

Sciencewatch

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Early vegetable cooking

Humans started using thermally resistant cooking vessels some 15,000 years ago, opening new food groups and leading to major changes in diet and nutrition. Research shows that such vessels were routinely used to process animal products, but until now there has been no evidence of early plant cooking. A new study by Richard Evershed of the University of Bristol in the UK and colleagues reports the earliest direct evidence for plant processing at two archeological sites in the Libyan Desert, dating to 8200–6400 BC. A total of 110 broken ceramic pieces from the early to middle Holocene periods were analysed using gas chromatography and mass spectrometry, revealing distributions typical



Archaeobotanical remains from the Libyan site, dated approximately 8000 BC.

of both animal fat and plant origins. Some samples contained both, indicating that plants and animal products were processed together or that the vessels were used for multiple purposes. The distinctive lipid profile from the vessels demonstrated the processing of a broad variety of plants, including seeds, leafy terrestrial and aquatic plants. The advent of plant cooking would have had a significant impact on human nutrition, health and energy, and the preparation of cooked foods soft enough for infants to ingest could have led to earlier weaning and thus enhanced fertility.

● **Further reading**
J Dunne *et al.* 2016 *Nature Plants* **3** 16194.

Alcohol and hunger

People have enjoyed an *apéritif* to stimulate appetite since at least the 5th century AD. While popular explanations for alcohol-induced overeating include a reduction of self-control, Sarah Cains of the Francis Crick Institute in London and colleagues have now identified a physiological mechanism. Giving mice alcohol for a period of three days increased their food intake and boosted the activity of AgRP neurons, which trigger feelings of intense hunger when stimulated. The activity level was similar to that induced by fasting or hunger hormones, and mice that had these cells silenced did not increase the amount they ate.

● **Further reading**
S Cains *et al.* 2017 *Nature Communications* **8** 14014.

Colourful qubits

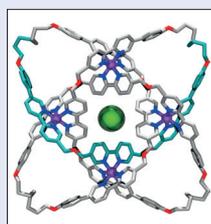
Single photons can now be prepared in a quantum-mechanical superposition of colours, giving rise to a new qubit that could be useful in quantum-information processing. Stéphane Clemmen of Cornell University in the US and colleagues combined single photons in a single stream with photons from two strong laser pumps in a cryogenically cooled 100 m-long optical fibre, bumping their energy up and down and thus placing them in a superposition of two colours.

● **Further reading**
S Clemmen *et al.* 2016 *Phys. Rev. Lett.* **117** 223601.

Molecules form tightest knot

David Leigh and colleagues of the University of Manchester in the UK have tied the world's tightest knot, in the form of an organic molecule. The knot has eight non-alternating crossings in a 192 atom closed loop measuring about 20 nm long, and is made from many benzene rings strung together with octahedral iron(II) ions controlling the relative positions of the three strands at each crossing point. Knots may ultimately prove just as versatile and useful at the nanoscale as at the macroscale, says the team, but a lack of synthetic routes to all but the simplest molecular knots currently prevents systematic investigations of the influence of knotting at the molecular level.

● **Further reading**
J Danon *et al.* 2017 *Science* **355** 159.



The knot showing carbon (light grey) and turquoise in one repeat unit of the knot, nitrogen (blue), oxygen (red) and iron (purple) atoms.

How the penis bone got lost

The penis bone, or baculum, rests at the end of the penis and provides structural support during copulation in many mammals, although not in humans. Matilde Brindle and

Christopher Opie of University College London in the UK have analysed the baculums of nearly 2000 mammal species including primates and carnivores, finding that species that copulate for longer periods have longer bacula, as do those with more than one mate or with seasonal breeding patterns. The baculum first evolved 145–195 million years ago in the common ancestor of carnivores and primates, and disappeared in humans when we split from chimpanzees. This may have coincided with the change towards a more monogamous lifestyle, concludes the team.

● **Further reading**
M Brindle and C Opie 2016 *Proc. Roy. Soc. B* **283** 20161736.

Superconducting bismuth raises questions

Bulk superconductivity has been observed in bismuth when it is cooled to a temperature below 0.53 mK at ambient pressure. The discovery, reported by S Ramakrishnan and colleagues of the Tata Institute of Fundamental Research in Mumbai, India, is a surprise because conventional Bardeen–Cooper–Schrieffer theory cannot explain it. Since the Debye temperature and the Fermi level are comparable in this system, something other than phonon-mediated pairing seems to be required.

● **Further reading**
O Prakash *et al.* 2017 *Science* **355** 52.