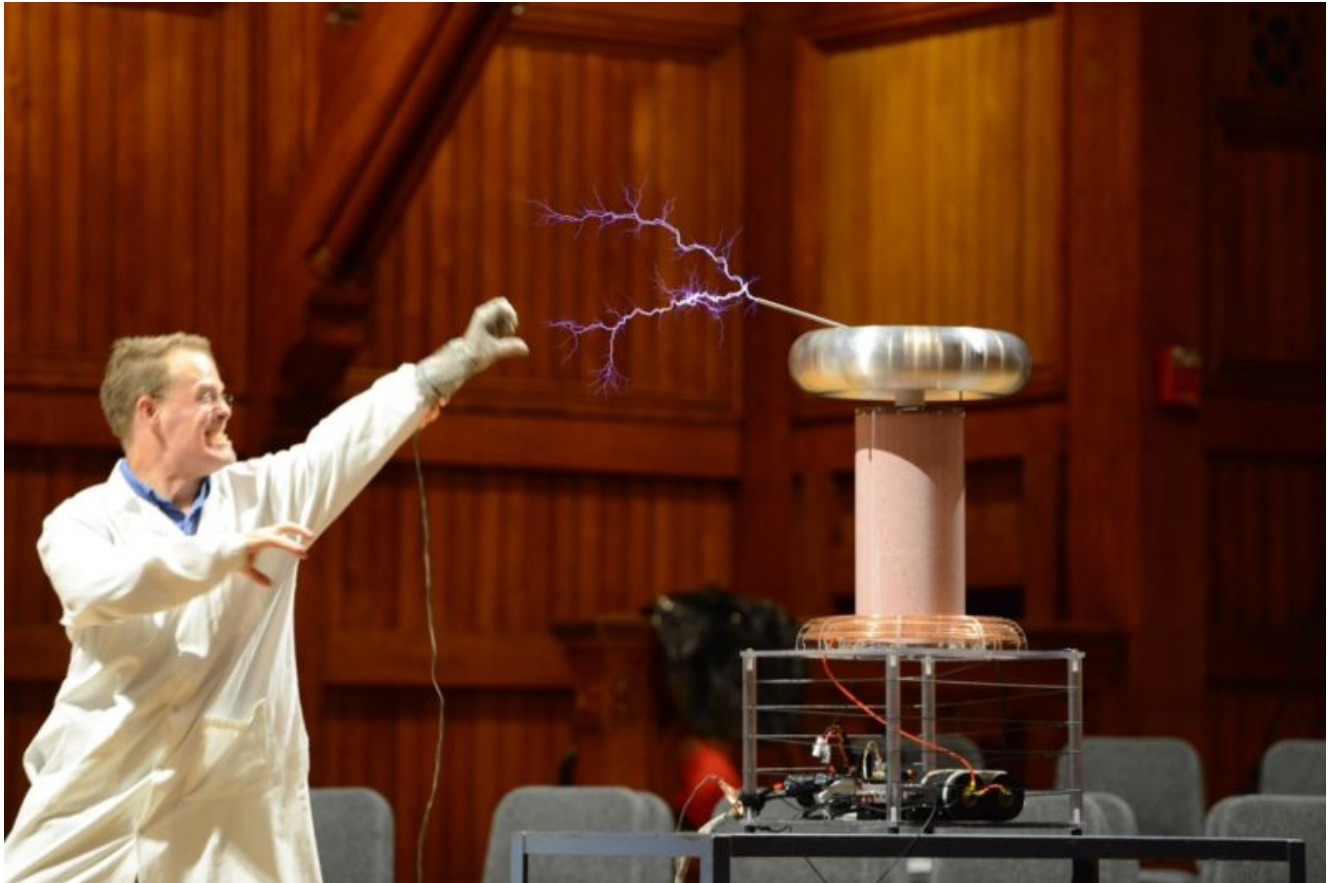


Cubed wombat poop, why your left nut runs hot, among Ig Nobel winners



Enlarge / A “Moment of Science” in the 2017 Ig Nobel ceremony: Daniel Davis faces a Tesla coil.

Mike Binveniste/Improbable Research

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Over the years, curious intrepid scientists have gleaned insight into why the wombat’s poo is cube-shaped, explored the magnetic properties of living and dead cockroaches, and determined that a man’s left testicle really does run hotter than the right. These and other unusual research topics were

honored tonight in a ceremony at Harvard University's Sanders Theater to announce the 2019 recipients of the annual Ig Nobel Prizes.

Established in 1991, the Ig Nobels are a good-natured parody of the Nobel Prizes and honor "achievements that first make people laugh, and then make them think." The unapologetically campy award ceremony features mini-operas, scientific demos, and the 24/7 lectures, whereby experts must explain their work twice: once in 24 seconds, and the second in just seven words. Acceptance speeches are limited to 60 seconds. And as the motto implies, the research being honored might seem ridiculous at first glance, but that doesn't mean it is devoid of scientific merit.

The winners receive eternal Ig Nobel fame and a ten-trillion dollar bill from Zimbabwe. It's a long-running Ig Nobel gag. Zimbabwe stopped using its native currency in 2009 because of skyrocketing inflation and hyperinflation; at its nadir, the 100-trillion dollar bill was roughly the equivalent of 40 cents US. (Earlier this year the Reserve Bank of Zimbabwe introduced the "zollar" as a potential replacement.) The 2009 Ig Nobel Prize for Mathematics was awarded to the then-head of the RBZ, Gideon Gono, "for giving people a simple, everyday way to cope with a wide range of numbers – from very small to very big – by having his bank print bank notes with denominations ranging from one cent (\$.01) to one hundred trillion dollars (\$100,000,000,000,000)."

Physics

Citation: Patricia Yang, Alexander Lee, Miles Chan, Alynn Martin, Ashley Edwards, Scott Carver, and David Hu, "for studying how, and why, wombats make cube-shaped poo."

Wombats are the only known animals to produce cube-shaped poo, which means they literally "drop a brick" when defecating. But it took an intrepid team of researchers from Georgia Tech to

figure out why this is the case, with the help of a few wombat carcasses. The answer: it all comes down to the shape and flexibility of the wombat intestines, combined with the relatively dry environments in which the animals live. Apparently this new knowledge could one day prove useful to manufacturing industries keen to expand their techniques for producing cube-shaped products.

Anatomy

Citation: Roger Mieusset and Bourras Bengoudifa, “for measuring scrotal temperature asymmetry in naked and clothed postmen in France.”

I was unaware that there was a raging scientific debate about whether a man’s left scrotum is slightly hotter than the right. It’s fairly well-known that sometimes the left testicle hangs a bit lower than the right, probably either to prevent collision between the two testicles or to ensure more effective cooling. These two attributes just might be related. Some studies showed the temperature asymmetry, while others did not, so the authors set out to do their own study to resolve the discrepancy. After subjecting young postmen (clothed and naked, in different positions) to repeated probes to measure testicle temperature, they found there was indeed a temperature asymmetry. Furthermore, “This thermal difference between right and left scrotum could contribute to the asymmetry in the male external genital organs,” they concluded.

Medicine

Citation: Silvano Gallus, “for collecting evidence that pizza might protect against illness and death, if the pizza is made and eaten in Italy.”

In 2003, Gallus and his colleagues investigated whether

ingesting Italian pizza can protect against cancer. In 2004, they examined whether pizza could offset the risk of acute myocardial infarction. And in 2006, Gallus and his co-authors built on their 2003 work to study whether eating pizza reduced the risk of breast, ovarian, and prostate cancer. Granted, Gallus *et al.* acknowledge that any positive influential effects they found could be due to the overall benefits of a Mediterranean diet. But I think we can all agree this is still very important work, if only as quirky conversational fodder at your next pizza party.

Medical Education

Citation: Karen Pryor and Theresa McKeon, “for using a simple animal-training technique— called ‘clicker training’—to train surgeons to perform orthopedic surgery.”

This 2016 study focused on two specific surgical tasks: “tying the locking, sliding knot” and “making a low-angle drill hole.” The authors wanted to test the effectiveness of “acoustic feedback” on the learning process—typically used by animal trainers—which prior studies indicated might also work on human behavior and could be superior to traditional demonstration techniques. “The clicker serves as a conditioned reinforcer that communicates in a way that is language- and judgment-free,” they observed. The result: the clicker-trained group of medical students took more time to learn the tasks than the control group, but they were better at performing the tasks precisely. And when it comes to surgery, precision is paramount.

Biology

Citation: Ling-Jun Kong, Herbert Crepaz, Agnieszka Górecka, Aleksandra Urbanek, Rainer Dumke, and Tomasz Paterek, “for discovering that dead magnetized cockroaches behave differently than living magnetized cockroaches.”

Studies have shown that cockroaches and other types of insects seem to be capable of detecting magnetic fields (magneto-reception), and can also become magnetized themselves. Kong *et al.* used a non-invasive technique called magnetorelaxometry (MRX) to measure how both dead and alive American cockroaches become magnetized and how quickly that magnetization decays. Conclusion: the live cockroaches demagnetize (i.e., the magnetic field decays) much faster than dead ones. According to the authors, such work will “not only allow us to understand better different ways of visualizing the world but may also find applications in improved [human]-made sensors inspired by their biological counterparts.”

Chemistry

Citation: Shigeru Watanabe, Mineko Ohnishi, Kaori Imai, Eiji Kawano, and Seiji Igarashi, “for estimating the total saliva volume produced per day by a typical five-year-old child.”

For their 1995 study, the authors examined the effect of different foods (steamed rice, sausage, mashed potato, cookie, apple, and pickled radish) on the flow rate of saliva in five-year-old kids. The children would chew bites of food and then spit it out instead of swallowing, and the researchers subtracted how much the bite originally weighed from how much it weighed after being chewed up to determine the volume of secreted saliva. We know that saliva is generally beneficial, containing salts and mucus that keep the gums healthy, remove bacteria, and reduce bad breath, as well as helping kick off digestion. But the authors persistently fail to clearly explain in their paper why they decided this was worth studying.

Engineering

Citation: Iman Farahbakhsh, “for inventing a diaper-changing machine for use on human infants.”

Parents of newborns know all too well that changing diapers can be a noxious and tedious task. Farahbakhsh, an Iranian engineer, decided to do something to alleviate the burden. So he devised a machine along the same lines as a standard dishwasher. "Once the infant is placed inside the apparatus, various steps may in some cases be carried out automatically without needing the operator to touch the infant or interact manually with the diaper or infant during the changing process," the patent claims. It could also reduce water usage. He received a US patent for his invention last year.

Economics

Citation: Habip Gedik, Timothy A. Voss, and Andreas Voss, "for testing which country's paper money is best at transmitting dangerous bacteria."

"Globally, money is one of the items most frequently passed from hand to hand," the authors wrote in their 2013 paper. "During its passing, money can get contaminated and may thus play a role in the transmission of microorganisms to other people." To test this hypothesis, they deliberately contaminated banknotes from around the world—including the Euro, US Dollar, Canadian Dollar, Croatian Lira, Romanian Leu, Moroccan Dirham, and Indian Rupee—with strains of *Staphylococcus aureus* and *Escherichia coli*, for example. Then they tested (1) how long the bacteria survived on the banknotes, and (2) whether any of the bacteria were transmitted after being handled by the subjects. The Romanian Leu was the only one to transfer two of the bacterial strains, perhaps because it is polymer-based. So maybe avoid handling polymer-based currency in the future, or just rely on non-cash payment methods.

Peace

Citation: Ghada A. bin Saif, Alexandru Papoiu, Liliana Banari, Francis McGlone, Shawn G. Kwatra, Yiong-Huak Chan, and Gil Yosipovitch, “for trying to measure the pleasurability of scratching an itch.”

Who hasn't experienced the pleasurable relief that comes from scratching a persistent itch? But bin Saif *et al.* noticed that there didn't seem to be any studies quantifying that pleasurable experience. For their 2012 study, they used a tropical legume called cowhage to induce itching on various parts of the body: forearm, ankle, and back, just under the shoulder blade. (These are all “areas where patients with diseases such as lichen simplex chronicus or atopic eczema frequently itch and scratch.”) The results: the itch was more intense on the ankle and back than on the forearm, with a corresponding high degree of pleasurability derived from scratching. And yes, scratching does significantly reduce itch intensity, at least temporarily.

Psychology

Citation: Fritz Strack, “for discovering that holding a pen in one's mouth makes one smile, which makes one happier—and for then discovering that it does not.”

Back in 1988, Strack and a couple of colleagues published their findings that holding a pen in your mouth causes you to smile, and that this in turn makes you feel happier—a kind of facial feedback mechanism. It's a pretty famous study, and nobody really thought to question the results, until Strack himself revisited the topic as part of a 2016 meta-study that failed to replicate his conclusions. So turning that frown upside down isn't likely to have any significant effect on your level of happiness—just another casualty of the ongoing replication crisis.

If you happen to be in the Cambridge, Massachusetts, area on Saturday afternoon, September 14, most of the new winners will give free public talks at the Massachusetts Institute of Technology. The lectures will also be webcast.

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