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Climate Change in Urban Biographies

Stage, Event, Agent

All the world's a stage,
And all the men and women merely players:
They have their exits and their entrances;
And one man in his time plays many parts,
His acts being seven ages.

(William Shakespeare,
As You Like It,
Act II, Scene VII)

ABSTRACT How do archaeologists understand the relationship between climate, climate change, and urban biographies? In this article, I argue that urban biographies should be approached as the life stories they claim to be, with events propelling the narrative between phases or periods in the history of a city. In order to integrate the wealth of palaeoclimatological data now available into such narratives, scholars need to be conscious about how the relationship between climate and urban change is modelled. Taking a bibliometric survey of urban archaeology as the point of departure, different narrative templates for using climate to explain urban trajectories are identified and briefly exemplified on the basis of scholarship on the Early/Middle Bronze Age transition in the Near East and the Maya Classical/post-Classical transition.

KEYWORDS Urban archaeology; urban biographies; urban collapse; urban resilience; life stories; narratives; climate; climate change; Near East; Maya civilization.

Introduction

Urban history, here taken to include archaeology, is a venerable genre, with precursors back to the Roman narratives *ab urbe condita* ('from the founding of the city'). In its social science-oriented tradition, the field combines broad public appeal and hands-on societal relevance with the potential to address key aspects of human existence (Tilly 1996).

Scholars investigating the past have long been aware that any reconstruction of earlier periods entails the construction of narratives (Veyne 1971; White 1973), identifiable according to Philippe Carrard by the basic question 'what happened?', which e.g. in the well-known case of the *Odyssey* can be answered with the equally straightforward 'Odysseus returned to Ithaka' (Carrard 1992, 36). In urban biographies, one of the answers might be 'the city was abandoned', which in turn will prompt more specific questions such as 'why?'. As theoretical studies of urbanism point out, the narrative in general and its constituting elements, the plot, provide the scholar with a way of situating the object of study — the city — in space as well as time (Finnegan 1998; Sonda, Coletta, and Gabbi 2010). Urban narratives have strong parallels with life stories or biographies, if only because cities have been personified and even deified by their inhabitants since Antiquity, and the concept of the biography provides an evocative structure for the urban narrative.

A life story will typically follow a teleological narrative from birth to death. The division of the human experience into phases or stages has roots in Antiquity, but the concept was immortalized by William Shakespeare as the 'seven ages of man' quoted above. In his version, the human life story is divided into the stages of birth, childhood, youth, young adult, middle age, advanced years, and death. Many urban biographies arguably follow the same plot, the

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Table 12.1. Ages of man and ages of the city.

Seven ages of man (Shakespeare)	Five ages of the city
Birth	Founding/emergence
Childhood	Growth
Adolescence	Growth/prime
Adulthood	Prime
Middle age	Prime/decline
Advanced age	Decline
Death	Collapse

archetypal example of Rome, going from foundation by Romulus and Remus (birth), to monarchy (childhood), aristocratic republic (youth), popular republic and Mediterranean expansion (young adult), world empire (middle age), Christian empire (advanced years), and fifth-century collapse (death).[1]

Rome of course flourishes still today, and which and how many stages an urban biography of the city should contain are open to debate. The point is that the concept of a life story can easily be transferred to that of a city, and one could in the case of Rome even introduce adolescent and mid-life crises into the narrative in the form of the fall of the Republic in the first century BC and the civil wars of the third century AD. That said, I would argue that most urban biographies could be structured into five narrative stages/ages (Table 12.1): founding, growth, prime, decline, and collapse. In some cases, these will be repeated, and stages such as collapse might be omitted, as the majority of cities described in urban biographies continue to exist. They are, to use a key term of urban studies, resilient.

Urban biographies, however, differ from personal life stories not only in their potential for repeated life phases and their temporarily suspended mortality, but also in their longevity. Most urban settlements exist for centuries, and many present-day cities can trace their roots to the medieval period, the Classical period, and in a few Near Eastern cases even the Bronze Age or before. Among the analytical tools at our disposal to deal with such incredibly long time spans are Fernand Braudel's concepts of the *longue durée*, the primacy of long-lasting structures defined by the natural environment over short-term actions and events (Braudel 1958), and the 'biological old regime', the restraints imposed on a world all but dependent on solar energy transformed into food and fuel by photosynthesis (Braudel 1981, 70–92; Marks 2007, 38–39). Carrard (1992), however, demonstrated that even long-term and structurally oriented history, exemplified by Braudel and members of the French *Annales* school that was heavily influenced by his work, depends on narratives that are structured and propelled by events. Premodern cities, even if dependent on relatively stable natural environments, were in constant change. Such changes constitute the events that propel the urban life story, and climate must have played an important part. This article probes what role archaeological scholarship has ascribed to climate as backdrop and as an agent of change in urban biographies. This will be pursued partly through bibliometric and partly through narrative analyses of the urban archaeology field. The aim is to identify different ways of conceptualizing the relationship between climate and urban change.

Urban Archaeology and Climate

Archaeological interest in how and to what extent the environment shapes human societies has been at the heart of the discipline since its early days (Trigger 2006, 131–33). The nineteenth-century discovery of the last glacial period and the early twentieth-century realization that there had been multiple such periods, and that these could be dated, made possible attempts at correlating archaeological and geological developments (Huntington 1915; Van de Noort 2013, 20–21). In the 1920s to 1950s, the disillusionment with cultural-historical archaeology combined with Marxist-inspired interest in production, technology, and subsistence, and an increased insight into palaeoenvironments, gradually led to environment taking the lead among factors of explanation (Rosen 2007, 1–2). V. Gordon Childe's 1928 theory of the Neolithic revolution and Grahame Clark's publication of the Mesolithic site of Star Carr are seminal examples of narratives and methodology respectively (Childe 2014; Clark and others 1954). This development, arguably represented as a programme in Karl W. Butzer's (1964) influential *Environment and Archaeology*, led to what was later criticized as environmental determinism, although few of its proponents ever denied human agency in archaeological processes. Processual and post-processual approaches that came to dominate in the 1970s and 1980s in different ways emphasized culture over economy, and thus in the words of Arie S. Issar came to 'blame people for their own misfortune' (Issar and Zohar 2007, pp. xi–xii; Van de Noort 2013, 22–23). Since then, the awareness that we are currently living through

1 The similarities between urban and personal biographies were of course not lost on the Romans themselves, see Demandt 2017, 21–22.

Table 12.2. Frequency of key terms occurring together with 'climate' in urban-archaeology texts, 1966–2015. Source: Google Scholar.

	1 urbanism AND archaeology	2 AND climate	3 AND 'population growth'	4 OR collapse	5 OR decline	6 OR resilience
1966	10	1	0	0	1	0
1967	19	9	0	5	7	0
1968	14	4	3	1	4	0
1969	24	13	9	1	5	0
1970	16	8	4	2	3	0
1971	15	8	1	3	5	0
1972	28	14	8	5	12	1
1973	41	19	3	7	7	0
1974	52	18	5	5	9	3
1975	56	32	13	10	21	3
1976	55	23	12	10	17	0
1977	85	35	10	8	19	1
1978	98	40	9	14	22	3
1979	57	29	14	11	16	1
1980	64	30	16	8	14	2
1981	85	47	21	24	37	3
1982	86	37	10	14	20	3
1983	101	42	17	13	29	5
1984	79	36	10	12	24	1
1985	81	30	4	11	21	3
1986	99	39	14	14	26	3
1987	111	41	14	17	21	1
1988	130	71	16	22	45	3
1989	109	44	7	18	25	1
1990	139	59	14	28	45	4
1991	147	59	17	28	41	5
1992	145	59	15	24	37	8
1993	160	74	16	33	54	7
1994	199	87	17	41	54	5
1995	203	88	27	44	57	5
1996	226	110	30	58	75	10
1997	315	187	103	136	147	52
1998	284	173	32	98	109	15
1999	436	228	89	139	194	46
2000	473	238	54	169	209	15
2001	417	176	65	77	125	20
2002	561	250	51	146	164	22
2003	617	409	88	253	310	37
2004	600	303	70	159	230	24
2005	742	459	147	271	320	114
2006	743	407	113	229	303	98
2007	837	439	100	239	305	67
2008	995	555	105	323	376	66
2009	992	479	90	247	302	104
2010	1060	539	124	291	360	113
2011	1160	582	108	313	326	120
2012	1440	909	260	509	623	186
2013	1690	980	213	503	610	241
2014	1690	938	209	489	620	269
2015	2030	1190	188	510	754	359

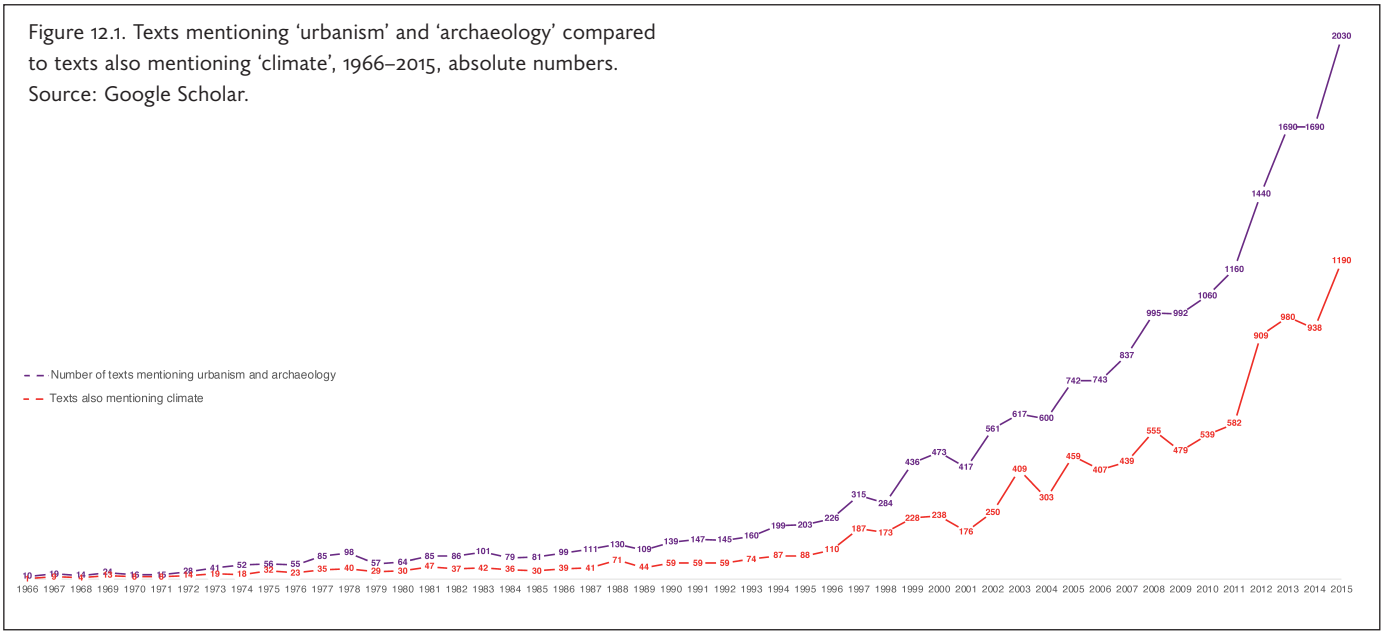


Figure 12.1. Texts mentioning 'urbanism' and 'archaeology' compared to texts also mentioning 'climate', 1966–2015, absolute numbers. Source: Google Scholar.

a period of unprecedented and dramatic anthropogenic global warming has gone from being specialist and activist theory to scientific fact and mainstream knowledge. Parallel with this, archaeology gradually returned to its interest in the natural environment, now with more sophisticated ideas about climate–society interaction. Also archaeologists claim that the discipline has an important role to play in preparing the contemporary world for what is to come, by raising awareness of the consequences of past climate change (e.g. Anderson, Maasch, and Sandweiss 2011; Issar and Zohar 2007; Lane 2015; Rosen 2007, 2–3; Sandweiss and Kelley 2012; Van de Noort 2013). The question posed here is how this interest in the archaeology of climate and climate change has influenced the subdiscipline of urban archaeology.

A Bibliometric Approach

Research builds on the cumulative insight established through earlier scholarship. In addition to the state-of-the-art section expected in any research paper, a way to assess this is through bibliometrics — the statistical analysis of publications. Search engines specialized in academic texts have become an indispensable scholarly tool over the last decade. Although biases towards English-language literature, indexed journals, and the natural sciences remain a problem, especially Google Scholar — launched in 2004 — covers also academic monographs and book chapters and has considerable time-depth, making it useful for bibliometric analyses of the social sciences and humanities, more so than alternatives such as Scopus and Web of Science (Harzing and Alakangas 2016; Prins and others 2016).

To gauge scholarly interest in urban archaeology and climate, a six-step series of Google Scholar searches was conducted for each of the fifty years between 1966 and 2015, excluding citations and patents. Searches were made for texts containing the words 'urbanism' and 'archaeology' (1). Within this group of texts, those containing the word 'climate' were identified (2), and this latter corpus was searched for the terms/words 'population growth' (3), 'collapse' (4), 'decline' (5), and 'resilience' (6). Relevant terms were selected through reading of selected texts in combination with trial and error. The results of the three hundred searches are listed in Table 12.2.

It is evident that the number of publications within the field has risen dramatically, going from ten co-occurrences of 'archaeology' and 'urbanism' in 1966 to 2030 in 2015, with a total of 19,816 texts. In 1966, one of the texts also contained the word 'climate', while this was the case with 1190 texts in 2015 (Fig. 12.1).

This, of course, does not indicate that archaeologists were not interested in urban archaeology or climate before, but rather reflects the coverage of Google Scholar along with the exponential growth of scholarly publishing that has taken place in the period. The limited number of records makes it possible to go through the entire search results for the early years, confirming that most retrieved references are actually relevant and are dealing with urban archaeology, although a few texts deal primarily with other branches of urban studies, such

Figure 12.2. Percentage of texts containing 'urbanism' and 'archaeology' that also mention 'climate'. Source: Google Scholar.

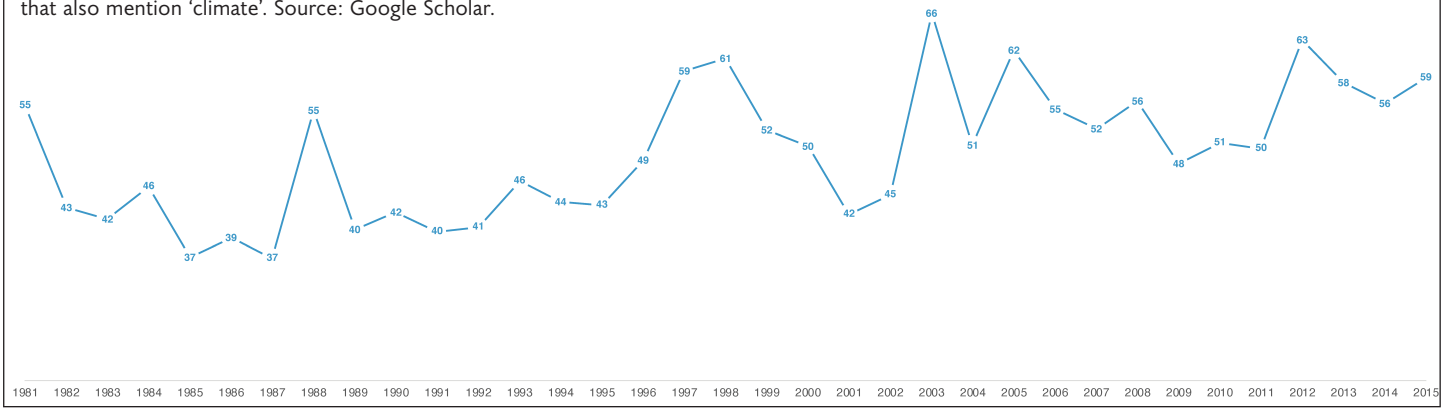
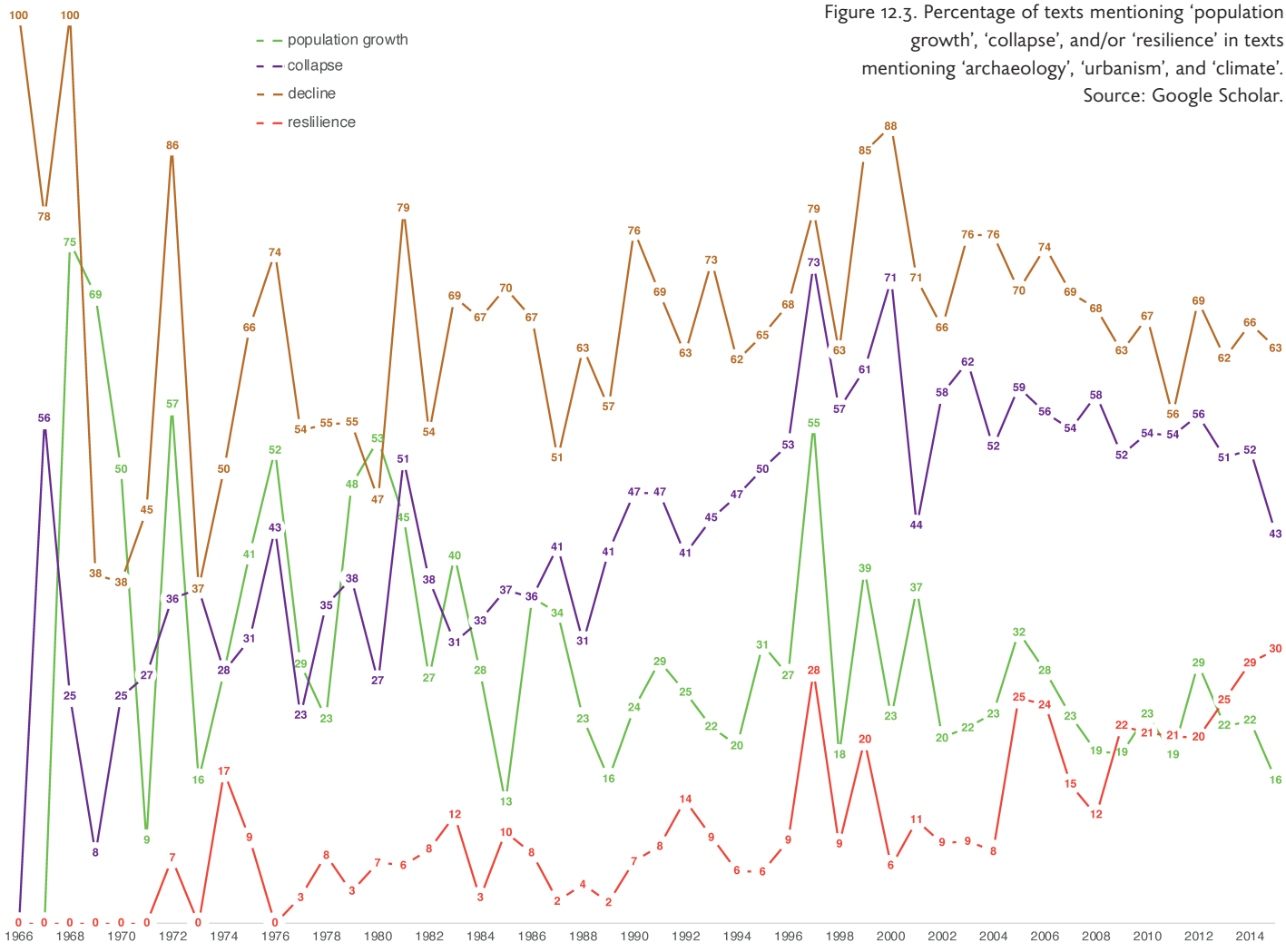


Figure 12.3. Percentage of texts mentioning 'population growth', 'collapse', and/or 'resilience' in texts mentioning 'archaeology', 'urbanism', and 'climate'. Source: Google Scholar.



as town planning. As numbers grow, this 'noise' becomes less significant.

In terms of relative frequency, the percentage of texts in the corpus mentioning climate varies from 10 per cent in 1966 to 66 per cent in 2003. Percentages are not very useful in the early part of the period, as the annual number of texts is low. Looking at texts published after 1980, we may observe a rising trend from *c.* 40 per cent of publications containing the word climate in most years in the early part of the period to above 60 per cent in the peak years of 1998, 2003, 2005, and 2012 (Fig. 12.2).

If nothing else, the numbers indicate that the qualitative observation by Robert Van de Noort (2013) cited above, of a relative lack of interest in climate and environment in processual and post-processual archaeology can also be observed within studies of the urban past.

What is the interest of urban archaeologists with regard to climate? In order to assess this, searches were made for the terms/words of 'population growth', 'collapse', 'decline', and 'resilience' within the 10,647 academic publications that mentioned 'climate' in addition to 'urbanism' and 'archaeology' (Fig. 12.3).

We should be careful not to read too much into the numbers, for instance they do not reveal whether a link between climate change and societal collapse is argued or denied. Nevertheless, the trends give indications of changing scholarly interest. That 'population growth' becomes relatively less frequent than 'collapse' from 1985, and also than 'resilience' in recent years, is likely to reflect changes in how scholars perceive the impact of climate change on urban life. Similarly, the decreasing difference in frequency between 'collapse' and 'resilience' since *c.* 2004 is an indication of changing perceptions of societal response to climatic conditions.

Narratives of Climate and Urban Change

Even if few of the texts identified in the bibliometric survey explicitly identify themselves as urban biographies, most of them contain assumptions about how climate and climate change have shaped urban developments in the distant past. Pioneering, influential, or typical texts can be identified. This makes it possible to investigate how climate is cast as an agent of change in past scholarship. Below, brief examples have been taken from two fields of world archaeology that stand out in the archaeological discourse on climate and urbanism. These are the crisis of urbanism in the Early/Middle Bronze Age transition in the Near East in general and northern Mesopotamia in particular in the last centuries of the third millennium BC and the abandonment of cities in the Terminal Classic period of Maya civilization in Central America in the eighth to early tenth centuries AD. These cases are also of interest because the paucity of contemporary written records makes the identification of events and their causes dependent on material proxies. While the brief examples are intended to be representative, they are not exhaustive, and no claim is made about what role climate change actually played in these cases, only about how its potential for societal change is perceived in the examined texts.

Climate as Stage

It is clear that climate was not seen as a prominent agent of societal change in the early part of the period discussed here. This is not surprising. As John G. Evans (2004, 100–02) points out, climate change was until the 1970s, even within the sciences, still regarded as processes playing out over geological timescales rather than within years or decades. The Holocene climate was considered to be remarkably stable compared to earlier periods (Bond and others 1997). Nevertheless, climate does figure in literature on Mesopotamian and Maya urbanism. Significantly, climate is thematized in debates on how scholars explain societal change rather than in studies directly addressing the reasons for such transformations. Thus Jeremy A. Sabloff and Gordon R. Willey (1967), in a paper warning against the emerging processual archaeology, argue that the profession needs to address historical events rather than processes, and that the natural environment — of which climate is an integral aspect — while important in framing long-term development, cannot explain abrupt change which depends on events, such as in this particular case war. On a related note, but with focus on environmental events, Robert McC. Adams could argue that climate was part of the backdrop for fluctuations between pastoral and urban lifestyles in Mesopotamia. The cause of such fluctuations, however, were anthropogenic long-term processes of salination as well as short- and medium-term variations in rainfall, which he in contrast to present archaeologists did not see as results of climate changes (Adams, Lamberg-Karlovsky, and Moran 1974). In terms of urban biographies, this perception of climate as a stable framework makes it part of the narrative setting: it is an integrative part of the stage on which the urban life story unfolds. Climate defines the potential for urban development, but cannot explain urban change. The bibliometric sample is too small to make quantitative inferences for this period, but the impression gained from titles and abstracts in the collected corpus is that climate was seen in connection with agricultural production, and primarily as a factor facilitating urban growth.

Climate as Event

From the 1970s onwards, long-established scientific proxies for studying medium- and short-term climate changes, such as pollen and shoreline sediments, gradually became familiar to archaeologists,

and new methodologies, including core drilling and isotope analyses, became available. Evans (2004, 100–06) observes that this development unsurprisingly coincides with the growing awareness of and interest in theories of anthropogenic climate change in environmental and political circles in the same period. Only with the data produced by such methodologies did it become possible to identify climate change as an event rather than climate as a constant in narratives of short- and medium-term archaeological processes.

Studies of pollen, lake sediments, and sea levels from sites across the Middle East in the 1960s and 1970s, along with literary sources from Egypt, indicated long-lasting change towards drier climate in the last centuries of the third millennium. This is seen by some as an abrupt development dubbed 'the 4.2 ka BP event', which among other things has been blamed for the collapse of urbanism in northern Mesopotamia and the Indus Plain, and the collapse of Old Kingdom Egypt and the Akkadian Empire in Mesopotamia (cf. Coombes and Barber 2005; Ur 2015). Recent scholarship regards any such event as the high point of a period of a globally changing climate, taking the form of increased aridity in the Near East in the latter half of the third millennium (Arz, Lamy, and Pätzold 2006).

Early scholarly engagement with these results saw the climate change they indicated as either one of a number of societal stresses along with wars, migrations, and breakdown of long-distance trade (Richard 1980), or as the prime mover of other processes leading to deurbanization (Ritter-Kaplan 1984). In both cases, drought was perceived to have led to abandonment of marginal sites as well as increased emphasis on pastoralism. This in turn strengthened the growing semi-nomadic groups over remaining urban populations. Compared to Adams's narrative a decade earlier, climate is now a decisive event changing the urban biographies of the Middle East. A much debated example of this was the site of Tell Leilan in northern Syria. This site's sudden abandonment *c.* 2200 BC was ascribed to abrupt climate change deduced from changes in surface deposits including volcanic glass and fine-grained airborne silts, interpreted as stemming from a volcanic eruption and a period of increased wind (Ur 2015; Weiss and others 1993).

The turn towards emphasizing the importance of climate as a cause of change might be seen to an even greater extent in Mesoamerican archaeology, where newly available climate records were juxtaposed with the archaeological evidence of Maya urbanism. Early advocates of this environmental turn saw climate as *the one* determining factor in the development of complex societies, and the primary cause of other symptoms of societal stress such as warfare or breakdown of long-distance connection (Folan and others 1983). To stay in the metaphor of the stage, climate change emerges as a *deus ex machina* in relation to which the city and its inhabitants had no independent agency. In this deterministic narrative, urban biographies no longer need to identify seminal events in the life of a city, but become a by-product of fluctuating climate. As elements in urban life stories, climate changes constitute the seminal events — over which the subject has no control — birth and death. In the bibliometric record, the tendency towards casting climate change as a harmful force beyond human control is likely reflected in the increased occurrence of the terms 'collapse' and 'decline' in texts mentioning urbanism, archaeology, and climate in this period (Fig. 12.3).

Climate as Agent

The wealth of regional archaeological data has failed to correlate neatly with the increasingly refined available climate series. For instance, urban communities near Tell Leilan exhibited different trajectories in the same period (Ur 2015), as did different areas of the Maya heartlands during the ninth century (Aimers 2007, 384). Critics argued that advocates of ecological determinism equated correlation with causation, and thus failed to explain why some societies adapted to changing climate with varying degrees of problems, while others seemingly failed to (Coombes and Barber 2005). Many archaeologists also questioned the very concept of societal collapse, seeing decreased complexity as a rational response to changing conditions (McAnany and Yoffee 2009). This renewed interest in human agency and cultural response is probably reflected in the emergence of the term 'resilience' in the bibliometric record as well as the marked decrease in the occurrence of the term 'collapse' (Fig. 12.3). A closer look at many of the texts mentioning collapse reveals that they actually call the very usefulness of the concept into question, preferring alternative terms such as 'transformation'. In these narratives, climate becomes the antagonist of the urban biography. Ever present and important, the climate changes through the millennial scale of urban life stories, presenting opportunities for growth and expansion, or challenges leading to transformation of the resilient city. Such an approach can be exemplified by Lawrence and others (2016) who correlate city size and climate change in the Fertile Crescent over a period of seven millennia. Their conclusion is that after the Early/Middle Bronze Age transition

discussed above, correlation is limited. This does not imply that climate was not important, but that it has the potential to play different parts in different ages of different cities.

Climate and Narratives in Urban Biographies

Despite scientific consensus that our contemporary world is facing dramatic challenges at the hands of climate change, widespread public apathy, and political lack of action prevail. Scholars engaging with climate and culture in the modern world have realized the existence and significance of conflicting and competing narratives of climate change in our own time as well as in the past (Bristow and Ford 2016; Hulme 2009; Smith, Tyszczuk, and Butler 2014). That how archaeologists think about climate–culture interaction changes over time is not surprising and is also thematized in recent scholarship (Evans 2004; Van de Noort 2013). Still few urban biographies explicitly discuss how climate has shaped the urban life story in the long term.[2] This is bound to change in light of our growing understanding of how climate change influences contemporary societies, and as an increased and more detailed knowledge about climate change in the past becomes available. The lessons to be learned from narrative theory and past archaeological scholarship is that awareness of the narrative nature of urban life stories, and the potential of climate and climate change to fill different roles in such narratives, such as stage, event, and agent, is necessary if climate records are to become integrated rather than parallel parts of urban biographies.

2 See, however, Sinclair and others 2010, in which studies of climate, environment, and urbanism are integrated in the same volume, although arguably not into the same narrative. See also Lawrence and others 2016 who correlates city size and climate change on a millennial scale.

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