.gov/library/center-for-the-study-of-intelligence/csi-publications/books-and-monographs/sherman-kent-and-the-board-of-national-estimates-collected-essays/1tribute.html>

knowledge making “functional” links based on generalities. This way forward provides the “opportunity,” as Ullman wrote to his friend Edward Ackerman in January 1946, “for geographers to leave their stamp on government” (Ullman Papers, Edward L. Ullman to Edward Ackerman 1946). JANIS drew upon the expertise of 20 U.S. government agencies, involving hundreds of people, in combination with Ullman’s own staff of 25, and had a publication budget of more than \$1 million (in 1945 values). Again, this was not rocket science, but it was to have a significant impact on American human geography. The mangling that went on at both R&A and JANIS showed Ullman both the limits of traditional geography and the possibilities of remaking the discipline. Ullman was hailed. Now he needed to show the wider discipline what could be done.

Postwar, Harvard, and central place theory. Ullman was in a position to effect that end once he demobilized in May 1946 and returned to the academy. He was stymied on his first attempt at Harvard University, however, when James Conant, the university president, closed the geography program in 1948 because he thought that geography was “not a university subject” (quoted in Smith 2003, 443).

Neil Smith’s (1987) study of the closing of the Geography Department at Harvard pointed to a number of factors, but I want to emphasize Conant’s seemingly tossed-off one-liner. I suggest it reflected a new cold war assessment of the worth of academic scholarship, one that in its old guise geography was judged inadequate. Conant had been appointed university president in 1933 (–1953), his mission to tighten up scholarship and to make Harvard a world leader in scientific research. World War II offered such an opening with opportunities for new scientific research tied to war and enormous sums of money from the state to pay for it. Conant became one of the key scientific wartime managers, for a period chair of the National Science Research Committee, shaping projects like MIT’s RadLab and the Manhattan Project. By being rigorous, dynamic, focused on ends, and experimental and by mangling, he believed, science could do great things, including winning wars. But none of these virtuous features characterized conventional human geography in 1948. Moreover, Hartshorne’s *Nature*, ostensibly the most sophisticated philosophical treatise then written in English, said that geography could not and should not be Conant’s kind of science anyway; that is, the discipline was incapable of interpellation by cold war science.

A Committee on Educational Policy, which included Ullman, was formed at Harvard to judge the scientific worthiness of geography (Glick 1988). Ullman’s tack was to try to convince the other committee members and Conant himself that there was another vision of geography that conformed to cold war science and in which central place theory was key (Ullman Papers, “Is Geography Important” 1948; Ullman Papers, “Geography and Harvard” n.d.; Ullman Papers, “Geography and Harvard” 1950; Ullman Papers, “Geography” n.d.). Of course, more than just the incorporation of central place theory was going on here, but central place theory, and the associated idea of geography as the discipline of “spatial relations,” was critical. For example, the last sentence in paragraph 7 of the committee’s final report was pure Ullman: “From an earlier concern with the delineating of simple “homogenous regions,” the geographer in recent years has been developing techniques for the analysis of more complex regions, including their nodal centers and the dynamics of their varied and intricate systems of organization” (Ullman Paper, Report of the Subcommittee 1950). The sentence was simultaneously anti-Hartshorne (he of the “earlier concern” of “homogenous regions”) and pro-central place theory (the “analysis” of “nodal centers” and their “intricate systems of organization”). Unfortunately, it was too late. Conant had already made up his mind. While geography might be interesting for

primary school students, Conant thought (Glick 1988, 52), it was not up to the scientific task of keeping America safe and free in the era of the cold war. The editorial headline at *The Harvard Crimson* for the new academic year 1951–52 was “Geography Razed” (Ullman Papers 1951). Geography would not be interpellated into cold war science at Harvard, and rather than hailed, Ullman was given a cold shoulder. Ullman could have stayed at Harvard by going full time in the Regional Planning Department, but he was a geographer. He wanted to practice a new geography. Consequently, he packed his bags and left for the University of Washington, Seattle.

Coda

20 While geography was razed at Harvard, it was reinvigorated in Seattle once Ullman arrived in 1952. With William Garrison, an assistant professor hired from Northwestern University in 1950, Ullman pursued the new geography along with their graduate students like Bill Bunge. Perhaps the crowning glory was the collective volume, *Studies of Highway Development and Geographic Change* (Garrison 1959). Crammed with calculations, data matrices, statistical techniques, cost curves, and demand schedules, it was revolutionary book. Most important, the theoretical inspiration was central place theory. A microfiche version of Carl Baskin’s 1957 doctoral dissertation, an English translation of Christaller’s 1933 published thesis, circulated among the group during the late 1950s,⁹ and Lösch’s *Economic of Location* had appeared in English in 1954.¹⁰ Christaller was finally redeemed in his own discipline, and Ullman, too, with geographers showing that they knew how to be hailed and mangled by cold war science. Geography was university worthy after all.

Conclusion

In literally thousands of accounts of central place theory, there is rarely a mention of war, economic geography’s historical underground, or the processes unfolding there. The theory is presented as orderly and unsullied, the tidy arrangement of a spotless logic untouched by history. In contrast, my account of central place theory has emphasized the charged, complex, and messy role of history in which theory is inextricably caught. As Oscar Wilde might have said, theory is rarely pure and never simple.

This is what the mangle metaphor points to: entities that are knotted and twisted, inexorably joined. Theories are never distillations of an unadulterated logic, purifications of the already pure, but are connected open-endedly to the world in which they originate and the events that occur therein. An event like war, especially a world war, explodes and reverberates at multiple registers, from the everyday to high theory. In the specific case of central place theory, it was pulled into Nazism early on through Konrad Meyer’s

⁹ Baskin’s dissertation was not published until 1966 as *Central Places in Southern German* (Christaller 1966).

¹⁰ Richard Preston, a student at the University of Washington in the mid-1950s, said that Baskin’s 1957 dissertation, which circulated among the space cadets, was “instrumental to Brian Berry’s MA thesis, out of which came the two articles in *Economic Geography* in 1958” (interview with Richard Preston, Waterloo, Ontario, Canada, June 2000). And Berry (1993), in an autobiographical essay, said that he took the English translation of Lösch’s (1954) *The Economics of Location* on the *Queen Mary* to read on the transatlantic crossing from England to the United States to start graduate school at the University of Washington in Seattle in September 1955.

employment of Christaller and mangled with the complex institutional structure and political ends of Himmler's SS. Christaller at first was against Hitler and National Socialism. He even attempted a getaway, bicycling to France. But the rolling force of the mangle was relentless. This is the usefulness of the second set of ideas deployed in this article—hailing and interpellation—which capture how, despite themselves, various entities—humans, institutions, machines, intellectual disciplines—are drawn to the sites where mangling occurs and are incorporated. Christaller did not want to become part of the Nazi war machine, but he could not not join. He needed a job, sought academic credibility and relevance, and wanted to show that his ideas were not mere childhood squiggles on atlases but capable of remaking the world. Moreover, the SS did not give him just a piece of paper on which to draw, but a conquered territory of 44,000 square kilometers, Warthegau.

Central place theory was hailed and mangled by the National Socialist regime, as was Christaller. Rössler (2001) argued that almost as soon as the war ended, Germany's urban planning bureaucracy was back up and running, occupied and managed by many of the same people who were there under National Socialism, and drawing on the same techniques and models they used previously. The rationalist part of central place theory was kept. In many ways, this fitted perfectly with the new postwar mindset of rational state planning, which was being practiced not only in Western Europe, but increasingly in North America. World War II demonstrated both that the state could plan and possessed the means to plan, that is, in its development of an assortment of formal techniques, methods, and strategies for achieving various instrumental ends. One of these methods, of course, was central place theory. Christaller should have been feted, becoming the Werner von Braun of urban planning. Instead, he did something unforgivable, worse even than working for the SS. He became a communist, stopping hailing and interpellation and a future career.

Ullman really had only a germ of an idea of central place theory before he read Christaller's full-blown formal version. But the mangling that Ullman experienced during World War II once he was employed in U.S. military intelligence convinced him that American human geography should be struck in its image. It would be a geography that conformed to the larger template of science that had proved itself during the war and which was managed by people like James Conant. While Ullman was all set to be hailed once the war ended and to launch a new science of geography as spatial relations, hailing from Harvard never came. Conant, who helped invent the model of science that Ullman wanted to pursue, was not convinced that geography could ever practice it. Consequently, Ullman was banished, forced to launch his larger project from the periphery and not from the center—from Smith Hall at the University of Washington, not from Harvard Yard.

Ullman's project from that point forward, especially in the hands of the space cadets, was one in which central place theory was subject to increasing technical scientific refinement and formalization. But along with greater mathematics went greater historical and political amnesia. Central place theory's wartime connections were erased, leaving only the equations.

In contrast, the purpose of my article was to remember rather than to forget. Once you go into the archives, are antirationalist, take soundings beneath the surface plane, and countenance critique, a different, much darker, central place theory emerges. It is a central place theory in which the history of economic geography matters. Marx (1963 [1852], 9) famously said in *The Eighteenth Brumaire* that "the tradition of all dead generations weigh like a nightmare on the brains of the living." As a discipline, we need to wake up. If we do not, we will only repeat history rather than make it. Economic geography can make history but only if it remembers its own.

- Ackerman Papers. 1945. Edward Ackerman to Preston James, January 12, 1945, Centennial Center, University of Wyoming, Laramie, Box 38, Correspondence January–December 1945.
- Althusser, L. 1971. *Lenin and philosophy and other essays*, trans. Ben Brewster. London and New York: New Left Review.
- Aly, G., and Heim, S. 2002. *Architects of annihilation: Auschwitz and the logic of destruction*, trans. A. G. Blunden. First published in German in 1991. London: Weidenfeld and Nicolson.
- Baggott, J. 2010. *The first war of physics: The secret history of the atomic bomb, 1939–49*. New York: Pegasus.
- Barnes, T. J. 2004. Placing ideas: *Genius loci*, heterotopia, and geography's quantitative revolution. *Progress in Human Geography* 29:565–95.
- . 2006. Geographical intelligence: American geographers and Research and Analysis in the Office of Strategic Services 1941–5. *Journal of Historical Geography* 32:149–68.
- . 2010. Taking the pulse of the dead. *Progress in Human Geography* 34:668–77.
- . 2011a. The quantitative revolution and economic geography. In *The Sage handbook of economic geography*, ed. A. Leyshon, R. Lee, L. McDowell, and P. Sunley, 39–52. London: Sage.
- . 2011b. Spatial analysis. In *The Sage handbook of geographical knowledge*, ed. J. Agnew and D. Livingstone, 380–91. London: Sage.
- . 2011c. From region to space. In *The Wiley-Blackwell companion to human geography*, ed. J. A. Agnew and J. S. Duncan, 146–60. Chichester, U.K.: Wiley-Blackwell.
- Beavon, K. S. O. 1977. *Central place theory: A reinterpretation*. New York: Longman.
- Berger, D. L. 1994. The Nazi concept of “*Volksdeutsche*” and the exacerbation of anti-Semitism in Eastern Europe. *Journal of Contemporary History* 29:569–82.
- Berry, B. J. L. 1967. *Geography of market centers and retail distribution*. Englewood Cliffs, N.J.: Prentice-Hall.
- . 1993. Geography's quantitative revolution: Initial conditions, 1954–1960. A personal memoir. *Urban Geography* 14:434–41.
- Binder Johnson, H. 1978. Walter Christaller: Another personal memoir. *Ontario Geography* 12:93–101.
- Blaug, M. 1979. The German hegemony of location theory: A puzzle in the history of economic thought. *History of Political Economy* 11:21–9.
- Bowd, G., and Clayton, D. Forthcoming. Geographical warfare in the tropics: Yves Lacoste and the bombing of the Tonkin Dikes. *Annals of the Association of American Geographers*.
- Burleigh, M. 1988. *Germany turns eastwards: A study of Ostforschung in the Third Reich*. Cambridge, U.K.: Cambridge University Press.
- . 2000. *The Third Reich: A new history*. New York: Hill and Wang.
- Christaller, W. 1940. Die Kultur- und Marktgebiete der zentralen Orte im Deutschen Ostraum und die Gliederung der Verwaltung [Cultural areas and market areas of the central places in the German east space and the arrangement of the management]. *Raumforschung und Raumordnung* 4:498–503.
- . 1966. *Central places in southern Germany*, trans. C.W. Baskin. Originally published in German in 1933. Englewood Cliffs, N.J.: Prentice-Hall.

- . 1942. Land und Stadt in der Deutsche Volksordnung [Country and city in the German national order], *Deutsche Agrapolitik* 1, 53–56.
- . 1972. How I discovered the theory of central places: A report about the origin of central places. In *Man, space, and environment: Concepts in contemporary human geography*, ed. P. W. English and R. C. Mayfield, 601–10. New York: Oxford University Press. Originally published in German as “Wie ich zu der Theorie der zentralen Orte gekommen bin,” *Geographische Zeitschrift* 56:88–101 (1968).
- Dostoevsky, F. 1974 [1864] *Notes from underground*. New York: Bantam.
- Dow, M. W. 1972. Geographers on Film interview of Edward L. Ullman by Preston E. James, April 23, 1972, Kansas City, Mo. Available also as an online Geographers on Film transcription, 1–7, <http://oz.plymouth.edu/~gof/home.html>.
- Eyre, J. D. 1978. Edward Ullman: A career profile. In *A man for all regions* (Studies in Geography, No. 11), ed. J. D. Eyre, 1–15. Chapel Hill: Department of Geography, University of North Carolina at Chapel Hill.
- Farish, M. 2010. *The contours of America's cold war*. Minneapolis: University of Minnesota Press.
- Fehl, G. 1992. The Nazi garden city. In *The garden city: Past, present, and future*, ed. S. V. Ward, 88–105. London and New York: E. & F. N. Spon.
- Foucault, M. 1972. *Archaeology of knowledge*, trans. A. M. Sheridan. First published in French in 1969. New York: Harper and Row.
- . 1980. *Power/knowledge: Selected interviews and other writings 1972–7*, ed. C. Gordon. New York: Pantheon.
- Funck, R. H., and Kuklinski, A., eds. 1986. *Space-structure-economy: A tribute to August Lösch*. Karlsruhe, Germany: von Loeper Verlag.
- Gardner, M. 1965. *Archimedes, mathematician and inventor*. London: Macmillan.
- Garrison, W.; Berry, B. J. L.; Marble, D. F.; Nystuen, J. D.; and Morrill, R. L. 1959. *Studies of highway development and geographic change*. Seattle: University of Washington Press.
- Glick, T. F. 1988. Before the revolution: Edward Ullman and the crisis of geography at Harvard, 1949–1950. In *Geography in New England*, ed. J. Harmon and T. J. Rickard, 49–62. Keene, N.H.: New England/St. Lawrence Valley Geographical Society. Available online: old.geog.psu.edu/hog/depthistory_files/Harvard_Geog_inNE.pdf
- Gregory, D. 2010. War and peace. *Transactions of the Institute of British Geographers* 35:154–86.
- Haber, L. F. 1986. *The poisonous cloud: Chemical warfare in the First World War*. Oxford, U.K.: Oxford University press.
- Hacking, I. 2002. *Historical ontology*. Cambridge, Mass: Harvard University Press.
- Haraway, D. J. 1997. *Modest_witness@second.millennium.female.man[®]meets_Oncomouse[™]*. London: Routledge.
- Harris, C. D. 1978. Pattern of cities. In *A man for all regions: Contributions of Edward L. Ullman to geography*, Studies in Geography No. 11, ed. J. Eyre, 66–79. Chapel Hill: Department of Geography, University of North Carolina at Chapel Hill.
- Hartshorne, R. 1939. *The nature of geography: A critical survey of current thought in the light of the past*. Lancaster, Pa: Association of American Geographers.
- Harvey, D. 2011. Roepke lecture in economic geography: Crises, geographic disruptions, and the uneven development of political responses. *Economic Geography* 87:1–22.
- Heffernan, M. 2000. Mars and Minerva: Centres of geographical calculation in an age of total war. *Erkunde* 54:320–33.
- . 2001. History, geography and the French national space; The question of Alsace-Lorraine, 1914–8. *Space and Polity*, 5:27–48.

- Heinemann, I.; Oberkrome, W.; Schleiermacher, S.; and Wagner, P. 2006. *Katalog zur Ausstellung: Wissenschaft, Planung, Vertreibung: Der Generalplan Ost der Nationalsozialisten* [Exhibition catalog: Science, planning, expulsion: The National Socialist General Plan for the East]. Bonn: Deutsche Forschungsgemeinschaft.
- Herf, J. 1984. *Reactionary modernism: Technology, culture and politics in Weimar and the Third Reich*. Cambridge, U.K.: Cambridge University Press.
- Hesse, M. B. 1980. *Revolutions and reconstructions in the philosophy of science*. Brighton, U.K.: Harvester Wheatsheaf.
- Hottes, K.; Hottes, R.; and Schöller, P. 1977. Walter Christaller 1893–969. In *Geographers: Biobibliographical studies* 7, ed. T.W. Freeman, M. Oughton, and P. Pinchemel, 11–18. London: Mansell Information.
- Hudson, B. 1977. The new geography and the new imperialism: 1870–918. *Antipode* 9(2):12–19.
- Isard, W. 1979. Notes on the origins, development and future of regional science. *Papers in Regional Science* 43:9–22.
- Kamenetsky, I. 1961. *Secret Nazi plans for Eastern Europe: A study of Lebensraum policies*. New York: Bookman Associates.
- 24 Katz, B. M. 1989. *Foreign intelligence: Research and Analysis in the Office of Strategic Services 1942–5*. Cambridge, Mass.: Harvard University Press.
- Keynes, J. M. 1936. *The general theory of employment, interest and money*. London: Macmillan.
- Koehl, R. L. 1957. *RKFDV: German resettlement and population policy 1939–45*. Cambridge, Mass.: Harvard University Press.
- Kuklinski, A. 1986. August Lösch: The prominent classic of regional studies. In *Space-structure-economy: A tribute to August Lösch*, ed. R. H. Funck and A. Kuklinski, 275–83. Karlsruhe, Germany: von Loeper Verlag.
- Lösch, A. 1954. *The economics of location*, 2nd ed. trans W. H. Woglom with the assistance of W. F. Stolper. First published in German in 1940. New Haven, Conn.: Yale University Press.
- Madajczyk, C. 1962. General Plan East: Hitler's master plan for expansion. *Polish Western Affairs* III. English translation available online: <http://www.worldfuturefund.org/wffmaster/Reading/GPO/gpoarticle.htm>
- Marx, K. 1963 [1852]. *The eighteenth brumaire of Louis Bonaparte*. New York: International Publishers.
- Müller-Wille, C. F. 1978. The forgotten heritage: Christaller's antecedents. In *Perspectives in geography 3: The nature of change in geographical ideas*, ed. B. J. L. Berry, 37–64. DeKalb: Northern Illinois University Press.
- National Archives. Memo: War and Navy Department and OSS, July 1 1943, RG 226, Entry 1, Box 1, Folder 2.
- . Edward Ackerman to Edward L. Ullman, Report on Examination of past JANIS publications and present recommended research procedures, 10 June 1944, RG 226, Box 1, Folder 20, p. 1.
- . Edward L. Ullman, Notes on organization of topographical intelligence, 13 December 1944, RG 226, Entry 1, Box 1, Folder 18.
- Nietzsche, F. 1979 [1888]. *Ecce Homo*, trans R. Hollingdale. London: Penguin.
- Norborg, K. 1962. Ed. *Proceedings of the IGU symposium in urban geography: Lund Studies in Geography, Series B, human geography, no. 24*. Lund, Sweden: C.W. K. Gleerup.
- Pickering, A. 1995. *The mangle of practice: Time, agency and science*. Chicago: University of Chicago Press.
- Ponsard, C. 1983. *History of spatial economic theory*, trans B. H. Stevens, M. Chevallier, and J. P. Pujol. Berlin: Springer-Verlag.

- Preston, R. 2009. Walter Christaller's research on regional and rural development planning during World War II. *METAR—Papers in Metropolitan Studies*, vol. 52, Freie Universität Berlin, Institut für Geographische Wissenschaften.
- Renneberg, M., and Walker, M., eds. 1994. *Science, technology and National Socialism*. Cambridge, U.K.: Cambridge University Press.
- Richard Hartshorne Papers, Box 192, Folders A–N, American Geographical Society Library, University of Wisconsin, Milwaukee.
- . Correspondence William Bunge, Box 194, Folder F. American Geographical Society Library, University of Wisconsin, Milwaukee.
- Robic, M. C. 2003. Geography. In *The Cambridge history of science: the modern social sciences*, vol. 7, ed. T. Porter and D. Ross, 379–90. Cambridge, U.K.: Cambridge University Press.
- Rorty, R. 1979. *Philosophy and the mirror of nature*. Princeton, N.J.: Princeton University Press.
- Rössler, M. 1989. Applied geography and area research in Nazi society: central place theory and planning, 1933–45. *Environment and Planning D: Society and Space* 7:419–31.
- . 1994. “Area research” and “spatial planning” from the Weimar Republic to the German Federal Republic: Creating a society with a spatial order under National Socialism. In *Science, technology and National Socialism*, ed. M. Renneberg and M. Walker, 126–38. Cambridge, U.K.: Cambridge University Press.
- . 2001. Geography and area planning under National Socialism. In *Science in the Third Reich*, ed. M. Szöllösi-Janze, 59–78. Oxford, U.K., and New York: Berg.
- Santayana, G. 1905. *The life of reason, or the phases of human progress: Introduction and reason in common sense*, vol. 1. New York: Dover.
- Schaefer, F. K. 1953. Exceptionalism in geography: A methodological introduction. *Annals of the Association of American Geographers* 43:226–49.
- Smith, N. 1987. “Academic war over the field of geography”: The elimination of geography at Harvard, 1947–1951. *Annals of the Association of American Geographers* 77:155–72.
- . 2003. *American empire: Roosevelt's geographer and the prelude to globalization*. Berkeley: University of California Press.
- Stoler, A. L. 2009. *Along the archival grain: Epistemic anxieties and colonial common sense*. Princeton, N.J.: Princeton University Press.
- Szöllösi-Janze, M. 2001. National Socialism and the sciences: Reflections, conclusions, and historical perspectives. In *Science in the Third Reich*, ed. M. Szöllösi-Janze, 1–35. Oxford, U.K., and New York: Berg.
- Troy, T. F. 1981. *Donovan and the CIA*. Frederick, Md.: University Press of America.
- Ullman, E. L. 1941. A theory of location for cities. *American Journal of Sociology* 46:853–64.
- . 1962. Symposium discussion: The theoretical approach: Central place theory. In *Proceedings of the IGU symposium in urban geography. Lund Studies in Geography, Series B, human geography, no. 24*, ed. K. Norborg, 157–60. Lund, Sweden: C.W. K. Gleerup.
- . 1980. Appendix: An autobiographical statement. In *Geography as spatial interaction*, ed. R. R. Boyce, 217–21. Seattle: University of Washington Press. Originally written as a letter to Robert N. McNee, August 25, 1971.
- Ullman Papers, Edward Ullman to Donald Hudson, November 7, 1950, University of Washington, Seattle, Box 8, Folder 23.
- . Eugene Van Cleef to Edward Ullman, 10 June, 1941, Ullman Papers, University of Washington, Seattle, Box 16, Folder 33.
- . Edward L. Ullman to Edward Ackerman, 2 January, 1946, University of Washington, Seattle, Box 1, Folder 17.



- . Is Geography important to Harvard University today? April 23, 1948, Box 75, folder 13.
- . Geography and Harvard, preliminary draft, n.d.
- . Geography and Harvard, February 14, 1950, Box 75, folder 13.
- . Geography, n.d. Box 77, Folder 9.
- . Report of the Sub-Committee on Geography of the Committee on Educational Policy, April 3, 1950, Box 75, Folder 13, p. 3.
- . Geography razed, *The Harvard Crimson*, October 9, 1951, Box 8, Folder 6.
- . Captain Hart to Edward L. Ullman, December 8, 1941, University of Washington, Seattle, Box 8, Folder 3.