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50 YEARS AGO

Charles Dupin, a French mathematician and naval engineer visiting Britain in 1816, was much struck by two brothers who worked in a bakehouse which they had equipped with portable gas-lights. In the intervals of baking bread, these two made a steam engine which they used in turn to make "des machines et des instruments de physique". Their uncle (who apparently owned the bakehouse) was neither amused nor interested; according to Dupin, "il préfère de beaucoup la boulangerie et la pâtisserie à la gazometrie et l'astronomie". These baking brothers, who symbolized for Dupin the incubation of technological zeal in Britain, were neither an isolated nor a new phenomenon... The steam-intellect societies had begun.

From *Nature* 1 March 1958.

100 YEARS AGO

Alcohol and the Human Body — The importance of the alcohol question to the well-being of the race can scarcely be exaggerated, and in many respects this book will be very useful, but it is questionable whether the authors do not go too far in ascribing to alcohol ill effects only... surely there is a consensus of opinion that the moderate use of good, well-matured spirit or wine is frequently beneficial in some disease conditions ... The experiments quoted, in which even weak solutions of alcohol are shown to be protoplasmic poisons, are hardly convincing as to the deleterious action of alcohol on the organism as a whole, for are not distilled water, 3 per cent. salt solution, and beef-tea similarly protoplasmic poisons? A good deal is made of the supposed disastrous effect of alcohol on the nervous system, and it is stated that alcohol is accountable for 20 per cent. of the cases under care in our asylums ... [but] in an American inquiry into the subject, total abstinence was found to be more frequently an antecedent of insanity than was intemperance.

From *Nature* 27 February 1908.

50 & 100 YEARS AGO

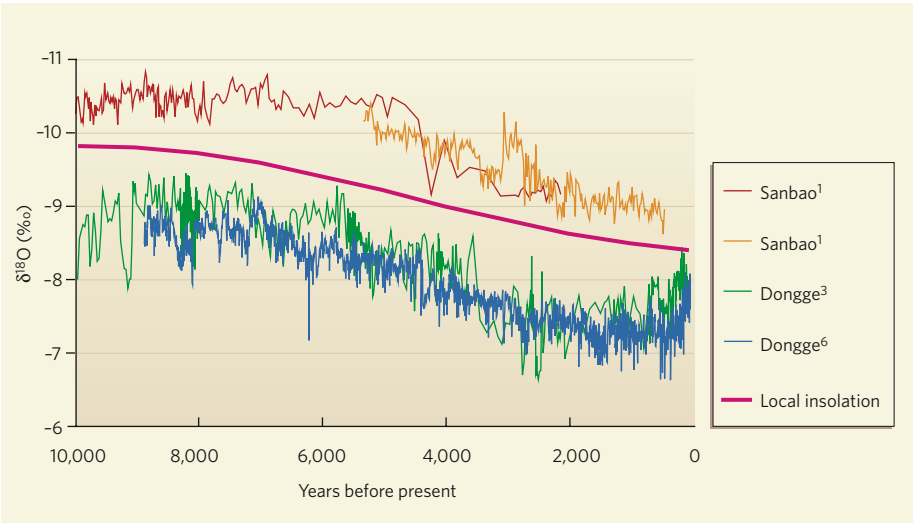

Figure 1 | Cave records. A comparison of oxygen isotope ratios (expressed as $\delta^{18}O$) from Sanbao[1] (two records) and Dongge[3,6] caves in eastern China over the Holocene period yields clear trends in agreement with millennial-scale decline in insolation[16] (in July at 30° N; pink line), caused by variations in Earth's orbit. The mean values are offset between the two caves owing to differences in elevation and temperature[1]. Century-scale variance is not always consistent among the records, highlighting the need for replication to isolate climate signals that are uniform over whole regions.

swamps non-climatic and local noise over the long timescales of orbital change. What emerges is a record of monsoon variation unprecedented in its detail and chronology stretching back 224,000 years. The primacy of orbital precession in driving the monsoon with a quasi-periodic beat of approximately 23,000 years is nicely revealed, as are details of millennial monsoon variability that show the influence of changed ocean circulation in the North Atlantic during glacial periods.

These results bring into sharp relief the true power of speleothems: the ability to date their records precisely. This is made possible by measuring the growth of the isotope thorium-230 from the slow radioactive decay of uranium, which is incorporated in trace amounts in the speleothem deposits. This method works for samples hundreds of thousands of years old, far beyond the limit of about 50,000 years that radiocarbon dating allows. Until now, the best well-dated, high-resolution records of climate variability from the Northern Hemisphere have been those from the long cores extracted from the remote Greenland ice cap. These justly famous records extend back only into the last interglacial period, less than 125,000 years ago, and uncertainties in the models used to date the cores remain above the precision possible with uranium–thorium dating[11].

The Sanbao Cave record reveals that there is more to monsoon variability than a simple linear response to precessional climate effects. Precession unsurprisingly controls the largest changes in amplitude in the Asian monsoon, by altering the supply of latent heat from the Southern Hemisphere or the amount of heating over the adjacent, 5,000-metre-high Tibetan Plateau, or possibly both[8,12,13]. But the maximum-insolation peak during the last interglacial seems to have produced a weaker monsoon than smaller insolation maxima during the glacial period that preceded it. The monsoon response is also far less uniformly sinusoidal than the precession-induced variation in insolation, making it hard to judge the true nature of the phasing between the two effects. Work to unravel these mysteries will have to tap a variety of proxy sources and elaborate on the mechanisms linking monsoon variability to broader climate variability[14,15].

The smaller-amplitude, higher-frequency variations of the monsoon that occurred during both glacial and interglacial periods are even more of a challenge: here, the discrepancies between individual Sanbao records, just as with the Dongge data, indicate that details may be clouded by the smaller apparent signal-to-noise ratio (Fig. 1). Is the problem related to noise associated with cave processes? Or is it simply that smaller changes in climate forcing yield a monsoon response that varies more from place to place than is supposed? The answer will come from continuing to build up a network of data from different proxy sources, such as speleothems and lake and marine sediments, that covers the most recent glacial cycle, and especially the past 10,000 years.

The foremost goal is, of course, to anticipate how the Asian monsoon might change in the future. One thing seems certain: the monsoon is sensitive to climate changes, and if the future brings a sufficiently large net increase in summer heating of the Tibetan Plateau, its response could be large and relatively homogeneous. That could be good for those living in the shadow of the monsoon who need more rainfall. But a stronger monsoon would be hard on those in parts of south and east Asia already plagued by summer flooding. As sea levels rise along with monsoon floodwaters, the low-lying