Chapter 7
Knowledges in Disciplines and Cities: An Essay on Relations Between Archaeology and Social Sciences

Peter J. Taylor

Preamble: Knowledges

In this paper I argue that the path dependency of disciplinary knowledges in the social sciences and archaeology that emerged in the late nineteenth century have led to a long-standing focus on states for framing knowledge production, thus overlooking the important role of cities for understanding social change. By outlining the neglect of cities in the social sciences and archaeology, I develop the radical position that cities as hubs of practical knowledge production preceded both the emergence of states and agriculture. It is contended that this argument has to be made outside of established disciplinary frameworks because researchers working within conventional disciplinary tenets have been too "disciplined" by seemingly established truths set about a century ago. The perspective of a geographer seems to be ideal in this regard because geography never quite fitted into the nineteenth century disciplinary canon. A geographical perspective is thus well suited for bringing cities back into disciplinary discourses as well as into debates about the development of societies.

In the modern world, knowledge comes in two different forms. First, there is the academic knowledge created in universities and associated institutions. It is here that research work is done that cumulatively adds to stocks of knowledge called disciplines. In addition there is a teaching function in this academic knowledge production that reproduces the disciplines through socializing young adults to become future cohorts of knowledge creators. This knowledge has essentially an oligarchic structure of disciplining by peer review (i.e., certifying the created knowledge). Second, there is practical knowledge that is required to make a living outside universities. In this case the disciplining is by the market. Practical knowledge has

P.J. Taylor (✉)
Department of Geography, Northumbria University, Newcastle upon Tyne, UK
e-mail: crogfam@gmail.com

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to be useful so that it can be deployed to make money. I realize these two knowledges overlap in many instances (e.g., in corporate research and development departments, in the professions, in defense department laboratories), but I will keep them separate for the purposes of this essay. Here I will tell a story about an intersection of these two knowledges, with particular emphasis on their contrasting spatialities.

The spatial mobility of academic knowledge is facilitated by academic networks. This is concretely represented by researchers bringing new knowledge to seminars, workshops, and conferences, but the crucial network is the one that records the cumulative knowledge production. Disciplinary journal articles, research monographs, and academic books are the nodes where the spatial mobility of knowledge is represented by the citations. In contrast, practical knowledge has many more loci, but one stands out as the exceptional place for knowledge production: cities. It is the hustle and bustle of cities—their inherent *busy-ness*—that is the major testing ground for practical knowledge, which is why commercial knowledge constitutes business. If the knowledge works—you can make money from it—then the knowledge will be reproduced, modified, and extended as necessary. Vibrant cities are the best places for doing business. The spatial mobility of this practical knowledge flows within and between cities. This essay is about a specific case study of how the academic knowledge of disciplines makes sense of practical knowledge practices.

To explore this intersection I will focus on origins, on how cities came about in association with the beginnings of both agriculture and states. These social changes are the practical knowledge productions I consider. The academic knowledges then follow. Archaeology is the discipline that specializes in the study of such origins; social science is about social change, and since these three origins constitute epochal changes they are of direct relevance to social science understanding. The hypothesis is that by shining the spotlight on these critical origins some basic contradictions of knowledge production in cities and disciplines will be revealed.

The argument proceeds in a rather distinctive way. There will be two introductions, one for each type of knowledge. And then there will be two indictments, for social science and for archaeology. In all of this I will be taking a very city-centric position and this comes to the fore in the substantive section where I bring cities back in to understand both the creation of states and the development of agriculture.

Introductions

The Times and Spaces of Academic Social Knowledges

The academic knowledge of today is ultimately derived from the nineteenth century reorganization of German-speaking universities to emphasis the research function and thereby privilege specialization. It is from the university chairs established to organize the new intensive research work that modern disciplines have evolved. Of

the four original faculties—theology, law, medicine, and philosophy—it was in the latter two that research specialization occurred, and especially in philosophy (the highest research degree is still a PhD) (Ben-David & Zloczower, 1962). One key feature of this process was a bifurcation into sciences and arts that commonly resulted in division into two separate faculties housing very different disciplines (lower research degrees are still called MSc or MA). The differences existed in both research subject matter (non-human–human) and research practices (nomothetic–idiographic). It was the immense dominance of Germany in academic science knowledge in the second half of the nineteenth century (Taylor, Hoyler, & Evans, 2008) that stimulated emulation in many other countries to create the modern university.

The social sciences began to emerge in the late nineteenth century as a sort of in-between research category combining the research subject matter of the arts with the research methods of the sciences. This process was largely consolidated in U.S. universities in the first half of the twentieth century to create a tripartite division for studying social change, the new disciplines of economics, political science, and sociology (Wallerstein et al., 1996). By about 1950, it was commonplace for this disciplinary trinity to be established as departments in most universities. This three-way division of knowledge broadly followed the reform movements that dominated late nineteenth century politics. The goals of these movements were articulated as demands for economic reforms, political reforms, and social reforms. Thus there came about a general view of human behavior being divided into economic, political, and social activities taking place in the economy, the state, and (civil) society as separate institutional worlds. The new social science disciplines reflected this view and set about devising separate research agendas along these lines.

There are three key points that arise from this construction of social science (Wallerstein et al., 1996).

1. The basic units of analysis were defined by state territories—empirically the abstract concepts of economy, state, and society were all nationalized, as in British economy, French state, and American society, to produce a one-scale *mosaic social science* of multiple countries.
2. The knowledge produced by the three disciplines covered all modern human behaviors—this was a knowledge monopoly position. The power of this monopoly can be seen in other surviving disciplines eventually having to create trilogy subdisciplines as they adjusted to demands of being modern: for instance, economic anthropology, political geography, and social history.
3. This was nomothetic knowledge of modern, rational behavior and therefore it initially only applied to modern, rational economies, states, and societies in advanced regions of the world where the modern universities were located. It was a social knowledge of modern *us*, with the un-modern *them* initially excluded. The exclusions were in both time and space and, being un-modern, they could only be studied idiographically (i.e., outside social science). In time a new discipline of history studied the un-modern past of modern nations. In space there were two un-moderns, for old civilizations Orientalism emerged to understand why they stagnated, and for smaller societies, anthropology was constructed to understand why they never progressed in the first place.

Note that geography does not feature in this academic knowledge framework; straddling the science–arts boundary and initially eschewing specialization (favoring synthesis over analysis), it is an odd-ball survivor only adapting to social science as human geography in the second half of the twentieth century with the victory of systematic geographies (specialist trinity subdisciplines) over regional geography (the art of synthesis). I make this point to reveal my personal intellectual positionality as a geographer: I am a social scientist outsider.

This neat academic knowledge arrangement began to change in the second half of the twentieth century (Wallerstein et al., 1996). Most importantly the world changed with decolonization so that development (a property of states) replaced progress (a property of modern civilization only). This meant that the whole world was opened up to social science study with new research agendas on economic development (toward affluence), political development (toward democracy), and social development (toward modernization). In addition disciplinary boundaries became increasingly porous, resulting in new research areas, such as cultural studies, area studies, and feminist studies, refusing to be contained by the old disciplines. Even more important these areas of study have undermined, or really sidestepped, the simple nomothetic–ideographic distinction so that, especially through cultural studies, the methodological wall between the trinity and the humanities (arts) has crumbled. Thus in the early twenty-first century the academic knowledge organization in the social sciences and humanities is quite complex. Old disciplines remain institutionally powerful within universities as departments (awarding PhDs) and with their traditional prestigious research journals; while at the same time there is a plethora of new interdisciplinary (or multidisciplinary or transdisciplinary) journals with their own networks of researchers and conferences.

Practical Knowledges in, Through, and Out of Cities

Practical knowledge is constituted by the everyday constructs and information people use to live their lives. I focus on the practical knowledge that is necessary for making a living. Such knowledge depends on quality and quantity of contacts and intensity of communications with those contacts. In this situation one particular class of settlements, cities, has been found to be exceptionally important. One can go as far as to say that there is a qualitative difference between city life and life elsewhere in terms of the nature and salience of knowledge for work. This idea of cities as special knowledge-rich milieus is to be found in a wide range of scientific studies (Batty, 2013; Brenner, 2014; Glaeser, 2011; LeGates & Stout, 2015; Neal, 2013; Scott, 2012; Storper, 2013; Taylor, 2013).

Recent resurgences in urban economics and economic geography have focused on the advantages of cities for economic development. Two main processes have been postulated. First, localization refers to the knowledge-related benefits of firms

from the same industry clustered together. This relates to industry-specific opportunities thus stimulating creativity and innovation. In particular tacit knowledge within an industry is said to require immersion in localized industrial culture. This is important in both product development and skilled labor availability. Classic historical examples are the New York advertising cluster on Madison Avenue and the London newspaper cluster on Fleet Street. In these cases cost-cutting opportunities elsewhere eventually made the two clusters uneconomic but they had by then provided untraded advantages to their cluster of firms for several generations. And after the cluster breakup proximity remained important as clustering re-emerged in new locations (Faulconbridge, Beaverstock, Nativel, & Taylor, 2010).

Second, there are agglomeration effects of multiple firms from a wide range of industries co-locating in a city or region. There are collective advantages in terms of infrastructure and other common services. But a key advantage is to be near to clients. For instance, in Sassen's (2001) classic work, the global city is simultaneously the main producer of advanced business services and the main market for such services. And in such work, close and regular contact with clients is found to be necessary, especially face-to-face meetings. Agglomeration also constitutes an ecology of skills that facilitates project work involving producers from different specialties combining to create unique products for particular clients. This is specifically important for user-led innovation where observation and interaction in cities are indispensable. In an empirical test for the efficacy of clusters and agglomeration Glaeser, Kalial, Scheinkman, and Schleifer (1992) found the latter to be more associated with economic growth.

The above advantages are place or territorial (internal) assets and it is now widely recognized that they are complemented by network (external) assets. As Sassen (2001) recognizes, cities are strategic places within myriad flows of materials, people, and information. Contemporary cities in globalization have been modeled as a world city network generated through knowledge-based work: professional, financial, and creative servicing of global capital (Taylor, 2004). Intensity of integration into this network (city connectivity) is a measure of a city's global external assets through globalization. This has been conceptualized in several ways, such as global pipelines (Bathelt, Malmberg, & Maskell, 2004) and global communities of practice (Amin & Thrift, 1992).

Outside this specifically economic consideration of contemporary cities and their networks, there are other studies that emphasize the generic importance of cities across history. For example, the world city network model has been interpreted generically as central flow theory, a general description of cities in networks. The key substantive examples are Hall (1998) with his description of leading cities as centers of creativity, Soja's (2000, 2010) concepts of synekism and regionality of cityspace in urban revolutions, McNeill and McNeill (2003) with their references to cities in the human web of world history, Algaze's (2005a, 2005b) work on internal and external relations in Sumerian cities, and LaBianca and Scham's (2006) applications of Castells's (1996) space of flows to antiquity. These are all discursive harnessings of evidence to support the critical importance of practical knowledge production in and through cities for historical social change.

Indictments

All institutions are created at some point in time to satisfy a need. Subsequently needs change and relevance of an institution is naturally eroded. As noted previously, today's disciplines are about a century old and they still retain many vestiges of their creation. In fact by the twenty-first century they appear not to have worn particularly well (Wallerstein, 1991). Here I indict social science (in general) and archaeology.

Of Mainstream Social Science

As previously shown, contemporary social science consists of a mixture of old disciplines and various new areas of study. The latter can seem to be opportunist, perhaps transient, compared to the deep knowledge of the disciplines. Thus researchers in the studies sector are commonly certified by their PhD in one of the disciplines, and there is always a tendency to revert to trinity thinking as in politico-cultural studies, economic area studies, and feminist sociology. In other words, social science is currently strewn with ambiguities. These are reflected in Wallerstein's (2004) prognosis. On the one hand he argues that "the social construction of the disciplines as intellectual arenas that was made in the nineteenth century has outlived its usefulness and is today a major obstacle to serious intellectual work" (pp. 169–170). But at the same time he suggests that "there is richness in each of the disciplinary cultures that should be harvested, stripped off its chaff, and combined (or at least used) in a reconstruction of the social sciences" (pp. 169–170).

Of course, the debate will be about identifying the "chaff" (Wallerstein, 2004)! In his contribution to this reconstruction, world-systems analysis, he transcends states and I agree this to be an essential stripping.

Cities have not been well served by the trinity and not just because the nationalization of social knowledge downgraded them to, literally, a bit part in the overall scheme of things. With the focus on the scale of the state, the exceptional nature of cities in relation to enhanced knowledge potentials has been severely neglected. In Wallerstein's stripping off the state-centric chaff he moves focus from national economies to world-economy; I will follow Jacobs (1969, 1984) and move from national economies to city economies. I highlighted profound economic contributions being made at this scale above, but it is still the case that urban economics (or regional economics or spatial economics) remains a Cinderella area of study in the discipline of economics, where status remains wedded to national econometric models. Geography has been the other discipline contributing to the rediscovery of the importance of cities described previously. But the main legacy of research here has been in studying cities in hierarchies within countries modeled as national urban systems. In this approach the world consists of circa 200 (the number of countries

varies with world political processes) national urban systems (i.e., one per country). This is mosaic social science at its very worse. Cities abhor boundaries. Their raison d'être is being strategically connected within complex spaces of flows, which is antithetical to being neatly ordered within state territories.

The ridiculousness of this academic knowledge can be easily illustrated using the examples of London and New York, both interpreted as being top of the hierarchy in their respective national urban systems. At first glance this seems obvious but in fact it grossly underestimates the importance of both cities. Both of these great cities have long been leading ports in the world-economy but this very tangible property could be kept from social science academic knowledge because the study of trade through trade theory was nationalized, it was deemed a property of states not cities. Thus this major city function was largely ignored in national urban systems analyses, seemingly unmindful that New York cannot be understood as just part of the United States, and London cannot be understood as just part of the United Kingdom. Perhaps because of such limitations, national urban systems research largely disappeared in the 1980s and was replaced by research on studies of cities in globalization, originally conceived hierarchically, following the mosaic habit, but latterly seen as world city network (Taylor, 2004, 2009). It might have been thought that the coming of globalization would have advanced the importance of cities in social science. Certainly an impressive world and global city literature has emerged (Brenner & Keil, 2006) that locates cities as critical to globalization processes. However, the study of cities sits uncomfortably in reader compilations from the globalization literature where cities are largely neglected (Lechner & Boli, 2000). This is because the trinity has survived the huge social changes wrought by globalization, as reflected by the labels economic globalization, political globalization, and social (or cultural) globalization. This is not surprising when the key text, Held, McGrew, Goldblatt, and Perraton's (1999) *Global Transformation*, is actually about transformation of the state in economic, political, and social realms of activity (Taylor, 2000).

Research on cities in social science has come to be labeled urban studies (which aspires to combine urban economics, urban political science, urban sociology plus urban geography and urban history); that is to say, it is one of the many areas of study that have grown to facilitate subject matter that transcends trinity divisions as indicated earlier. There is an excellent reader representing this literature (LeGates & Stout, 2015) but one part of its composition reveals the extant shallowness of this example of an area of study. When it comes to including chapters on the origins of cities there is actually just one paper, a classic written in 1950 by Gordon Childe, who appears in archaeological textbooks as a founding father, one of Renfrew and Bahn's (2008) early "searchers" (p. 36). Presumably this means that the compilers of the urban studies reader cannot find a later, social science, contribution on the question of city origins. What an indictment of social science for neglecting the study of city origins. But using such an old archaeology paper is also strange; does it suggest cities have been similarly neglected in this discipline?

Of Mainstream Archaeology

Archaeology is the discipline that we might be expected to go to for research on the origins of cities. Childe's (1950; Smith, 2009) classic paper located the first cities in late fourth millennium BC Mesopotamia and this remains the consensus within the discipline. There have been other suggestions, as I will relate later in this essay, but these have been largely dismissed as not providing credible evidence for the existence of earlier cities. But, more importantly, this question has been of peripheral concern in archaeological research. This can be shown by reference to the latest edition of the best-selling introductory textbook on archaeology (Renfrew & Bahn, 2008). Textbooks are the basic means of socializing new generations into a discipline; thus they provide the current understanding of the key questions, methods, and theories that constitute that discipline (Taylor, 2015). Renfrew and Bahn (2008) include no discussion at all about city origins. Why might this be?

In my introductory discussion of social science above there was no mention of archaeology. The discipline's obvious locale would be as a time discipline alongside history with ancient history. However its formal location in universities is mostly with anthropology. This makes some sense to the degree that anthropology treats hunter-gatherer and early agricultural societies, and such societies dominate the prehistory that archaeology investigates. This is to locate archaeology in the outer reaches of comparative anthropology with an inevitable neglect of concern for cities. Thus in their text of over six hundred pages, Renfrew and Bahn's (2008) index includes no reference for city or cities.

Whereas national spatiality has dominated social science scholarship, in archaeology it is evolutionary temporality that features strongly in this scholarship. Evolution theory, related to nineteenth century obsession with progress, survives more in archaeology than elsewhere in social science. Darwin has his own box feature in Renfrew and Bahn (2008, p. 27) entitled "Evolution: Darwin's Great Idea." Basically, evolution has been used to understand increasing complexity of society but without any recognition of the exceptional complexity of cities.

Recently, some archaeologists have provided very strong critiques of traditional evolutionary models of social change (Gamble, 2007, pp. 10–32; Yoffee, 2005, pp. 8–15). Yoffee (2005, p. 34), in particular, is a trenchant critic of what he calls the current "neo-evolutionary" approach in archaeology.

> What neo-evolutionalism never was, was a theory of social change. Rather, it was a theory of classification, of identification of ideal types in the material record. … In a vague sort of way, mainly by talking about different adaptations as if they were somehow like genetic differences, neo-evolutionists drew on the prestige of Darwin's theory and often proclaimed they had created a new science of social evolution. However, neo-evolutionists could not explain change other than in holistic terms and were content to identify as evolutionary mechanisms… climatic change or/and population growth. (pp. 31–32)

For Gamble (2007) "change takes the form of future-creep" so that "differences are expected to happen eventually and can be explained simply by the passage of enough time, a commodity with which human prehistory is abundantly blessed" (p. 23).

For both scholars there is not enough emphasis on process: Who are the agents and why do their activities generate social change? Such questions lead to social science.

It is very relevant that the archaeologists I have drawn on to critique city-state and evolution—Gamble, Smith and Yoffee—are familiar with social science literature (including rediscovery of cities) and bring these disciplines into their own work. But they are not necessarily very typical. Renfrew and Bahn (2008, pp. 12–13) introduce archaeology by relating it to other disciplines: they identify only three: anthropology, history, and science (for techniques). There is no specified relation to social science and this is reflected in subsequent substantive chapters. Chapter 5 "How Were Societies Organized: Social Archaeology" (pp. 177–230) makes no reference to sociology literature, and chapter 9 "What Contact Did They Have: Trade and Exchange" makes no reference to economics literature (pp. 357–390). Despite this distain for social science, archaeology has shared the latter's propensity to neglect cities. Unfortunately the archaeologists I have identified above as knowing recent cities literature do not contribute to the question of city origins. Strangely, Renfrew and Bahn (2008, pp. 46–47) do have a two-page box feature on Çatalhöyük, the key settlement in the city origins debate (Jacobs, 1969; Soja, 2000; Taylor, 2012, 2013), but they use it to illustrate changing approaches to the practices of archaeology, with no mention of the controversies over interpreting the urban nature of the settlement. There can be no clearer example of denial of the city origins question in contemporary archaeology.

Debates Generated by Bringing Cities Back In

Although both social science and archaeology have early classic studies of cities, my two indictments show that both have developed traditional structures of knowledge that have underestimated the importance of cities for understanding social change. But I have also shown that cities will win out; there is development of a city-centric social science and this is being introduced into archaeology and interpretation of ancient history. The most explicit example is the work of Algaze (2005a, 2005b). In this substantive section I deploy the city-centric social science to challenge existing ideas on first, the relation between cities and states and second, the relation between cities and agriculture. In both cases I will argue that cities came first.

Unlike studies of contemporary cities, for historical cities it is not possible, of course, to directly study the processes that make cities so exceptional. With very early cities, agency in particular is a problem. Researchers do not know the agents—merchants, priests, soldiers, textile producers, scribes—researchers only know of their presence from the artifacts they have left to be discovered. Thus researchers have to investigate the potency of a city through its knowledge-rich internal and external assets in an indirect way. Fortunately there is a relevant variable, population size, for which there are general estimates that will serve as a surrogate for cities as potential creative centers. I call this the communication model of city-ness because

population size is a measure of potential communication capacity (Taylor, 2012, 2013, pp. 98–102). This is a network measure derived for internal links first and then doubled to account for equally important external links. From such analyses we find that Çatalhöyük, a possible early city, has a potential communication capacity much more than a thousand times that of a hunter-gatherer band, whereas First Dynasty Uruk, the first *great city*, had a capacity of more than half a million times said band. These quantitative results indicate the huge qualitative social difference that cities create and constitute the prime reason for city-centric study in archaeology. This generates two related debates.

Cities and the Creation of States

The first debate is about two processes being conflated into one. I reported above to there being no index references for cities in Renfrew and Bahn's (2008) textbook; however, there are nine references to city-states. It would seem understanding early cities is subsumed into the study of early states (Charlton & Nichols, 1997). But city-making and state-making are two very different processes, each requiring their own process analysis. This position is held by some social scientists (e.g., Soja, 2010, p. 364) and by a few archaeologists familiar with social science writings on cities. Monica Smith (2003) is a good example of the latter group. She is explicit on the importance of recognizing that "cities do not require a state level of authority to exist and thrive" (p. 12). Therefore:

> it is … time for the understanding of cities to be uncoupled from the necessary presence of states. By breaking this pairing of cities and states, we allow cities to be understood on their own terms as centers of political, economic, and social organization that may be considerably more complex than the territories and regions in which they are located. (p. 13)

She traces the conflation of cities with states back to Childe (1950, p. 12), who created a framework in which "theorizing about urbanism has often really been about states rather than cities." This key point had been made much earlier by Price (1978):

> The relation between urbanism and the state, however, has been the cause of profound confusion for a variety of reasons, both scholarly and ideological. Childe's Mesopotamian data combined urbanism and the state in a single sequence and permitted the uncritical evaluation of this particular association. (p. 175)

Monica Smith (2003) indicts Robert Adams, the great chronicler of Mesopotamian urbanism; she points out that, paradoxically, in his 1966 classic *The Evolution of Urban Society*, despite the book's title, his "central concern is the growth of the state" (quoted in Smith, 2003, p. 12). But Smith (p. 15) argues that "cities in the premodern world did not require a state level of organization". This important point seems not to have (yet?) percolated into the archaeological mainstream as represented by Renfrew and Bahn (2008).

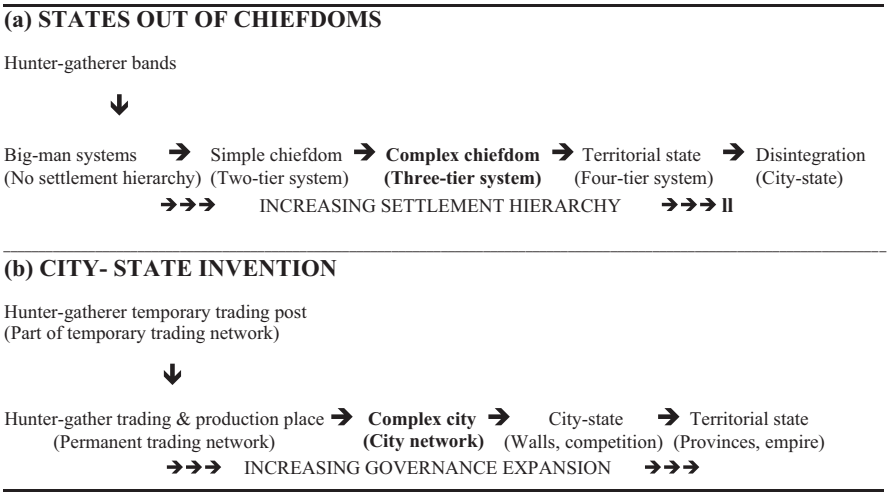

Fig. 7.1 Alternative origins of states. Pivotal stages or steps are in *bold*. **||** indicates ending of increase (Design by author)

Traditionally, states have been interpreted as the outcome of increasingly complex governance processes, consequent upon class formation and widening material inequalities. This model is stripped bare to its essentials in Fig. 7.1a as a sequence of governance types representing evolutionary stages as criticized by Yoffee (2005, p. 34). Enhanced complexity is represented spatially by central place hierarchies with three settlement tiers indicating the key complex chiefdoms that generate states in civilizations (in which the number of tiers increases to four). An alternative model is shown in Fig. 7.1b based upon Jacobs (1969) and Soja (2000). The starting point is settlements in a trading network that morphs into a city network via the Jacobs process of import replacement. The more successful this network becomes, the more cosmopolitan are the cities. It is this unprecedented social complexity with consequent intergroup conflicts that generates a demand for new stronger governance structures. This is best illustrated in Childe's (1950) original case study: his "urban revolution" in early Mesopotamia (Taylor, 2012, 2013, pp. 115–118). Here we find two important sequences. First, accountancy—the language of commerce—is invented before writing—the language of state bureaucracy (Nissen, Damerow, & Englund, 1993). Second, in the new literature, there are myths—collective stories—that describe times before the era of epics, heroic tales of individuals who become kings (i.e., they centralize governance into states). This relates to a change from transient governance in the form of a league of cities towards a region of city-states in military competition (Jacobsen, 1970). The change is marked by huge labor investments in city walls. Thus are city networks converted into competitive city-states. In Mesopotamia this transition took about 700 years.

The vast majority of archaeologists continue to support narratives related to Fig. 7.1a, whereas the alternative narrative based upon Fig. 7.1b is much more

pleasing to social scientists (including archaeologists who identify as social scientists). It all comes down to whether you think chiefdoms can become complex enough to invent states; I think not. Social complexity in and through cities occurs at a whole new level; surely this is what is needed to generate such an important invention as states.

Cities and the Development of Agriculture

The second debate is about one process being divided into two. These are Childe's (1950) ancient historical framework of two revolutions seemingly several millennia apart. First there is the agricultural revolution that ushers in the Neolithic followed, second, by the urban revolution ushering in the Bronze Age civilization. Since this temporal sequencing was created, new evidence for origins of agriculture has pushed back the first revolution by several millennia, while the second revolution has proven to be much more temporally stable in mainstream thinking: hence a widening gap between them. Despite this divergence there is a social science intervention here that subsumes the development of agriculture into the process of initial city development.

Here I develop the controversial idea of Jacobs (1969) on agriculture being invented in cities. I know of no archaeologist who supports her thesis. Her argument involves pushing back the timing of the first cities. She focuses upon Çatalhöyük in southern Anatolia where a settlement of between four thousand and ten thousand people has been excavated to show a complex division of labor. The problem for archaeologists is that it appears about four thousand years before the rise of cities in Mesopotamia, traditionally viewed as the very first cities (i.e., Childe's urban revolution). Their reaction has been to dismiss it as a city; their preferred label is *large village* to emphasize its rurality. But Çatalhöyük is not alone as a relatively large settlement existing before Mesopotamian cities. Soja (2000) has augmented Jacobs's interpretation by showing a large network of such settlements at this time within the Fertile Crescent, birthplace of agriculture.

Figure 7.2a shows the traditional interpretation of the rise of cities: a simple sequencing of settlements by size culminating in cities. In this argument the latter first occur in Mesopotamia because improvements in agriculture (irrigation) increased production, thereby generating a food surplus large enough to feed cities. But this is a naive supply model; why should farmers work harder to generate large surpluses and create cities? Surely increased production potential is an opportunity for more leisure time? The alternative model is shown in Fig. 7.2b in which it is existing cities that provide a demand for more food. For Jacobs (1969) this is a classic case of import replacement. Hunter–gatherer–traders were exchanging food products within new trade networks but found it hard to keep up supply as city networks emerged. In this situation people in cities invented agriculture to replace and enhance the hunter–gatherer–trader food supply. Thus hinterlands were created around cities in which to produce food. As cities grew larger, more food

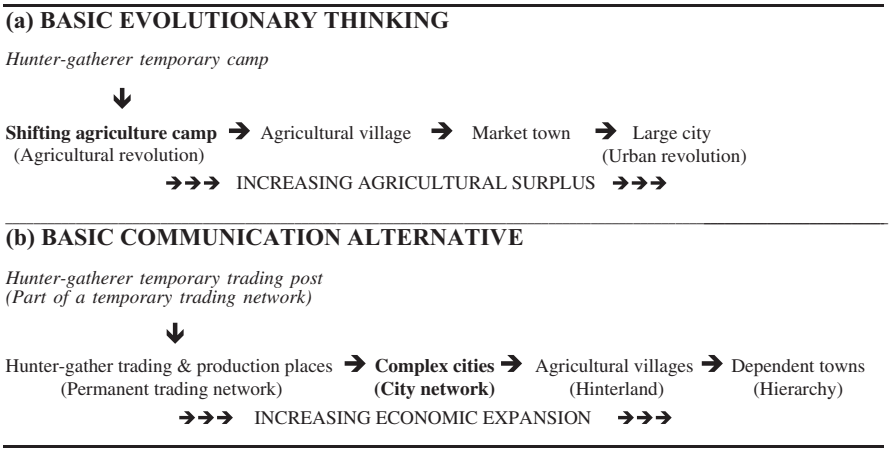

Fig. 7.2 Two settlement development sequences. Starting points of developmental phases are in italics; pivotal stages are in bold (Design by author)

technologies were invented, including irrigation in Mesopotamia, which fed new large cities such as Uruk.

This is more like a stand-off than a debate, with the minority position again based upon the qualitative social difference that cities make. The stark differences have been recently exposed in the debate between Smith, Ur, and Feinman (2014) and Taylor (2012, 2015). The former's only reference to social science is a very early paper from about the same time as Childe's work (Wirth, 1938), the link being made previously by Gates (2011, pp. 2–3).

Conclusion: The Limiting Case of Uncertainty of Knowledge

My conclusion is that understanding origins is a limiting case of Wallerstein's (2004) uncertainty of knowledge thesis. Wallerstein (2004) has argued that there is an inherent uncertainty of knowledge due to the positionality of researchers/practitioners interacting with ever-changing subject matters. Archaeological knowledge, especially on origins lost in the mist of time, is a limiting case of this uncertainty because empirical evidence derives from serendipity, based upon immensely low probabilities of survival and discovery. Strong opinions are therefore due to either entrenched paradigmatic thinking (my take on archaeology's reluctance to shake off nineteenth century ideas) or plausible process theory that makes sense of what little evidence we have (my view of what social science can be). It is on this basis that I think hunter–gatherer–traders created city networks and thereby released knowledge potentials for the invention of such epoch-making institutions as agriculture and states.

References

Algaze, G. (2005a). *The Uruk world system: The dynamics of expansion of early Mesopotamian civilization* (2nd ed.). Chicago: University of Chicago Press. (Original work published 1993)

Algaze, G. (2005b). The Sumerian takeoff. *Structure and Dynamics: eJournal of Anthropological and Related Sciences, 1,* 5–48. Retrieved from http://escholarship.org/uc/item/76r673km

Amin, A., & Thrift, N. J. (1992). Neo-Marshallian nodes in global network. *International Journal of Urban and Regional Research, 16,* 571–581. doi:10.1111/j.1468-2427.1992.tb00197.x

Bathelt, H., Malmberg, A., & Maskell, P. (2004). Clusters and knowledge: Local buzz, global pipelines and the process of knowledge creation. *Progress in Human Geography, 28,* 31–56. doi:10.1191/0309132504ph469oa

Batty, M. (2013). *The new science of cities*. Cambridge, MA: MIT Press.

Ben-David, J., & Zloczower, A. (1962). Universities and academic systems in modern societies. *European Journal of Sociology, 3,* 45–84. doi:10.1017/S0003975600000527

Brenner, N. (Ed.). (2014) *Implosions/explosions: Towards a study of planetary urbanization.* Berlin: Jovis

Brenner, N,. & Keil, R. (Eds.). (2006). *The global city reader.* London: Routledge.

Castells, M. (1996). *The rise of network society*. Oxford: Blackwell.

Charlton, T. H., & Nichols, D. L. (1997). The city-state concept: Development and application. In D. L. Nichols & T. H. Charlton (Eds.), *The archaeology of city-states: Cross-cultural approaches* (pp. 1–14). Washington, DC: Smithsonian Institute Press.

Childe, V. G. (1950). The urban revolution. *Town Planning Review, 21,* 3–17. doi:10.3828/tpr.21.1.k853061t614q42qh

Faulconbridge, J., Beaverstock, J. V., Nativel, C., & Taylor, P. J. (2010). *The globalization of advertizing: Agencies, cities and spaces of creativity*. London: Routledge.

Gamble, C. (2007). *Origins and revolutions: Human identity in earliest prehistory*. Cambridge, UK: Cambridge University Press.

Gates, C. (2011). *Ancient cities: The archaeology of urban life in the Ancient Near East and Egypt, Greece and Rome*. London: Routledge.

Glaeser, E. (2011). *Triumph of the city*. London: Macmillan.

Glaeser, E. L., Kalial, H. D., Scheinkman, J. A., & Schleifer, A. (1992). Growth in cities. *Journal of Political Economy, 100,* 1126–1152. Retrieved from http://www.jstor.org/stable/2138829

Hall, P. (1998). *Cities in Civilization*. London: Pantheon Books.

Held, D., McGrew, A., Goldblatt, D., & Perraton, J. (1999). *Global Transformations*. Cambridge, UK: Polity Press.

Jacobs, J. (1969). *The economy of cities*. New York: Vintage.

Jacobs, J. (1984). *Cities and the wealth of nations*. New York: Vintage.

Jacobsen, T. (1970). *Toward the image of Tammuz and other essays on Mesopotamian history and culture*. Cambridge, MA: Harvard University Press.

LaBianca, O. S., & Scham, S. A. (Eds.). (2006). *Connectivity in antiquity: Globalization as long-term historical process*. London: Equinox.

Lechner, F. J., & Boli, J. (Eds.). (2000). *The globalization reader*. Oxford: Blackwell.

LeGates, R. T., & Stout, F. (Eds.). (2015). *The city reader* (3rd ed.). London: Routledge. (Original work published 1996)

McNeill, J. R., & McNeill, W. H. (2003). *The human web: A bird's-eye view of world history*. New York: Norton.

Neal, Z. P. (2013). *The connected city*. London: Routledge.

Nissen, H. J., Damerow, P., & Englund, R. K. (1993). *Archaic bookkeeping: Early writing and techniques of economic administration in the ancient Near East*. Chicago: University of Chicago Press.

Price, B. (1978). Secondary state formation: An explanatory model. In R. Cohen & E. R. Service (Eds.), *Origins of the state: The anthropology of political evolution* (pp. 165–190). Philadelphia: Institute for the Study of Human Issues.

Renfrew, C., & Bahn, P. (2008). *Archaeology: Theories, methods and practice*. London: Thames & Hudson.

Sassen, S. (2001). *The global city*. Princeton: Princeton University Press.
Scott, A. J. (2012). *A world in emergence: Cities and regions in the 21st century.* Cheltenham: Edward Elgar.
Smith, M. E., Ur, J., & Feinman, G. M. (2014). Jane Jacobs' 'city first' model and archaeological reality. *International Journal of Regional and Urban Research, 38,* 1525–1535.
Smith, M. L. (2003). Introduction: The social construction of ancient cities. In M. L. Smith (Ed.), *The social construction of ancient cities* (pp. 1–36). Washington, DC: Smithsonian Books.
Smith, M. L. (2009). V. Gordon Childe and the urban revolution: A historical perspective on a revolution in urban studies. *Town Planning Review, 80,* 3–29. Retrieved from http://works.bepress.com/michael_e_smith/37
Soja, E. W. (2000). *Postmetropolis: Critical studies of cities and regions*. Oxford: Blackwell.
Soja, E. W. (2010). Cities and states in geohistory. *Theory and Society, 39,* 361–376. doi:10.1007/978-94-007-0756-6_15
Storper, M. (2013). *Keys to the city*. Princeton: Princeton University Press.
Taylor, P. J. (2000). Embedded statism and the social sciences 2: Geographies (and metageographies) in globalization. *Environment and Planning A, 32,* 1105–1114. doi:10.1068/a32153
Taylor, P. J. (2004). *World city network: A global urban analysis*. London: Routledge.
Taylor, P. J. (2009). Urban economics in thrall to Christaller: A misguided search for city hierarchies in external urban relations. *Environment and Planning A, 41,* 2550–2555. doi:10.1068/a42235
Taylor, P. J. (2012). Extraordinary cities: Early 'city-ness' and the origins of agriculture and states. *International Journal of Urban and Regional Research, 36,* 415–447. doi:10.1111/j.1468-2427.2011.01101.x
Taylor, P. J. (2013). *Extraordinary cities: Millennia of moral syndromes, world-systems and city/state relations*. Cheltenham: Edward Elgar.
Taylor, P. J. (2015). Post-Childe, post-Wirth: Response to Smith, Ur and Feinman. *International Journal of Urban and Regional Research, 39,* 168–171. doi:10.1111/j.1468-2427.2015.12181.x
Taylor, P. J., Hoyler, M., & Evans, D. M. (2008). A geohistorical study of 'The rise of modern science': Mapping scientific practice through urban networks, 1500–1900. *Minerva, 46,* 391–410.
Wallerstein, I. (1991). *Unthinking social science: The limits of nineteenth century paradigms*. Cambridge, MA: Polity Press.
Wallerstein, I. (2004). *The uncertainties of knowledge*. Philadelphia: Temple University Press.
Wallerstein, I., Juma, C., Keller, E. F., Kocka, J., Lecourt, D., Mudimbe, V. Y.,…Trouillot, M-R. (1996). *Open the Social Sciences*. Stanford: Stanford University Press.
Wirth, L. (1938). Urbanism as a way of life. *American Journal of Sociology, 44,* 1–24.
Yoffee, N. (2005). *Myths of the archaic state: evolution of the earliest cities, states and civilizations*. Cambridge, UK: Cambridge University Press.