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Literatur

Aktuell

Aydin 2011

Murat Aydin et al., *Recent decreases in fossil-fuel emissions of ethane*. nature **476** (2011), 198–201.

n476-0198-Supplement1.pdf, n476-0198-Supplement2.xls

Murat Aydin, Kristal R. Verhulst, Eric S. Saltzman, Mark O. Battle, Stephen A. Montzka, Donald R. Blake, Qi Tang & Michael J. Prather

Methane and ethane are the most abundant hydrocarbons in the atmosphere and they affect both atmospheric chemistry and climate. Both gases are emitted from fossil fuels and biomass burning, whereas methane (CH4) alone has large sources from wetlands, agriculture, landfills and waste water. Here we use measurements in firn (perennial snowpack) air from Greenland and Antarctica to reconstruct the atmospheric variability of ethane (C2H6) during the twentieth century. Ethane levels rose from early in the century until the 1980s, when the trend reversed, with a period of decline over the next 20 years. We find that this variability was primarily driven by changes in ethane emissions from fossil fuels; these emissions peaked in the 1960s and 1970s at 14-16 teragrams per year (1 Tg = 1E12 g) and dropped to 8–10 Tg yr-1 by the turn of the century. The reduction in fossil-fuel sources is probably related to changes in light hydrocarbon emissions associated with petroleum production and use. The ethane-based fossil-fuel emission history is strikingly different from bottom-up estimates of methane emissions from fossil-fuel use1,2, and implies that the fossil-fuel source of methane started to decline in the 1980s and probably caused the late twentieth century slow-down in the growth rate of atmospheric methane3,4.

Baldocchi 2011

Dennis Baldocchi, *The grass response*. nature **476** (2011), 160–161.

A three-year study provides insights into how the productivity of a semi-arid rangeland, containing grasses using different photosynthetic pathways, will change in a warmer world with more atmospheric carbon dioxide.

However, users of this new information must appreciate the conditional aspects of Morgan and colleagues' results. Shortterm studies of elevated CO2, over single to several growing seasons, manipulate the ecosystem's eco-physiological 'knobs', such as stomatal conductance, leaf-area index and the soil-water balance. In such circumstances, elevated CO2 will indeed cause stomata to close partially, restricting leaf transpiration and conserving soil moisture. But enhanced growth increases the population of leaves and so counteracts potential soil-moisture savings—up to a limit.

Ginsparg 2011

Paul Ginsparg, *ArXiv at 20*. nature **476** (2011), 145–147.

Paul Ginsparg, founder of the preprint server, reflects on two decades of sharing results rapidly online – and on the future of scholarly communication.

Even today, fields vary hugely in how they recognize intellectual precedence. It baffles me that scientists in some fields can announce a result in a public forum, such as a meeting, while another group can reproduce the results, publish first in a journal, and be given complete intellectual precedence, as though the information did not exist until vetted by the referee process. Journal editors and referees should make more effort to ensure proper attribution is given to publicly accessible materials in a stable resource, such as arXiv.

Heimann 2011

Martin Heimann, *Enigma of the recent methane budget*. nature **476** (2011), 157–158.

The previously increasing atmospheric methane concentration has inexplicably stalled over the past three decades. This may be due to a fall in fossil-fuel emissions or to farming practices that are curtailing microbial sources.

Aydin and colleagues2 offer new information on the history of methane emissions from fossil fuels in the Northern and Southern Hemispheres over the past 60 years. Their results are surprising. Whereas the emissions deduced for biomass burning are consistent with independent bottom-up estimates, the inferred history of fossil-fuelderived methane emissions before 1980 is strikingly different – double the estimates from standard databases based on the statistics of fossil-fuel production. During 1980-2000, the record of fossil-fuel methane emissions shows an almost 30 % decline, which would go a long way towards explaining the observed decrease in the global methane growth rate.

Surprisingly, Kai et al. find that a reduction in the fossil-fuel methane source is not compatible with their measurements, and that the isotope record can be explained only by a reduction in the microbial sources in the Northern Hemisphere. A drying trend in northern wetlands could have contributed to this finding6, but the authors convincingly show that methane emissions from rice agriculture, particularly in China, must also have decreased. Their conclusion is based on changes in agricultural practices: new highyield rice species, together with greater application of fertilizer, require shorter inundation periods, making substantial water savings and reducing methane emissions.

Kai 2011

Fuu Ming Kai, Stanley C. Tyler, James T. Randerson & Donald R. Blake, *Reduced methane growth rate explained by decreased Northern Hemisphere microbial sources*. nature **476** (2011), 194–197.

n476-0194-Supplement.pdf

Atmospheric methane(CH4) increased through much of the twentieth century, but this trend gradually weakened until a stable state was temporarily reached around the turn of the millennium1,2, after which levels increased once more3. The reasons for the slowdown are incompletely understood, with past work identifying changes in fossil fuel, wetland and agricultural sources and hydroxyl (OH) sinks as important causal factors1,4-8. Here we show that the late-twentieth-century changes in the CH4 growth rates are best explained by reduced microbial sources in the Northern Hemisphere. Our results, based on synchronous time series of atmospheric CH4 mixing and 13C/12C ratios and a two-box atmospheric model, indicate that the evolution of the mixing ratio requires no significant change in Southern Hemisphere sources between 1984 and 2005. Observed changes in the interhemispheric difference of 13C effectively exclude reduced fossil fuel emissions as the primary cause of the slowdown. The 13C observations are consistent with long-term reductions in agricultural emissions or another microbial source within the Northern Hemisphere. Approximately half (51±18 %) of the decrease in Northern Hemisphere CH4 emissions can be explained by reduced emissions from rice agriculture in Asia over the past three decades associated with increases in fertilizer application9 and reductions in water use10,11.

Katsnelson 2011

Alla Katsnelson, *Why fake it? How 'sham' brain surgery could be killing off valuable therapies for Parkinson's disease*. nature **476** (2011), 142–144.

According to Perry Cohen, who leads a network of patient activists called the Parkinson Pipeline Project, patients have different priorities and that researchers must take these into account. Researchers use placebo controls to weed out false positives. But for patients, the real ogre is the false negatives – which can sink a therapy before it has been

optimized. The better a trial is at stamping out the former, the higher the rate of the latter – which means at best delays, and at worst dead ends.
Patients also have different perspectives on risk from researchers, Cohen says. He offers the story of Tom Intili, who had had Parkinson's for 10 years when, at the age of 50, he signed on to the double-blind, placebocontrolled trial of neurturin. At first, Intili improved dramatically. But when the results were unblinded, he learned that he had received the sham. His condition plummeted, leaving him more debilitated than he had been before the trial. "We just don't know what the psychological effects of unblinding are," Cohen says.
Moreover, trying to exclude the placebo effect is simply misguided, Cohen argues. "I don't want to subtract out the placebo effect – I want to keep it, because in real life it's part of the treatment," he insists. Because psychological factors are so salient in Parkinson's, a placebo response might actually potentiate a therapy, he explains. "I want to be convinced that sham surgery is necessary. I'm looking for arguments that might change my mind, but I haven't found any yet," he says.

Morgan 2011

Jack A. Morgan et al., *C4 grasses prosper as carbon dioxide eliminates desiccation in warmed semi-arid grassland*. nature **476** (2011), 202–205.
n476-0202-Supplement.pdf
Jack A. Morgan, Daniel R. LeCain, Elise Pendall, Dana M. Blumenthal, Bruce A. Kimball, Yolima Carrillo, David G.Williams, Jana Heisler-White, Feike A. Dijkstra & Mark West
Global warming is predicted to induce desiccation in many world regions through increases in evaporative demand1-3. Rising CO2 may counter that trend by improving plant water-use efficiency4,5. However, it is not clear how important this CO2-enhanced water use efficiency might be in offsetting warming-induced desiccation because higher CO2 also leads to higher plant biomass, and therefore greater transpirational surface2,6,7. Furthermore, although warming is predicted to favour warm-season, C4 grasses, rising CO2 should favour C3, or cool-season plants8. Here we show in a semi-arid grassland that elevated CO2 can completely reverse the desiccating effects of moderate warming. Although enrichment of air to 600 p.p.m.v. CO2 increased soil water content (SWC), 1.5/3.0 °C day/night warming resulted in desiccation, such that combined CO2 enrichment and warming had no effect on SWC relative to control plots. As predicted, elevated CO2 favoured C3 grasses and enhanced stand productivity, whereas warming favoured C4 grasses. Combined warming and CO2 enrichment stimulated above-ground growth of C4 grasses in 2 of 3 years when soil moisture most limited plant productivity. The results indicate that in a warmer, CO2-enriched world, both SWC and productivity in semi-arid grasslands may be higher than previously expected.

Amerika

Blackman 2011

Benjamin K. Blackman et al., *Sunflower domestication alleles support single domestication center in eastern North America*. PNAS **108** (2011), 14360–14365.
Benjamin K. Blackman, Moira Scascitelli, Nolan C. Kane, Harry H. Luton, David A. Rasmussen, Robert A. Bye, David L. Lentz and Loren H. Rieseberg
Phylogenetic analyses of genes with demonstrated involvement in evolutionary transitions can be an important means of resolving conflicting hypotheses about evolutionary history or process. In sunflower, two genes have previously been shown to have experienced selective sweeps during its early domestication. In the present study, we identified a third

candidate early domestication gene and conducted haplotype analyses of all three genes to address a recent, controversial hypothesis about the origin of cultivated sunflower. Although the scientific consensus had long been that sunflower was domesticated once in eastern North America, the discovery of preColumbian sunflower remains at archaeological sites in Mexico led to the proposal of a second domestication center in southern Mexico. Previous molecular studies with neutral markers were consistent with the former hypothesis. However, only two indigenous Mexican cultivars were included in these studies, and their provenance and genetic purity have been questioned. Therefore, we sequenced regions of the three candidate domestication genes containing SNPs diagnostic for domestication from large, newly collected samples of Mexican sunflower landraces and Mexican wild populations from a broad geographic range. The new germplasm also was genotyped for 12 microsatellite loci. Our evidence from multiple evolutionarily important loci and from neutral markers supports a single domestication event for extant cultivated sunflower in eastern North America.
agriculture | Helianthus annuus | phylogeography

Anthropologie

Callaway 2011

Ewen Callaway, *Ancient DNA reveals secrets of human history*, *Modern humans may have picked up key genes from extinct relatives.* nature **476** (2011), 136–137.

Falk 2007

Dean Falk et al., *Brain shape in human microcephalics and Homo floresiensis.* PNAS **104** (2007), 2513–2518.

pnas104-02513-Supplement.zip

Dean Falk, Charles Hildebolt, Kirk Smith, M. J. Morwood, Thomas Sutikna, Jatmiko, E. Wayhu Saptomo, Herwig Imhof, Horst Seidler and Fred Prior

Because the cranial capacity of LB1 (Homo floresiensis) is only 417 cm3, some workers propose that it represents a microcephalic Homo sapiens rather than a new species. This hypothesis is difficult to assess, however, without a clear understanding of how brain shape of microcephalics compares with that of normal humans. We compare three-dimensional computed tomographic reconstructions of the internal braincases (virtual endocasts that reproduce details of external brain morphology, including cranial capacities and shape) from a sample of 9 microcephalic humans and 10 normal humans. Discriminant and canonical analyses are used to identify two variables that classify normal and microcephalic humans with 100 % success. The classification functions classify the virtual endocast from LB1 with normal humans rather than microcephalics. On the other hand, our classification functions classify a pathological H. sapiens specimen that, like LB1, represents an ≈3-foot tall adult female and an adult Basuto microcephalic woman that is alleged to have an endocast similar to LB1's with the microcephalic humans. Although microcephaly is genetically and clinically variable, virtual endocasts from our highly heterogeneous sample share similarities in protruding and proportionately large cerebella and relatively narrow, flattened orbital surfaces compared with normal humans. These findings have relevance for hypotheses regarding the genetic substrates of hominin brain evolution and may have medical diagnostic value. Despite LB1's having brain shape features that sort it with normal humans rather than microcephalics, other shape features and its small brain size are consistent with its assignment to a separate species.
virtual endocast

Mo 2011

Lei Mo, Guiping Xu, Paul Kay & Li-Hai Tan, *Electrophysiological evidence for the left-lateralized effect of language on preattentive categorical perception of color*. PNAS **108** (2011), 14026–14030.

Previous studies have shown that the effect of language on categorical perception of color is stronger when stimuli are presented in the right visual field than in the left. To examine whether this lateralized effect occurs preattentively at an early stage of processing, we monitored the visual mismatch negativity, which is a component of the event-related potential of the brain to an unfamiliar stimulus among a temporally presented series of stimuli. In the oddball paradigm we used, the deviant stimuli were unrelated to the explicit task. A significant interaction between color-pair type (within-category vs. between-category) and visual field (left vs. right) was found. The amplitude of the visual mismatch negativity component evoked by the within-category deviant was significantly smaller than that evoked by the between-category deviant when displayed in the right visual field, but no such difference was observed for the left visual field. This result constitutes electroencephalographic evidence that the lateralized Whorf effect per se occurs out of awareness and at an early stage of processing.

lateralization | Whorfian

Renfrew 2011

Colin Renfrew, *From molecular genetics to archaeogenetics*. PNAS **98** (2011), 4830–4832.

I suspect, however, that these arguments rest on two uncertain premises that illustrate the general difficulties in interpretation of all archaeogenetic data. The first problem is the inference that, if the Irish, Welsh, and Basque Y chromosome haplotype frequencies are closely similar today and may have been so in Upper Palaeolithic times, then no significant gene flow into Ireland and Wales in the male line occurred at the onset of the neolithic. As noted above, very significant gene flow could have occurred at that time without notable impact on haplotype frequencies if the donor and receptor populations were themselves not distinguishable in that respect. Such may well have been the case. The second problem lies with the mitochondrial data and with the conclusion that the female-mediated gene flow inferred must have occurred "since the Upper Palaeolithic." This conclusion rests on the implicit assumption that much of the variability now seen in mtDNA haplogroup distributions entered Europe since the Upper Paleolithic, an assumption developed in the original "wave of advance" model but one contested in subsequent mtDNA studies.

Richards 2002

Martin Richards, Vincent Macaulay, Antonio Torroni & Hans-Jürgen Bandelt, *In Search of Geographical Patterns in European Mitochondrial DNA*. American Journal of Human Genetics **71** (2002), 1168–1174.

Previous studies of mitochondrial DNA (mtDNA) in Europe and the Near East have suggested that, in contrast with classical markers and the Y chromosome, mtDNA does not exhibit significant geographical structuring. Here, we show that, with a sufficiently large sample size and a better resolved mtDNA tree, clades of mtDNA do indeed exhibit gradients similar to those of other marker systems. However, the more detailed analyses afforded by molecular sequence data suggest that the explanations for these gradients are likely to be much more complex than those proposed for classical markers.

Strassmann 2011

Beverly I. Strassmann & Wendy M. Garrard, *Alternatives to the Grandmother Hypothesis, A Meta-Analysis of the Association Between Grandparental*

and Grandchild Survival in Patrilineal Populations. Human Nature **22** (2011), 201–222.

We conducted a meta-analysis of 17 studies that tested for an association between grandparental survival and grandchild survival in patrilineal populations. Using two different methodologies, we found that the survival of the maternal grandmother and grandfather, but not the paternal grandmother and grandfather, was associated with decreased grandoffspring mortality. These results are consistent with the findings of psychological studies in developed countries (Coall and Hertwig Behavioral and Brain Sciences 33:1-59, 2010). When tested against the predictions of five hypotheses (confidence of paternity; grandmothering, kin proximity, grandparental senescence, and local resource competition), our meta-analysis results are most in line with the local resource competition hypothesis. In patrilineal and predominantly patrilocal societies, the grandparents who are most likely to live with the grandchildren have a less beneficial association than those who do not. We consider the extent to which these results may be influenced by the methodological limitations of the source studies, including the use of retrospective designs and inadequate controls for confounding variables such as wealth.

Keywords: Grandmother | Grandparental investment | Child survival | Cooperative breeding | Kin competition | Local resource competition | Complementary filiation

Vannucci 2011

Robert C. Vannucci, Todd F. Barron & Ralph L. Holloway, *Craniometric ratios of microcephaly and LB1, Homo floresiensis, using MRI and endocasts*. PNAS **108** (2011), 14043–14048.

The designation of Homo floresiensis as a new species derived from an ancient population is controversial, because the type specimen, LB1, might represent a pathological microcephalic modern Homo sapiens. Accordingly, two specific craniometric ratios (relative frontal breadth and cerebellar protrusion) were ascertained in 21 microcephalic infants and children by using MRI. Data on 118 age-equivalent control (normocephalic) subjects were collected for comparative purposes. In addition, the same craniometric ratios were determined on the endocasts of 10 microcephalic individuals, 79 normal controls (anatomically modern humans), and 17 Homo erectus specimens. These ratios were then compared with those of two LB1 endocasts. The findings showed that the calculated cerebral/ cerebellar ratios of the LB1 endocast [Falk D, et al. (2007) Proc Natl Acad Sci USA 104:2513-2518] fall outside the range of living normocephalic individuals. The ratios derived from two LB1 endocasts also fall largely outside the range of modern normal human and H. erectus endocasts and within the range of microcephalic endocasts. The findings support but do not prove the contention that LB1 represents a pathological microcephalic Homo sapiens rather than a new species, (i.e., H. floresiensis).

Wilson 2011

James F. Wilson, Deborah A. Weiss, Martin Richards, Mark G. Thomas, Neil Bradman & David B. Goldstein, *Genetic evidence for different male and female roles during cultural transitions in the British Isles*. PNAS **98** (2011), 5078–5083.

Human history is punctuated by periods of rapid cultural change. Although archeologists have developed a range of models to describe cultural transitions, in most real examples we do not know whether the processes involved the movement of people or the movement of culture only. With a series of relatively well defined cultural transitions, the British Isles present an ideal opportunity to assess the demographic context of cultural change. Important transitions after the first Paleolithic settlements include the Neolithic, the development of Iron Age cultures, and various historical invasions from continental Europe. Here we show that patterns of Y-chromosome variation indicate that the Neolithic and

Iron Age transitions in the British Isles occurred without large-scale male movements. The more recent invasions from Scandinavia, on the other hand, appear to have left a significant paternal genetic legacy. In contrast, patterns of mtDNA and X-chromosome variation indicate that one or more of these pre-Anglo-Saxon cultural revolutions had a major effect on the maternal genetic heritage of the British Isles.

Kultur

Sarnoff 1939

David Sarnoff, *Probable Influences of Television on Society*. Journal of Applied Physics **10** (1939), 426–431.

It is probable that television drama of high caliber and produced by first-rate artists, will materially raise the level of dramatic taste of the American nation, just as aural broadcasting has raised the general level of musical appreciation.
Through television, coupled with the universal increase in schooling, Americans may attain the highest general cultural level of any people in the history of the world.
With a rising cultural level, we may expect also an increase in the number of creative artists working with the materials of the theatre. Such artists will be used not only by the television broadcasting systems; they will find additional outlets for their creative energies. Through these new developments we may see a rebirth of local community theatres for the production of legitimate drama, musical performances, dances, and the like.

Stanish 2011

Charles Stanish & Abigail Levine, *War and early state formation in the northern Titicaca Basin, Peru*. PNAS **108** (2011), 13901–13906.

Excavations at the site of Taraco in the northern Titicaca Basin of southern Peru indicate a 2,600-y sequence of human occupation beginning ca. 1100 B.C.E. Previous research has identified several political centers in the region in the latter part of the first millennium B.C.E. The two largest centers were Taraco, located near the northern lake edge, and Pukara, located 50 km to the northwest in the grassland pampas. Our data reveal that a high-status residential section of Taraco was burned in the first century A.D., after which economic activity in the area dramatically declined. Coincident with this massive fire at Taraco, Pukara adopted many of the characteristics of state societies and emerged as an expanding regional polity. We conclude that organized conflict, beginning approximately 500 B.C.E., is a significant factor in the evolution of the archaic state in the northern Titicaca Basin.

archaeology | evolution of cooperation | Pukara | Taraco

Stika 2010

Hans-Peter Stika, *Trinkgelage in der Vor- und Frühgeschichte – Schweineschmorbraten zum Keltenbräu*. (Stuttgart 2010). <https://botanik.uni-hohenheim.de/fileadmin/einrichtungen/botanik/downloads/HPS_Keltenbier.pdf> (2011-08-25).

Das Produktionsverfahren des Keltenbräus war im Vergleich zum modernen Bierbrauen sicherlich sehr verschieden. Der Geschmack unserer heutigen Biere wird zu einem großen Teil durch die Bierwürze “Hopfen” bestimmt. Die Nutzung von Hopfen im Bier geht wohl lediglich bis ins frühe Mittelalter zurück. Für die frühen Kelten liegen keinerlei Hinweise auf eine Verwendung von Hopfen (Humulus lupulus) beim Bierbrauen vor. Statistische Analysen der archäobotanischen Fundlisten ergaben eine enge Korrelation von Gewöhnlichem Beifuß (Artemisia vulgaris) und Wilder Möhre (Daucus carota) mit

den Hochdorfer Malzfunden. Auch in Zusammenhang mit vorgeschichtlichen Bierfunden in Spanien wurde Beifuß mehrfach nachgewiesen und dort ebenfalls als Bierwürze interpretiert. Der Geschmack des Keltenbieres lässt sich vielleicht wie folgt zusammenfassen: das dunkle, rauchige, aus Spelzgerste mit obergärigen Hefen vergorene Bier hatte durch Mitwirkung von Milchsäurebakterien einen säuerlich spritzigen Geschmack. Für den heutigen Bierkenner fehlte der typische Biergeschmack der Bierwürze "Hopfen", der durch den gewöhnungsbedürftigen Geschmack von Beifußkraut und Möhrensamen ersetzt war.

Neolithikum

Gkiasta 2003

Marina Gkiasta, Thembi Russell, Stephen Shennan & James Steele, *Neolithic transition in Europe: the radiocarbon record revisited*. Antiquity **77** (2003), 45–62.

Understanding the introduction of farming and the adoption of Neolithic culture continues to be a major research objective in Europe. The authors make use of a new database of radiocarbon dates from Mesolithic and Neolithic sites to map the transition. While the overall effect is still a diffusion into Europe from the south-east, detailed spatial analysis reveals fascinating local variations: in some places change was rapid, and one population replaced another, in others it was gradual and owed to incoming ideas rather than people. Keywords: Origns of agriculture; Neolithic; genetics; Europe

Physik

Anderson 1939

H. L. Anderson, E. T. Booth, J. R. Dunning, E. Fermi, G. N. Glasoe & F. G. Slack, *The Fission of Uranium*. Physical Review **55** (1939), 511–512.

Corson 1939

D. R. Corson & R. L. Thornton, *Disintegration of Uranium*. Physical Review **55** (1939), 509.

Langmuir 1953

Irving Langmuir, *Pathological Science, Certain symptoms seen in studies of 'N rays' ond other elusive phenomena characterize 'the science of things that aren't so'*. Physics Today **1989**, x, 36–48.

Irving Langmuir spent many productive years pursuing Nobel-caliber research (see the photo on the opposite page). Over the years, he also explored the subject of what he called "pathological science." Although he never published his investigations in this area, on 18 December 1953 at General Electrics Knolls Atomic Power Laboratory, he gave a colloquium on the subject that will long be remembered by those in his audience. This talk was a colorful account of a particular kind of pitfall into which scientists may stumble. The tape recording that was made of Langmuir's colloquium has been lost or erased. However, in 1966, a microgroove disk transcription that was made of this tape was found among the Langmuir papers in the Library of Congress. The disk recording is of poor quality, but most of what Langmuir said can be understood with a little practice. Robert N. Hall, a former colleague of Langmuir's at General Electric, transcribed the disk and edited it to make an internal report for the company. At that time, a small amount of editing was felt to be desirable. Some abortive or repetitious sentences were eliminated.

Hall wrote the epilogue. Figures from corresponding publications were used to represent Langmuir's blackboard sketches. These agree in essence, if not in every detail, with Langmuir's descriptions. Some references were added for the benefit of anyone wishing to undertake a further investigation of this subject.

McMillan 1939
Edwin McMillan, *Radioactive Recoils from Uranium Activated by Neutrons*. Physical Review **55** (1939), 510.

Roberts 1939
R. B. Roberts & J. B. H. Kuper, *Uranium and Atomic Power*. Journal of Applied Physics **10** (1939), 612–614.
Can the energy which is locked up in the nuclei of atoms be made available for everyday use? Dr. Roberts and Dr. Kuper in this article analyze the possibilities at the present time.

Roberts 1939
R. B. Roberts, R. C. Meyer & P. Wang, *Further Observations on the Sylitting of Uranium and Thorium*. Physical Review **55** (1939), 510–511.

Wächter 1922
Friedrich Wächter, *Über einige merkwürdige Eigenschaften der Gase*. Zeitschrift für anorganische und allgemeine Chemie **121** (1922), 225–239.