RESEARCH HIGHLIGHTS

Selections from the scientific literature

MICROBIOLOGY

Protozoan protects the gut

Many single-celled microorganisms are harmful, but others regulate the immune responses of their animal hosts to guard against infections.

Some such organisms, called protozoa, live in the intestine, but have not been as well studied as their disease-causing counterparts. Miriam Merad at the Icahn School of Medicine at Mount Sinai in New York City and her colleagues identified a previously unknown protozoan, *Tritrichomonas musculis*, in the intestines of some laboratory mice. When this microbe colonized the guts of other mice, the animals exhibited an inflammatory response that protected against pathogenic *Salmonella* bacteria. However, the animals also showed increased susceptibility to inflammatory intestinal disease and colon tumours.

Cell 167, **444–456 (2016)**

QUANTUM COMMUNICATION

Quantum secret kept for a day

A bit of information can be kept secure for 24 hours before being revealed — more than 5 million times longer than the previous record.

Quantum cryptography guards against eavesdroppers, but in secure voting and sealed-bid auctions, a message must remain unread and protected for a certain period of time. Routing the message through a pair of trusted 'friends' that are between the sender and receiver can delay and secure the message, but the friends would need to be located extremely far away from the sender and receiver to achieve a delay of more than a few milliseconds.

Anthony Martin and his colleagues at the University of Geneva in Switzerland developed a protocol in which this kind of exchange happened 5 billion times, with encryption occurring at each round that built on that created previously. This allowed the authors to separate the sender and receiver computers from their 'friends' by just 7 kilometres while securing the bit for 24 hours.

Phys. Rev. Lett. 117, **140506 (2016)**

RICK WILKING/REUTERS

CLIMATE

Megadroughts loom large

Climate warming looks set to plunge the American Southwest into decades-long drought by the end of the century.

Such 'megadroughts' have hit the region (Lake Powell on the Colorado River, **pictured**) during the past millennium. To calculate how changes in temperature, rainfall and soil moisture will affect the likelihood of such events, Toby Ault of Cornell University in Ithaca, New York, and his colleagues ran simulations using climate models and two greenhouse-gas emission scenarios.

If emissions continue to rise unabated, the projected increase in regional mean temperature alone will boost the risk of a megadrought to 70–99% by 2100, depending on whether precipitation increases moderately, stays the same or decreases. If warming remains below 2 °C compared to temperatures seen in the second half of the twentieth century, that risk falls to less than 66%.

Sci. Adv. 2, **e1600873 (2016)**

COGNITION

Human-like ape expectations

Chimpanzees and other great apes seem to understand the beliefs of others, suggesting that this ability is not unique to humans.

Researchers have long debated whether humans are the only primates to have a 'theory of mind' — the ability to attribute mental states such as desires and beliefs to others. To test this, Christopher Krupenye at Duke University in Durham, North Carolina, Fumihiro Kano at Kyoto University in Japan and their colleagues monitored the gaze of chimpanzees, bonobos and orang-utans as they watched short videos. Two videos showed a person watching an object being hidden, and then searching for it. A third video tested the apes' understanding of false beliefs by showing the object being moved while the person was not watching. As the person then prepared to search for the object, most apes looked in anticipation to the location where the person