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## From Patterns in Space to Rhythms in Time: A Personal Odyssey

SILVER MEDAL

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It is an honor to be able to address this conference on the 125<sup>th</sup> anniversary of the birth of Nikolai Kondratieff, and to accept the award of the 2017 Kondratieff Medal by the International N. D. Kondratieff Foundation. I thank my nominator, those who supported my nomination, the members of the jury who oversaw the international competition and recommended the award, and those who have encouraged and supported my research over the years. To all I am grateful.

The honor, of course, is to be associated with the name of a great economist and a genuinely creative mind, Nikolai Kondratieff, a scholar who introduced a radically new framework for understanding economic growth and change.

Mine has been a sixty-year career<sup>1</sup> and I like to think that there is more to come, some of which will be devoted to continuing Kondratieff's traditions. In 1955 I traveled from England to the United States to begin graduate studies at the University of Washington in Seattle. My English degree had been in economics but I had been exposed to the theory of location and wanted to pursue related studies, at that time only possible in departments of geography in the United States. But the geography I encountered was dominated by a philosophy of exceptionalism: every place on Earth was said to be unique, leaving no room for generalization (Hartshorne 1939). I was told that to become a professional geographer I should select a part of the world and learn more about it than anyone else, and to excel at the art of description. I was one of a small group of graduate students and one advisor who rebelled against this dictum. We believed that there had to be a *science* of geography with its own bodies of theory, methods of analysis, and secure facts that detailed generalizable patterns in space. Thus, began the first three decades of my academic career. I completed a

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<sup>1</sup> See URL: <http://brianjlberry.com>.

master's thesis that tested certain propositions about central place hierarchies, introducing to geographical research statistical inference and the acceptable procedures of science (Berry 1956). After some struggle against the established order several papers were published (jointly with my advisor because the journals did not accept submissions by students) and immediately kicked off a firestorm, the beginnings of geography's 'quantitative' revolution and the creation of a new spatial science (Berry and Garrison 1958a, 1958b, 1958c). Over the next three decades human geography was transformed into a discipline accepted among the sciences, with a body of theory focused on the processes giving rise to spatial patterns and spatial systems [sic]<sup>2</sup>. Alongside the theory a new body of research methods was put into place and new fields emerged: spatial analysis, particularly of urban systems, regional science, *etc.* And now, with the advent of 'big data' and large-scale computation, distributed networks, satellite observation platforms and the like, we are seeing rapid growth of another dynamic field, geospatial information science.

Much of my work in this first time period took place at the University of Chicago, and later at Harvard University, where I also directed the pioneering Laboratory for Computer Graphers and Spatial Analysis. While serving as a professor I also attempted to keep one foot in theory and one in practice, each informing the other. I had many city and regional planning and policy assignments in many parts of the globe, traveled many miles to many places, also becoming a certified city and regional planner.

But then, in 1986, after spending five years as the dean of Carnegie-Mellon University's School of Urban and Public Affairs, I was persuaded to move to The University of Texas at Dallas, a new institution in its building stages. The move enabled me to participate in the creation of a multidisciplinary public policy program anchored in quantitative social science that was unhindered by traditional departments and their jealously guarded boundaries. With three decades promoting spatial analytic social science behind me, I asked myself what research might lie ahead in this new setting. I embarked upon what some of my friends have called my second 30+ year research career (Clark 2011).

The conflict about Kondratieff waves had caught my attention. Just as the scientifically inclined geographer of the 1950s had to contend with that discipline's consensus of exceptionalism, I saw analogous issues with respect to the rhythms in time explored by Kondratieff (1925, 1926a, 1926b), Kuznets (1930, 1958), and Schumpeter (1939). There were those who invoked Slutsky's theorem to argue that economic rhythms were temporary and misleading expressions of random walks (Slutsky 1925), while others sneered at the very idea of rhythmic repetitions and focused on their neoclassical microeconomics or

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<sup>2</sup> See URL: <http://geography.name/berry-brain-j-l-1934>.

turned to macroeconomic management guided by the theories of John Maynard Keynes (*e.g.*, Samuelson 1948). The idea that there were rhythms and repetitions in time was rejected either because it implied exogeneity, systemic causes lying beyond the control of Keynesian interventions, or because in the eyes of left-wing theorists capitalist economies were not supposed to be able to regenerate themselves, but were destined to an inevitable collapse. What an opportunity! From patterns in space I could now focus on rhythms in time and on the successive revolutions that have kept on transforming market societies, an idea with which I was very comfortable.

I admit that I did begin to study Kondratieff waves with skepticism. Was there empirical evidence for 50–60 year long rhythms of prices and economic growth? I focused my research on the United States and deployed a variety of methods to explore the available time series data, initially proceeding graphically (Berry 1991), but later by introducing new methods of spectral analysis adapted to shorter timespans than demanded by traditional spectral procedures (Berry, Kim, and Baker 2001). The resulting story was more complex than I had expected. There clearly were long waves of prices averaging 55–56 years in length – Kondratieff Waves. But there also were cycles of economic development that were nested three to each long wave, averaging 18.6 years in duration – Kuznets cycles, plus 9.3-year business cycles – Juglar cycles – nested two per Kuznets cycle and six per Kondratieff Wave. I was able to assemble them into a picture using a 55–56 year ‘Long Wave Clock’ with noon marked by inflationary spirals at the Kondratieff peaks and 6 pm by the deflationary depressions that marked Kondratieff troughs (Berry and Dean 2012). Then a myriad of other things began to fall into place that confirmed Kondratieff’s notions of conjunctures – the intertwined relationships that cut across many facets of economic, social and political life. The decades after each Kondratieff peak were epochs of radical innovation that reshaped economy and society for the next half century (Berry, Kim, and Kim 1993; Berry and Kim 1994), led by political conservatives in government (Berry *et al.* 1998). The decades after each Kondratieff trough were typically periods of social reform that addressed the inequalities that had increased during the periods of rapid economic change as change leaders and innovators benefitted and those committed to older ways saw their influence and welfare wither (Berry, Harpham, and Elliott 1995; Berry and Dean 2015). The troughs also were periods when utopians sought to detach themselves from capitalist society and create settlements offering alternative communal lifestyles (Berry 1992). The embedded Kuznets cycles were each occupied by a distinctive birth cohort and generational ethos, and the passage from one Kuznets cycle to another was accompanied by generational changes in beliefs, preferences and lifestyles (Berry and Kim 1994). Migration waves also pulsed with long wave frequency (Berry 1996). Instabilities were

most serious in the Kondratieff troughs and peaks and these were the times when conflict and war were most likely (*Idem* 2006). A new view of macrohistory was emerging and I was pleased to see that others agreed with my formulation: 'following Schumpeter...it is Berry who most appropriately wears Kondratieff's mantle of long-wave theorist' (Koppala and Budden 2015: 39–43). Why should the repetitions be so regular, and why the 55–56 year timing? Further investigation entered dangerous conceptual ground when it suggested an exogenous pacemaker that nudged the system at regular intervals to keep the long-wave clock on time (Berry 2000), an idea that needs further development.

So what of the years that I have left? My explorations continue. The latest draft manuscript is entitled 'Seven Long Waves in American History'. It explores the economic circumstances behind the original settlement of North America, the rhythms of the colonial agricultural period, and their interface with the succeeding rhythms of an independent and newly-industrial nation.<sup>3</sup> I am sure that other contributions will follow.

Looking back, my 30-year journey since 1986 accompanied the most recent (the 7<sup>th</sup> American) Kondratieff wave downward from its inflationary heights in 1980–1981, through the information technology revolution of the 1980s that has radically changed the world in which we lived to the deflationary depression of the 2007–2013 period, and now into the next (the 8<sup>th</sup>) up-wave. I had enough sense to suggest an imminent trough in the 2010s in my 1991 book, but no one paid attention (*Idem* 1991). Today, even though inflation rates remain at historic lows, I believe that by the mid-2030s we will be well on the way to the next inflationary spiral at the next Kondratieff peak. More generally, I believe and hope that what is now in place is a picture of the interwoven dynamics of social and economic change that will inform and challenge the next generation of investigators and policymakers, much as Kondratieff did for us. Just as my first three decades contributed to the creation of a new spatial science, perhaps my second three decades will have led to broader acceptance of a new macrohistorical paradigm that realizes what Kondratieff might have provided had he been able to live a full and productive life.

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<sup>3</sup> The first European settlement in North America was in Jamestown, Virginia in 1607, followed by the arrival of the Mayflower in New England in 1620. The first was 400 years before the onset of the most recent Kondratieff trough in 2007 and the second 373 years. Seven Kondratieff waves averaging 55.8 years each are  $55.8 \times 7 = 390.6$  years, a remarkable persistence of long wave timing.

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