

## References

### Aktuell

LOFTUS 2019

Emma Loftus, Peter J. Mitchell & Christopher Bronk Ramsey, *An archaeological radiocarbon database for southern Africa*. [Antiquity 93 \(2019\), 870–885](#).

The Southern African Radiocarbon Database (SARD) is a new online, open-access database of published radiocarbon dates from southern African archaeological contexts. Compatible with the calibration, Bayesian modelling and mapping functionality of the OxCal software, the SARD will greatly assist in the documentation and analysis of chronological trends across the subcontinent. This article introduces the database and presents two case studies that demonstrate its utility and its integration with OxCal, comparing the temporal distribution of radiocarbon dates in two archaeologically well-investigated regions, and assessing the timing of Middle to Later Stone Age technological developments across the African subcontinent.

Keywords: southern Africa | radiocarbon | open access | chronological modelling

MANOLI 2019

Gabriele Manoli et al., *Magnitude of urban heat islands largely explained by climate and population*. [nature 573 \(2019\), 55–60](#).

[n573-0055-Supplement.pdf](#)

Urban heat islands (UHIs) exacerbate the risk of heat-related mortality associated with global climate change. The intensity of UHIs varies with population size and mean annual precipitation, but a unifying explanation for this variation is lacking, and there are no geographically targeted guidelines for heat mitigation. Here we analyse summertime differences between urban and rural surface temperatures (DTs) worldwide and find a nonlinear increase in DTs with precipitation that is controlled by water or energy limitations on evapotranspiration and that modulates the scaling of DTs with city size. We introduce a coarse-grained model that links population, background climate, and UHI intensity, and show that urban-rural differences in evapotranspiration and convection efficiency are the main determinants of warming. The direct implication of these nonlinearities is that mitigation strategies aimed at increasing green cover and albedo are more efficient in dry regions, whereas the challenge of cooling tropical cities will require innovative solutions.

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### Bibel

ALBERTZ 2015

Rainer Albertz, *Open-Mindedness for Understanding the Formation of the Pentateuch, The Challenge of Exodus 19–20*. In: MARJO C. A. KORPEL & LESTER L. GRABBE (Hrsg.), *Open-Mindedness in*

*the Bible and Beyond, A Volume of Studies in Honour of Bob Becking.* Library of Hebrew Bible / Old Testament Studies (JSOT-Supp.) 616 (London 2015), 1–9.

The fact that a late editor from the Chronistic milieu felt obliged to make some additions to the already existing Pentateuch suggests an utmost concern. Probably the editor was concerned that – according to Exodus 19 – the laypeople, who were sanctified in some way, should have access to the sacred area and could question the priestly and Levitical privileges. Taking Mount Sinai as an example for the Jerusalem temple the editor clarified that laymen, although all Israel was honoured to become a ‘kingdom of priests’ (v. 6), were not allowed to break through to YHWH, that is, injure those walls which kept the sacred area (vv. 21, 23),<sup>22</sup> for their own sake. The editor stated that only those priests who had ordinarily consecrated themselves are allowed to approach YHWH (v. 22). But even they were excluded from the Holy of Holies, where only High Priests would have permitted access (v. 24). Finally, in Exodus 32.26–29 the editor provided the Levites – still missing in Exodus 19 – with quasi-priestly rights. Inserting all these regulations into Israel’s foundation charter, the Chronistic editor possibly reacted to disputes of his time, which he wanted to bring to an end. Thus, even a literary historical derivation, which has questioned my former opinion, makes sense. The biblical texts are dependent on the open-mindedness of the exegetes.

#### BOLEN 2002

Todd Bolen, *The Reign of Jeroboam II, A Historical and Archaeological Interpretation.* MA thesis, Master’s Seminary (Sun Valley 2002).

The reign of Jeroboam II was the final period of greatness for the kingdom of Israel. As Manasseh was blamed for the exile of Judah, so Jeroboam could be held responsible for causing the downfall of the north. The brief respite that Israel enjoyed from a dominant Aram and the powerful nations at the ends of the Fertile Crescent enabled an Israelite territorial expansion that was never achieved before in the history of the Divided Kingdom.

The extraordinarily long reign of Jeroboam is given an astonishingly short report in Scripture; of his forty years the biblical writer mentions only his feat of dominating the southern Levant. It is, however, incomplete to dismiss Jeroboam’s rule with a simple generalization. The historical and archaeological evidence does not support the assumption that Jeroboam’s reign was marked by a single characteristic. It was neither a time of unprecedented prosperity nor one of decline and stagnation, as recent assessments are apt to conclude. Closer examination of the historical and archaeological sources reveals the dynamics and complexities of which this era consisted. Jeroboam’s reign included both unparalleled territorial expansion and an administration apathetic to the concerns of its citizens. It evidenced a minority upper class striving for the wealth of their grandfathers and a general populace oppressed and persecuted.

#### FAUST 2005

Avraham Faust, *The Settlement of Jerusalem’s Western Hill and the City’s Status in Iron Age II Revisited.* *Zeitschrift des Deutschen Palästina-Vereins* 121 (2005), 97–118.

As time progressed, the City of David became crowded, and part of the population started to settle outside the city walls. Gradually, Jerusalem expanded toward the Western Hill. This process started quite early, and the settlement reached the top of the hill at some point in the (early?) 8th century. The process continued during that century, and perhaps accelerated in its last third, following the fall of

Samaria and the arrival of an unknown number of refugees. Much of the Western Hill, and especially its eastern parts and the top of the hill, were probably densely occupied during the 8th century. At some point toward the end of the century, and probably because of the impending Assyrian campaign, the entire Western Hill was encompassed with a new massive city wall. Not all of the hill was probably settled at the time, or at least not densely settled, and the wall probably encompassed also unoccupied quarters. This was done mainly because of the need to build the wall along a defensible route, but also in order to enable the state to use the unpopulated regions that were now defended for its needs. Whether before or after Sennacherib's campaign, it is likely that new public buildings, and probably palaces, were built in some of these areas. The new neighborhoods were therefore inhabited by people of all social classes. Settlement in Jerusalem became denser in the 7th century, as can be seen, e.g., in the city's hinterland. The fact that the majority of Judah was devastated by Sennacherib's campaign, while Jerusalem survived, further explains Jerusalem's growth; while much of Judah's population probably died due to war, famine, etc., or was exiled, it is also clear that many were still alive when the war ended, but did not really have a place to live in. Jerusalem was the only major city left intact, so refugees probably flooded the city. The northern extramural quarters, and probably part of the Western Hill, were the areas where they could have settled. And it is likely that this is what they did. The 7th century, which was perhaps the peak of cultural and literary activity in Jerusalem (e.g., Na'aman 2002), was also the peak of the settlement on the Western Hill.

#### FINKELSTEIN 2002

Israel Finkelstein, *The Campaign of Shoshenq I to Palestine, A Guide to the 10th Century BCE Polity*. *Zeitschrift des Deutschen Palästina-Vereins* **118** (2002), 109–135.

The campaign of Shoshenq I to Palestine in the 10th century BCE was a groundbreaking event in the history of the country even though it failed to bring about the renewal of Egyptian imperial rule in the region. The territorio-political systems which emerged in the country after the campaign were utterly different from those which characterized the Iron I. From this point of view it is justified to see the Shoshenq campaign as a meaningful (though not the only) datum which closes the Iron I and ushers in the Iron II.

The Egyptian campaign was directed against three regions. In the south, Shoshenq obliterated the Hirbet el-Mes's desert polity. Egypt may have destroyed one Philistine city (Ekron) but seems to have embraced the others. Shoshenq's campaign was probably a factor in the shift of power in Philistia from Iron I Ekron to early Iron II Gath and Ashdod. In the north, Shoshenq took over the still Canaanite Jezreel Valley and opened the way for a North Israelite expansion into this region a short while later. In the highlands, the Egyptians assaulted an Israelite polity which was centered around Gibeon and which extended over the hill country of Benjamin and Ephraim and possibly also over the Jabbok area in Transjordan. The Jerusalem chiefdom was not attacked and possibly cooperated with the Egyptians. Shechem and the hill country to its north were also spared. As a result of the campaign – in cooperation with the Egyptians or after their withdrawal – the Jerusalem rulers took over hill country territories to their north. The large territories which were ruled for a few decades from Jerusalem could have supplied the memory for the Deuteronomistic notion of a great 'United Monarchy' in the days of the early Davidides. This phase in the history of the hill country came to an end with the rise of the powerful Omride Dynasty in Samaria.

FINKELSTEIN 2004

Israel Finkelstein, *Tel Rehov and Iron Age Chronology*. [Levant 36 \(2004\), 181–188](#).

The article challenges the notion that Tel Rehov can serve as an anchor for Iron Age chronology. It summarizes the main shortcomings in the analysis of the new 14C readings from Tel Rehov and then points to difficulties in the interpretation of the stratigraphy, pottery (including Greek sherds) and chronology of the site. The author equates Tel Rehov IV with Megiddo VA and concludes that the Megiddo palaces, conventionally described as the best manifestation for the tenth century United Monarchy, date to the early ninth century – the time of the Omride Dynasty in northern Israel.

FINKELSTEIN 2005

Israel Finkelstein, *From Canaanites to Israelites, When, How and Why*. In: *Recenti tendenze nella ricostruzione della storia antica d'Israele, Convegno internazionale, Roma, 6–7 marzo 2003*. Contributi del Centro linceo interdisciplinare “Beniamino Segre” 110 ([Rome 2005](#)), 11–27.

The transition from Canaan to Israel was dictated by three major events. The collapse of the Canaanite city-state system under Egyptian domination in the second half of the 12th century BCE was the first, though not the most crucial, step, since it was followed by a Canaanite revival in the lowlands. Canaanite material culture and the city-state system came to an end in the second half of the 10th century BCE, possibly as a result of the Shoshenq I campaign. This opened the way for the rise of the Northern Kingdom in the early 9th century. Certain remnants of Canaanite material culture – not territorial-political organization – can be traced in the north even later, until the Assyrian take-over. The final step in the transition from Canaan to Israel came with the weakening of the Omride state by Damascus in the second half of the 9th century. This facilitated the rise of Judah – and as a by-product – the emergence of pan-Israelite conscience after the fall of the Northern Kingdom a century later.

FINKELSTEIN 2005

Israel Finkelstein, *Hazor at the End of the Late Bronze Age, A Reassessment*. [Ugarit-Forschungen 37 \(2005\), 341–349](#).

The history of Hazor in the Late Bronze II and Iron I should be reconstructed in an utterly different way than that proposed by Yadin. Hazor experienced a major destruction by fire sometime in the not-too-late 13th century BCE (my Horizon B). The lower tell was then partially reoccupied for a short period (Horizon A) and then abandoned, probably still before 1200 BCE. The mound remained in ruins for a long time, until a small village was established on the upper tell by the local (“Canaanite”) population in the 11th century BCE.

FINKELSTEIN 2005

Israel Finkelstein & Nadav Na’aman, *Shechem of the Amama Period and the Rise of the Northern Kingdom of Israel*. [Israel Exploration Journal 55 \(2005\), 172–193](#).

The initial stage in the emergence of the Northern Kingdom must have been the consolidation of power in the hiU country, probably by forming coalition(s) among the groups living there. This was followed by an effort to subjugate the weakened city-states in the northern valleys and the coast. These city-states were unable to resist the inhabitants of the hill country by themselves and probably called for help on the Philistine city-states.

Like in the Amarna period, the Philistine city-states could have been backed by Egypt which, under Shoshenq I of the 22nd Dynasty, showed a renewed interest in the Levant. This may have been the kernel of the biblical tradition about the Philistine campaign to the Jezreel Valley and the Battle of Gilboa, which was pitched near the traditional, age-old Egyptian stronghold of Beth Shean (1 Sam. 29; 31). The participation of a remote city like Gath in the battle of Gilboa is not surprising once we remember the alliance of Shuwardatu of Gath (and 'Abdi-Heba of Jerusalem) with Achshaph and Acco in the struggle against the Gezer-Shechem coalition in the Amarna period. Though details of the events in the northern valleys in the tenth century are missing, the end result is clear: the city-states there were subjugated and the way was open for further expansion of the Northern Kingdom.

It must be emphasised that the course of action described above was not only military. The Amarna letters well illustrate the combination of diplomacy and the forming of coalitions as a way of gaining political and military power. The process could have lasted a few generations in the late tenth and early ninth centuries. It ended with the emergence of the Northern Kingdom as a dominant power in the Levant under the Omrides, in the first half of the ninth century BCE.

#### HECKL 2013

Raik Heckl, *Eine Kultstätte auf dem Ebal? Josua 8, 30–35 und der Streit mit Samaria um die Auslegung der Tora. Zeitschrift des Deutschen Palästina-Vereins* **129** (2013), 79–98.

Dem Nachtrag zum Josuabuch Jos 8,30-35 liegt eine fortgeschrittene Exegese des bereits anerkannten, abgeschlossenen, aber in der Auslegung gleichwohl umstrittenen Pentateuchs vor. Er schließt eine Lücke, die im Josuabuch dem Pentateuch gegenüber bestand, sodass man von einer frühen Form des Midrasch sprechen kann. Der Abschnitt harmonisiert außerdem zwischen Dtn 27 und 31.

Anlass für den Nachtrag dürfte die Nutzung von Dtn 27 für die Legitimierung des Tempels auf dem Garizim gewesen sein, wie sie im zehnten Dekaloggebot des samaritanischen Pentateuchs bezeugt ist. Die Auslegung in Jos 8 setzt sich mit der entstehenden Gemeinschaft der Samaritaner bzw. mit der von jener praktizierten Tora-Auslegung auseinander. In Jos 8 dient die Rezeption von Dtn 27 und 31 dazu, die Legitimität von Altar und Tempel auf dem Garizim zu bestreiten. Durch die nach der kultischen Begehung vollzogene Aufzeichnung der Tora auf den Altar wird jener wie der Altar in Josua 22 zu einem Denkmal für ein während der Landnahme vollzogenes Ritual. Der Text macht deutlich, dass der Ebal lediglich für die kurze Zeit der Anwesenheit der Bundeslade der Ort war, den sich Jahwe erwählt hat. Zugleich tauscht man die Ortsnamen und macht den Ebal zum Ort des Altars, was mit der ideologischen Veränderung im masoretischen Text zu Dtn 27,4 zusammenhängen muss.

Der Intention des Textabschnittes entspricht am ehesten die von Josephus bezeugte Einordnung in den Kontext des Josuabuches, sowohl geographisch als auch wegen der Nähe zur Diskussion des anderen Altars in Jos 22. Die anderen Versionen, LXX, MT und 4QJosha ordnen den Text an Stellen ein, wo er besser zu der späteren polemischen Lokaltradition passte.

#### HIEKE 2009

Thomas Hieke, *Der Kult ist für den Menschen da, Auf Spurensuche in den Opfervorschriften von Levitikus 1-10. Bibel und Kirche* **2009**, iii, 141–147.

Die auf den ersten Blick sehr technisch wirkenden Opferbeschreibungen in Levitikus 1-10 enthalten Spuren von Hinweisen darauf, dass der Opferkult dem

Heil und Wohlergehen der Menschen dient. Er ist Ausdruck der Kommunikation mit Gott, in der dem darbringenden Menschen das Wohlgefallen Gottes zugesagt wird (Lev 1-3). Bestimmte Opfer (Lev 4-5) dienen dazu, die "Sünde" zu entfernen. "Sünde" ist dabei alles, was sich trennend zwischen Gott und Mensch schiebt und was der Mensch nicht aufgrund seines absichtlichen Fehlverhaltens zu verantworten hätte, sondern was unbeabsichtigt oder naturbedingt geschieht, dennoch aber den Menschen tiefgreifend verunsichert und die Beziehung zu Gott (zer)stört. Nach der erzählerischen Struktur des Levitikusbuches stellt Gott selbst das Ritual als den Weg bereit, der zur "Versöhnung" führt. Versöhnung ist dabei die Entfernung des Trennenden und Wiederherstellung der Gottesbeziehung sowie die Wiedereingliederung des betroffenen Menschen in die tragende Kultgemeinschaft. Gott eröffnet damit von sich aus die Möglichkeit, dass der Mensch coram Deo ("vor Gottes Angesicht") bestehen kann.

#### HUTTON 2015

JEREMY M. HUTTON & AARON D. RUBIN (Hrsg.), *Epigraphy, Philology, and the Hebrew Bible, Methodological Perspectives on Philological and Comparative Study of the Hebrew Bible in Honor of Jo Ann Hackett*. Ancient Near East Monographs 12 (Atlanta 2015).

#### JERICKE 2005

Detlef Jericke, *Toponyme im Hohenlied*. [Zeitschrift des Deutschen Palästina-Vereins 121 \(2005\), 39–58](#).

Die zeitliche Ansetzung des Hohenlieds in die Epoche ptolemäischer Herrschaft über Palästina erklärt nun ihrerseits einige Auffälligkeiten im Gebrauch der Toponyme. Die häufige Erwähnung des Libanon und die zusätzliche Auffüstung der Bergmassive des Anti-Libanon spiegeln sozial- bzw. wirtschaftsgeschichtliche Verhältnisse. Aus Jerusalemer Sicht war es wichtig, daß weite Teile des Libanon-Gebirges von den Ptolemäern kontrolliert wurden, da im 3. Jh. v.Chr. die Jerusalemer Oberschicht erheblich am wirtschaftlichen Aufschwung des Ptolemäerreichs partizipierte. [...] So verwundert es nicht, daß der Libanon mit seinen verschiedenen Teilregionen für die Jerusalemer Oberschicht des 3. Jh.s v. Chr. ein durchaus erwähnenswertes Gebirge war, nicht allein weil das Gebirge exotischen Reiz ausstrahlte und „mythische [...] Erinnerungsreste“ evozierte, sondern weil die territoriale Zugehörigkeit des Libanon zum ptolemäischen Territorium zumindest indirekte Partizipation am wirtschaftlichen Gewinn aus dem Holzhandel versprach.

Sowohl die konkrete historisch-topographische Bedeutung als auch die literarisch-ästhetische Sinnebene der Ortsangaben verweisen somit darauf, daß das Hohelied ein literarisches Produkt des 3. Jh.s v.Chr., der Epoche ptolemäischer Herrschaft in Palästina, ist. Der Anhauch von Exotik und Luxus, der die Ortsangaben des Hohenlieds umgibt, und der historisch topographische Erfahrungshintergrund, der den Toponymen zu entnehmen ist, spiegeln je auf ihre Weise das Lebensgefühl der am wirtschaftlichen Aufschwung der Ptolemäer partizipierenden Jerusalemer Oberschicht.

#### KLETTER 2004

Raz Kletter, *Chronology and United Monarchy, A Methodological Review*. [Zeitschrift des Deutschen Palästina-Vereins 120 \(2004\), 13–54](#).

The LC does not solve the debate about the United Monarchy. The shift in the middle the debate, away from the Copenhagen school and back to a quite historical United Monarchy, empties much of the claims about the historical importance of the LC. Knauf's accusations (2002, 18) against Fritz and Münger fit

much better the LC than the HC. The LC ‘wins’ only in using sharp language and in presenting itself in terms of certain facts. These should not be recipes for accepting academic theories. Yet, as long as secure chronological pegs are missing, it is possible to maintain different arrangements of archaeological strata early Iron Age Palestine. Hence, the LC is possible, though it is not superior to the HC. Before it is proven, no far-fetched historical conclusions should be based upon it.

#### KORPEL 2015

MARJO C. A. KORPEL & LESTER L. GRABBE (Hrsg.), *Open-Mindedness in the Bible and Beyond, A Volume of Studies in Honour of Bob Becking*. Library of Hebrew Bible / Old Testament Studies (JSOT-Supp.) 616 ([London 2015](#)).

#### REICH 2014

Ronny Reich, *A Depiction of a Menorah Found near the Temple Mount and the Shape of Its Base*. *Zeitschrift des Deutschen Palästina-Vereins* **130** (2014), 96–101.

A small stone vessel is presented which was retrieved in an excavation carried out recently near the Temple Mount. The object, dating to the late Second Temple period is bearing a representation of a menorah which is incised upon its side. The author is of the opinion that the depicted menorah contributes to the question related to the form and construction of the base of this object, which once stood inside the Temple in Jerusalem.

#### ROLLSTON 2012

Christopher A. Rollston, *An Old Hebrewstone Inscription from the City of David, A Trained Hand and a Remedial Hand on the Same Inscription*. In: MARILYN J. LUNDBERG, STEVEN FINE & WAYNE T. PITARD (Hrsg.), *Puzzling Out the Past, Studies in Northwest Semitic Languages and Literatures in Honor of Bruce Zuckerman*. Culture and History of the Ancient Near East 55 ([Leiden 2012](#)), 189–196.

Thus, I would cautiously suggest that the City of David Inscribed Stone is a brief but important exemplar of a writing exercise, similar to others known from Near Eastern and Mediterranean antiquity. As such, I believe this inscription to be a very important one.

#### ROLLSTON 2015

Christopher A. Rollston, *The Ivory Pomegranate, The Anatomy of a Probable Modern Forgery*. In: JEREMY M. HUTTON & AARON D. RUBIN (Hrsg.), *Epigraphy, Philology, and the Hebrew Bible, Methodological Perspectives on Philological and Comparative Study of the Hebrew Bible in Honor of Jo Ann Hackett*. Ancient Near East Monographs 12 ([Atlanta 2015](#)), 237–252.

One should bear in mind that many West Semitic seals and bullae, mostly Hebrew ones, bought on the antiquities market since ca. 1970, may have been produced by a skilled hand, with somewhat peculiar iconography and letter forms not represented in the epigraphical corpus known at the time of their publication. Although it is impossible to prove definitively that these seals are forgeries, there is room for suspicion that modern forger(s) might have had excellent knowledge of

Biblical Hebrew and Old Hebrew epigraphy, and possessed the technical ability to produce seals and ostraca of very high quality. [Joseph Naveh]

#### SAPIR-HEN 2013

Lidar Sapir-Hen, Guy Bar-Oz, Yuval Gadot & Israel Finkelstein, *Pig Husbandry in Iron Age Israel and Judah, New Insights Regarding the Origin of the “Taboo”*. *Zeitschrift des Deutschen Palästina-Vereins* **129** (2013), 1–20.

What did cause the rapid increase in the frequency of pigs in north Israelite sites in the Iron Age IIB?

Furthermore, although better environmental conditions for pigs include higher rainfall and humidity, a new palynological record from the Dead Sea demonstrates that higher precipitation was prevalent during the Iron Age I than during the Iron Age II, in addition to a significant reduction in forest size that occurred during the Iron Age II, probably as a result of major population growth and slightly drier climatic conditions. All of these circumstances made the area less suitable for pig husbandry. Regarding the sites' function and the political and social status, it seems that these factors did not change considerably at any of the sites in the transition to the Iron Age IIB: The northern valley sites functioned as administrative and agricultural centers of the Northern Kingdom in both the Iron Age IIA and IIB. Moreover, other material culture traits, such as evidence for trade with Phoenicia, show that the Iron Age IIB was a time of prosperity in the Northern Kingdom, while higher status sites are correlated with lower frequency of pigs. It seems, therefore, that none of the factors listed above changed during the Iron Age IIB in a way that would encourage raising pigs.

The answer to this riddle can be found in the settlement and demographic processes that took place in the territory of the Northern Kingdom. In both the northern valleys and the Samaritan highlands the number of settlements and their size, and thus the population, grew significantly and steadily throughout the Iron Age I-IIA and reached a peak in the Iron Age IIB.

The biblical decree (Lev 11:7; Deut comes from the world of Judah in late monarchic and early post-exilic times. Our work demonstrates that pork avoidance fits the reality in Judah in the Iron Age IIB-C (no data for the Persian period exist for now), but does not reflect daily life in the Northern Kingdom, at least in its lowland sites, in the Iron Age IIB.

Promotion of pig avoidance could have been directed toward Israelites who moved to Judah after the collapse of the Northern Kingdom in 720 B.C.E.. In other words, it was the growing pork consumption habits in Israel in the Iron Age IIB that provoked the Judahite authors (one may assume that pig exploitation continued to be prevalent in the territory of the ex-Northern Kingdom in the 7th cent. B.C.E.). Judahite aspirations regarding these territories after the withdrawal of Assyria from the region could have been the reason for the continuing concern regarding pigs at that time. The biblical authors insisted that all Hebrews who dwelt in the territories of both, Israel and Judah, must acknowledge the rule of the Davidic Dynasty and worship in a sole Temple – in Jerusalem. The pig taboo could have been another Judahite cultural trait that was opposed to the situation in the north, and which the authors wished to impose on the entire Israelite population.

#### SINGER-AVITZ 2012

Lily Singer-Avitz, *The Date of the Pottery from the Rock-Cut Pool Near the Gihon Spring in the City of David, Jerusalem*. *Zeitschrift des Deutschen Palästina-Vereins* **128** (2012), 10–14.



A. De Groot and A. Fadida recently suggested to date the pottery unearthed in the Rock-Cut Pool near the Gihon spring to the Iron Age IIA period i.e., to the late 9th century B.C.E. Based on this early date, Reich and Shukron raised some far-reaching suggestions regarding wider archaeological and historical issues. However, it seems that the fill assemblage cannot be dated to a short time range in the late 9th century B.C.E. It should rather be assigned to a longer period of time – in the Iron Age IIA and Iron Age IIB periods, that is the 9th as well as the 8th centuries B.C.E.

## Biologie

### CAPPUCCI 2019

Ugo Cappucci, Fabrizia Noro, Lucia Piacentini & Sergio Pimpinelli et al., *The Hsp70 chaperone is a major player in stress-induced transposable element activation*. [PNAS 116 \(2019\), 17943–17950](#).

[pnas116-17943-Supplement.pdf](#)

Previous studies have shown that heat shock stress may activate transposable elements (TEs) in *Drosophila* and other organisms. Such an effect depends on the disruption of a chaperone complex that is normally involved in biogenesis of Piwi-interacting RNAs (piRNAs), the largest class of germline-enriched small non-coding RNAs implicated in the epigenetic silencing of TEs. However, a satisfying picture of how chaperones could be involved in repressing TEs in germ cells is still unknown. Here we show that, in *Drosophila*, heat shock stress increases the expression of TEs at a posttranscriptional level by affecting piRNA biogenesis through the action of the inducible chaperone Hsp70. We found that stress-induced TE activation is triggered by an interaction of Hsp70 with the Hsc70-Hsp90 complex and other factors all involved in piRNA biogenesis in both ovaries and testes. Such interaction induces a displacement of all such factors to the lysosomes, resulting in a functional collapse of piRNA biogenesis. This mechanism has clear evolutionary implications. In the presence of drastic environmental changes, Hsp70 plays a key dual role in increasing both the survival probability of individuals and the genetic variability in their germ cells. The consequent increase of genetic variation in a population potentiates evolutionary plasticity and evolvability.

**Keywords:** transposable elements | Hsp70 | evolution

Ugo Cappucci, Fabrizia Noro, Assunta Maria Casale, Laura Fanti, Maria Berloco, Angela Alessandra Alagia, Luigi Grassi, Loredana Le Pera, Lucia Piacentini & Sergio Pimpinelli

**Significance:** We have identified, by genetic and cytological analyses, the minimal components of a chaperone complex involved in transposon (TE) silencing in *Drosophila* germcells. We found that, after heat shock, the stress-inducible Hsp70 chaperone interacts with the chaperone complex and factors involved in piRNAs biogenesis in both ovaries and testes. Hsp70 induces displacement of these factors to the lysosomes. Concomitantly, we observed a significant activation of TEs at the posttranscriptional level, suggesting an involvement of Hsp70 in TE activation after stress. We propose that such a mechanism has evolutionary implications for the genome's response to environmental stress.

### MAGGERT 2019

Keith A. Maggert, *Stress: An evolutionary mutagen*. [PNAS 116 \(2019\), 17616–17618](#).

However, [Barbara McClintock] noted that under stressful conditions her maize had a much higher mutation rate.

In so doing, these investigators have uncovered a profound evolutionary mechanism for potentiating possibly genome-damaging, and possibly species-saving, hypermutation. The idea that evolution may be sped up, potentiated in times of stress, is not entirely new. Of course, it was Charles Darwin who first articulated not just that selection occurs but that it thrives in times of environmental stress.

## Datierung

KUZMIN 2019

Yaroslav V. Kuzmin, Thomas F. G. Higham, Paul Pettitt & Robert Witcher, *The older, the better? On the radiocarbon dating of Upper Palaeolithic burials in Northern Eurasia and beyond*. [Antiquity 93 \(2019\), 1061–1081](#).

The reliability of radiocarbon dates for Palaeolithic human burials is of utmost importance for prehistoric archaeologists. Recently obtained dates for several such burials in central Russia raise important interrelated issues concerning site taphonomy and the precise radiocarbon dating technique employed, with implications for the ‘true’ age of the burials. A critical review of the dating of the Sungir and Kostenki burials calls into question the reliability of employing ultrafiltration or single amino acids for the radiocarbon dating of Upper Palaeolithic bones.

Keywords: Russia | Eurasia | Upper Palaeolithic | radiocarbon dating | human bones

Removing contaminants: a restatement of the value of isolating single compounds for AMS dating

Cherry-picking one or two examples to support one’s argument is not a scientifically rigorous approach. Kuzmin’s (2019) misleading and circular article serves only to confuse rather than add clarity. Single amino acid or compound-specific methods are the future for reliably dating the Palaeolithic, where the effects of modern contamination are so acute.

Fast and slow science and the Palaeolithic dating game

In the current research climate, where big grants and big headlines dominate an increasingly aggressive and competitive field, machine-driven ‘fast science’ is a sure route to competitive fitness, rather than the painstaking and long-term methods such as fieldwork, ethnoarchaeology, zooarchaeology and artefact analysis that can be all too easily caricatured as slow and low-profile

From the wisdom of old age to a wider debate

Whether palaeogenetics or radiocarbon dating, what these examples instantiate is the difficulty of communicating not only with the press and the public (e.g. Brophy 2018), but also among ourselves. If, as Booth suggests, the high-impact journals in which our scientific colleagues are compelled to publish do not provide sufficient space to explore nuance, there is a venue in general archaeology journals—including but not limited to *Antiquity*—for such elaboration. As the demand for communication beyond our immediate specialist circles increases, there is greater need for a common and comprehensible space where we can explain, educate and promote collaboration and understanding. Higham’s (2019) response to Kuzmin’s article provides a clear exposition of the chemistry supporting the single amino acid method. This may involve, in his words, a “basic chemistry” (2019: 1073) lesson, yet this lesson will be greatly appreciated by those of us who do not have a science background but who nonetheless wish to understand, evaluate and make use of the results of such techniques.

When any new and unexpected results demand that we rewrite our narratives, extra scrutiny is required: “It is not necessary for extraordinary claims to have

extraordinary proofs—they just need to be robust; the more extraordinary the claim, the more robust the proof must be”.

## Energie

FISCHHOFF 1983

Baruch Fischhoff, *Acceptable Risk, The Case of Nuclear Power. Journal of Policy Analysis and Management* **2** (1983), 559–575.

The key policy question in managing hazardous technologies is often some variant of: “How safe is safe enough?” A typical response of regulatory agencies has been to lay down minimum requirements for how hazardous facilities should be built and operated, without specifying the level of safety that it is hoping to achieve. The U.S. Nuclear Regulatory Commission, charged with regulating safety in nuclear power plants, has recently tackled the safety question directly, by adopting “safety goals” that facilities must meet. The NRC’s approach proves to be sophisticated in some respects, incomplete in others. More generally, it points up the inherent difficulties that exist with the concept of “acceptable risk” and with any attempt to build policy instruments around it. Lessons from the NRC case apply to other hazardous technologies, as well as to public policies unrelated to safety.

WU 2019

Yican Wu, Zhibin Chen, Zhen Wang, Shanqi Chen, Daochuan Ge & Chao Chen et al., *Nuclear safety in the unexpected second nuclear era. PNAS* **116** (2019), 17673–17682.

Nuclear energy development has entered an unexpected second nuclear era, which is mainly driven by developing countries. Despite major efforts to pursue a safe nuclear energy system in the first nuclear era, severe nuclear accidents occurred. A basic problem is that we do not have an adequate understanding of nuclear safety. From the viewpoints of risk and the close coupling of technical and social factors, this paper reexamines the nature of nuclear safety and reviews how previous experts understood it. We also highlight the new challenges that we are likely to confront in the unexpected second nuclear era and clarify some of the refinements that need to be made to the concept of nuclear safety from a sociotechnical perspective. These include the following: 1) Risk decisions should be made based on integrating social and technical elements (i.e., “social rationality”); 2) risk needs to be controlled based on the “Wuli–Shili–Renli” framework; 3) systems thinking should be substituted for reductionism in risk assessment, and social mechanisms need to be combined to address uncertainties; and 4) public-centered risk communication should be established. This contribution can provide a theoretical foundation for improving our understanding of the nature of nuclear safety and for transforming the concept of nuclear safety in the unexpected second nuclear era.

**Keywords:** nuclear safety | risk | sociotechnical perspective | unexpected second nuclear era

Yican Wu, Zhibin Chen, Zhen Wang, Shanqi Chen, Daochuan Ge, Chao Chen, Jiangtao Jia, Yazhou Li, Ming Jin, Tao Zhou, Fang Wang & Liqin Hu

**Significance:** Despite great efforts to pursue a safe nuclear energy system during the first nuclear era, which was dominated by developed countries, severe nuclear accidents still occurred. Today, nuclear energy development has entered an unexpected second nuclear era, which is driven by developing countries. This may give rise to a great risk. Nuclear power plants are complex sociotechnical systems,

and their safety has never been fully defined. We argue that social aspects, rather than just technical measures, must be involved to ensure nuclear safety. In this paper, the nature of nuclear safety is elucidated with identification of new challenges, and corresponding suggestions are proposed to improve nuclear safety in the unexpected second nuclear era.

## Kultur

SHILLITO 2019

Lisa-Marie Shillito, *Building Stonehenge? An alternative interpretation of lipid residues in Neolithic Grooved Ware from Durrington Walls*. *Antiquity* **93** (2019), 1052–1060.

Lipid residues identified in GroovedWare pottery from Durrington Walls have been interpreted as evidence for large-scale feasting associated with the construction of Stonehenge, around 2500 BC. While a function related to food consumption is possible, other explanations may be equally plausible. An alternative interpretation not previously considered is that these residues may be related to a non-food use of animal resources, such as in the production of tallow. Such an interpretation would support the ‘greased sled’ theory for the transport of the megaliths for Stonehenge.

Keywords: Neolithic Britain | Durrington Walls | Stonehenge | lipid residues

## Metallzeiten

GOREN 2002

Yuval Goren, Israel Finkelstein & Nadav Na’aman, *The Seat of Three Disputed Canaanite Rulers According to Petrographic Investigation of the Amarna Tablets*. *Tel Aviv: Archaeology* **29** (2002), 221–237.

Identifying the capitals of Ba’lu-UR.SAG, Ba’lu-mehir and Tagi clarifies the entire territorial-political situation in the Sharon Plain and the Jezreel Valley in the Amarna period. From his city of Ginti-kirmil (=Jatt) Tagi ruled over the entire Coastal Plain between the sources of the Yarkon River in the south and the Carmel Ridge in the north. The western Jezreel Valley was dominated by the city-states of Megiddo, [x(x)-i]G -ma-te (=Tel Yokneam), and according to Na’aman, also Ta’anach, the seat of Yashdata (EA 248). The northwestern tip of the valley and the western Lower Galilee were controlled by Shamhuna, while the eastern Lower Galilee was dominated by Anaharath (for the latter see Goren, Finkelstein and Na’aman forthcoming). The Beth Shean Valley was ruled by Rehob. The Egyptian administrative centre of Beth Shean had a territory of its own, which was cultivated by the Canaanite vassals.

GOREN 2003

Yuval Goren, Shlomo Bunimovitz, Israel Finkelstein & Nadav Na’Aman, *The Location of Alashiya, New Evidence from Petrographic Investigation of Alashiyan Tablets from El-Amarna and Ugarit*. *American Journal of Archaeology* **107** (2003), 233–255.

Ancient Near Eastern archives of cuneiform texts contain tablets whose origin is unknown. Letters often do not contain the name or address of the sender. Moreover, the locations of some ancient Near Eastern countries and cities have

not yet been clearly established. Hence we perform a research program that intends to fill this gap through a systematic provenance study of the Amarna letters and other Near Eastern texts using petrographic and geochemical methods. So far, over 300 tablets have been analyzed. This paper presents the provenance of the Alashiya letters from Amarna and Ugarit as well as an assemblage of Cyprominoan texts from Cyprus. Petrographic and chemical examinations indicate that the Amarna letters from Alashiya originate from the area on the margin of the Troodos Mountains in Cyprus. Various lines of evidence make it clear that the raw material was collected by the scribes in their immediate vicinity and not transported over large distances. Within Cyprus, either Kalavassos-Ayios Dhimitrios or Alassa Paliotaverna / Pano Manadilaris are identified as the source of official Alashiyan letters. Since the geopolitical configuration of Late Bronze Age Alashiya is still unclear, the implications of our conclusions for this vexed issue are discussed.

#### GOREN 2003

Yuval Goren, Israel Finkelstein & Nadav Na'aman, *The Expansion of the Kingdom of Amurru According to the Petrographic Investigation of the Amarna Tablets*. [Bulletin of the American Schools of Oriental Research](#) **329** (2003), 1–11.

A petrographic investigation of the Amarna tablets has been carried out by the authors since 1997. Over 300 tablets have so far been examined, including 14 letters sent by the rulers of Amurru. The petrographic data makes it possible to trace the territorial expansion of the kingdom of Amurru in the days of Abdi-Ashirta and Aziru. The Amurru letters fall into four distinct petrographic groups. The first includes two letters, which were sent from the mountainous area east of Tripoli, the core area of the kingdom. The second includes four letters, which were probably dispatched from the city of Ardata in the foothills. Five letters were sent from Tell Arqa. This seems to indicate that after consolidating his reign, Aziru transferred his capital to Irqata in the Akkar Plain. Finally, three of Aziru's letters were sent from the Egyptian center of Sumur.

No Amurru letter was sent from the city of Tunip, which was also captured by Aziru. The analysis of the letter of the citizens of Tunip supports the identification of this important city at Tell Asharneh northwest of Hama. This city was too remote from the main arena of Aziru's operations, which was focused on the Lebanese coast.

## Methoden

#### FOCHESATO 2019

Mattia Fochesato, Amy Bogaard & Samuel Bowles, *Comparing ancient inequalities, The challenges of comparability, bias and precision*. [Antiquity](#) **93** (2019), 853–869.

[Antiquity093-0853-Supplement1.pdf](#), [Antiquity093-0853-Supplement2.xlsx](#)

Archaeological evidence provides the only basis for comparative research charting wealth inequality over vast stretches of the human past. But researchers are confronted by a number of problems: small sample sizes; variable indicators of wealth (including individual grave goods, the area of household dwellings or storage spaces); overrepresentation of the wealthy, or invisibility of those without wealth; and vastly different population sizes. Here, the authors develop methods for estimating the Gini coefficient—a measure of wealth inequality—that address

these challenges, allowing them to provide a set of 150 comparable estimates of ancient wealth inequality.

Keywords: wealth inequality | household | storage | grave goods | Gini coefficient

## Mittelpaläolithikum

SCHMIDT 2019

Patrick Schmidt & Claudio Tennie et al., *Birch tar production does not prove Neanderthal behavioral complexity*. [PNAS 116 \(2019\), 17707–17711](#).

[pnas116-17707-Supplement1.pdf](#), [pnas116-17707-Supplement2.mp4](#), [pnas116-17707-Supplement3.mp4](#), [pnas116-17707-Supplement4.mp4](#)

Birch tar production by Neanderthals—used for hafting tools—has been interpreted as one of the earliest manifestations of modern cultural behavior. This is because birch tar production per se was assumed to require a cognitively demanding setup, in which birch bark is heated in anaerobic conditions, a setup whose inherent complexity was thought to require modern levels of cognition and cultural transmission. Here we demonstrate that recognizable amounts of birch tar were likely a relatively frequent byproduct of burning birch bark (a natural tinder) under common, i.e., aerobic, conditions. We show that when birch bark burns close to a vertical to subvertical hard surface, such as an adjacent stone, birch tar is naturally deposited and can be easily scraped off the surface. The burning of birch bark near suitable surfaces provides useable quantities of birch tar in a single work session (3 h; including birch bark procurement). Chemical analysis of the resulting tar showed typical markers present in archaeological tar. Mechanical tests verify the tar’s suitability for hafting and for hafted tools use. Given that similarly sized stones as in our experiment are frequently found in archaeological contexts associated with Neanderthals, the cognitively undemanding connection between burning birch bark and the production of birch tar would have been readily discoverable multiple times. Thus, the presence of birch tar alone cannot indicate the presence of modern cognition and/or cultural behaviors in Neanderthals.

Keywords: modern behaviors | cognitive complexity | early pyrotechnology | Neanderthal birch tar | adhesives

Patrick Schmidt, Matthias Blessing, Maxime Rageot, Radu Iovita, Johannes Pflöging, Klaus G. Nickel, Ludovic Righetti & Claudio Tennie

Significance: We found a previously unknown way to produce birch tar. Instead of creating cognitively demanding structures (underground or in containers), this method consists of simply burning bark close to cobbles in a hearth. The tar is deposited on the stones and can be scraped off for use. This approach to interpreting early tar resolves the mystery of the associated and still not understood early technical complexity and provides a “discoverable” pathway to one of the earliest pyrotechnologies. These results have implications for our interpretation of birch tar in the archaeological record: Birch tar from early archaeological contexts alone can no longer indicate the presence of modern cognition and/or cultural behaviors in Neanderthals.

## Neolithikum

BALASSE 2019

Marie Balasse, Anne Tresset, Gaël Obein, Denis Fiorillo & Henri Gandois, *Seaweed-eating sheep and the adaptation of husbandry in Neo-*

*lithic Orkney, New insights from Skara Brae. Antiquity 93 (2019), 919–932.*

[Antiquity093-0919-Supplement.pdf](#)

The Neolithisation of Europe involved socioeconomic and biological adaptations to new environments. The use of seaweed as livestock fodder, for example, was key to the introduction of animal husbandry to the Orkney archipelago, c. 3500 cal BC. Using stable isotope analysis of faunal remains from Skara Brae, this study provides new evidence for, and clarifies the chronology of, the adoption of seaweed consumption by sheep. The results show that sheep consumed moderate amounts of seaweed from the moment of their introduction to Orkney — a practice that facilitated the successful spread of the farming lifeways to the most remote areas of Europe.

Keywords: Orkney | Neolithic | seaweed | stable isotopes | sheep | husbandry

## Ostasien

LI 2019

Zhanyang Li, Luc Doyon, Hao Li, Qiang Wang, Zhongqiang Zhang, Qingpo Zhao & Francesco d’Errico, *Engraved bones from the archaic hominin site of Lingjing, Henan Province. Antiquity 93 (2019), 886–900.*

[Antiquity093-0886-Supplement.pdf](#)

The production of abstract engravings is considered an indicator of modern human cognition and a means for the long-term recording and transmission of information. This article reports the discovery of two engraved bones from the Lingjing site in Henan Province, China, dated to 105–125 kya. The carefully engraved nature of the incisions, made on weathered rib fragments, precludes the possibility of unintentional or utilitarian origins. Residue analysis demonstrates the presence of ochre within the incised lines on one specimen. This research provides the first evidence for the deliberate use of ochred engravings for symbolic purposes by East Asian Late Pleistocene hominins.

Keywords: East Asia | China | Late Pleistocene | symbolism | art | ochre

## Politik

BERGSTROM 2019

Carl T. Bergstrom & Joseph B. Bak-Coleman, *Gerrymandering in social networks. nature 573 (2019), 40–41.*

An analysis shows that information flow between individuals in a social network can be ‘gerrymandered’ to skew perceptions of how others in the community will vote — which can alter the outcomes of elections.

STEWART 2019

Alexander J. Stewart, Mohsen Mosleh, Marina Diakonova, Antonio A. Arechar, David G. Rand & Joshua B. Plotkin, *Information gerrymandering and undemocratic decisions. nature 573 (2019), 117–121.*

[n573-0117-Supplement1.pdf](#), [n573-0117-Supplement2.mov](#)

People must integrate disparate sources of information when making decisions, especially in social contexts. But information does not always flow freely. It can be constrained by social networks<sup>1–3</sup> and distorted by zealots and automated bots<sup>4</sup>.

Here we develop a voter game as a model system to study information flow in collective decisions. Players are assigned to competing groups (parties) and placed on an ‘influence network’ that determines whose voting intentions each player can observe. Players are incentivized to vote according to partisan interest, but also to coordinate their vote with the entire group. Our mathematical analysis uncovers a phenomenon that we call information gerrymandering: the structure of the influence network can sway the vote outcome towards one party, even when both parties have equal sizes and each player has the same influence. A small number of zealots, when strategically placed on the influence network, can also induce information gerrymandering and thereby bias vote outcomes. We confirm the predicted effects of information gerrymandering in social network experiments with  $n = 2,520$  human subjects. Furthermore, we identify extensive information gerrymandering in real-world influence networks, including online political discussions leading up to the US federal elections, and in historical patterns of bill co-sponsorship in the US Congress and European legislatures. Our analysis provides an account of the vulnerabilities of collective decision-making to systematic distortion by restricted information flow. Our analysis also Highlights a group-level social dilemma: information gerrymandering can enable one party to sway decisions in its favour, but when multiple parties engage in gerrymandering the group loses its ability to reach consensus and remains trapped in deadlock.

## Religion

KELLY 2019

Eamonn ‘Ned’ Kelly, *Croagh Patrick (County Mayo), The Sacred Mountain of the Sun God*. [Irish Lives Remembered 45 \(2019\), 10–17](#).

The key dates that divide the solar year into three equal parts are 18th April, 24th August, and Midwinter’s Day (between 20th and 23rd December). Each of these dates has attracted an important Christian feast day, which suggests the Christianization of earlier pagan festivals.

It was at Bohea on St. Bartholomew’s Day 1990 that Gerry Bracken first witnessed the spectacular event that he had predicted. The setting sun, having descended onto the summit of Croagh Patrick appeared to roll slowly down the northern slope before disappearing behind a ridge (Figs 4A, B, C, D). This extraordinary spectacle proved to be a twice-yearly event that occurs also on 18th April. I was present this year (2019) to witness the spectacle which occurred on a cloudless April sky watched by large crowds who had gathered for the event. The event does not occur at the midwinter sunset. However, as revealed by Gerry Bracken, an ancient stone row at the Killadangan megalithic complex on the shores of Clew Bay (Mayo) is aligned to a niche in the ridge adjoining Croagh Patrick into which the midwinter sun descends at sunset.

## Story or Book

DÍAZ-GUARDAMINO 2019

Marta Díaz-Guardamino, *El Dolmen de Soto*. [Antiquity 93 \(2019\), 1100–1102](#).

Primitiva Bueno Ramírez, José Antonio Linares Catela, Rodrigo de Balbín Behrmann & Rosa Barroso Bermejo (ed.). 2019. *Símbolos de la muerte en la Prehistoria Reciente del sur de Europa. El Dolmen de Soto, Huelva, España*. Sevilla: Junta de Andalucía, Consejería de Cultura: Arqueología Monografías; 978-84-9959-316-6 E 20.



The new results, stratigraphy and radiocarbon dates shed light on the emergence of the megalithic phenomenon, and the persistence of some monuments through time. Most of the slabs used in the fabric of the gallery seem to have been older, culturally significant elements (e.g. stelae or menhirs), as they show existing decoration and signs of secondary reshaping. The authors interpret five pits located along and beneath the edge of the peristaltic ring of the tumulus as possible erection pits for standing stones. These could have belonged to a stone circle that was later dismantled to construct the gallery.

Overall, the volume contributes significant preliminary data to the broader understanding of megalithic art and monuments, their temporalities and influential roles in the long-term social make-up of late prehistoric Iberia. Some collective ancestral places and monuments were persistently revisited and transformed; they were used to (re)create social relations and inequalities, and to sustain power. In the context of increased mobility in third-millennium BC Europe, persistent places such as Soto hold invaluable clues that are worth pursuing.

## SPATZIER 2019

André Spatzier, *Big men or chiefs? Rondel builders of Neolithic Europe. Antiquity* **93** (2019), 1098–1100.

Jaroslav Řídký, Petr Květina, Petr Limburský, Markéta Končelova, Pavel Burgert & Radka Šumberová. 2018. *Big men or chiefs? Rondel builders of Neolithic Europe*. Oxford: Oxbow; 978-1-789-25026-8 £ 38.

Over the last 20 years, much fieldwork and research has been undertaken on the so-called Kreisgrabenanlagen or rondels, a type of circular monument comprising ditches and post-built rings that appeared and flourished across Europe in the early fifth millennium BC. In light of the increase in data, the monograph under review is an important contribution to rondel research. The authors have a profound knowledge of the archaeology of this period in Central Europe and in the field of rondel research, having undertaken excavations on numerous sites. As the title suggests, however, the authors' aim goes beyond Kreisgrabenanlagen, and they challenge the traditional view that societies in the Stroke pottery/Lengyel periods were egalitarian.