Mel says, “This is swell! But it’s not ideal—it’s a free, grainy PDF.”

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Ptak: Hobo Symbol Map

Intriguing imagery from the literature

by John F. Ptak
Ptak Science Books
http://longstreet.typepad.com/thesciencebookstore

This is the frontispiece to a book called The Slang Dictionary; or, the Vulgar Words, Street Phrases and Fast Expression of High and Low Society, printed in London by John Camden Hotten in 1872 (and there were earlier editions). It is a hobo or “cadger” (“a mean or vulgar fellow who would rather live on other people than work for himself”) map (or the map of “a tribe of vagabonds”) of the town of Maidstone, in Kent, drawn by a “screever” (a sidewalk chalk artist who normally would draw religious images for money), and showing the various chalked and etched signs (“and other mendicant marks”) that the hobos would leave for one another.

This map was a key to the town, indicating, from a hobo’s point of view, what was inviting, what safe, and what dangerous. The book includes a key to the symbols used in the map.

Recorded hobo and tramp symbols of this vintage are rare.
Contents

The features marked with a star (*) are based entirely on material taken straight from standard research (and other Official and Therefore Always Correct) literature. Many of the other articles are genuine, too, but we don’t know which ones.

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On the Front Cover

This trail inside the Grand Canyon may be symbolic of something to someone. See page 6.

On the Back Cover

A small portion of a large collection of items of interest in a home workshop in Battle Creek, Michigan USA. Photo by Geri Sullivan.

Coming Events

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See WWW.IMPROBABLE.COM for details of these and other events.
NOTE: The opinions expressed here represent the opinions of the authors and do not necessarily represent the opinions of those who hold other opinions.

WRONG-WRONG-WRONG?
The letter you printed (in AIR 16:4) from Professor WRONG-WRONG-WRONG, a.k.a. Don Weinshank, is, to put it succinctly, WRONG WRONG WRONG. He claimed that you continue to misquote Sherlock Holmes on your inside cover: “When all other contingencies fail, whatever remains, however improbable, must be the truth.” My copy of the Sherlock Holmes set (a first edition, to the extent that the term makes sense given that most of the stories were first published in magazines) proves him WRONG WRONG WRONG. I met Professor Weinshank at a conference one time long ago. We got into an argument about the veracity of a quotation from Donald Knuth’s book The Art of Computer Programming, Volume 3: Sorting and Searching. On that, too, Professor WRONG-WRONG-WRONG was WRONG WRONG WRONG, but I could not get the man to admit it. He has never spoken to me again, a fact that I attribute to our never again having been in the same city at the same time.

Bill Twomey
Burnie, Tasmania, Australia

Marconi’s Standing
I am incensed that you published that piece of trash called “Marconi Has No Standing” (AIR 15:7). I, too, have my doubts as to whether Marconi should receive credit as being “the” inventor of radio. But surely someone has proof one way or another as to whether he had two legs, or for that matter even one leg. Marconi was one of my childhood heroes. I first learned about him in J.C.H. Macbeth’s book Marconi Dictionary: Specially Arranged and Edited for Code Users, which my parents read to me every night until I was six years old, after which I read it to them every night until I was 26 and one of them was dead. While I do not recall ever seeing a full-length photograph of Marconi, surely someone would have at least mentioned it if he had had fewer than two legs. Here, enclosed, is my favorite photograph of Marconi. My parents willed it to me, and I cherish it still, despite the fact that Marconi’s legs are not visible. Surely that is due to the table, which obscures the view of his lower half.

Rosalyn Briand
Toulouse, France

Marked Quibble About a Mark
I just had a look at the new AIR (16:4) where in the research review section you mention the paper “When Zombies Attack.” Unfortunately, you gave a wrong name for the fourth author. He is not named Robert J. Smith, but Robert J. Smith?, including the question mark, as stated on his homepage: http://www.mathstat.uottawa.ca/~rsmith/

Dr. Vreeland Heiss
Hamburg, Germany
Sound Quibble About a Tree

I have just finished reading “The Sound-ness of Tree Falls” by Martin Melchior (AIR 16:3). Melchior claims to have empirically answered the age-old question “If a tree falls in the forest and no one is there to hear it, does it make a sound?” in the affirmative. The flaw with his experiment is that by placing sound recording equipment in the forest, he has ensured that there was someone there to hear it, namely himself via the sound recording equipment.

The argument that non-human recording equipment is not a someone falls like one of the trees whose fall Melchior heard. Just as a video recorder allows a human someone to see an event that occurred in the past, a sound recorder allows a human someone to hear an event in the past. The event is no less seen or heard via the recordings than by eyes and ears directly. Thus, the mere placement of the sound recording device in the forest violates the second conjunct of the antecedent of the question.

The basic question is fundamentally unanswerable because, as in quantum physics, the mere attempt to observe the condition of the question negates the condition. Therefore, we will never know a true scientific answer to the age-old question, and it remains a rich topic for exploration by philosophers and cocktail party goers.

Daniel M. Berry
Cheriton School of Computer Science
University of Waterloo
Waterloo, Ontario, Canada
Dogs Outperform Humans, in the Absence of Squirrels

“Trained Dogs Outperform Human Surveyors in the Detection of Rare Spotted Knapweed (Centaurea stoebe),” Kim M. Goodwin, Rick E. Engel, and David K. Weaver, Invasive Plant Science and Management, vol. 3, no. 2, 2010, pp. 113–21. (Thanks to Charles Delain for bringing this to our attention.) The authors, at Montana State University, report:

Invasive plants have devastating effects on ecosystems and biodiversity that early intervention can prevent.... The objective of this study was to compare the accuracy and detection distances of dogs to humans in locating new spotted knapweed (Centaurea stoebe) invasions. Three dogs, trained to detect knapweed using scent discrimination and tracking techniques, were compared with human surveyors.... We attributed mistakes and lower accuracy to distraction by ground squirrels (Spermophilus spp.), resulting from high prey drive to chase and catch small animals.

Steadily, Assuredly Bored


Francophilic Subtleties


Impact of French Fry Length

“Impact of French Fry Length on the Number of Servings Produced Per Case for Quick Service Restaurants,” Catherine A. Durham and Qingyue Ling, American Journal of Potato Research, vol. 82, 2005, pp. 241–9. The authors, at Oregon State University, report:

The contribution of different fry length categories short (<2 in.), medium (2 to 3 in.), and long (3 to 4 in.) and extra long (>4 in.) to serving (individual portions) production in a “quick service restaurant” (QSR) was estimated using regression analysis with serving data developed for the purpose.... Higher proportions of longer fries produced a larger number of servings and thus produced higher serving yield per case.
The Woman, the Teaspoon, and the Hot Dog Competition

“Novel Strategy for Removal of an Ingested Metallic Object,” Wei-Chen Huang, Tsai-Yuan Hsieh, Wei-Kuo Chang, Heng-Cheng Chu, Jung-Chun Lin, and Hsin-Hung Huang, *Gastrointestinal Endoscopy*, e-pub before print, May 31, 2010. (Thanks to Ivan Oransky for bringing this to our attention.) The authors, at National Defense Medical Center, Taipei, Taiwan, report:

The removal of an ingested foreign body submerged in food material is a challenging task. In such cases, the foreign body is difficult to trace and access. We report an extraordinary case in which a woman swallowed a large teaspoon while participating in a hot dog-eating competition. We used a novel approach of magnetic stones to identify the initially undetected metallic teaspoon, thereby facilitating the removal of the spoon without causing iatrogenic trauma.

Ghenghis Khan’s Mom’s Morning Urine


Genghis Khan in the 13th century was probably brought up imbibing his mother’s early morning urine as a remedy for his childhood episodes of acute respiratory infections.

There Was an Attorney Who Swallowed a Spoon


A 30-year-old British white male barrister presented with abdominal pain 10 years after he swallowed a spoon that never passed spontaneously. His workup revealed the spoon lodged in his ascending colon. Laparoscopic retrieval was not feasible so a laparotomy was done for retrieval. He did well and went home with no complications.
What Lies Behind the Grand Canyon?

By Earle E. Spamer
American Philosophical Society, Philadelphia, Pennsylvania

For a long time now, people visiting the Grand Canyon of the Colorado River have been told it is about 12 to 18 miles wide and “more than” a mile deep, convinced that its majestic views are due to the incessant powers of erosion. New analyses now indicate that the canyon is far larger than imagined. It can never be accurately measured and may unexpectedly hold the answers to long-held geological and environmental mysteries.

Fooling Some of the People

In 1903, President Theodore Roosevelt was the first to recognize generally that there was a problem with the Grand Canyon. Speaking near the canyon rim, he urged Americans to “keep it as it is.” He foresaw an endangered canyon, one that without our intervention would deliver a dwindled heritage to the “children’s children” of his audience. His plea, though widely repeated, went unheeded for decades.

Twenty years ago I devised a plan to place the Grand Canyon in stasis, until such time that the problem of erosion can be remedied. The Final Report called for filling the canyon with styrofoam packing material, or “piffles”—some 291 quadrillion of them, to be precise. This plan was also promoted by Grand Canyon National Park. I was interviewed a number of times for newspapers and radio to explain myself, and Internet features have taken up the cause. A few years later, my Further Final Report revealed that the plan had failed because, by mistake, biodegradable piffles had been used—at least, that was the conclusion. This was not correct.

The follow-up report went on to recommend that to safeguard an unprotected canyon, we should ensure that it not be visited at all, nor written about, nor photographed. I argued that all available superlatives have been overextended, and that the number of photons removed from the national park in tourist’s cameras have reached alarming numbers, greatly reducing the amount available for appreciation by our own children’s children. It would be pointless for most of us to visit the canyon anyway. It has been pre-appreciated for us, professionally, by celebrated writers, poets, singers, painters, photographers and filmmakers; our amateur efforts would be lacklusterly insufficient, depreciating further the superlatives and photons.

Still later I postulated that the Grand Canyon may be a fake. Had we been all along deceived about the identity or location of the canyon? Hundreds of other places around the world—and on other worlds—claim to be a (or the) Grand Canyon. I charged readers to campaign, vigorously, to have the “one true Grand Canyon” designated as the Official Grand Canyon. Apparently, our representatives in Congress and the editors of the world’s great newspapers have thought otherwise, ignoring the pleas of constituents and readers.
Straight Down to China

Now there is conclusive evidence to show that the Grand Canyon is not a fake. Rather, we have deluded ourselves into believing that it is disappearing due to erosion, when in fact it is far more immense than supposed. We have accumulated the evidence for a century and more, but have failed to recognize its significance.

John Hance was one of the early Grand Canyon pioneers, pecking out asbestos from a few mines, then doing much better business in the lucrative tourist trade. By his own admission, he dug the canyon. Hance said he once tried to take his horse across the chasm. “He give a fine big jump—but when we was ‘bout halfway over I seed we couldn’t make it, so I turned him back.”7 This gives us some inkling about how vast the canyon was even a century ago.

Another Grand Canyon pioneer–miner, Louis Boucher, reported that the side canyon where he lived “is so narrow and deep that [I see] stars from its recesses at midday.”8 Some years earlier, a traveler reported that elsewhere in the canyon, “So deep and narrow became the rift that the darkness of twilight was experienced, and stars appeared in the narrow line of sky.”9 Yet another tourist corroborated that “From the bottom of the canyon you can look up and see the stars at noonday as plain as though it were night time.”10

Lest one find so many credible reports incredible, first consider that at least one geography text teaches that the canyon contains “tributary gorges, into whose depths the sun penetrates scarcely two hours a day.”11 The Grand Canyon is so deep that even solar radiation attenuates dramatically there, rarely reaching the bottom.

Further substantiating these reports and analyses is a startling report of “bottomless but colorful abysses of the Grand Canyon.”12 Seeing colors may contradict the attenuation of light, but we may presume, too, that the traveler had a flashlight.

John Hance himself likewise declared that he “coun’t see fer into th’ canyon.” If you dismiss Hance as a yarn-spinner, consider the testimony of Chester T. Crowell, one of the many professional authors who have pre-appreciated the Grand Canyon for us. About his first look at the canyon, he said, “If I had seen a Chinaman peeking at me thru the bottom it would not have surprized me. And then they told me that I could see only half way down from the top…”13

One may just as likely blame the liberal application of whiskey to parched palates on the American frontier for many of the first-hand reports cited here. Then again, a well-loosened tongue can offer great and uninhibited truths.

What Can Be Seen at the Grand Canyon?

We have clear, empirical observations of the attenuation of views of the Grand Canyon. How, then, may we account for the billions of mostly amateur photographs taken of the Grand Canyon that display sweeping, majestic panoramas, clear to the bottom of the canyon? I have not slept in years thinking about this. But modern computers save the day.

An advertisement for Sales Cycle Manager software from Sales Ways promises “More Views Than the Grand Canyon!”14 This begs the question, so far as I know never before asked, “How many views are there at the Grand Canyon?” Obviously, Sales Ways’s software engineers have derived the answer, since their product offers more views than that. It seems that the precise number is proprietary information.

A simple calculation can be made. If one presumes that every occupiable spot on the rim of the Grand Canyon equals 1.0 View, then if we know the lengths of the rims we can derive the total.

There is a problem: Just what constitutes the rim of the Grand Canyon? Precisely defined, it is an event horizon, where gravity has its greatest effect. There, one more step will be, dramatically, one’s last.15 Moreover, the Grand Canyon is so massive that it has two event horizons, or rims, one on each side.

Wegener and the Rim Cycle: A Fractal Fairy Tale

In 1894, the distance around the Grand Canyon was reported to be 450 miles.16 This seems to be a reasonable estimate, but it differs dramatically from a precise measurement made a century later by top government scientists. They measured 2,757 miles.17

In 1903, two hikers search futilely for the other side the Grand Canyon, dangerously close to the event horizon.

continued >
So why the great difference between 1894 and 1999? One might suspect the influence of continental drift, first postulated by Alfred Wegener. However, no geodetic measurements have indicated a change in the distance between the two sides of Grand Canyon during the last century. Still it is worth noting that in 1890 the journal Science reported contrarily, “The walls of the Grand Canyon of the Colorado are moving toward each other” and they may eventually touch!18 This is a conundrum that I choose to ignore.19

Now it is becoming clear that what should be very accurate measurements—the rim, depth, and breadth of the Grand Canyon—has everything to do with where and how the canyon is measured. For a long time we have intuitively known the canyon is big—in fact, before it was named the Grand Canyon in the 1860s it was called Big Canyon, a tantalizing clue that early explorers recognized that the canyon was becoming larger the more they looked at it. Yet in all this time we failed to realize that it is even bigger yet. Benoit B. Mandelbrot’s groundbreaking 1967 paper, “How Long is the Coast of Britain?”20 introduced many scientists to the theory and applications of fractals. Mandelbrot demonstrated that the island’s coast, when not measured with “ordinary curves,” may be instead measured with any number of straight-line segments. As segment vectors and the number of them are changed, astonishingly different results are obtained at ever-finer scales of resolution.

Mandelbrot’s study was tidy, two-dimensional in perspective. Had he sauntered the edge of the Grand Canyon instead of an odyssey around Britain, he may have found himself postulating from a perspective that was three-dimensional, and far deeper. Had he done that, who knows where the science and mathematics of fractals would be today!

Extrapolating the U.S. Geological Survey’s inferentially reliable data on the mileages of the Grand Canyon rims, the formula for total Grand Canyon views is \( N = 2,757x \), where \( x \) is the number of vantage points per mile. Fractal science, however, dictates that we may derive up to an infinity of segments between points, thus also an infinity of vantage points. A convincing application is found in Karl-Heinz Becker and Michael Dörfer’s Dynamical Systems and Fractals, where they feature the Grand Canyon throughout the chapter, “Journey to the Land of Infinite Structures.”21 And a sample of actual field images of elusive fractals in their natural canyon habitat are in Gayla Chandler’s online exhibit, “Natural Fractals in Grand Canyon National Park.”22

Science On the Edge: Wonders Beyond Sight

In fractal illustrations, the pointy parts in the diagrams occupy far less space than do edges or planes. The Grand Canyon expresses its fractal nature in having more edge than points. There can be an infinity of viewpoints along the Grand Canyon’s rims, so it should make no difference where one views the canyon. Yet as we observe empirically, people crowd the viewpoints; longer, less interesting edges are infrequently visited. This must be because the viewpoints offer proper view and sun angles that occasionally reveal breathtaking panoramas.

Given that there is much more beyond the view, as fractals intimate, do people honestly see what they go to see? Chester Crowell’s report, cited earlier, retells the account of a man bragging about the places he had seen. “Have you ever had delirium tremens?” asked a second man. “No,” was the reply. “Then you ain’t never seen nothing.”

There are documented sightings of nothing in the Grand Canyon, as previously discussed. One writer further clarified that in the canyon “there ain’t no possible way of paintin’ a sign you could make out with the Lick telescope [and] a full-grown World’s Fair goin’ full blast with the blower on you wouldn’t even see across that Canyon.”23 Hundreds

U.S. Geological Survey map of the “Physiographic Rim of the Grand Canyon, Arizona.” Clearly shown are the double event horizons, or rims. At the scale of this map it is impossible to discern the infinite number of crenulations predicted in the fractal model of the canyon.
more writers further testify that the canyon is not only indescribable, but unfathomable. The one and truly Grand Canyon must be larger—and may hold more—than we have ever imagined.

**Enduring Mysteries—Solved!**

If the edges of the Grand Canyon can, upon close examination, approach infinite lengths due to ever-increasing crenulation, it stands to reason that the volumetric potential of the canyon must increase likewise, with profound effects. The hypothesis is presented here that the whole of Grand Canyon’s three-dimensional fabric, bound within its two event horizons, must, like the rims, become more crenulated the more precisely it is measured.

If a fractally defined Grand Canyon is a large photonic sink, as is demonstrated by the attenuation of solar radiation in its depths, it must also be a sedimentary sink. For a century and more geologists have searched the Colorado River region downstream from the Grand Canyon for the largely unaccounted-for sediment eroded from the canyon. They have followed standard, Newtonian processes of erosion, presuming also that the actions of the river flowing within the canyon carried away the eroded material. They have been searching too far afield.

A fractally derived model of the Grand Canyon suggests that the sediment can still be within a canyon that comprises a densely packed fractal dimension of undetermined complexity, up to an infinity of fractal crenulations. Paradoxically, the Grand Canyon may store within highly crenulated walls and slopes, at scales too small to measure, the very sediments already eroded from them. Likewise, the utter failure to fill the canyon with styrofoam piffles, and the subsequent fruitless search for those missing piffles, provide further evidence for an exceedingly large number of fractal crenulations throughout the Grand Canyon. The attenuation both of canyon views and solar radiation (discussed earlier) may further assist by concealing evidence of the canyon’s intricate fractal sheath.

In the manner of a prediction, as yet untested, an infinitely long plumb line dropped into the canyon will become entangled in a fractal matrix, with no way of determining whether it has struck true bottom. If proved, it may be reasoned that all other measurements of the Grand Canyon can never be precise. Nonetheless, should these and other such steps be taken it will be quite a giant leap for mankind.*

**Note**

With apologies to Neil Armstrong. (Both Armstrong and Benoit Mandelbrot are elected members of the American Philosophical Society. Although I do not know whether the two men have ever met, both are resolved to exploring the infinite and are, in the words of Society founder Benjamin Franklin and the Society’s mission, “For Promoting Useful Knowledge.”)

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*Note with apologies to Neil Armstrong. (Both Armstrong and Benoit Mandelbrot are elected members of the American Philosophical Society. Although I do not know whether the two men have ever met, both are resolved to exploring the infinite and are, in the words of Society founder Benjamin Franklin and the Society’s mission, “For Promoting Useful Knowledge.”)

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**Regular Notes**


6 “Other Grand Canyons: Incarnations Around the World and on Other Worlds,” *Annals of Improbable Research*, vol. 12, no. 2, March–April 2006, pp. 24–5. This list is so long that it had to be printed in exceedingly small type. Magnifying glass not provided.

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continued >
The evolution of wildlife in the Grand Canyon responds to the chasm’s immense size. This California Condor exhibits dark pigmentation as the result of the attenuation of solar radiation. Also carefully note the influence of fractals, where the bird has relatively few pointy parts compared to the number of more linear and curly features.


George Wharton James, In and Around the Grand Canyon, Little, Brown, and Co., Boston, 1900.


Joe Mitchell Chapple, The Happy Habit, Chapple, Boston, 1908.


Elbert Hubbard and George Wharton James, So Here Then Is a Little Journey to the Home of Joaquin Miller, Roycrofters, East Aurora NY, 1903.

Chester T. Crowell, “Straight Down to China,” The Independent, June 4, 1921, p. 579. Not to spoil a great title, but the Indian Ocean is actually straight down from the Grand Canyon. And come to think of it, since no one else has, straight down from China is southern South America and the South Atlantic and Pacific Oceans. You read it here first.

Sales Cycle Manager, Lotus Notes Edition promotional brochure, Sales Ways, Mississauga, ON, seen in 2010. The use of product names here does not imply an endorsement by me or the publisher of AIR. Sales Ways’s brochure was just a serendipitous find since I have nothing to sell.

Michael P. Ghiglieri and Thomas M. Myers, Over the Edge: Death in Grand Canyon; Gripping Accounts of All Known Fatal Mishaps in the Most Famous of the World’s Seven Natural Wonders, Puma Press, Flagstaff, 2001.


George H. Billingsley and Haydee M. Hampton, “Physiographic Rim of the Grand Canyon, Arizona,” U.S. Geological Survey Open-File Report 99-30, 1999. Although the Grand Canyon was first mapped in 1858, and despite the construction of a few retaining walls and railings on the brink of the canyon by the National Park Service early in the 20th century, it was not until this map was published that the U.S. Geological Survey finally located the entire rim of the Grand Canyon. In their explanatory notes the geologists did not disclose the lengths of the lines. Fortunately, one of the geologists is a good acquaintance of mine. Despite this I was able to get the answer through the Freedom of Information Act. Using ArcInfo, the computer-based data points for the rim lines on the north side of the canyon, following all the wiggles of the lines as mapped, shows the north rim is 1,384 miles long. The south side, even though the waggles are completely different, has a rim 1,373 miles long. This reveals that even though the two rims look significantly different, they are obviously nearly the same, although there is a subtle asymmetry that may have deep significance.


Behold! A footnote within a footnote: http://www.amphilsoc.org
I have solved a longstanding mystery: why skunks have their characteristic stripes.

Striped skunks (*Mephitis mephitis*) are among the most familiar yet least understood of North American mammals. For example, people commonly think of these vividly marked animals as denizens of forests, prairie, swamps, and virtually any other terrestrial habitat, and many scientists argue that the skunk’s contrasting black and white dorsal stripes purposely advertise the skunk’s presence but simultaneously “warn” potential predators not to tangle with it. If a potential predator approaches a skunk too closely the skunk typically sprays an obnoxious musk that is commonly believed to deter further attack, but since there is no guarantee that the “musking” will actually protect the skunk some kind of advance warning might benefit the skunk (and the predator).

All of this sounds good but is not supported by the facts. I’m prepared to show that in reality, striped skunks are virtually confined to an entirely different type of habitat than woods and fields and that far from being an advertisement the vivid white stripes enable skunks to occupy this habitat in almost total secrecy.

**How it Works**

This paper rests on a few simple, easily verified facts.

First, if the number of live and dead striped skunks we see on highways versus those we see elsewhere is any indication, it’s clear that most striped skunks actually spend their entire lives on the highways, not in forests, prairies, or swamps. And I don’t mean along the edges of the highways or on

*continued*
the medians, I mean right on the highways. Now and again you might see a skunk in a public park or housing development, but these skunks are just dispersing and always find a road sooner or later.

Second, the highway is obviously a difficult place to live unless you (the skunk) are well adapted to survive in the midst of pervasive hazards. Such adaptation might include great speed or agility, neither of which the skunk has, or it might involve concealment while on the highway through cryptic coloration. A simple comparison of skunks and highways shows that cryptic coloration is the correct interpretation. Skunks survive and reach great abundance on the highways because the white dorsal stripe is an incredibly precise “mimic” of the painted highway lane divider stripes (Fig. 1A).

Rather than advertise the skunks’ presence, the skunks’ stripes blend right in with the highway stripes and no one sees the millions of skunks that populate the lane dividers. All a skunk has to do is to stay on the white lane divider line and it becomes extraordinarily difficult for any predator to detect.

What else factors into skunk/highway adaptation? Well, for one thing, skunk survival on the highways is linked directly to skunk behavior. As long as the skunk stays longways on the painted lines the animal is relatively protected from any kind of attack (Fig 1A) but if the skunk moves off of the stripe (Fig. 1B) its visibility and vulnerability increase. If the skunk turns sideways (Fig 1C) the entire crypsis system breaks down and then the skunk is extremely vulnerable to any of a number of predators. In fact it is most often taken instantly by the most efficient skunk predator of all, the automobile. As common as these casualties are they are still several orders of magnitude below the millions of skunks that thrive for years on the highways just by staying longways on the stripes.

Likewise, life on the highway is in itself an efficient selective force that maintains striped skunk color pattern phenotypes within very narrow limits. Normally patterned striped skunks (Fig 2A) are, as previously noted, cryptic when positioned longways against the highway stripes (Fig 1A). However, crosswise striped (Fig 2B) and offset striped (Fig 2C) skunks are easily detected especially when positioned longways on the highway stripes. Consequently, these aberrant crosswise and offset color patterns are so rare in the striped skunk population that the only place I’ve ever seen them is in


Fig. 2. Thus, only normally patterned, normally behaving striped skunks benefit maximally from life on the highway.

Earlier Progress on This Question
The only reference I could find regarding a cause and effect relationship between skunks and highways is Wainwright (1972), but although the fundamental observations that Wainwright reported were correct as far as they went, that author overlooked the cryptic coloration that is the foundation of this new paper. Nevertheless, in recognition of Wainwright’s seminal contribution to this research I propose the term “Wainwrightian Adaptation” for the newly discovered phenomenon reported here. Further investigation will probably show that other animals such as magpies and garter snakes also demonstrate Wainwrightian Adaptation and may even interact trophically with skunks in the same type of habitat. Research into Wainwrightian Adaptation shows great promise for investigators with the requisite speed, agility, and insurance.

Acknowledgements
Emily Barry prepared the two figures. I also thank Loudon Wainwright III, who likely has no idea why.

Literature cited
Skunk Research Review
Salient points from research on or about skunks
by Alice Shirrell Kaswell, Improbable Research staff

History of Skunk Defensive Secretion Research

The striped skunk (*Mephitis mephitis*) is widely known for the highly odoriferous defensive secretion it uses to repel predators. Chemists have sporadically investigated the chemical composition of this secretion for many years. In this research, a number of chemicals have been incorrectly attributed to this secretion and the errors incorporated into the chemical literature. The major component in skunk spray was erroneously believed to be 1-butanethiol, until it was later shown that the actual compound was (E)-2-butene-1-thiol. More recently, two studies identified the third major compound in the secretion as either (E)-2-butenyl methyl disulfide or (E)-2-butenyl propyl sulfide. These structural assignments were incorrect and the compound was later shown to be (E)-2-butenyl thioacetate.

Folklore asserts that tomato juice will neutralize the odor of skunk spray, but human olfactory fatigue can explain the apparent disappearance of the odor on sprayed pets. The odoriferous thiols in skunk spray can easily be neutralized by oxidation to sulfonic acids.

Skunk Spray Maliciously Deployed

Our laboratory has been asked to elucidate the origin of a strong “toxic smell” present in a prominent politician’s office, private house and motorcar. This stinky and pungent atmosphere has caused serious nausea and vomiting to several individuals....

A literature review and manual MS spectra interpretation allowed us to identify compounds identical to those produced by skunks for their defence....

The present study shows that compounds produced by skunks may be used in “chemical/biological threats” to generate psychological stress because of their repugnant smell. However, these compounds are otherwise relatively harmless when present at low concentrations. In our case the repugnant smell lasted for several days. During this period nobody could enter the office or home of the politician. No health sequels were observed for any of the persons implicated in this incident. As far as we know the offender(s) of this incident has (have) never been identified.
The Scent of the Striped Skunk

“Some Chemical Constituents of the Scent of the Striped Skunk (Mephitis mephitis),” Kenneth K. Andersen and David T. Bernstein, Journal of Chemical Ecology, vol. 1, no. 4, 1975, pp. 493–9, DOI 10.1007/BF00988589. The authors explain that:

The malodorous, volatile portion of the scent or musk of the striped skunk (Mephitis mephitis) contains trans-2-butene-1-thiol, 3-methyl-1-butanethiol, and trans-2-butenyl methyl disulfide but no 1-butanethiol.

The Spray of the Spotted Skunk


GC-MS analysis of the anal sac secretion from the spotted skunk, Spilogale putorius, showed three major volatile components: (E)-2-butene-1-thiol, 3-methyl-1-butanethiol, and 2-phenylethyl disulfide. Minor volatile components identified from this secretion were: phenylmethanethiol, 2-methylquinoline, 2-quinolinemethanethiol, bis[(E)-2-butenyl] disulfide, (E)-2-butenyl 3-methylbutyl disulfide, bis(3-methylbutyl) disulfide.
The Spray of the Hog-nosed Skunk


GC-MS analysis of the anal sac secretion from the hog-nosed skunk, Conepatus mesoleucus, showed two major volatile components, (E)-2-butene-1-thiol and (E)-S-2-butenyl thioacetate.

The Spray of the Hooded Skunk


GC-MS analysis of the anal sac secretion from the hooded skunk, Mephitis macroura, showed the following seven major components comprised 99% of the volatiles in this secretion: (E)-2-butene-1-thiol, 3-methyl-1-butanethiol, S-(E)-2-butenyl thioacetate, S-3-methylbutenyl thioacetate, 2-phenylethanol thiol, 2-methylquinoline, and 2-quinolinemethanol thiol.

No Spray Live Skunk Trap Apparatus

“No Spray Live Skunk Trap Apparatus,” U.S. Patent 4,821,450, granted to W.D. Kenison of Pioche, Nevada, April 18, 1989. The inventor explains the superiority of his design over earlier kinds of skunk trap devices:

In those instances wherein an open wire framework comprises the trap housing, it does not require a vivid imagination to foresee the problems of even approaching the trapped skunk no less actually transporting the polecat from the location where the animal was actually captured.

As a consequence of the foregoing situation there has existed a longstanding need among individuals who are interested in trapping skunks at one location and releasing the animals unharmed at another location, for a live trap construction that will minimize to the greatest extent feasible the possibility of the trapper receiving an unwanted dosage of skunk essence. The provision of such a no spray live skunk trapping apparatus being the stated purpose and objective of the present invention.

continued >
BONUS: Skunk Silkworm Faeces Smell Factor


“Hormonal Changes When Falling In Love,” Donatella Marazziti and Domenico Canale, Psychoneuroendocrinology, vol. 29, no. 7, August 2004, pp. 931–6. Marazziti and several colleagues shared the 2000 Ig Nobel Prize in chemistry for their discovery that, biochemically, romantic love may be indistinguishable from having severe obsessive-compulsive disorder. Here the authors, at the University of Pisa, Italy, report:

The little information available in this field prompted us to measure the levels of some pituitary, adrenal and gonadal hormones in a group of 24 subjects of both sexes who had recently (within the previous six months) fallen in love, and to compare them with those of 24 subjects who were single or were part of a long-lasting relationship.... The results showed that estradiol, progesterone, DHEAS and androstenedione levels did not differ between the groups and were within the normal ranges. Cortisol levels were significantly higher amongst those subjects who had recently fallen in love, as compared with those who had not. FSH and testosterone levels were lower in men in love, while women of the same group presented higher testosterone levels. All hormonal differences were eliminated when the subjects were re-tested from 12 to 24 months later.

Extending Romantic-Chemistry Knowledge (2009)


Pain and Inverted Binoculars

“Visual Distortion of a Limb Modulates the Pain and Swelling Evoked By Movement,” G. Lorimer Moseley, Timothy J. Parsons, and Charles Spence, Current Biology, vol. 18, no. 22, November 25, 2008, pp. R1047–8, DOI 10.1016/j.cub.2008.09.031. Spence shared the 2008 Ig Nobel Prize in nutrition for electronically modifying the sound of a potato chip to make the person chewing the chip believe it to be crisper and fresher than it really is. Here the authors, who are variously at the University of Oxford, U.K. and at the Prince of Wales Medical Research Institute in Sydney, Australia, report:

In patients with chronic hand pain, magnifying their view of their own limb [by looking through binoculars] during movement significantly increases the pain and swelling evoked by movement. By contrast, minifying their view of the limb [by looking through inverted binoculars] significantly decreases the pain and swelling evoked by movement.
AIR Teachers’ Guide

Three out of five teachers agree: curiosity is a dangerous thing, especially in students. If you are one of the other two teachers, AIR and mini-AIR can be powerful tools. Choose your favorite hAIR-raising article and give copies to your students. The approach is simple. The scientist thinks that he (or she, or whatever), of all people, has discovered something about how the universe behaves. So:

• Is this scientist right—and what does “right” mean, anyway?
• Can you think of even one different explanation that works as well or better?
• Did the test really, really, truly, unquestionably, completely test what the author thought he was testing?
• Is the scientist ruthlessly honest with himself about how well his idea explains everything, or could he be suffering from wishful thinking?
• Some people might say this is foolish. Should you take their word for it?
• Other people might say this is absolutely correct and important. Should you take their word for it?

Kids are naturally good scientists. Help them stay that way.

My Teacher is a Blowhard

“My Teacher Is a Blowhard,” Brian W. Holmes, Physics Teacher, vol. 34, no. 6, September 1996, p. 362. The author, at San Jose State University in San Jose, California, explains how:

You too can blow air through a drinking straw at over one hundred miles per hour.

May We Recommend

Items that merit a trip to the library

compiled by Stephen Drew, Improbable Research staff

My Teacher is a Blowhard

“My Teacher Is a Blowhard,” Brian W. Holmes, Physics Teacher, vol. 34, no. 6, September 1996, p. 362. The author, at San Jose State University in San Jose, California, explains how:

You too can blow air through a drinking straw at over one hundred miles per hour.
Puzzling Solutions

Solution to Last Month’s Puzzler

by Emil Filterbag, Improbable Research staff

No, do not spit.
Icky Cutesy Research Review

Research reports that are icky and/or cutesy
compiled by Alice Shirrell Kaswell, Improbable Research staff

CUTESY: We’ve Come a Long Way, Baby-Talk

“Recent Developments in Speech to Children: We’ve Come a Long Way, Baby-Talk,” John Neil Bohannon, III and Amye Warren Leubecker, Language Sciences, vol. 10, no. 1, 1988, pp. 89-110. The authors, at Butler University and at the University of Tennessee at Chattanooga, report:

Children do not acquire language in a void; their hypothesized language learning devices typically operate within conversations with more mature language users.... Despite the fact that many studies have reported the features which distinguish speech to children (child directed speech or CDS), from speech between adults, the study of why CDS is so prevalent across languages seems to have been largely neglected. However, in this paper we offer a model that allows children to control the complexity of the speech they hear within conversations on a moment-to-moment basis.

Icky: Centipedal


We here report the first case of postmortem injury caused by a centipede. An old man was found dead in his bedroom. The death was estimated to be due to intracranial hemorrhage and to have occurred two days before the police inspection. A centipede about 12 cm long emerged from a subcutaneous cavity on the victim’s forearm. Obviously, the centipede had dug the cavity on the intact skin. A police inspector was bitten by the centipede, so he stepped on the centipede on the floor. The exudate from the insect was identified to be derived from the victim’s blood.

ICKY: A Winking Anus May Signify Spinal Injury


CUTESIFIED ICKY: A Shake of the Head to a Wink of the Anus

XKCD by Randall Monroe: “Desert Island”

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WHAT: Three-minute videos about research that makes people laugh, then think.

Soft Is Hard
Further evidence why the “soft” sciences are the hardest to do well
compiled by Alice Shirrell Kaswell and Bissell Mango, Improbable Research staff

Swapped, Unnoticed Cinnamon-Apple and Bitter Grapefruit

“Magic at the Marketplace: Choice Blindness for the Taste of Jam and the Smell of Tea,” Lars Hall, Petter Johansson, Betty Tarning, Sverker Sikstrom, and Thérèse Deutgen, Cognition, in press, 2010. (Thanks to Ig Nobel Prize winner Dan Simons for bringing this to our attention.) The authors, at Lund University, Sweden and University College London, U.K., explain:

We set up a tasting venue at a local supermarket and invited passerby shoppers to sample two different varieties of jam and tea, and to decide which alternative in each pair they preferred the most. Immediately after the participants had made their choice, we asked them to again sample the chosen alternative, and to verbally explain why they chose the way they did. At this point we secretly switched the contents of the sample containers, so that the outcome of the choice became the opposite of what the participants intended. In total, no more than a third of the manipulated trials were detected. Even for remarkably different tastes like Cinnamon-Apple and bitter Grapefruit, or the smell of Mango and Pernod, was no more than half of all trials detected, thus demonstrating considerable levels of choice blindness for the taste and smell of two different consumer goods.

An Economic Theory with Horses and Dogs, for CEOs

“The Thrill of Victory: Measuring the Incentive to Win,” Bentley Coffey and M.T. Maloney, Journal of Labor Economics, vol. 28, no. 1, January 2010, pp. 87–112, DOI 10.1086/648318. (Thanks to Peter Kinder for bringing this to our attention.) The authors, at Clemson University, explain:

There is ample evidence that incentive pay structures, such as tournaments, result in increased performance. Is this due to selection or increased individual effort, and is any increased individual effort caused by pecuniary incentives or merely thirst for the thrill of victory (TOV)? Prior literature has not separated the different effects. We look at performance in horse and dog racing and find that only horses, controlled by jockeys during the race, exhibit performance corresponding to pecuniary incentives, while both respond to selection and TOV. The results show that pay structures do matter.
“Big, Drunk, Aggressive Guy” Experiment

“The Big, the Bad, and the Boozed-Up: Weight Moderates the Effect of Alcohol on Aggression,” C. Nathan DeWall, Brad J. Bushman, Peter R. Giancola, and Gregory D. Webster, *Journal of Experimental Social Psychology*, vol. 46, no. 4, July 2010, pp. 619–23. The authors, who are variously at the University of Kentucky, the University of Michigan and University of Florida in the U.S. and at VU University in Amsterdam, The Netherlands, explain:

Most people avoid the “big, drunk guy” in bars because they do not want to get assaulted. Is this stereotype supported by empirical evidence? Unfortunately, no scientific work has investigated this topic. Based on the recalibrational theory of anger and embodied cognition theory, we predicted that heavier men would behave the most aggressively when intoxicated.... Apparently there is a kernel of truth in the stereotype of the “big, drunk, aggressive guy.”

Disliking a Subject Possibly Predicts Poor Performance


Disliking programming appears to be associated with lower success in early programming courses.

Measuring Formidability of the Shirtless

“Formidability and the Logic of Human Anger,” Aaron Sell, John Tooby, and Leda Cosmides, *Proceedings of the National Academy of Sciences*, vol. 106, no. 35, September 1, 2009, pp. 15073–8. The authors, at the University of California, Santa Barbara, report:

Eleven predictions derived from the recalibrational theory of anger were tested. This theory proposes that anger is produced by a neurocognitive program engineered by natural selection to use bargaining tactics to resolve conflicts of interest in favor of the angry individual....

Raters were shown full body photographs of each subject wearing a standard black pair of shorts and standing next to an experimenter (for a standard comparison); these had been edited with Photoshop 8.0 so that the subjects’ heads were not visible. Men removed their shirts for the photographs; for cultural reasons, women could not be photographed shirtless, and were instead given a white t-shirt to wear over their shirts to standardize style of dress.
Boys Will Be Boys
Research by and for adolescent males of all ages and sexes
compiled by Katherine Lee, Improbable Research staff

Defining the Booty Call

Booty calls tend to utilize various communication mediums to facilitate sexual contact among friends who, for men, may represent low-investment, attractive sexual partners and, for women, may represent attractive test-mates. The relationship is discussed as a compromise between men’s and women’s ideal mating strategies that allows men greater sexual access and women an ongoing opportunity to evaluate potential long-term mates.

Positioning the Booty Call
“Positioning the Booty-Call Relationship on the Spectrum of Relationships: Sexual but More Emotional Than One-Night Stands,” Peter K. Jonason, Norman P. Li, and Jessica Richardson, Journal of Sex Research, e-pub before print, July 28, 2010, DOI 10.1080/00224499.2010.497984. The authors, who are variously at the University of West Florida, at Singapore Management University, and at New Mexico State University, report:

The purpose of this study was to describe the sexual and emotional nature of booty-call relationships by (a) examining the types of emotional and sexual acts involved in booty-call relationships and (b) comparing the frequency of those acts in booty-call relationships to one-night stands and serious long-term relationships.... Demonstrative of booty-call relationships’ sexual nature was individuals’ tendency to leave after sex and infrequent handholding. In contrast, the romantic nature of booty-call relationships was demonstrated through the frequency of acts like kissing. The results suggest the booty-call relationship is a distinct type of relationship situated between one-night stands and serious romantic relationships.

Detail from Jonason, Li, and Richardson’s study “Positioning the Booty-Call Relationship on the Spectrum of Relationships: Sexual but More Emotional Than One-Night Stands.”
Monitoring Breast Motion

“Can Fabric Sensors Monitor Breast Motion?” Toni E. Campbell, Bridget J. Munro, Gordon G. Wallace, and Julie R. Steele, *Journal of Biomechanics*, vol. 40, 2007, pp. 3056–9. *(Thanks to Brian W. Schultz for bringing this to our attention.)* The authors, at the University of Wollongong, NSW, Australia, report:

To establish whether conducting polymer-coated fabric sensors could be used to monitor breast motion, vertical breast motion of two large breasted women (C+ bra cup) was simultaneously monitored using an OPTOTRAKs 3020 motion analysis system (200 Hz) and polymer-coated fabric sensors linked to a custom-made Bluetooth telemetry system (100 Hz) as the subjects walked and ran on a treadmill (7–10 kilometers/hour-1)…. It was concluded that, although polymer-coated fabric sensors may exhibit a small response lag due to textile geometry changes, they were able to accurately and reliably represent changes in the amplitude of vertical breast displacement during treadmill gait.

His Sexual Thrill From Ants (1986)

“Transcultural Sexology: Formicophilia, a Newly Named Paraphilia in a Young Buddhist Male,” Ratnin Dewaraja and J. Money, *Journal of Sex and Marital Therapy*, vol. 12, No. 2, summer 1986, pp. 139–45. *(Thanks to David Baker for bringing this to our attention.)* The authors, at the University of Colombo, Sri Lanka, report:

His syndrome, formicophilia, was endogenously generated without reference to or influence by commercial pornography. The complete causal explanation of paraphilia will require both a phylogenetic (phylismic) and an ontogenetic (life-history) component.

His Sexual Thrill From Ants (1987)


The case of a patient exhibiting rare paraphilic behavior with ants, snails, and cockroaches is reported…. The patient’s psychosocial status was much improved at the end of the twelve-week therapy, and his paraphilic behavior had lessened.
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How Not To Get Your Article Published

by Stephen Drew, Improbable Research staff

We received this cover letter, which accompanied a lengthy article written in Russian. We have blotted out the author’s name (which may be overkill, because it was illegible).

When a magazine is published entirely in one language (our magazine happens to be in English), submissions written in other languages may be at a disadvantage. In this case, we will not publish the article, but we have (as you can see) published the cover letter.

KIM CARTOON by Nick Kim: “Fly Hell”
Ig Nobel Limericks: Love, Cows, Gorby
Ig Nobel Achievements distilled into limerick form

by Martin Eiger, Improbable Research Limerick Laureate

The Ig Nobel Prizes honor achievements that first make people laugh, then make them think. For details of all the Ig Nobel Prize–winning achievements, see each year’s special Ig Nobel issue of the magazine, and also see http://improbable.com/ig/winners.

2000 Ig Nobel Chemistry Prize
The prize was awarded to Donatella Marazziti, Alessandra Rossi, and Giovanni B. Cassano of the University of Pisa, and Hagop S. Akiskal of the University of California (San Diego), for their discovery that, biochemically, romantic love may be indistinguishable from having severe obsessive-compulsive disorder.


I loved her intensely, and she
Was equally wild about me.
Our passion was mad,
But it seems all we had
Was a case of severe OCD.

Romantic love biochemistry researcher Donatella Marazziti.

2009 Ig Nobel Veterinary Medicine Prize
The prize was awarded to Catherine Douglas [nee Bertenshaw] and Peter Rowlinson of Newcastle University, Newcastle-Upon-Tyne, U.K., for showing that cows who have names give more milk than cows that are nameless.


The Bard wondered, “What’s in a name?”
But Douglas and Rowlinson claim
Lactation’s correlative
To status appellative.
Production of milk’s not the same.

1993 Ig Nobel Mathematics Prize
The prize was awarded to Robert Faid of Greenville, South Carolina, farsighted and faithful seer of statistics, for calculating the exact odds (710,609,175,188,282,000 to 1) that Mikhail Gorbachev is the Antichrist.


A theologian wanted to show
Whether Gorby’s the Antichrist, so
Using numbers exact,
Undeniable fact
Is revealed: maybe yes, maybe no.
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