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References

Aktuell

Baude 2016

Mathilde Baude et al., *Historical nectar assessment reveals the fall and rise of floral resources in Britain*. nature **530** (2016), 85–88.

n530-0085-Supplement1.pdf, n530-0085-Supplement2.xlsx, n530-0085-Supplement3.xlsx, n530-0085-Supplement4.xlsx

Mathilde Baude, William E. Kunin, Nigel D. Boatman, Simon Conyers, Nancy Davies, Mark A. K. Gillespie, R. Daniel Morton, Simon M. Smart & Jane Memmott

There is considerable concern over declines in insect pollinator communities and potential impacts on the pollination of crops and wildflowers1–4. Among the multiple pressures facing pollinators2–4, decreasing floral resources due to habitat loss and degradation has been suggested as a key contributing factor2–8. However, a lack of quantitative data has hampered testing for historical changes in floral resources. Here we show that overall floral rewards can be estimated at a national scale by combining vegetation surveys and direct nectar measurements. We find evidence for substantial losses in nectar resources in England and Wales between the 1930s and 1970s; however, total nectar provision in Great Britain as a whole had stabilized by 1978, and increased from 1998 to 2007. These findings concur with trends in pollinator diversity, which declined in the mid-twentieth century9 but stabilized more recently10. The diversity of nectar sources declined from 1978 to 1990 and thereafter in some habitats, with four plant species accounting for over 50 % of national nectar provision in 2007. Calcareous grassland, broadleaved woodland and neutral grassland are the habitats that produce the greatest amount of nectar per unit area from the most diverse sources, whereas arable land is the poorest with respect to amount of nectar per unit area and diversity of nectar sources. Although agri-environment schemes add resources to arable landscapes, their national contribution is low. Owing to their large area, improved grasslands could add substantially to national nectar provision if they were managed to increase floral resource provision. This national-scale assessment of floral resource provision affords new insights into the links between plant and pollinator declines, and offers considerable opportunities for conservation.

Dalgaard 2016

Kevin Dalgaard et al., *Trim28 Haploinsufficiency Triggers Bi-stable Epigenetic Obesity*. Cell **164** (2016), 353–364.

Kevin Dalgaard, Kathrin Landgraf, Steffen Heyne, Adelheid Lempradl, John Longinotto, Klaus Gossens, Marius Ruf, Michael Orthofer, Ruslan Strogantsev, Madhan Selvaraj, Tess Tsai-Hsiu Lu, Eduard Casas, Raffaele Teperino, M. Azim Surani, Ilona Zvetkova, Debra Rimmington, Y. C. Loraine Tung, Brian Lam, Rachel Larder, Giles S. H. Yeo, Stephen O'Rahilly, Tanya Vavouri, Emma Whitelaw, Josef M. Penninger, Thomas Jenuwein, Ching-Lung Cheung, Anne C. Ferguson-Smith, Anthony P. Coll, Antje Körner & J. Andrew Pospisilik

Highlights

- Trim28 haploinsufficiency triggers stochastic bi-stable obesity or polyphenism
- Non-classical imprinted gene dysregulation specifies "on" versus "off" obese states

- Peg3 and Nnat perturbation trigger stochastic bi-stable obesity
- Human BMI distributions and transcriptomes suggest Trim28-associated subpopulations

More than one-half billion people are obese, and despite progress in genetic research, much of the heritability of obesity remains enigmatic. Here, we identify a Trim28-dependent network capable of triggering obesity in a non-Mendelian, "on/off" manner. Trim28+/D9 mutant mice exhibit a bi-modal body-weight distribution, with isogenic animals randomly emerging as either normal or obese and few intermediates. We find that the obese-"on" state is characterized by reduced expression of an imprinted gene network including Nnat, Peg3, Cdkn1c, and Plagl1 and that independent targeting of these alleles recapitulates the stochastic bi-stable disease phenotype. Adipose tissue transcriptome analyses in children indicate that humans too cluster into distinct sub-populations, stratifying according to Trim28 expression, transcriptome organization, and obesity-associated imprinted gene dysregulation. These data provide evidence of discrete polyphenism in mouse and man and thus carry important implications for complex trait genetics, evolution, and medicine.

Domack 2016

Eugene Domack, *A great Arctic ice shelf*. nature **530** (2016), 163–164.

Newly mapped features on the floor of the Arctic Ocean suggest that the Arctic basin was once covered by a one-kilometre-thick, flowing ice shelf derived from large ice sheets in eastern Siberia, Arctic Canada and the Barents Sea.

Frazer 2016

Kate Frazer, Joanne E. Callinan, Jack McHugh, Susan van Baarsel, Anna Clarke, Kirsten Doherty & Cecily Kelleher, *Legislative smoking bans for reducing harms from secondhand smoke exposure, smoking prevalence and tobacco consumption*. Cochrane Database of Systematic Reviews **2016**, ii, CD005992. DOI:10.1002/14651858.CD005992.pub3.

Since the first version of this review was published, the current evidence provides more robust support for the previous conclusions that the introduction of a legislative smoking ban does lead to improved health outcomes through reduction in SHS for countries and their populations. The clearest evidence is observed in reduced admissions for acute coronary syndrome. There is evidence of reduced mortality from smoking-related illnesses at a national level. There is inconsistent evidence of an impact on respiratory and perinatal health outcomes, and on smoking prevalence and tobacco consumption.

Hu 2016

Youna Hu, Alena Shmygelska, David Tran, Nicholas Eriksson, Joyce Y. Tung & David A. Hinds, *GWAS of 89,283 individuals identifies genetic variants associated with self-reporting of being a morning person*. Nature Communications **7** (2016), 10448. DOI:10.1038/ncomms10448.

NatComm07-10448-Supplement1.pdf, NatComm07-10448-Supplement2.txt, NatComm07-10448-Supplement3.txt

Circadian rhythms are a nearly universal feature of living organisms and affect almost every biological process. Our innate preference for mornings or evenings is determined by the phase of our circadian rhythms. We conduct a genome-wide association analysis of selfreported morningness, followed by analyses of biological pathways and related phenotypes. We identify 15 significantly associated loci, including seven near established circadian genes (rs12736689 near

RGS16, P=7.0×10E18; rs9479402 near VIP, P=3.9×10E11; rs55694368 near PER2, P=2.6×10E9; rs35833281 near HCRTR2, P=3.7×10E9; rs11545787 near RASD1, P=1.4×10E8; rs11121022 near PER3, P=2.0×10E8; rs9565309 near FBXL3, P=3.5×10E8. Circadian and phototransduction pathways are enriched in our results. Morningness is associated with insomnia and other sleep phenotypes; and is associated with body mass index and depression but we did not find evidence for a causal relationship in our Mendelian randomization analysis. Our findings reinforce current understanding of circadian biology and will guide future studies.

Rietbroek 2016

Roelof Rietbroek, Sandra-Esther Brunnabend, Jürgen Kusche, Jens Schröter & Christoph Dahle, *Revisiting the contemporary sea-level budget on global and regional scales*. PNAS **113** (2016), 1504–1509.

Dividing the sea-level budget into contributions from ice sheets and glaciers, the water cycle, steric expansion, and crustal movement is challenging, especially on regional scales. Here, Gravity Recovery And Climate Experiment (GRACE) gravity observations and sea-level anomalies from altimetry are used in a joint inversion, ensuring a consistent decomposition of the global and regional sea-level rise budget. Over the years 2002–2014, we find a global mean steric trend of 1.38 ± 0.16 mm/y, compared with a total trend of 2.74 ± 0.58 mm/y. This is significantly larger than steric trends derived from in situ temperature/salinity profiles and models which range from 0.66 ± 0.2 to 0.94 ± 0.1 mm/y. Mass contributions from ice sheets and glaciers (1.37 ± 0.09 mm/y, accelerating with 0.03 ± 0.02 mm/y2) are offset by a negative hydrological component (-0.29 ± 0.26 mm/y). The combined mass rate (1.08 ± 0.3 mm/y) is smaller than previous GRACE estimates (up to 2 mm/y), but it is consistent with the sum of individual contributions (ice sheets, glaciers, and hydrology) found in literature. The altimetric sea-level budget is closed by coestimating a remaining component of 0.22 ± 0.26 mm/y. Well above average sea-level rise is found regionally near the Philippines (14.7 ± 4.39 mm/y) and Indonesia (8.3 ± 4.7 mm/y) which is dominated by steric components (11.2 ± 3.58 mm/y and 6.4 ± 3.18 mm/y, respectively). In contrast, in the central and Eastern part of the Pacific, negative steric trends (down to -2.8 ± 1.53 mm/y) are detected. Significant regional components are found, up to 5.3 ± 2.6 mm/y in the northwest Atlantic, which are likely due to ocean bottom pressure variations.

Keywords: sea level | budget | steric | GRACE | altimetry

Significance: Understanding sea-level change is of paramount importance because it reflects climate-related factors, such as the ocean heat budget, mass changes in the cryosphere, and natural ocean/ atmosphere variations. Furthermore, sea-level rise directly affects coastal areas, which has ramifications for its population and economy. From a novel combination of Gravity Recovery And Climate Experiment and radar altimetry data we find over the last 12 y: (i) a larger global steric sea-level rise as previously reported, (ii) a mass contribution to global sea level consistent with mass loss estimates from the world's ice sheets, glaciers, and hydrological sources, and (iii) regionally resolved sea-level budget components which differ significantly from that of the global sea-level budget.

Schaller 2016

Nathalie Schaller et al., *Human influence on climate in the 2014 southern England winter floods and their impacts*. nature climate change (2016), preprint, 1–8. DOI:10.1038/NCLIMATE2927.

NatClimCh2016-Schaller-Supplement.pdf

Nathalie Schaller, Alison L. Kay, Rob Lamb, Neil R. Massey, Geert Jan van Oldenborgh, Friederike E. L. Otto, Sarah N. Sparrow, Robert Vautard, Pascal

Yiou, Ian Ashpole, Andy Bowery, Susan M. Crooks, Karsten Haustein, Chris Huntingford,William J. Ingram, Richard G. Jones, Tim Legg, Jonathan Miller, Jessica Skeggs, DavidWallom, AntjeWeisheimer, SimonWilson & Peter A. Stott and Myles R. Allen

A succession of storms reaching southern England in the winter of 2013/2014 caused severe floods and £451 million insured losses. In a large ensemble of climate model simulations, we find that, as well as increasing the amount of moisture the atmosphere can hold, anthropogenic warming caused a small but significant increase in the number of January days with westerly flow, both of which increased extreme precipitation. Hydrological modelling indicates this increased extreme 30-day-average Thames river flows, and slightly increased daily peak flows, consistent with the understanding of the catchment's sensitivity to longer-duration precipitation and changes in the role of snowmelt. Consequently, flood risk mapping shows a small increase in properties in the Thames catchment potentially at risk of riverine flooding, with a substantial range of uncertainty, demonstrating the importance of explicit modelling of impacts and relatively subtle changes in weather-related risks when quantifying present-day effects of human influence on climate.

Amerika

Liebmann 2016

Matthew J. Liebmann, Joshua Farella, Christopher I. Roos, Adam Stack, Sarah Martini & Thomas W. Swetnam, *Native American depopulation, reforestation, and fire regimes in the Southwest United States, 1492–1900 CE*. PNAS **113** (2016), E696–E704.

Native American populations declined between 1492 and 1900 CE, instigated by the European colonization of the Americas. However, the magnitude, tempo, and ecological effects of this depopulation remain the source of enduring debates. Recently, scholars have linked indigenous demographic decline, Neotropical reforestation, and shifting fire regimes to global changes in climate, atmosphere, and the Early Anthropocene hypothesis. In light of these studies, we assess these processes in coniferdominated forests of the Southwest United States. We compare light detection and ranging data, archaeology, dendrochronology, and historical records from the Jemez Province of New Mexico to quantify population losses, establish dates of depopulation events, and determine the extent and timing of forest regrowth and fire regimes between 1492 and 1900. We present a new formula for the estimation of Pueblo population based on architectural remains and apply this formula to 18 archaeological sites in the Jemez Province. A dendrochronological study of remnant wood establishes dates of terminal occupation at these sites. By combining our results with historical records, we report a model of pre- and post-Columbian population dynamics in the Jemez Province. Our results indicate that the indigenous population of the Jemez Province declined by 87 % following European colonization but that this reduction occurred nearly a century after initial contact. Depopulation also triggered an increase in the frequency of extensive surface fires between 1640 and 1900. Ultimately, this study illustrates the quality of integrated archaeological and paleoecological data needed to assess the links between Native American population decline and ecological change after European contact.

Keywords: archaeology | dendrochronology | Ancestral Pueblo | anthropogenic landscapes | Anthropocene

Significance: Debates about the magnitude, tempo, and ecological effects of Native American depopulation after 1492 CE constitute some of the most contentious issues in American Indian history. Was population decline rapid and catastrophic, with effects extensive enough to change even the earth's atmosphere? Or was depopulation more moderate, with indigenous numbers declining slowly after European colonization? Through a study of archaeology and dendrochronology, we conclude that neither of these scenarios accurately characterizes Pueblo peoples in the Southwest United States. Among the Jemez pueblos of New Mexico, depopulation struck swiftly and irrevocably, but occurred nearly a century after first contact with Europeans. This population crash subsequently altered the local environment, spurring the growth of trees and facilitating the spread of frequent forest fires.

Anthropologie

Eckhardt 2015

Robert B. Eckhardt, Sakdapong Chavanaves & Maciej Henneberg, *Riddle unravel reprised, The role of LB1 in inferences about human functional morphology and phylogeny.* Archäologische Informationen **38** (2015), 453–463.

In his paper titled "The unraveled LB1 (Homo loresiensis) riddle? Some critical comments on the morphology of LB1" Alfred Czarnetzki (2014) argued that LB1, incorrectly designated as Homo loresiensis, is actually a specimen of an orangutan (Pongo abelii loresiensis). Although we agree that LB1 is not a member of a new hominin species, we disagree with Dr Czarnetzki's diagnosis. He bases his conclusion on some poorly observable morphological traits such as the oblique line of the lower jaw and condyle tangent angle of the femur, plus unspeciic characters including rounded orbits, and arbitrary conversion of continuously distributed traits into discrete traits. Some of these traits of LB1 clearly differ from those of the orangutan, e.g. wide interorbital region, while some others, such as those of wrist bones, vaguely echo those of Pongo. As hominoid primates, orangutans show some morphological similarities to humans, but these are not borne out by DNA sequence analyses. Bones and teeth of LB1 yielded only DNA fragments compatible with modern humans, though so far they are interpreted as contamination. Morphological traits of LB1 show disharmony that is a sign of abnormal development and thus LB1 is best interpreted as a pathological modern human.

Keywords: "the hobbit" | developmental disharmony | DNA | Flores | species diagnosis

In seinem Aufsatz "The unraveled LB1 (Homo loresiensis) riddle? Some critical comments on the morphology of LB1" in dieser Zeitschrift legt Alfred Czarnetzki (2014) dar, dass der als LB1 bezeichnete Knochenkomplex fälschlicherweise als Homo loresiensis klassiiziert wird, jedoch tatsächlich als ein Exemplar des Orang-Utan (Pongo abelii loresiensis) anzusprechen sei. Wir stimmen mit ihm darin überein, dass LB1 kein Vertreter einer neuen Spezies ist, möchten aber Czarnetzkis Zuordnung zur Spezies der Orang-Utans widersprechen. Czarnetzki stützt seine Diagnose auf einige nur ungenau beobachtbare morphologische Merkmale wie z.B. die schräge Linie des Unterkiefers und den Kondylen-Tangenten-Winkel am Oberschenkelknochen, auf unspeziische Merkmale wie z.B. gerundete Augenhöhlen, und auf eine ad-hoc Umwandlung kontinuierlich verteilter Merkmale in diskrete Merkmale. Es gibt jedoch Merkmale am LB1, die eindeutig nicht zu Orang-Utans passen, z.B. die breite Interorbital-Region, während einige andere Merkmale wie etwa die der Handwurzelknochen der Gattung Pongo im Großen und Ganzen ents-

prechen. Als hominoide Primaten zeigen Orang-Utans in der Tat einige Ähnlichkeiten zu Menschen, welche aber durch DNA-Analysen nicht bestätigt werden. Aus Knochen und Zähnen des LB1 konnten Fragmente von DNA extrahiert werden, die mit denen moderner Menschen übereinstimmen; dies hat man bislang jedoch als Kontamination interpretiert. Die morphologischen Merkmale von LB1 zeigen eine Disharmonie, die von einem abnormalen Wachstum zeugt, weshalb LB1 am besten als ein moderner und pathologisch veränderter Mensch eingeordnet wird.

Keywords: der "Hobbit" | Entwicklungsstörung | DNA | Flores | Artenbestimmung

Read-Martin 1975

Catherine E. Read-Martin & Dwight W. Read, *Australopithecine Scavenging and Human Evolution, An Approach from Faunal Analysis*. Current Anthropology **16** (1975), 359–368.

The reconstruction of behavior patterns of extinct hominid populations, far removed chronologically, morphologically, and technologically from modern man, has long been important to anthropologists. This paper demonstrates some possibilities for using one archeological techniquefaunal analysis-to establish meaningful hypotheses concerning the way of life of the South African australopithecines. Scavenging is found to be significant for these hominids, and an association is made between scavenging and bipedalism.

Bibel

Faust 2015

Avraham Faust, *The Bible, Archaeology, and the Practice of Circumcision in Israelite and Philistine Societies*. Journal of Biblical Literature **134** (2015), 273–290.

The treatment of the Philistines in the biblical texts as uncircumcised, however, is somewhat peculiar. All the texts that depict the Philistines as uncircumcised are projected to the premonarchic era, regardless of their date, source, or even genre. Not a single text, of whatever nature, uses this pejorative to refer to the Philistines of the monarchic era, and this seems to suggest that the Philistines were practicing circumcision in Iron II. It is not only the clear distinction between the uncircumcised Philistines of Iron I and the not-uncircumcised Philistines of Iron II within the same sources (e.g., within the Deuteronomistic History) that indicates that the Philistines adopted circumcision in Iron II. This is supported also by the fact that all sources of whatever genre never deviate from this division (thus, the Prophets also never call the Philistines uncircumcised).This clear-cut dichotomy seems to suggest that this distinction relects a historical situation and that the Philistines started to circumcise in Iron II.

Datierung

Baillie 2010

M. G. L. Baillie, *Volcanoes, ice-cores and tree-rings, One story or two?* Antiquity **84** (2010), 202–215.

Good archaeology relies on ever more precise dates – obtainable, notably, from ice-cores and dendrochronology. These each provide year-by-year sequences, but they must be anchored at some point to real historical time, by a documented

volcanic eruption, for example. But what if the dating methods don't agree? Here the author throws down the gauntlet to the ice-core researchers – their assigned dates are several years too old, probably due to the spurious addition of 'uncertain' layers. Leave these out and the two methods correlate exactly ...

Keywords: dating | dendrochronology | ice-core | calibration

Baillie 2013

Mike Baillie, *Radical thinking on the Thera debate*. In: Harald Meller & Hans-Rudolf Bork (Hrsg.), *1600 – Kultureller Umbruch im Schatten des Thera-Ausbruchs? 4. Mitteldeutscher Archäologentag vom 14. bis 16. Oktober 2011 in Halle (Saale)*. Tagungen des Landesmuseums für Vorgeschichte Halle 9 (Halle 2013), 65–75.

The date of the eruption of Thera has been the subject of debate for many years and several of the best known dating estimates have become entrenched; particularly ice estimates in the 1640s B. C. and tree-ring estimates in the 1620s B.C. In preparing this paper a list of tree ring minima and frost ring dates was compared with all the volcanic signals in the main Greenland ice cores, namely GISP2 and Dye 3/GRIP/ NGRIP. Simple pattern matching suggested that the best fit of the tree-ring dates versus the ice dates involved moving the ice dates back in time by 25 years; a possibility that would not normally have been considered. Subsequent decoupling of the two main ice records showed that the optimum solution to relating volcanoes – as indicated by ice acidities – to environmental effects – as indicated by tree ring minima and frost ring occurrences – was to retain the GISP2 published dating and move only the Dye 3/GRIP/NGRIP dates. The solution suggested by this data movement would show six environmentally effective eruptions between 1595 B.C. and 1695 B.C. and one eruption, probably Aniakchak, in the 1660s B.C. that had no obvious environmental effects. A curiosity is that the original GISP2 1623 B.C. acid layer, which contained controversial tephra, seems to only show up in that core. The outcome of this speculative analysis is that, based on radiocarbon evidence, Thera could be related to any one of the five volcanoes that have left evidence in ice core and tree ring records between 1650 B. C. and 1595 B. C. With the exception of the GISP2 1623 B.C. layer, none of the others have been searched for tephra from Thera.

Der genaue Zeitpunkt des Vulkanausbruchs des Thera wird nun schon seit vielen Jahren debattiert und einige der bekannten Datierungsvorschläge haben sich in der Forschung fest etabliert. Dies betrifft besonders die Eiskerndatierungen in die 1640er Jahren v.Chr. und die Jahrringdatierungen in die 1620er Jahre v. Chr. Für den vorliegenden Beitrag wurde eine Liste mit Jahrringminima und Frostringdatierungen mit den Vulkanspuren in den wichtigsten Eiskernen aus Grönland – GISP2 und Dye j/GRIP/NGRIP – verglichen. Die Suche nach einem bestimmten Muster legte nahe, die Eiskerndatierungen um 25 Jahren nach hinten zu verschieben, um die Jahrring- und Eiskerndaten einander anzupassen – eine Möglichkeit, die man normalerweise nicht in Erwägung ziehen würde. Die folgende Entkoppelung der beiden wichtigsten Eisdaten zeigte als optimale Lösung, um Vulkanausbrüche (durch Säuregehalte im Eis angezeigt) und Umweltauswirkungen (durch Jahrringminima und Frostringe angezeigt) miteinander zu verbinden, die GISP2 Datierungen beizubehalten und nur die Datierungen der Dye 3/ Grip/ NGRIP zu verschieben. Das Ergebnis dieser Datenverschiebung würde sechs Vulkanausbrüche mit Umweltauswirkungen zwischen 1695 v. Chr. und 1595 v. Chr. zeigen und einen Ausbruch (wahrscheinlich des Aniakchak) in den 1660er Jahren v. Chr. ohne auffallende Auswirkungen auf die Umwelt. Eigenartig ist, dass

die ursprüngliche GISP2 Säureschicht von 1623 v.Chr., die kontroverse Tephra enthielt, lediglich in diesem einen Eiskern vorkam.

Das Ergebnis dieser etwas spekulativen Analyse ist, dass aufgrund von Radiocarbonbefunden der Theraausbruch mit jedem der fünf Vulkanausbrüche in Verbindung gebracht werden könnte, die in Eiskernen und Jahrringen zwischen 1650 v.Chr. und 1595 v.Chr. Spuren hinterlassen haben. Mit Ausnahme der GISP2 Schicht von 1623 v.Chr. wurde keine andere auf Tephra von Thera hin untersucht.

Downey 1984

W. S. Downey & D. H. Tarling, *Archaeomagnetic dating of Santorini volcanic eruptions and fired destruction levels of late Minoan civilization*. nature **309** (1984), 519–523.

Archaeomagnetic dating on the Minoan ash horizons of the Santorini volcano and on fired destruction levels at late Minoan sites on Crete demonstrates that the basal (Plinian) air-fall ash of the first 'Minoan' pumice is contemporaneous with the destruction levels on central Crete, while the higher 'Minoan' ashes are contemporaneous with the destruction levels in extreme eastern Crete. These destruction levels were almost certainly caused by seismic activity, rather than the ash fall. The determination of a time gap between these events lead to a reappraisal of the archaeological evidence and is important volcanologically.

Eggert 1987

Manfred K. H. Eggert & Hans-Peter Wotzka, *Kreta und die absolute Chronologie des europäischen Neolithikums*. Germania **65** (1987), 379–422.

Das Ergebnis unserer Untersuchung ist eindeutig. Es läßt sich in einem Satz ausdrücken: Das von Milojcic errichtete System der absoluten Chronologie des ägäischen und kontinentalen Neolithikums ist eine Fiktion. Die von ihm aufgestellte Beweiskette für eine angeblich solide Fundierung der absolut-zeitlichen Ansätze muß in toto und ohne jede Einschränkung zurückgewiesen werden. Dies gilt nicht nur für die direkte, über Kreta führende Verbindung, sondern – wie in einer anderen Arbeit gezeigt wurde — auch für jenen Weg, der über Mersin und Mesopotamien nach Ägypten führt. Das Fazit ist somit klar: Die absolute Chronologie des ägäischen und kontinentalen Neolithikums hängt an einem in spätneolithischem kretischen Kontext gefundenen Bodenfragment eines ägyptischen Zylindergefäßes, das in die Zeit der 1. bis 6. Dynastie datiert. Die mit diesem Importstück gekoppelte Datierungsunsicherheit umfaßt somit eine Zeitspanne von mindestens 700 Jahren.

Es bleibt nur noch darauf hinzuweisen, daß die hier für mehr oder weniger tragfähig erachteten "Fixpunkte" nicht nur durch den ihnen inhärenten absolutzeitlichen Unsicherheitsfaktor die an sie gestellten Ansprüche nur sehr unvollkommen zu erfüllen vermögen. Sie unterliegen darüber hinaus der generellen Problematik des Prinzips der kleinen Zahl, das jedwede auf einer derartigen Basis getroffenen Schlußfolgerungen ganz erheblich relativiert. Dies gilt zweifellos in einem ganz besonderen Maße für das komplexe Feld von Importbeziehungen.

Die Implikationen der vorliegenden Abhandlung reichen über unser hier im Vordergrund stehendes Anliegen einer Überprüfung der Basis der historischen, komparativ-stratigraphischen absoluten Datierung des Neolithikums hinaus. Sie transzendieren auch das parallele Problem der entsprechenden Fundierung der Chronologie der Bronzezeit. Es ist offenbar, daß nunmehr der heute weithin akzeptierte, jeweils zugunsten der einen oder der anderen Seite entschiedene Widerspruch von Radiokohlenstoff- und komparativ-stratigraphischer Datierung in einem

gänzlich neuen Lichte erscheint. Das auf letzterem Wege gewonnene Chronologie-System fällt als historisches Korrektiv der Radiokarbon-Datierung aus.

Keenan 2003

Douglas J. Keenan, *Volcanic ash retrieved from the GRIP ice core is not from Thera.* Geochemistry Geophysics Geosystems **4** (2003), 1097.

Tephra found in an ice core from Greenland (GRIP) has been claimed to be from the Minoan eruption of Thera (Santorini), Greece. If true, this would date the eruption, thereby resolving a decades-long debate in chronology. Herein, it is shown that the methods used to match the Greenlandic tephra with Thera are flawed and that the geochemical data imply the tephra is not from Thera.

Keywords: Tephrochronology | Thera | Santorini | ice core

Klontza-Jaklová 2007

Vera Klontza-Jaklová, *Datierung der Katastrophe von Santorini, Kurze Zusammenfassung des bisherigen Standes der Forschung und vorherrschende Tendenzen.* Anodos (2007), Supplementum 4, 13–57.

Auch trotz sehr intensiver Forschung, die viele Probleme beleuchtete und ans Tageslicht viele neue Feststellungen gebracht hatte, wurden bisher folgende Fragen gerade hinsichtlich der ägyptischen Chronologie nicht eindeutig beantwortet:
1. Ist es zu der Katastrophe von Santorini während der Zweiten Zwischenperiode oder in der Zeit der Regierung der frühen 18. Dynastie gekommen?
2. Ist die Periode LMIA chronologisch zeitgleich mit dem Schluss der Zweiten Zwischenperiode oder übergreift sie in die frühe 18. Dynastie?
3. Ist es möglich, dass die ägyptische Chronologie länger sein könnte und die 18. Dynastie trat früher als wir heute denken?

Vorläufig ist der Streit zwischen der hohen und niedrigen Chronologie eindeutig nicht entschieden.

Kuniholm 1990

Peter Kuniholm, *Overview and Assessment of the Evidence for the Date of the Eruption of Thera.* In: D. A. Hardy & A. C. Renfrew (Hrsg.), *Thera and the Aegean World III, Vol. 3: Chronology, Proceedings of the Third International Congress, Santorini, Greece, 3–9 September 1989.* (London 1990), 13–18.

What I propose to do is to survey some of the heterogeneous evidence for the dating of the eruption of Thera and, where possible, give my subjective assessment of the validity of each bit of evidence, both individually and collectively. I should add that I have been extremely skeptical of 'big-bang' approaches to history, but I now believe that in certain circumstances, especially when there are multiple, converging lines of evidence, one is sometimes justified in looking for 'big bangs' and their effects.

Although at least one scholar (Betancourt 1987) has voiced open support for a higher dating system for the Aegean late Bronze Age, for many other colleagues the jury is still out. I, for one, find it difficult to believe that something as cataclysmic as the Theran eruption could have taken place without causing world-wide tremors or reactions and am therefore inclined to favor the earlier date because of what I believe to be the more than accidental clustering of the bristlecone pine frost rings, the extraordinarily narrow bands in the Northern Irish oak, the acidity layer in the Greenland ice cores, and the bulk of the radiocarbon determinations, all around 1628-1627 BC, possibly corroborated by the silence from Egypt and more distant events commented on by Kevin Pang (1985) who believes that the

1628 event is the same one that ushered in the beginning of the Shang Dynasty in China, as reported in the Bamboo Annals for 1618 BC: 'yellow fog, a dim sun, then three suns, frost in July, famine, and the withering of all five cereals.' The Chinese evidence is not entirely secure as to its date, the Annals having been found, lost, and then recovered, and the question of the Shang Dynasty and its dates really depends on one line in the text (information from Professor Martin Bernal at Cornell), but these phenomena are symptomatic of a large volcanic eruption such as the one which now preoccupies us and which certainly must have had a global rather than a purely local impact.

Manning 1998

Sturt W. Manning, *Correction. New GISP2 Ice-Core Evidence Supports 17th Century BC Date for the Santorini (Minoan) Eruption, Response to Zielinski & Germani (1998).* Journal of Archaeological Science **25** (1998), 1039–1042.

In correction to the interpretation of Zielinski & Germani (1998), the tephra shards from the 1623 bc layer of the GISP2 ice-core do not discount the likelihood of a 1628 bc date for the Minoan eruption of the Santorini volcano. In fact, excitingly, they provide the first tangible evidence in strong support of a later 17th century bc date for the Santorini eruption. The 1623 ± 36 bc date is entirely compatible with the previous suggestions of a 1628/27 bc date from treering data (LaMarche & Hirschboeck, 1984; Baillie & Munro, 1988; Kuniholm et al., 1996) or a c. 1636 ± 7 bc or 1644 ± 7 bc (realistic error therefore c. ± 20 years?) date from other ice-core evidence (Hammer et al., 1987; Clausen et al., 1997), or the most likely date range from the radiocarbon evidence relevant to the eruption (Manning, 1995: 200–216). At this time a 1628 bc date for the Santorini eruption remains the best working hypothesis from all scientific data. This does not, of course, mean that it is correct. Further positive confirmation and replication must now be sought, both from the ice-core data (including traceelement analysis and if possible refractive index data), and also potentially from the establishment of a direct physical link between volcanic activity and tree-rings along the lines of the analyses of Hall, Yamaguchi & Rettberg (1990).

Keywords: Santorini | Thera | Ice-Cores | Tree-Rings | Dendrochronology | Volcanoes

Pearce 2004

Nicholas J. G. Pearce, John A. Westgate, Shari J. Preece, Warren J. Eastwood & William T. Perkins, *Identification of Aniakchak (Alaska) tephra in Greenland ice core challenges the 1645 BC date for Minoan eruption of Santorini.* Geochemistry Geophysics Geosystems **5** (2004), Q3005.

Minute shards of volcanic glass recovered from the 1645 ± 4 BC layer in the Greenland GRIP ice core have recently been claimed to originate from the Minoan eruption of Santorini [Hammer et al., 2003]. This is a significant claim because a precise age for the Minoan eruption provides an important time constraint on the evolution of civilizations in the Eastern Mediterranean. There are however significant differences between the concentrations of SiO2, TiO2, MgO, Ba, Sr, Nb and LREE between the ice core glass and the Minoan eruption, such that they cannot be correlatives. New chemical analyses of tephra from the Late Holocene eruption of the Aniakchak Volcano in Alaska, however, show a remarkable similarity to the ice core glass for all elements, and this eruption is proposed as the most likely source of the glass in the GRIP ice core. This provides a precise date of 1645 BC

for the eruption of Aniakchak and is the first firm identification ofAlaskan tephra in the Greenland ice cores. The age of theMinoan eruption of Santorini, however, remains unresolved.

Keywords: Aniakchak | tephra | Minoa | Santirini | ice core

Pichler 1978

H. Pichler & W. Schiering, *Der Ausbruch des Thera-Vulkans um 1500 v. Chr. Archäologische Datierung, Eruptionsverlauf und Auswirkungen auf die minoische Kultur Kretas*. Naturwissenschaften **65** (1978), 605–610.

The stylistic development of the painted pottery from the excavations of Akrotiri on Thera evidences that the great Late-Minoan eruption of the Thera volcano must be dated around 1500 B.C. The eruption had only minor effects on Crete which were not nearly so serious as has been supposed. The rate of ash fall and the height of the tsunamis did not play a significant role. After the Thera eruption Minoan trade and culture flourished as before. This means that the decline of the Minoan civilization was neither caused nor influenced by this volcanic event as suggested by the Marinatos theory. The Minoan decline was substantially initiated by great devastations in Crete which occurred, according to the ceramic chronology, around 1450 B.C. These destructions were the result of one or several violent regional tectonic earthquake(s) in combination with severe internal revolts.

Pike 2016

Alistair W. G. Pike, Dirk L. Hoffmann, Paul B. Pettitt, Marcos García-Diez & João Zilhão, *Dating Palaeolithic cave art, Why U-Th is the way to go*. Quaternary International (2016), preprint, 1–9. DOI:10.1016/j.quaint.2015.12.013.

The chronology of European Upper Palaeolithic cave art is poorly known. Three chronometric techniques are commonly applicable: AMS 14C, TL and U-Th, and in recent years the efficacy of each has been the subject of considerable debate. We review here the use of the U-Th technique to date the formation of calcites that can be shown to have stratigraphic relationships to cave art. We focus particularly on two recent critiques of the method. By using specific examples from our own work using this method in Spain, we demonstrate how these critiques are highly flawed and hence misleading, and we argue that the U-Th dating of calcites is currently the most reliable of available chronometric techniques for dating cave art.

Keywords: Uranium-Thorium | Chronology | Cave art | Paleolithic | Calcite

Zielinski 1998

Gregory A. Zielinski & Mark S. Germani, *New Ice-Core Evidence Challenges the 1620s BC age for the Santorini (Minoan) Eruption*. Journal of Archaeological Science **25** (1998), 279–289.

Determining a reliable calendrical age of the Santorini (Minoan) eruption is necessary to place the impact of the eruption into its proper context within Bronze Age society in the Aegean region. The high-resolution record of the deposition of volcanically produced acids on polar ice sheets, as available in the SO4(2-) time series from ice cores (a direct signal), and the high-resolution record of the climatic impact of past volcanism inferred in tree rings (a secondary signal) have been widely used to assign a 1628/1627 bc age to the eruption. The layer of ice in the GISP2 (Greenland) ice core corresponding to 1623 ± 36 bc, which is probably correlative to the 1628/1627 bc event, not only contains a large volcanic-SO4(2-) spike, but it contains volcanic glass. Composition of this glass does not

match the composition of glass from the Santorini eruption, thus severely challenging the 1620s bc age for the eruption. Similarly, the GISP2 glass does not match the composition of glass from other eruptions (Aniakchak, Mt. St. Helens, Vesuvius) thought to have occurred in the 17th century bc nor does it match potential Icelandic sources. These findings suggest that an eruption not documented in the geological record is responsible for the many climate-proxy signals in the late 1620s bc. Although these findings do not unequivocally discount the 1620s bc age, we recommend that 1628/1627 bc no longer be held as the "definitive" age for the Santorini eruption.

Keywords: Santorini (Thera) | Ice Cores | Tephra | Bronze Age | Minoan Civilization

Energie

Bonatesta 2016

F. Bonatesta, G. Altamore, J. Kalsi & M. Cary, *Fuel economy analysis of part-load variable camshaft timing strategies in two modern small-capacity spark ignition engines*. Applied Energy **164** (2016), 475–491.

Variable Camshaft Timing strategies have been investigated at part-load operating conditions in two 3cylinder, 1.0-litre, Spark Ignition engines. The two small-size engines are different variants of the same 4valve/cylinder, pent-roof design platform. The first engine is naturally aspirated, port fuel injection and features high nominal compression ratio of 12:1. The second one is the turbo-charged, direct injection version, featuring lower compression ratio of 10:1. The aim of the investigation has been to identify optimal camshaft timing strategies which maximise engine thermal efficiency through improvements in brake specific fuel consumption at fixed engine load.

The results of the investigation show that the two engines demonstrate consistent thermal efficiency response to valve timing changes in the low and mid part-load envelope, up to a load of 4 bar BMEP. At the lower engine loads investigated, reduced intake valve opening advance limits the hot burned gas internal recirculation, while increasingly retarded exhaust valve opening timing favours engine efficiency through greater effective expansion ratio. At mid load (4 bar BMEP), a degree of intake advance becomes beneficial, owing mostly to the associated intake de-throttling. In the upper part-load domain, for engine load of 5 bar BMEP and above, the differences between the two engines determine very different efficiency response to the valve timing setting. The lower compression ratio engine continues to benefit from advanced intake valve timing, with a moderate degree of exhaust timing retard, which minimises the exhaust blow-down losses. The higher compression ratio engine is knock-limited, forcing the valve timing strategy towards regions of lower intake advance and lower hot gas recirculation. The theoretical best valve timing strategy determined peak fuel economy improvements in excess of 8 % for the port fuel injection engine; the peak improvement was 5 % for the more efficient direct injection engine platform.

Keywords: Variable camshaft timing | Variable valve timing | Down-sized engine | Cylinder charge dilution | Direct injection | Fuel economy

Dou 2016

Xuan Dou, Andrew R. Koltonow, Xingliang He, Hee Dong Jang, Qian Wang, Yip-Wah Chung & Jiaxing Huang, *Self-dispersed crumpled graphene balls in oil for friction and wear reduction*. PNAS **113** (2016), 1528–1533.

Ultrafine particles are often used as lubricant additives because they are capable of entering tribological contacts to reduce friction and protect surfaces from wear. They tend to be more stable than molecular additives under high thermal and mechanical stresses during rubbing. It is highly desirable for these particles to remain well dispersed in oil without relying on molecular ligands. Borrowing from the analogy that pieces of paper that are crumpled do not readily stick to each other (unlike flat sheets),we expect that ultrafine particles resembling miniaturized crumpled paper balls should selfdisperse in oil and could act like nanoscale ball bearings to reduce friction and wear. Here we report the use of crumpled graphene balls as a high-performance additive that can significantly improve the lubrication properties of polyalphaolefin base oil. The tribological performance of crumpled graphene balls is only weakly dependent on their concentration in oil and readily exceeds that of other carbon additives such as graphite, reduced graphene oxide, and carbon black. Notably, polyalphaolefin base oil with only 0.01–0.1 wt % of crumpled graphene balls outperforms a fully formulated commercial lubricant in terms of friction and wear reduction.

Keywords: lubrication | tribology | aggregation-resistant particles | graphene

Significance: Aggregation is a major problem for ultrafine particle additives in lubricant oil because it reduces the effective particle concentrations, prevents particles from entering the contact area of working surfaces, and leads to unstable tribological performance. Molecular ligands can help the particles to disperse, but they tend to degrade under the harsh tribological conditions. Therefore, self-dispersed particles without the need for surfactant are highly desirable. We report here, for the first time to our knowledge, such type of ultrafine particles made of crumpled, paper-ball–like graphene, which indeed can self-disperse in lubricant oil, and exhibit stable and superior tribological performances.

Klima

Boos 2016

William R. Boos & Trude Storelvmo, *Near-linear response of mean monsoon strength to a broad range of radiative forcings*. PNAS **113** (2016), 1510–1515.

Theoretical models have been used to argue that seasonal mean monsoons will shift abruptly and discontinuously from wet to dry stable states as their radiative forcings pass a critical threshold, sometimes referred to as a "tipping point." Further support for a strongly nonlinear response of monsoons to radiative forcings is found in the seasonal onset of the South Asian summer monsoon, which is abrupt compared with the annual cycle of insolation. Here it is shown that the seasonal mean strength of monsoons instead exhibits a nearly linear dependence on a wide range of radiative forcings. First, a previous theory that predicted a discontinuous, threshold response is shown to omit a dominant stabilizing term in the equations of motion; a corrected theory predicts a continuous and nearly linear response of seasonal mean monsoon strength to forcings. A comprehensive global climate model is then used to show that the seasonal mean South Asian monsoon exhibits a near-linear dependence on a wide range of isolated greenhouse gas, aerosol, and surface albedo forcings. This model reproduces the observed abrupt seasonal onset of the South Asian monsoon but produces a near-linear response of the mean monsoon by changing the duration of the summer circulation and the latitude of that circulation's ascent branch. Thus, neither a physically correct theoretical model nor a comprehensive climate model support the idea that seasonal mean monsoons will undergo abrupt, nonlinear shifts in response to changes in greenhouse gas concentrations, aerosol emissions, or land surface albedo.

Keywords: monsoons | tropical climate | tipping points

Significance: Previous studies have argued that monsoons, which are continentalscale atmospheric circulations that deliver water to billions of people, will abruptly shut down when aerosol emissions, land use change, or greenhouse gas concentrations reach a critical threshold. Here it is shown that the theory used to predict such "tipping points" omits a dominant term in the equations of motion, and that both a corrected theory and an ensemble of global climate model simulations exhibit no abrupt shift inmonsoon strength in response to large changes in various forcings. Therefore, although monsoons are expected to change in response to anthropogenic forcings, there is no reason to expect an abrupt shift into a dry regime in the next century or two.

Sharifi 2015

Arash Sharifi et al., *Abrupt climate variability since the last deglaciation based on a high-resolution, multi-proxy peat record from NW Iran, The hand that rocked the Cradle of Civilization?* Quaternary Science Reviews **123** (2015), 215–230.

qsr123-0215-Supplement1.xlsx, qsr123-0215-Supplement2.docx

Arash Sharifi, Ali Pourmand, Elizabeth A. Canuel, Erin Ferer-Tyler, Larry C. Peterson, Bernhard Aichner, Sarah J. Feakins, Touraj Daryaee, Morteza Djamali, Abdolmajid Naderi Beni, Hamid A. K. Lahijani & Peter K. Swart

We present a high-resolution (sub-decadal to centennial), multi-proxy reconstruction of aeolian input and changes in palaeohydrological conditions based on a 13000 Yr record fromNeor Lake's peripheral peat in NW Iran.Variations inrelative abundancesof refractory (Al,Zr, Ti, andSi), redox sensitive (Fe)andmobile(KandRb) elements, total organic carbon (TOC), d13CTOC, compound-specific leaf wax hydrogen isotopes (dD), carbon accumulation rates and dust fluxes presented here fill a large gap in the existing terrestrial paleoclimate records from the interior of West Asia. Our results suggest that a transition occurred from dry and dusty conditions during the YoungerDryas (YD) to a relativelywetter periodwith higher carbon accumulation rates and lowaeolian input during the early Holocene (9000–6000 Yr BP). This period was followed by relatively drier and dustier conditions during middle to late Holocene,which is consistent with orbital changes in insolation that affected much of the northern hemisphere. Numerous episodes of high aeolian input spanning a few decades to millennia are prevalent during the middle to late Holocene. Wavelet analysis of variations in Ti abundances as a proxy for aeolian input revealed notable periodicities at 230, 320, and 470 years with significant periodicities centered around 820, 1550, and 3110 years over the last 13000 years. Comparison with palaeoclimate archives fromWest Asia, theNorth Atlantic andAfrican lakes point to a teleconnection between NorthAtlantic climate andthe interiorofWest Asiaduring the last glacial terminationandtheHoloceneepoch. We further assess the potential role of abrupt climate change on early human societies by comparing our record of palaeoclimate variability with historical, geological and archaeological archives from this region. The terrestrial record from this study confirms previous evidence from marine sediments of the Arabian Sea that suggested climate change influenced the termination of the Akkadian empire. In addition, nearly all observed episodes of enhanced dust deposition during the middle to late Holocene coincided with times of drought, famine, and power transitions across the Iranian Plateau, Mesopotamia and the eastern Mediterranean region. These findings indicate that while socio-economic factors are traditionally considered to shape ancient human societies in this region, the influence of abrupt climate change should not be underestimated.

Keywords: Holocene climate | Compound-specific biomarker | Cradle of Civilization | Atmospheric dust | Ombrotrophic peat | Younger Dryas | Iran

Kupfer

Barteilheim 1998

Martin Bartelheim, Elke Niederschlag & Thilo Rehren, *Research into prehistoric metallurgy in the Bohemian/Saxon Erzgebirge*. In: Bernhard Hänsel (Hrsg.), *Mensch und Umwelt in der Bronzezeit Europas – Man and Environment in European Bronze Age, Abschlußtagung: Die Bronzezeit, das erste goldene Zeitalter Europas, Berlin, 17.–19. März 1997*. (Kiel 1998), 225–229.

The metal/metal oxide part is highly tin dominated. The metal phase consists entirely of the 8-phase from the copper-tin system which contains about 34 wt % tin, i. e. the content is much higher than in typical tin bronzes, which normally do not exceed 10 or 15 wt % tin. The oxides in this sample are not simple tin oxide (SnO2, cassiterite), but contain very homogeneously about 15 wt % CuO, 5 to 10 wt % FeO and SiO2 each, and a few percent P2O5. These complex tin oxide phases differ clearly in size and shape from usual tin oxides found in burnt bronze. Particularly the bigger and rounded individuals can be interpreted as the residual oxides from unsmelted ore.

The ceramic is permeated with metal and oxide phases (phases of the Cu-Sn-system, SnO2 and CuO). The content of these phases decreases from the surface to the inner part of the fragment. The dominating metal phase at the surface is the 8-phase of the copper-tin system. It is interspersed with the d-phase (Fig. 5). Both phases contain several wt % Ni and Co. A phase with more than 90 wt % tin was analyzed accessorically. It was found that the tin oxides predominate over the copper oxides. The texture of the oxides corresponds to the usual oxidized bronzes which contain grains of metal with oxidized margins. Therefore the oxides can be interpreted as products of the partial oxidation of metals.

The high content of tin as oxides and in the metal phases indicates the processing of pure tin or at least an alloy with more than 50 wt % tin. The great depth of penetration by the metal and oxide phases into the ceramic is unusual. It suggests that the fragment was not only the product of a simple melting process. Probably it was involved in a process in which a tin-rich melt was alloyed with copper to produce bronze which could be cold-hammered.

Meliksetian 2011

K. Meliksetian, R. Schwab, S. Kraus, E. Pernicka & M. Brauns, *Chemical, lead isotope and metallographic analysis of extraordinary arsenic-rich alloys used for jewellery in Bronze Age Armenia*. Metalla.S **4** (2011), Sonderheft 4, 211–212.

Although the temperature of the eutectic in the Cu-As system is much lower (685 °C for melt containing 21 % As) it is nevertheless much higher than sublimation point of As (615 °C), so that ancient craftsmen must have used an advanced smelting technology to produce such unusual alloys.

Maran 2000

Joseph Maran, *Das Megaron im Megaron, Zur Datierung und Funktion des Antenbaus im Mykenischen Palast von Tiryns.* Archäologischer Anzeiger **2000**, 1–16.

Bei Betrachtung der kulturellen Gesamtentwicklung am Übergang von der Spätbronzezeit zur Eisenzeit in Tiryns, aber auch allgemein in Südgriechenland, verliert die These einer Kontinuität des Antenbaus ins 1. Jt.v.Chr. vollends ihre Überzeugungskraft. Genauso wie die Ausgrabungen von Kilian in der Unterburg gezeigt haben, daß sich bis zur Mitte der Phase SH III C das Gemeinwesen auf einem gegenüber der Palastzeit niedrigeren Niveau gefestigt hatte, wurde auch klar, daß es im späten SH III C zu Verfallserscheinungen kam, die schließlich die Aufgabe der lächendeckenden Besiedlung auf der Unterburg zur Folge hatten. Die Gründe für diesen schweren Rückschlag, der das Schicksal der mykenischen Kultur endgültig besiegelte, sind noch unbekannt, doch halte ich es für unwahrscheinlich, daß nur der Antenbau diese Ereignisse unbeschadet überdauert hat. Vielmehr dürften die Nachblüte der mykenischen Kultur und mit ihr die restaurativen Bestrebungen lediglich ein Zwischenspiel gewesen sein, dem der Umbruch im späten SH III C ein Ende bereitete. Der Antenbau und die anzunehmende zeitgleiche Bebauung der Oberburg wurden in dieser Zeit wahrscheinlich ebenso aufgegeben wie die Unterburg. Wenn es ein geometrisches bis archaisches großes Kultgebäude in Tiryns gegeben hat, so lag es jedenfalls nicht im Bereich des Großen Megarons. Die Annahme eines in Rückbesinnung auf das mykenische Zeitalter errichteten eisenzeitlichen Tempels ist somit, wie schon E.-L. Schwandner festgestellt hat42, in jedem Fall zurückzuweisen. Dennoch bleibt das in der Vergangenheit als "Tempel" bezeichnete letzte mykenische Megaron der Oberburg für die Baugeschichte der Eisenzeit bedeutsam, da die unleugbare hnlichkeit zu den späteren Kultbauten vor Augen führt, daß schon kurz nach der Zerstörung der mykenischen Paläste eine architektonische Formensprache geprägt wurde, die in der Folgezeit bestimmend werden sollte.

Maran 2001

Joseph Maran, *Political and Religious Aspects of Architectural Change on the Upper Citadel of Tiryns, The case of building T.* Aegaeum **22** (2001), 113–122.

In summary, the new insights concerning the relation of Building T to the Great Megaron lead to an ambivalent picture of post-palatial Tiryns. It is now certain, that not only in the cult area of the Lower Citadel, but also in the centre of Mycenaean power on the Upper Citadel there existed a line of continuity connecting the time before and after the destruction at the end of LH IIIB. The renewed claim on the most prestigious building plot of the acropolis and the reference to the ground-plan of the Great Megaron indicate, that a segment of society attempted to restore parts of the old social order and to legitimize their power by linking it to an old tradition. As it seems, similar events did not occur in the central Megaron-complexes of Pylos and Mycenae, and this is further evidence supporting the view of a special position of Tiryns in the power structure of the Argolid during LH IIIC. Nevertheless, in spite of the restorative attempts, this post-palatial elite did not have nearly the same power at their disposal as their predecessors in the 13th century B.C. Above all, this is demonstrated by the modest construction of Building T in comparison to the Great Megaron as well as the limited clearance of the Upper Citadel from the debris of the catastrophe, symbolizing the inability of the upper class of post-palatial Mycenaean Tiryns to carry out an ambitious

building program comparable, for instance, to the one in the mid of the 13th century B.C. Besides these obvious signs of a decline in the quality of architecture, I tried to show, that there is additional evidence suggesting a changed perception of the elite. Characteristic are the indications for the reference to the past as a means of legitimizing the existing political power. This may mark the beginning of the glorification of the palatial era and in this way anticipate phenomena, which would become conspicuous during the Iron Age, the main difference consisting in the fact, that the people in the 12th century B.C. did not appeal to a mythical past, but rather to a past they still knew very well. If our interpretation is correct the specific way of turning to the past reflects the weakness of rulership. Although the mere existence of the place of the throne suggests a social hierarchy still focussing on one person, and although this person probably had the responsibility of carrying out cultic activities in the public, the actual power and political authority of this ruler were limited and his position rather fragile. He may still have claimed the title wanax, but clearly, the days of the strong king of this designation had gone forever, and the process leading to the basileus of the Iron Age had begun.

Methoden

Allison 2016

David B. Allison, Andrew W. Brown, Brandon J. George & Kathryn A. Kaiser, *A tragedy of errors*. nature **530** (2016), 27–29.

Mistakes in peer-reviewed papers are easy to find but hard to fix, report David B. Allison and colleagues.

Our work was not a systematic search; we simply looked more closely at papers that caught our eye and that we were prepared to assess. We do not know the rate of errors or the motivations behind them (that is, whether they are honest mistakes or a 'sleight of statistics'). But we showed that a small team of investigators with expertise in statistics and experimental design could find dozens of problematic papers while keeping abreast of the literature. Most were detected simply by reading the paper.

Religion

Clines 2016

David J. A. Clines, *Gendering the Magnificat*. unknown (2016), preprint, 1–8.

Mary's Magnificat (Luke 1:46–55) is an enchanting text that has inspired composers, liberation theologians and countless of the faithful—and feminist writers also. But from the perspective of a gender analysis, it is also a shocking text for its incorporation into the words of a female character so much masculine ideology. Hardly a word of it fails to reflect male language, and it is ripe for an exposure of its ideological bias.

Here I plan to undertake a gender analysis of the Magnificat, asking how the three main characters in the poem are constructed—God, Mary, and the others.

If what I have argued amounts to a disenchantment of an enchanting text, there is a loss; but also a gain. For I think that disenchantment especially of sacred texts is the proper task of critical scholarship. Its purpose is not to remove magic (enchantment) from our lives or our texts but to dethrone it and show it for what it is.

Vosteen 2015

Markus Vosteen, *Subjektivische Paradigmen und Religiosität, Eine soziologische Ergänzung des paläogenetischen Ansatzes.* Archäologische Informationen **38** (2015), 465–465.

The biological explanation for the origin of religiosity presented in this journal in 2014 is here supplemented by a sociological approach. It is proposed that the reduction of instincts in human neonates provides a selective advantage resulting from a genetic predisposition. This reduction of instincts, combined with a subjective world-view which develops in the postnatal ontogenesis of every individual (the so-called historico-genetic theory), could lead to the origin of religions. This leads to the conclusion that it is unlikely that early forms of religiosity are dependent on economic systems – an evolutionary separation into the occurrence of animism in hunter-gatherer societies and the belief in gods in agricultural societies is not possible. This interpretation is supported by ethnographic evidence.

Keywords: religion | religiosity | sociology | historico-genetic theory | evolutionism | Palaeolithic

Der 2014 in dieser Zeitschrift vorgestellten biologischen Erklärung des Ursprungs der Religiosität wird hier eine soziologische Ergänzung an die Seite gestellt. Als Selektionsvorteil, der sich durch eine genetische Veranlagung ergibt, wird die Instinktreduktion menschlicher Neonaten vorgeschlagen. Diese könnte zusammen mit einer in der nachgeburtlichen Ontogenese jedes Individuums entstehenden subjektivischen Weltansicht (sog. historisch-genetische Theorie) zur Entstehung von Religionen führen. Daraus wird gefolgert, dass es unwahrscheinlich ist, dass frühe Arten der Religiosität an Wirtschaftsweisen gekoppelt sind – eine evolutionäre Trennung in Auftreten des Animismus bei Wildbeutern und Götterglaube in Bauernkulturen lässt sich nicht vornehmen. Ethnologische Befunde stützen diese Interpretation.

Keywords: Religion | Religiosität | Soziologie | historisch-genetische Theorie | Evolutionismus | Paläolithikum