

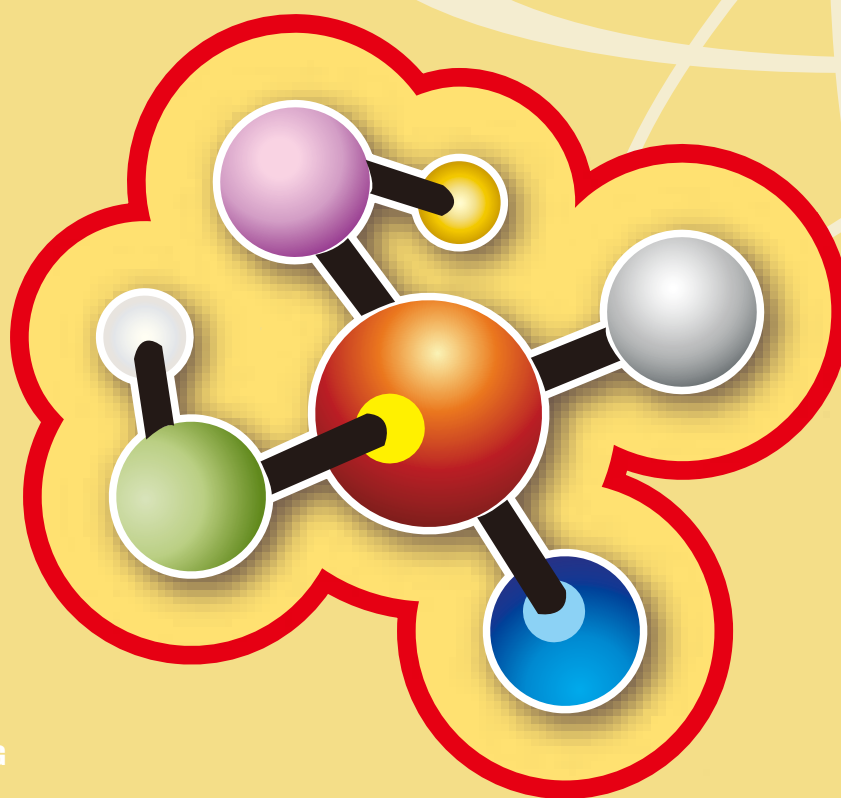


# SCIENTIFIC AMERICAN

## 60-SECOND SCIENCE

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# 60





## Hepatitis May Be Ally Against HIV

**A part of one of the proteins of the Hepatitis C virus shows anti-HIV activity in cell cultures. Cynthia Graber reports.**

**Podcast Transcript:** The disease hepatitis C might provide a new tool in the fight against HIV/AIDS, say scientists at the Scripps Institute and in the Netherlands. The research was published March 31st online in the Proceedings of the National Academy of Sciences.

A segment of one of the proteins of the hepatitis C virus is called C5A. Ironically, this segment, or peptide, actually actually is deadly to the hepatitis virus. So scientists wondered if it could kill the HIV virus as well. They found that in cell cultures, C5A did indeed damage HIV. It also interfered with HIV's ability to infect cells such as the immune system's T cells. And C5A properties are in effect at low pH, which is important if any therapy based on it were to be used by women before sex.

The researchers say that C5A has a wider range of anti-viral activity than other antimicrobial peptides. Scientists hope that the Hep C peptide research will lead to the development of antiviral therapies that could help prevent the sexual transmission of HIV.

—Cynthia Graber





April 2, 2008

## The Mythical Daily Water Requirement

**There's no evidence that humans actually need the oft-cited "eight-glasses-per-day" of water. Karen Hopkin reports.**

**Podcast Transcript:** Somewhere along the line you've probably heard that you should drink eight glasses of water a day. It's supposed to make your skin supple, keep your organs flush and help you avoid overeating. Now doctors from the University of Pennsylvania say that's hogwash. After exploring the health effects of hydration, they conclude that the purported benefits of drinking lots of water are not backed by any solid evidence—or liquid evidence, either. The physicians present their findings in the June issue of the *Journal of the American Society of Nephrology*.

Okay, humans can't last more than a few days without water. But very little research has been done to assess just how much water a healthy individual needs. So the Pennsylvania docs scanned the literature. They discovered that drinking water does help the kidneys clear out salt and such. But those studies don't suggest any sort of clinical benefit. There are no studies that show that chugging H<sub>2</sub>O will curb your appetite. Ditto for drinking water to enhance your skin tone. In fact, no studies indicate that people should drink eight glasses of water a day. Where that number came from no one seems to know. But in the end, it turns out to be all wet.

—Karen Hopkin



April 3, 2008

## Beetle Points Way To Better Spray

**The bombardier beetle fires a toxic stew at predators. Now researchers hope to copy that firing mechanism for better high-performance sprays. Cynthia Graber reports**

**Podcast Transcript:** How can we improve engines, inhalers, and fire extinguishers? Maybe by copying a beetle. The bombardier beetle's name might scare off predators if they knew it. To protect itself, the beetle shoots a spray of hot, toxic venom. The spray can travel nearly eight inches, about 2000 times the length of the insect's combustion chamber.

Scientists from Leeds University and from Swedish Biomimetics 3000 reported on these propellant abilities in the April issue of *Physics World*. Hydroquinone and hydrogen peroxide build up in the insect's abdomen. When the beetle needs protection, the chemicals flood the combustion chamber. In the presence of a catalyst, the chemicals create a toxin, along with other compounds and water. The reaction heats to near boiling. When the pressure is high enough, a membrane at the other end of the combustion chamber opens, and the mist and liquid fires. The pressure drops and the combustible chemicals quickly refill the chamber, leading to a series of bursts. Scientists modeled and replicated this system using hot water instead of venom. They say it could offer huge power and environmental benefits over current high-performance spray technologies.

—Cynthia Graber



April 4, 2008

## Some Bacteria Dine On Antibiotics

**Some bacteria are more than resistant to various antibiotics--they can actually survive eating nothing BUT antibiotics. Karen Hopkin reports**

**Podcast Transcript:** Bacteria are amazingly adaptable. They live in hot springs, in the Dead Sea and, of course, inside people, where they can dish up some truly nasty diseases. Over the years many of these crafty critters have figured out how to dodge the antibiotics we use to kill them, usually by chewing the drugs up and spitting 'em out. Now researchers from Harvard Medical School have figured out that in the soil, there are bacteria that are not only immune to our antibiotics—they eat antibiotics for breakfast. The discovery appears in the April 4 issue of *Science*.

The scientists collected a diverse sample of soils from cornfields, forests, swamps, even the Boston Public Garden. From this dirt they isolated hundreds of different bacteria that could grow in a broth that contained nothing to eat, except a great big helping of antibiotics. The fact that the ground is teeming with drug-munching bugs might seem surprising. But remember, most of our antibiotics come from organisms that live in the dirt, like molds and even other bacteria. With that kind of exposure, some bugs are bound to figure out how to turn these potential toxins into a tasty snack. The danger for us is that they'll share these recipes with their disease-causing pals.

—Karen Hopkin



April 7, 2008

## Alligator For What Ails Ya?

**Studies on alligator blood show that the big reptiles have incredibly robust immune systems, which researchers hope to exploit to create new antibiotics. Karen Hopkin reports.**

Podcast Transcript: Time for another episode of Those Amazing Alligators. On March 14, we told you how gators use their lungs to steer through the water. Now, Louisiana biochemists say that alligator blood may hold the key to fighting infections. In people. They presented their findings at the American Chemical Society meeting in New Orleans. Alligators, it seems, have unusually robust immune systems. They're able to swiftly eliminate invading viruses, bacteria and other microbial nasties. So the scientists collected some alligator blood. (Something you should not try at home. Unless you live in Florida. Actually, no, still don't try it at home.)

The researchers then extracted a slew of proteins from some disease-busting white blood cells. And they found that, in a culture dish, just a pinch of gator protein could destroy a wide variety of bugs, including the dreaded methicillin-resistant *Staph aureus* or MRSA. The scientists are now trying to figure out which proteins in the gator extract are the most potent. They'll then use those proteins to try to develop a new line of human-disease-fighting alligator antibiotics. Beats alligator shoes, which ain't gonna stomp out your MRSA.

—Karen Hopkin



April 8, 2008

## Ancient Mariners Sailed Between Mexico and South America

**MIT students recreated rafts that took people and goods between the west coasts of Mexico and South America. Cynthia Graber reports.**

**Podcast Transcript:** Western Mexico and countries on the west coast of South American had ancient relationships, involving trade in goods and culture. Now MIT students have analyzed just how this communication and transportation system worked. The research was published in the *Journal of Anthropological Research*.

First, the students recreated a raft, based on descriptions in European colonial writings. They successfully tested it on Boston's Charles River. Then the student used computerized engineering design programs to test the raft's size, weight, and cargo capacity. They had to develop a much more detailed design for the raft's dimensions than what was available in the centuries-old drawings. But they didn't stop at aerodynamics and hydrodynamics—they also delved into biology. Because shipworms can make a quick snack of South American balsa wood.

A one-way voyage would take between six and eight weeks. So how long would a raft last on the journey before succumbing to shipworms? According to the student's simulations, rafts could last two full round trips between Mexico and the Andean countries. Enough time for a vibrant exchange of goods and ideas.

—*Cynthia Graber*



April 9, 2008

## Computer Takes Clarinet Lessons

**Detailed analysis of how a clarinetist plays the instrument is a first step toward incredibly natural sounding synthesizer music. Christopher Intagliata reports.**

**Podcast Transcript:** Benny Goodman earned his title “The King of Swing” as a virtuoso of the clarinet. But now a computer in upstate New York has learned to rip him off. Researchers at the University of Rochester recently unveiled their computerized clarinet, which you’re hearing. It listens to a clarinet solo and figures out how hard the player was blowing, his lip pressure on the mouthpiece and his finger position. The virtual clarinet player uses this information to reproduce the solo on its virtual clarinet, a synthesizer based on the physics of the clarinet.

To design this synthesizer, the team played a real clarinet while measuring physical changes like the reed’s vibration and the pressure of the air column inside. They modeled these measurements with equations to create the virtual clarinet. An audio file of the solo reproduced by the virtual player is 1000 times smaller than the original as an mp3. But it still doesn’t sound as good as Benny. The simulation doesn’t swing as well as the king would have. But future music could come from various synthetic instruments, modeled on performances of the masters.

—*Christopher Intagliata*



April 10, 2008

## Why Did Matter Beat Out Antimatter?

**The odd behavior of a subatomic particle provides a clue as to why matter beat out antimatter in the early universe. Steve Mirsky and JR Minkel report.**

**Podcast Transcript:** Every Star Trek fan knows that there's matter and antimatter. But why is there apparently so much more matter than antimatter. Scientific American's JR Minkel: "Two recent experiments show something interesting is going on in a subatomic particle called the Bs (B-sub-S) meson. It flips between its matter and antimatter forms 3 trillion times a second. But the flipping isn't quite matching up with the predictions of the standard model of particle physics. We think that in the very early universe there were almost equal parts matter and antimatter.

"And the universe back then was acting like a giant cauldron spewing particles. Lot of energy, lot of particles being made, but a slightly higher chance that the particles would be matter and not antimatter—which the standard model doesn't explain. Now, the odd behavior of the Bs meson could be giving us some clues about why matter won out over antimatter. When the Large Hadron Collider goes online in Europe this year we may finally be able to observe conditions that would really show us what happened in the early universe to make it the way it is today." See JR's article "Matter-Antimatter Split Hints at Physics Breakdown" at [sciam.com](http://sciam.com).

—Steve Mirsky



April 11, 2008

## A Presidential Science Debate

**Science Debate 2008 is the name of an effort to get the Presidential candidates to commit to discussing science issues before the election. Adam Hinterthuer reports.**

**Podcast Transcript:** Hillary is undecided. Obama and McCain both passed. But the scientific community is committed to staging a candidates' debate about science and technology. They want straight talk on political buzzwords like climate change and stem cells, as well as less discussed issues like funding for basic research and the National Institutes of Health. What started as citizens worried about the U.S. losing its edge is now a movement called Science Debate 2008.

An article in the current issue of the journal *Science*, claims that, by 2010, 90 percent of the world's scientists and engineers will live in Asia, where research is well funded. The authors say the US needs to keep up because science and engineering drove half of America's economic growth over the last fifty years.

Science Debate 2008 had to cancel a debate before the upcoming Pennsylvania primaries because candidates wouldn't commit. Now plans are already in the works for Oregon, where primaries are set for May 20th. It's proof, the journal article says, "that scientists can be quickly organized when motivated." If only politicians shared that motivation.

—Adam Hinterthuer





April 14, 2008

## Oral Contraceptives As Part of IVF

**Using oral contraceptives before attempting IVF can allow women and their physicians to better know the timing of ovulation. Cynthia Graber reports.**

**Podcast Transcript:** In vitro fertilization efforts can be helped by, oddly enough, oral contraceptives. That's the finding from Tel Aviv University, site of the largest study on using birth control to help IVF.

One of the challenges to IVF is timing. Current hormone treatments to stimulate ovulation have to coincide with a particular moment in the woman's cycle. Not knowing the exact timing for scheduling the egg retrieval and fertilization can be stressful, which can lower the odds of success. In the Tel Aviv study, researchers looked at women who underwent a 12 to 17 day treatment of oral contraception. The women were checked to make sure there was absolutely no activity in their ovaries or uterus. Then they began stimulation hormones to start the clock. Women who went through this protocol had similar numbers of pregnancies to a control group that didn't use birth control. Which means that oral contraception didn't harm their ability to conceive.

The researchers say that this treatment demands a slightly longer cycle and higher levels of ovulation-inducing hormones. But they also say it could allow couples to more accurately plan for procedures, which might give couples more peace of mind.

—Cynthia Graber



April 15, 2008

## Listening In on Hurricanes

**Flying a plane over a hurricane to gather data is expensive--and dangerous. Getting equivalent data, by using undersea hydrophones that record the hurricane-driven churning of the ocean may be a cheaper, safer alternative. Cynthia Graber reports**

**Podcast Transcript:** Predicting a hurricane's strength and speed is crucial in order to save property and lives. Right now, the only way to get accurate information is to fly a plane right into the hurricane. That's frightening—and expensive. Now M.I.T. scientists say they've demonstrated a safer and cheaper method. Nicholas Makris, director of M.I.T.'s Laboratory for Undersea Remote Sensing, developed a model that uses underwater microphones. These hydrophones, as they're called, can pick up the sound of the roiling and churning waves caused by a hurricane.

Makris hypothesized that the volume picked up by the mic is a predictor of the hurricane's strength and speed. He's been doing theoretical work on this issue for years. In a paper accepted to *Geophysical Research Letters*, he and a graduate student show the first real-world proof of the technique. In 1999 a hurricane passed over an anchored hydrophone. Within 24 hours that hurricane was analyzed by fly-throughs. The data from the hydrophone and the information from the planes match Makris's predictions. M.I.T. researchers are now testing the system with the Mexican Navy. They hope this will lead to permanent hydrophones in other poor, hurricane-prone regions.

—Cynthia Graber



April 16, 2008

## Komodo Dragons' Skillful Skulls

**Komodo Dragons' powerful neck muscles generate huge forces when attacking prey. Their lightweight skulls can handle the forces thanks to a strong, "space-frame" structure. Steve Mirsky reports.**

**Podcast Transcript:** When I got into a cage with a Komodo Dragon almost 10 years ago for a story, I had no idea that its skull was so special. Neither did scientists until now. But a report in the *Journal of Anatomy* reveals that the world's largest living lizard has a remarkable, space-frame skull. Space frame refers to a light, rigid structure with interlocking struts that can handle big loads. The shape of the skull bones and the arrangement of bones of different strengths is the key. The researchers employed a technique called Finite Element Analysis, which is usually used to analyze trains or planes. But in this case it let them reverse engineer the Komodo to study the mechanical forces that the skull is subject to.

As opposed to, say, an alligator, the dragon has a pretty wimpy bite. So rather than clamp down on its victims, it yanks off chunks of meat, a move powered by incredibly strong neck muscles. And made possible by that space-frame skull able to handle the huge forces involved. Our [March 1999 article on Komodos](#) is available at [sciamdigital.com](http://sciamdigital.com).

—Steve Mirsky



April 17, 2008

## Vicious Circle of Belly Fat

**Abdominal fat cells produce a hormone that can make you hungrier, leading to more belly fat and so on. Steve Mirsky reports**

**Podcast Transcript:** Talk about your vicious cycles. A new study finds that belly fat could be making you hungrier. Which would lead to more belly fat. The research was performed at the University of Western Ontario. The culprit is a hormone called Neuropeptide Y, or NPY. It was thought that only the brain produced this hormone, but no, your belly fat can make it too. So NPY produced in the brain initially makes you eat more and gain weight around your middle, and then that fat makes more NPY, which makes you eat more.

Now, fat cells can't reproduce themselves. But the release of NPY can stimulate the reproduction of cells that are precursors to fat cells. So the result is the same—more and more fat cells. The researchers next want to come up with a way to easily detect the presence of the hormone—and to turn it off. The hope is to identify and treat those people at greatest risk for becoming abdominally obese. Because it would be easier to prevent obesity than to treat the many diseases that obesity can lead to.

—*Steve Mirsky*



April 18, 2008

## Never You Mine: Ben Stein's Selective Quoting of Darwin

**One of the many egregious moments in the new Ben Stein anti-evolution film "Expelled" is the truncation of a quote from Charles Darwin so that it makes him appear to give philosophical ammunition to the Nazis. Steve Mirsky reports.**

**Podcast Transcript:** This is *Scientific American's 60-Second Science*. Hi, Steve Mirsky here. I'm going over our usual one minute. By now, you've probably heard of *Expelled*, the new Ben Stein anti-evolution crockumentary. It officially opens today as I speak, that's April 18th. Because of my job, I've had the misfortune of sitting through this film twice now. As least I was getting paid. The film tries very hard to connect Darwin with the Holocaust.

Toward the end, Stein reads the following quote from the book *Descent of Man*: "With savages, the weak in body or mind are soon eliminated. We civilized men, on the other hand, do our utmost to check the process of elimination. We build asylums for the imbecile, the maimed and the sick. Thus the weak members of civilized societies propagate their kind. No one who has attended to the breeding of domestic animals will doubt that this must be highly injurious to the race of man. Hardly anyone is so ignorant as to allow his worst animals to breed."

That's the end of the quote. And when he finishes reading the quote, Ben Stein intones the guilty verdict by naming the source: Charles Darwin. Oh my, it sounds like Darwin actually did provide a rationale to the horrific practices of the Nazis.

Well, I've been covering the anti-evolution crowd for over 20 years. So I immediately suspected that the propaganda-makers had engaged in what's called quote-mining—you examine the writings of somebody you want to smear and then selectively quote those portions that appear to make your point. I bet that whatever came immediately after the quoted portion would be something that Stein wouldn't want you to hear. My research took all of about three minutes. I went to a full text of *Descent of Man* online and found the quoted passage. And then found the sentences that come right after where Stein stopped quoting.

So here's Charles Darwin again, from *Descent of Man*: "The aid which we feel impelled to give to the helpless is mainly an incidental result of the instinct of sympathy, which was originally acquired as part of the social instincts, but subsequently rendered, in the manner previously indicated, more tender and more widely diffused. *Nor could we check our sympathy, even at the urging of hard reason, without deterioration in the noblest part of our nature.* The surgeon may harden himself whilst performing an operation, for he knows that he is acting for the good

of his patient; *but if we were intentionally to neglect the weak and helpless, it could only be for a contingent benefit, with an overwhelming present evil.*"

Leads to kind of the very opposite impression of Darwin that the filmmakers want you to take away. Mind you, none of this has anything to do with whether or not Darwin's scientific findings were correct. They were. But Ben Stein and his cronies, in their selective use of passages written by a great man merely showed themselves to be so very small.

We have a package of coverage about *Expelled* and its misinformation at our website, [sciam.com](http://sciam.com). Also check out a resource page put together by the National Center for Science Education, [www.expelledexposed.com](http://www.expelledexposed.com). For Scientific American's 60 Second Science, I'm Steve Mirsky.



April 21, 2008

## Mercury Rising--Up the Food Web

**Elevated mercury levels in fish aren't alone. Higher levels in birds and insects point to a contamination across the food web. Adam Hinterthuer reports.**

**Podcast Transcript:** You've probably heard about mercury contamination in fish. But a new study says the toxin has climbed out of the water. Researchers from the College of William and Mary say landlubbing insects near the Shenandoah River have elevated levels of mercury in their blood—and so do the birds that eat them. The report appears in the April 18th issue of the journal *Science*.

The scientists tested mercury in 13 insect-eating bird species and found that twelve had dangerously high levels. They then examined the birds' food supply, literally snatching spiders, moths and grasshoppers out of the mouths of babies in their nests. These tasty morsels all contained mercury. And spiders, which sit higher up the food chain, had even more mercury than fish collected from the river.

The news is alarming, since mercury can cause reproductive failure and even death at low concentrations. The researchers now want to know how a problem thought to be confined to a single ecosystem is spreading. They speculate that contaminated aquatic insects, or maybe polluted floodwaters, are helping mercury creep out of the river and take to the wing.

—Adam Hinterthuer



April 22, 2008

## Lasers Let Lightning Loose

**Researchers have used powerful lasers to induce lightning in thunderclouds. Cynthia Graber reports.**

**Podcast Transcript:** Ben Franklin started it, and it's hotter than ever: research on lightning. For the first time, a team of European scientists have used lasers to create electrical activity in thunderclouds. They published in *Optics Express*. Man-made lightning strikes help with a variety of research efforts—including uncovering the mechanisms of lightening, and finding the sensitivity of airplanes and power lines. Current methods of creating lightning are expensive and only work about half the time. Lasers could provide a more reliable and cost-effective method.

Working atop a New Mexico mountain, scientists shot pulsed lasers into passing thunderclouds. This technique had been suggested 30 years ago, but lasers then weren't strong enough to trigger any response. The new generation of lasers create plasma filaments, or ionized channels of molecules that act like wires. Researchers tested the electrical activity at the sites where they'd aimed the lasers, and they found that there was in fact an electrical discharge. But the channels didn't last long enough to bring a lightening strike to earth. So the team is now working to build stronger and more targeted laser bursts to create home-made lightning.

—*Cynthia Graber*





April 23, 2008

## Floral Scent's Polluted Descent

**Chemical compounds in pollution interfere with the scent molecules produced by flowers, making it harder for pollinating insects to find their way. Karen Hopkin reports.**

**Podcast Transcript:** Shakespeare once said a rose by any other name would smell as sweet. And that's as true today as it was 400 years ago. What's different now, though, is that their smell doesn't travel as far as it used to. Or so say scientists in a study that appears online in the journal *Atmospheric Environment*.

Researchers at the University of Virginia made a mathematical model to show how the fragrance of flowers floats through the air. They found that the presence of pollution slows the scents down. Prior to the industrial revolution, the sweet smell of roses might drift for three-quarters of a mile. Now, downwind of a major city, a flower's delicate bouquet can't make it a full thousand feet. That's because the scent molecules produced by flowers are volatile. They chemically react with ozone and other pollutants, and ka-bloomy. No more eau d'springtime.

The effect might pose a minor nuisance to modern poets, but it's a major problem for flowering plants and the insects that pollinate them. Bumblebees find flowers by smelling them. Less aroma attracts fewer bees. Which ultimately means fewer flowers. So, stop and smell the roses. If you're close enough.

—Karen Hopkin



## Diet May Influence Sex of Baby

**Women who consumed more calories while pregnant had more males than women on lower-calorie diets. Cynthia Graber reports.**

**Podcast Transcript:** Considering getting pregnant and want to influence whether you have a boy or a girl? According to new research published in the Proceedings of the Royal Society, you might want to check out your diet. Scientists at the Universities of Exeter and Oxford in England followed 750 first-time pregnant women. The women were asked about their eating habits before and during pregnancy. They were split into three groups based on the sheer number of calories consumed and the healthfulness of their diets.

For the women who consumed more calories and received a wider range of nutrients, 56 percent had boys. This group was also the most likely to eat breakfast. Among the women with the lowest caloric intake, only 45 percent had boys.

The study is the first linking sex determination with diet in humans. Although it's been known in some animals that more calories equals more males. And while those of us in the West have plenty of calories available, in the US and UK the boy-to-girl ratio has been slipping. Possibly because mothers are on low-calorie diets or are skipping breakfast.

—Cynthia Graber



April 25, 2008

## Word Problems Fail Math Students

**The old "two trains traveling at 60 miles per hour in opposite directions" style of math word problems is less effective at training students than is dealing with abstract concepts, such as finding the value of  $x$ . Adam Hinterthuer reports.**

**Podcast Transcript:** If a train heading east leaves Chicago at noon and a train heading west leaves New York an hour later, will that make you any better at math? New evidence says "No." In a report in the April 25th issue of the journal *Science*, researchers from Ohio State University say the preferred method of teaching math just doesn't make the grade. The researchers taught undergraduates mathematical principles they would need to solve future problems. Some were taught using concrete visual examples, like cups filled with water or a pizza cut into slices. Other students learned abstract formulas in terms like " $n=x$ ."

When asked to solve new problems using these teachings, major discrepancies appeared. In one case, abstract-learning students scored an average of 80 percent on a test. Their "real-world" counterparts, however, seemed unable to transfer their knowledge to a new situation, posting only a 44 percent average. The researchers say using concrete examples is alluring, because students seem to learn lessons faster. However, students who take the time to get abstract concepts down are able to get on the train before it leaves the station.

—Adam Hinterthuer



April 28, 2008

## A Fair Share's Brain Reward

**Getting a decent deal activates the same reward centers of the brain as when people do drugs or win big. Christopher Intagliata reports.**

**Podcast Transcript:** But mommmm, that's not fair! Sound familiar? Even as children, we hate getting gypped, whether it's fewer slices of pizza or lousy presents from Santa. More surprisingly, though, a team of neuroscientists at UCLA recently concluded that getting a fair deal feels good, because it activates the brain's reward circuitry, just like lottery money and cocaine.

Participants were presented with offers to split a sum of money, like seven bucks out of 15. They almost always accepted 50/50 or 40/60 cuts, and these fair deals activated the brain's reward areas, like the ventral striatum and the ventromedial prefrontal cortex. But the lower the cut, the more participants turned up their noses. Seven of 15 ain't bad—but seven of 23 seems like a rip-off.

Confronted with insulting offers, the reward circuit remained inactive. And what turned on was a region of the brain associated with disgust, called the insula. But when participants then swallowed their pride and accepted a meager share, the insula laid low and emotion-regulating areas of the brain switched on. Being cheated doesn't feel good—but it's better than nothing.

—*Christopher Intagliata*



April 29, 2008

## Keeping Time Tied to Intelligence

**Men who could keep a steady beat did better on standardized intelligence tests than their rhythmless counterparts. Karen Hopkin reports.**

**Podcast Transcript:** Mozart was a genius. Duke Ellington, genius. Ringo Starr? Well, Ringo may be smarter than you think. Because a new study from Stockholm shows that people who can keep a beat score the highest on intelligence tests. The researchers asked 34 men to listen to a recording and then tap out the beat using a single drumstick. When the music stopped, the guys kept drumming, and they were scored by how closely they were able to maintain the original rhythm.

After their drum solos, the subjects traded their sticks for pencils and took a standardized intelligence test. The guys who had the steadiest rhythm also nailed the written exam.

What that means is hard to say. All of our actions, whether we're making music or solving equations, are governed by the rhythmic activity of nerve cells in the brain. So the scientists think that a keen sense of timing and a penchant for problem solving might come from having well coordinated brain cell activity. While sloppy drumming and sloppy thinking come from brain cells that are slightly out of synch. As for Ringo [lyric: "you know it don't come easy"].

—Karen Hopkin