

# John Robert Borchert, 1918–2001

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During a Geography Department faculty meeting in the 1980s, we were discussing the perennial question of whether a course on the development of geographic thought and practice should be required of our graduate students. After all, the department enjoyed a long-standing reputation for methodological inquiry and it had served us well. John Borchert listened to the debate for about 20 minutes, then volunteered that such a requirement would be a waste of time, that students should concentrate on their courses, seminars, field work, and research.

John's comment reflected his sleeves-rolled-up, mud-on-boots approach to geography's scholarly task: observe the landscape, ask questions, gather relevant data, plot them on a map or a series of maps for different time periods, do follow-up field work, revise the maps, suggest what is revealed by spatial analysis, especially as it might inform public policy, listen to feedback, and present interpretation and conclusions. Over a four-decade career, John's work in and outside the classroom, his keen observations, brilliant insights, and plain language inspired students, colleagues, planning professionals, and public officials in ways that garnered for him some of the highest honors ever awarded to a professional geographer in the United States.

John was a practical scholar of exceptional intellect and charismatic demeanor who made original and important contributions to climatology, natural resource assessment, regional economic analysis of the United States, American metropolitan evolution, urban and regional planning, geographic information science, and geographic education (Adams 2001a, 2001b; Adams and Ruttan 2002). As a Regents' Professor of Geography at the University of Minnesota, John inspired generations



of students to abandon their armchairs, visit the map library, get into the field, explore the territory, ask questions, produce dynamic map series, generalize from them to figure out what is occurring on the land, and participate in public policy debate and land use planning.

### Observing the Landscape

John was born in Chicago, son of Ernest J. Borchert and Maude (Gorndt) Borchert, and grew up in Crown Point, Indiana. In reflecting on his childhood, John recalled that he lived on the edge of one of the steepest physical/cultural geographical gradients in the world of the 1920s and 1930s. On one side was his hometown, a typical quiet Corn Belt county seat of 2,500, mostly of German and northwest European origins. But just to the north stood Gary, Indiana, and gates of the largest steel mills in the world, with 20,000 African-Americans, immigrants from eastern and southern Europe, and a small Asian cluster. In his later years, John told me that regular 59-minute train rides from his hometown to downtown Chicago carried him through Gary's modest residential neighborhoods, past refineries and factories, rail yards sprawling westward across the Calumet River flats, and finally to office towers and hotels rising above the bustle and grime of Chicago's Loop.

Combining his later knowledge with his prodigious memory for telling detail from those early experiences he talked about peering through filthy day-coach windows at the transitions from the northern Indiana countryside, through an iron and steel industrial complex, past rail yards teeming with rolling stock displaying railroad system names that read like a gazetteer of North America, into the center of one of the world's greatest industrial

cities. This was his first important geography lesson, and the more he observed it and mulled it over the more it stimulated his curiosity and shaped his thinking.

While John was coming of age in the 1920s and 1930s, academic geographers along with writers in other fields were struggling to understand the nature of the social, economic, political, and urban-industrial changes throughout the industrialized world during the previous century. One branch of academic geography had a history as earth science, a subset of nineteenth-century natural science; another as economic geography and industrial resource analysis in schools of commerce. What was slower to evolve was an understanding of how urban and rural settlement systems were transforming in response to socioeconomic change, and how human interaction with natural environments was producing changes in society as well as in the environmental systems they were exploiting. John came of age during those days and focused on those changes. Later in life he realized that his early life in Indiana and Illinois had provided him with an experiential foundation for a career as one of the leading geographers of the last half of the twentieth century.

### Education and Early Professional Work

John initially planned to be a journalist and began working with the local weekly paper intending to work his way up. But through the local Methodist minister he met a Chicago Tribune Company executive who advised John to ditch the cub reporter gig and enroll in college, so the following fall John entered DePauw, in Greencastle, Indiana. Quite by chance he took a year of geology as a freshman, and soon decided on a geology major for two reasons: studying historical geology was his most liberating intellectual experience in college up to that time, and economic geology might lead to a job.

The lone geology professor at DePauw, “Rock” Smith, offered one course called geography, which satisfied a state requirement for education majors but left John unimpressed. However, Smith recognized the promise of statistics, geophysics, and aerial photography in geology research and applications, and pushed his geology majors through a well-rounded introduction to geology, the basic sciences, and mathematics—a suite of rigorous courses unusual for the time. The accompanying fieldwork included observation of not only the physiographic but also the cultural landscapes throughout Indiana.

John received his A.B. degree from DePauw in 1941, but before proceeding to graduate school in geology at the University of Illinois, he worked in geophysical oil exploration on the northern Great Plains, where he met

his future wife, Jane Anne Willson, in Bismarck, North Dakota. A single semester of graduate work at Illinois, just long enough to discover he liked teaching, was punctuated by U.S. entry into World War II. It was hard to concentrate on graduate work, so John entered Army service and graduate work in meteorology at the Massachusetts Institute of Technology (M.I.T.), which concluded with an Army Air Force commission and marriage to Jane in June 1942. John later recalled that the most exciting part of M.I.T.’s meteorology program and a key element in his intellectual and professional formation was working with synoptic weather maps. One course dealt with world regional climatology and the Köppen classification of climates, which unknown to John was a central focus in American academic geography at that time.

The Army sent John to England as an operational weather forecaster at the headquarters of the B-24 “Liberator” bomber division. As he reported in his memoir, he found the drawing and analyzing of weather maps and preparing weather forecasts to be powerful learning experiences. His job was working with a large array of numerical data to produce twice-daily isopleth maps to locate highs, lows, gradients, air flows, and weather conditions generated by those flows as they diverged, converged, and crossed relief features and water bodies. Next he applied a combination of rigorous procedure and intuition to extrapolate the patterns through time in what amounted to four-dimensional cartographic analysis, a procedure that he later came to believe lay at the heart of geographic method, and of which he became one of modern geography’s outstanding practitioners.

### Discovering Geography and Entering Academia

The war’s end triggered a chain of events that led John quickly to the field of academic geography. At an Army base library in East Anglia he chanced upon and read a copy of *Elements of Geography*, by Vernor C. Finch and Glenn T. Trewartha, geography professors at the University of Wisconsin, which housed a top geography department of the 1940s. Much of the text was devoted to efforts to relate earth science material to the human use of the land, concluding with a section that addressed in a minimal way the morphology of human settlement. The effort was halting but the approach intrigued John, so he decided to investigate it further.

He visited Madison on his way home to Indiana to check out a job prospect at North Central Airlines after his discharge from the Army at Camp McCoy, Wisconsin. He also located the Geography Department and

Finch's office. John recalled that Finch received him graciously, and they talked for some time. Finch then looked at his watch, announcing that he had to lecture to the introductory physical geography class in a few minutes. He paused and said to John, "The lecture today deals with Marine West Coast climates in the Köppen system. You're certainly familiar with that climate and what it meant for our fliers in northwestern Europe. Would you like to give the lecture?" "Recklessly," John later recalled, "I accepted the invitation, illustrating the lecture with blackboard sketches describing weather forecasting episodes from the war." The lecture went well, and the 200 students applauded.

Following his lecture, John remained in the department for lunch with the half-dozen graduate students, including Allan Rodgers and Wilbur Zelinsky. By chance, a guest speaker after lunch was geographer Wellington Jones from the University of Chicago, reporting on his research in the Punjab. John recalled that the presentation was an eye-opener for someone at his level of geographical preparation. Jones's maps were work sheets displaying Indian census data on crops plotted for successive time intervals. Data were overlaid with isopleths distinguishing areas of high and low production, intervening gradients, and changes in patterns from one time to another. Jones laid out his explanations for the patterns and changes based on archival work, interviews in the field, and comparisons with other maps. He also examined his subject at different geographical scales. Behind him hung large wall maps on which he located his study area within South Asia and the world, and at the opposite end of the scale he showed photographs of local landscapes that were generalized on his maps. Jones discussed questions that puzzled him, and speculated about further questions that the maps suggested. A week later John and his family were living in Madison; Trewartha became his Ph.D. adviser, with additional dissertation help from Reid A. Bryson (Meteorology) and John T. Curtis (Botany). John had found the field he was looking for; he was hooked. After John had been admitted to the Geography Department at Madison, Smith of DePauw wrote to the geologists at Madison and urged them to rescue John. It didn't happen.

Years later John recalled that Jones's approach to geographical analysis in the Punjab was essentially analogous to what his weather forecasting team had done with weather observations in Europe—*isopleth analysis*, with description and classification of patterns; description at different scales from global to local; interpretation using both theory and simple, direct observations; then discussion of results with others who were interested. The Punjab study apparently impressed John

mightily at that formative stage in his training because it vividly demonstrated what he would later come to regard as the core of the geographic method. Jones's data were for minor civil divisions rather than specific weather stations. Jones was sampling an extensive surface using small areas rather than points. His time intervals were in years rather than hours. But there was plenty of opportunity to observe and map change as it was taking place.

In later years, John recalled for me that in those early days of graduate training he had no idea how far we would still be from understanding cognitive aspects of all this when he would retire fifty years later. Nevertheless, he was sensing the value of the map and maps series as powerful intellectual tools, and would later conclude that it would be hard to imagine a more efficient way to understand the locations and interactions among a great variety of day-to-day activities while at the same time contributing to the quest for understanding the role of humanity on the earth. He admitted that with the benefit of hindsight it was probably easy to make too much of that brief encounter with Wellington Jones. But the more he reflected on it in later years, the more convinced he became that important seeds were planted.

Once his thinking about the discipline and practice of geography was set in motion, its inspiration and his infectious enthusiasm for it never waned. It led to rewarding discussions with fellow graduate students including Rodgers and Zelinsky, as well as E. Cotton Mather, John E. Brush, and John W. Alexander. Richard Hartshorne, one of John's teachers at Madison, added historical depth to John's understanding of the history of the field of geography, background that he had missed in his college years. Arthur H. Robinson instilled insight into discussions of cartographic scale, generalization, and measurement. Glenn T. Trewartha, climatologist and expert on Japan, emphasized orderly and unequivocal description. Reid A. Bryson, fellow graduate student and later geography professor at Wisconsin, shared ideas about flows, gradients, boundary zones, and interactions between the earth and human settlement. Thinking sparked during that lunch hour with Wellington Jones in 1945 continued into later discussions with Minnesota colleagues including, especially, Jan O. M. Broek, John C. Weaver, Philip W. Porter, Joseph E. Schwartzberg, Fred E. Lukermann, and three generations of graduate students including myself, first as a graduate student and later as a colleague.

Maps arranged in time series to analyze geographic processes became a hallmark of most of John's geographical research. His first major publication was his 1949 doctoral dissertation in which he compared patterns of central North American atmospheric circulation,

rainfall, and temperature in different dry seasons through a series of decades. Two subsequent studies of municipal water supplies of American cities compared patterns of water use with available supplies during wet and dry periods.

## Evolution of a Research Program

Once at the University of Minnesota in 1949, John's research program proceeded in earnest, in tandem with attention to geography in the schools and preparation of teachers. Teacher education and training was a rapidly expanding business in the early 1950s as post-war Baby Boomers arrived at school in ever-larger numbers. John worked closely with Edith West, social studies coordinator in the College of Education, to craft part of his teaching to meet the needs of prospective teachers. Besides enrolling them in large numbers in his introductory course, "Geography of Natural Resources," John developed a televised version of the course and published several texts for classroom use.

On the research front, John settled with his family in Golden Valley, a first-ring Minneapolis suburb, giving him a front-row seat as participant-observer of the post-war suburban housing boom, increasing congestion on limited-capacity radial highways focused on downtown, warehouse relocation to the suburbs as transportation shifted from rail to road, office relocations to suburban sites closer to commuting executives and employees, and the emergence of a circumferential "belt-line" highway connecting the radials and allowing through traffic to bypass the downtown cores.

John's attention to these trends became focused when the Minnesota Highway Department engaged him to study the effects of highway improvements on land development in the Twin Cities area, work that he carried out (1958–1961) in collaboration with Philip M. Raup, a University of Minnesota agricultural and land economist, and their students. One outcome of that highway/land use study was "The Twin Cities Urbanized Area: Past, Present, Future," published in 1961 and illustrating a precise method for producing a geographical forecast of the expansion of suburban land development around a metropolitan area. The main goals were to measure (1) the size and shape of the metropolis, (2) significant variations in terrain over which the area was spreading, (3) the settlement-terrain associations, and (4) the rate and direction of change in these patterns and relationships. An additional goal of the study was to map a probable future geographic pattern of land subdivision in the metropolitan area. It is easy to see how John's early work as a wartime weather forecaster, followed by the

Great Plains drought study, provided him with a framework of spatial-temporal analysis that could be deployed at the metropolitan scale.

Computerized land records lay well in the future, so John devised a measure that could be derived readily from both old and recent topographic maps, and would be consistent through time. From a large sample of mile-square sections in the land survey and clever statistical analysis, his team determined that a count of public-street and road intersections per square mile provided a virtually perfect indicator of the emerging density of platted building lots and street mileage—that is, a physical descriptor of the cultural landscape.

The resulting set of maps provided an exceptional picture of the geographical expansion of the Minneapolis–St. Paul area from 1900 to the height of the post-World War II building boom in 1956, plus an extension of the growth picture to 1980 by means of a forecasted map that accommodated the number of new persons in accepted gross population forecasts. The map showed unprecedented geographical detail, and a quarter century later it turned out to be about 80 percent accurate. The study established John as one of America's most creative urban geographers at a time when research in geography was increasing its attention to, in Brian Berry's term, "cities as systems within systems of cities" (Berry 1964).

What was important and innovative about John's geographical scholarship during the period from the late 1950s to the mid-1960s was his meticulous use of quantitative data, statistical analysis, and replicable technique to portray on a series of maps the evolution of the geographical structure of a modern industrial metropolis. Urban geography was a relatively new direction in geographical scholarship in Europe and the United States in the 1950s, and research frontiers of modern quantitatively oriented urban geography were just beginning to expand.

One research initiative spearheaded by Brian Berry and colleagues included cross-sectional investigations of national and regional systems of cities with empirical tests of central place theory. A parallel thrust examined the emergence of national and regional systems of cities, and the growth and spread of individual metropolitan areas within those systems. John was an early leader contributing to both. Within this emerging scholarly milieu, John's 1961 Twin Cities study also established the direction for two large-scale research projects that he later directed: the Minnesota Lake Shore Development Study, and the Minnesota Statewide Land Use Management Study (known to students and state legislators in the late 1960s as the LSD and SLUM studies, respectively).

John's celebrated 1967 study, "American Metropolitan Evolution," depended on maps of the locations of the country's cities, using comparable size classes at successive dates to define the movement of the metropolitan frontier across the United States as that expansion was related to the evolution of transportation and industrial technologies. As the 1970 U.S. decennial census was being planned, conversations between John and Brian Berry laid the groundwork for the Comparative Metropolitan Analysis Project.<sup>1</sup>

John's study on "Major Control Points in American Economic Geography" (1978) mapped a half-century of change of headquarters locations of large business organizations. The maps reflected the importance of entrepreneurship, instability, inertia, and the drive for security, as well as the impact of local cultures. A follow-up study in 1983 on "Instability in American Metropolitan Growth" described a century of increasing variability in local urban growth rates that accompanied ever-greater speed and capacity of intermetropolitan transportation and communication.

His prize-winning 1987 book, *America's Northern Heartland*, his magnum opus, was built around maps comparing settlement patterns of the Upper Midwest through successive transportation-technology eras—at the beginning of railroading, the beginning of the auto-air age, and the beginning of the jet-satellite-fiber-optic era. He documented how the Upper Midwest functioned as a regional system, highlighting persistent features of culture and circulation networks in an important region the country, which many Americans had considered uninhabitable.

Later, John reflected on metropolitan system change after the 1960s in a chapter on "Futures of American Cities" in *Our Changing Cities* (1991), prepared on the occasion of his retirement. John argued that we have been in a new epoch since the 1970s, and speculated on the settlement features that would be hallmarks of the resulting new metropolitan "age rings," adding that "you never know that a new cycle is underway until you're in the middle of it." He understood two converging trends: society's growing need for geographic analysis and forecasting, and the potential power of geographic information systems.

## Geography Teacher as Public Citizen

In 1949 John joined the University of Minnesota geography faculty, a small but prominent department with new chair, Jan O. M. Broek, who had arrived the previous year. By the mid-1950s, the trio of Broek, John C. Weaver, and John Borchert, supported by a bevy of

graduate assistants and instructors (Fred Lukermann, Warren Kress, John W. Webb, Barbara Fenton, Leverett P. Hoag, Robert C. Eidt, David E. Sopher), had mounted an innovative program of courses with burgeoning enrollments. John assumed the chair of the department in 1956 and served until 1961. During his tenure as chair, John added four more faculty members to the bustling department (Philip W. Porter, E. Cotton Mather, Ward J. Barrett, and Ronald A. Helin).

In the 1950s the University of Minnesota did not offer a professional master's degree in city and regional planning, so a professionally oriented M.A. in geography served that purpose. John trained and launched a score of advisees into positions in state and local agencies and private consulting firms, and a few to Washington. Once on the job, they sent back to the department questions and resources that stimulated further applied work.

Chairing the department during a time of steady growth amplified John's professional reputation. He quickly made his mark in research, teaching, and outreach to government at all levels, and by the early 1960s his published scholarship had gained acclaim for originality and its emphasis on American urban development and science-based resource policy.

In the preface to *Minnesota's Changing Geography* (1959) John asserted that the book's maps and narrative "reveal one of the most exciting facts which the human mind can discover—the fact that the varied landscapes all around us are parts of an orderly spatial pattern. That spatial pattern is the focus of the study of geography. And it is a fascinating, ever-changing composite expression of the combined works of men and nature." He also claimed that, "Organized knowledge of the present is essential to give relevance to the historical past. Knowledge of the pattern of land and settlement provides the concrete framework upon which to build more abstract knowledge of human society. Knowledge of today's changing patterns provides the foundations from which plans for tomorrow must grow." In subsequent decades of use of that book by hundreds of teachers, and in the face of frequent restatements of those convictions in classes and workshops, John recalled, no one ever challenged them. So he remained convinced that if those convictions were true, little doubt exists about the importance of geography in liberal education, formal and informal, at every level.

The need for material for a course on the geography of Minnesota organized around a set of public policy challenges motivated the first atlas of the State of Minnesota, which John produced in the early 1950s. Work with local planning organizations led to leadership of the urban research component of the Ford Foundation-financed

Upper Midwest Economic Study (1959–1965). This regional development study, a joint undertaking of the Upper Midwest Research and Development Council (a 9<sup>th</sup> Federal Reserve District banking and business group) and the University of Minnesota, was inspired in part by the University's Economics Department chair, Walter W. Heller, and directed by James M. Henderson and Anne O. Krueger. John's team focused on the changing geography of towns and cities across the Upper Midwest using applications of central place theory. The ostensible goal was to encourage more urban planning in the changing economy, but the studies produced an understanding of the irreversible geographic trends that the post-WWII automobile era had wrought on every element of the region's settlement system.

### Applied Research and Outreach

The visibility of John's atlases and industry studies opened the door to working with state legislators on a response to the federal Outdoor Recreational Resources Act. Given Minnesota's exceptional natural resource setting, attention went directly to lakes and forests—to fisheries, public access, tourism, control of polluted surface and ground water, exchanges of public and private forest lands, and so on. The state needed centerpiece studies of the basic geography of those topics, and by the mid-1960s Minnesota geographers under John's direction were centrally involved with virtually all of them.

One urgent need was for a study of the state's recreational lakes—their physical properties, status, and trends in lake shore development. John's team assembled data from scattered sources, supplementing them with survey research. They compiled their data on a grid of 40-acre cells in a basic land survey covering 12,000 miles of inland lakeshore, eventually expanding the study to a statewide land inventory covering more than a million 40-acre cells. By 1972 the project had produced a land use map of the entire state, with files that formed the basis for the Minnesota State Planning Agency's Pioneering land management information system—an achievement of national renown, and one of the very first geographic information systems.

### Professional Leadership

John's vita listed his Teaching and Research Interests as “geography applied to public policies in land use and resource management.” After chairing the geography department at the University of Minnesota, he served as associate dean of the Graduate School and assistant to the vice president for Educational Relationships and

Development, then directed the University's new Center for Urban and Regional Affairs. He served on numerous committees of the Association of American Geographers (AAG), served on the council of the AAG, and assumed its presidency in 1968 during the worst of the Vietnam War years, just in time to deal with controversy over the annual summer meeting of the Association—that year scheduled for Chicago in the immediate aftermath of the Democratic National Convention. Violent antiwar protests at the convention site and brutal police responses triggered protests on the part of members, threats of boycotting the AAG meeting in sympathy with the antiwar protesters, and responses by other members that it was inappropriate to allow meeting plans to be disrupted by political events. Amid hue and cry on several sides of the issue, John ordered the meeting moved to Ann Arbor, Michigan.

He served on scores of local, national, and international committees, commissions, and boards concerned with transportation, natural resources, land management, and pollution control. His colleagues at the National Academy of Sciences were continually impressed by John's thoughtful approach to any research or policy issue, and his exceptional insight. The American Geographical Society awarded him the Eugene van Cleef Gold Medal for Outstanding Contributions to Urban Geography, and the AAG awarded him their Publication Award, the Jackson Prize, for his book on *America's Northern Heartland*.

In the final decades of his life, John remained an active scholar, teacher, and public citizen. At the end he was close to finishing a book on the expansion and eventual contraction of the Pennsylvania Railroad system, using records of postal receipts as indices of the functional importance of each urban node on the lines as they were laid down, used, and eventually abandoned. The method? What else—a series of meticulously constructed maps of lines and urban nodes.

### A Legacy of Example

Among John's thousands of students, twenty-two of his advisees received Ph.D. degrees and another ten received M.A.s. I asked former students to share reflections concerning their work with John, and they responded with moving tributes:

“One of the keys to John's success was his naïve, child-like curiosity. He had the ability to see the world as if he were seeing it for the first time”

“he personified all that was meritorious in university teaching, student advising, research, and all that is good in a caring and loving professor”

“he has been the most influential person in my life and the man I have most admired and tried to emulate”

“he taught me to think with maps”

“an infectious enthusiasm for geography”

“analytical without being arrogant or petty”

“continuing interest in advisees throughout their careers”

“easy affable style that made him always approachable”

“a great story-teller; name a place, and he’d know a story about it”

“always available, at the ready with sharp questions graciously presented”

“John’s most common suggestion was ‘let’s show this on a map’”

“he took pains to keep tabs on people, find out how the family was doing, and to entertain when he could”

“I will never forget John standing in front of a class of primarily graduate students with his USGS maps strewn all over the front of the lecture hall explaining the dynamics of selected cities”

“his enthusiasm, vision and constant curiosity about everything infected me and . . . I realize it still guides me”

“John’s memory reminds us of what we can be as geographers and as citizens”

“always positive and optimistic, but never critical that was his great strength.”

When in his office, John’s door was always open and the phone usually ringing, but he welcomed us in with a smile, sat back in his chair with foot on a desk drawer, hands behind his head, and gave us his full attention as we settled in for a chat. A question would elicit a story; a problem a thoughtful frown, followed by advice or offers of help. Unopened mail and a backlog of reading were neatly stacked on his desk, alongside the picture of Jane, the love of his life, his financial manager, travel companion, square-dance partner, full-time homemaker, and mother of their four children, Dianne, William, Robert, and David. We miss him.

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erett G. Smith, Kennard Smith, Amy Sunderland, and Barbara VanDrasek. Several years before John died, he began a memoir, but was unable to complete it. Portions that he finished appear on a family web site: <http://www.borchert.com/john/>. I have drawn liberally from this material.

## Note

1. The Comparative Metropolitan Analysis Project published many books. Important among these are Abler, Adams, and Lee (1976) and Adams (1976).

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