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

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2009 Ig Nobel Prize Ceremony. Photo: Alexey Eliseev.
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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

Numerical data can be presented in the form of “Chernoff Faces” — see page 6 (these particular faces are from a study by Bernhard Flury and Hans Riedwyl). The bat pictured here (photo by Geri Sullivan) is not performing the activity described on page 18.

On the Back Cover

Large-scale computation as practiced in 1924. Photo: Library of Congress.

Coming Events

September 30, 2010  Ig Nobel Prize Ceremony
October 2, 2010  Ig Informal Lectures
Oct, 2010  Genoa Science Festival
Nov 3, 2010  Agronomy, Crops, and Soil Science Societies, Long Beach, CA

See WWW.IMPROBABLE.COM for details of these and other events.
Neta Snook Southern? NO

Yes, the woman looks like her. The official NASA announcement from 1980, the year this supposed photo of her was supposedly taken, says “Neta Snook Southern, age 84, emerges from the Flight Simulator for Advanced Aircraft at Ames Research Center. Southern, one of the first women pilots, was Amelia Earhart’s flight instructor around the year 1920. In marked contrast with what she saw at Ames, Southern said her old plane was made of wood and cloth, had no gas gauge, and the instrument panel consisted of an altimeter and a dollar watch hanging from a hook.”

The Neta I knew disliked the word “hanging.” She had what amounted to a phobia of that word. I never found out why, despite repeated attempts (by telephoning her, writing letters, visiting, and even sending intermediaries) to get her to explain. It is the appearance of that word “hanging” that got me starting to doubt that this photo is what it claims to be.

Frederick Wilson Brox, ret.
Air Corps Maintenance Reserves
Lacklandale, Arkansas, USA

Neta Snook Southern? YES

I never met Neta Snook Southern, but from all I heard about her when I was at NASA Ames (where I was a perambulator), the entire story [“The Snooks of Science,” AIR 15:7] of the Snooks, and of Neta Snook Southern, rings true.

E.C. Lee, Ph. D.
San Francisco, California, USA

Neta Snook Southern? Technically, No

My great-uncle worked with Neta Snook Southern, and told me that she once confided to him that her name is really spelled “Snooke” with an “e,” not “Snook” without an “e.” My uncle said he had the impression that the spelling was of some concern to Neta Snooke Southern, but that she had decided to try to “take it in stride” and was taking steps in that direction. My great-uncle was a great admirer.

Astor Hein, MD
Belem, Brazil

Neta and Mel

I was thrilled to see your article about my favorite aviatrix Neta Snook Southern and her family. The author may be unaware that Neta had at least a passing acquaintance with Mel, the fellow whose adventures are so lavishly documented in your letters column. This postcard, a treasure now passed on through four(!) generations of my family of historic postal card collectors, was a holiday greeting from La Belle Snook to Mel. Perhaps one of your readers will know whether there are any cards in existence that Mel sent to Neta, and if so would be kind enough to get in touch with me.

Toni Edoun
Curator, Edoun Postal Artifacts Museum
Khartoum, Sudan
WRONG WRONG WRONG

WRONG WRONG WRONG — that you continue to misquote Sherlock Holmes. On your inside cover: “When all other contingencies fail, whatever remains, however improbable, must be the truth.” The quotation you want is in “The Blanched Soldier.” There are similar quotes in THE SIGN OF THE FOUR. Misquote Einstein, Newton or Watson if you wish, but remember that you misquote Holmes at your peril.

Dr. Don Weinshank, Prof. Emeritus
Computer Science & Engineering
Michigan State University
East Lansing, Michigan, USA

[EDITOR’S NOTE: Similar (yet not identical) phrases appear in other Holmes stories. One of those is always quoted on our inside cover.]

Mel on the Street

Please allow me to make another contribution to your collection of photographs of Mel, the little man who always appears in your pages. He is clearly visible here standing three persons to the left of the pole.

I again express my gratitude for the way you addressed my apology for making a mistake in the specifics of how I identified the probable location of Mel in that earlier photograph which I sent you and which you published (AIR Vents 16:2) and which my uncle came into possession of shortly after the world war in the 1940s.

As with that photograph, I hope that your readers can help me identify the date and location of the scene documented in this one, which I believe to be a street or square in some large city.

Dr. Vreeland Heiss
Hamburg, Germany

What’s New on Improbable TV

Check out the latest episode on Improbable Research TV.
Then watch them all!

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

Basic Math in Monkeys and College Students

“Basic Math in Monkeys and College Students,” Jessica F. Cantlon and Elizabeth M. Brannon, Public Library of Science Biology, vol. 5, no. 12, 2007, e328. DOI:10.1371/journal.pbio.0050328. (Thanks to Wim Crusio for bringing this to our attention.) The authors, at Duke University, report:

Here we show that monkeys can mentally add the numerical values of two sets of objects and choose a visual array that roughly corresponds to the arithmetic sum of these two sets. Furthermore, monkeys’ performance during these calculations adheres to the same pattern as humans tested on the same nonverbal addition task.

Mathematical Modelling of an Outbreak of Zombie Infection


Zombies are a popular figure in pop culture/entertainment and they are usually portrayed as being brought about through an outbreak or epidemic. Consequently, we model a zombie attack, using biological assumptions based on popular zombie movies. We introduce a basic model for zombie infection, determine equilibria and their stability, and illustrate the outcome with numerical solutions.... We show that only quick, aggressive attacks can stave off the doomsday scenario: the collapse of society as zombies overtake us all.
Beware of the Flaming Hairball

“Beware of the Flaming Hairball—A Brief Review and Warning,” Mehul V. Ravala, Timothy M. Weiner, Journal of Pediatric Surgery, vol. 40, no. 4, April 2005, pp. E37-E38. (Thanks to Stephen Black for bringing this to our attention.) The authors, who are respectively at the Doris Duke Charitable Foundation and at the University of North Carolina at Chapel Hill, report:

Operating room fires are receiving increasing attention in the medical literature and in the general public.... The authors present the case of a 14-year-old adolescent girl who had an apparent explosive event during a laparotomy for removal of a large gastric trichobezoar. This event was presumably associated with gas production under increased pressures in the gastrointestinal tract caused by an obstructive and decomposing trichobezoar. This is the first reported association between trichobezoars and potential intraoperative fire and/or injury.

Beware of the Flying Vacuum Cleaners


A study from Texas shows that potentially lethal incidents are occurring in magnetic resonance imaging (MRI) suites in US hospitals when ferromagnetic nitrous oxide or oxygen tanks are attracted to the magnet with such force they become projectiles. Other large objects drawn into the imaging equipment include a defibrillator, a wheelchair, a respirator, ankle weights, a tool box, a vacuum cleaner, and mop buckets.

Competitive Speed Eating: Truth and Consequences

“Competitive Speed Eating: Truth and Consequences,” Marc Levine, Geoffrey Spencer, Abass Alavi and David Metz, American Journal of Roentgenology, vol. 189, no. 3, September 2007, pp. 681-6. The authors, at the University of Pennsylvania School of Medicine, report:

OBJECTIVE: The purpose of our investigation was to assess the stomachs of a world-class speed-eating champion and of a control subject during a speed-eating test in our gastrointestinal fluoroscopy suite to determine how competitive speed eaters are able to eat so much so fast.

CONCLUSION: Our observations suggest that successful speed eaters expand the stomach to form an enormous flaccid sac capable of accommodating huge amounts of food. We speculate that professional speed eaters eventually may develop morbid obesity, profound gastroparesis, intractable nausea and vomiting, and even the need for a gastrectomy.
Chernoff and the Face Value of Numbers

A way to make statistics of good, and bad, demeanor

by Alice Shirrell Kaswell, Improbable Research staff

A smiley-face is very expressive, statistically. By tweaking the eyes, mouth and other bits, you can literally put a meaningful face on any jumble of numbers. Herman Chernoff pointed this out in 1973 in the Journal of the American Statistical Association, in a monograph called “The Use of Faces to Represent Points in K-Dimensional Space Graphically.”

Subsequently, folks took to calling these things Chernoff faces. Chernoff faces can make statistical analysis into a recognizably human activity.

Most people, when shown some statistics, sigh and get boggled. But Herman Chernoff realized that almost everyone is good at reading faces. So he devised recipes to convert any set of statistics into an equivalent bunch of smiley-face drawings.

Each data point, he wrote, “is represented by a cartoon of a face whose features, such as length of nose and curvature of mouth, correspond to components of the point. Thus every multivariate observation is visualized as a computer-drawn face. This presentation makes it easy for the human mind to grasp many of the essential regularities and irregularities present in the data.”

“The Use of Faces to Represent Points in K-Dimensional Space Graphically” is one of the few statistics papers that is visually goofy, rather than arid.

One page is filled with 87 cartoon faces, each slightly different. Some faces have little beady eyes, others have big, startled-wideawake peepers. There are wide mouths, little dried-up “I’m not here, don’t notice me” mouths, and middling mouths. Another page shows off some of the cartoony variety that’s possible: roundish simpleton heads, jowly alien-visitor heads, and a smattering of noggins that

An example of a Chernoff face, accompanied by faces expressing extreme values of the data, from John A. Lott and Timothy C. Durbridge’s 1990 study in the Journal of Clinical Laboratory Analysis.

Chernoff faces representing medical data from one hospital patient as it changed during a period of 24 hours. This, too, is from the Lott/Durbridge 1990 study.
look froggy. Elsewhere, the study perhaps inevitably includes conventional statistics machinery — charts of numbers, differential and integral calculus equations, and plenty of technical lingo.

Chernoff discovered, by experiment, that people could comfortably interpret a face that expresses quite large amounts of data. “At this point,” he wrote, “one can treat up to 18 variables, but it would be relatively easy to increase that number by adding other features such as ears, hair, [and] facial lines.”

The world has gone on to employ Chernoff faces a little, but not yet a lot. A 1981 report in the *Journal of Marketing*, for example, used them to display corporate financial data, with this explanation: “From Year 5 to Year 1, the nose narrows as well as increases in length, and the eccentricity of the eyes increases. Respectively, these facial features represent a decrease in total assets, an increase in the ratio of retained earnings to total assets, and an increase in cash flow.”

A note at the very end of Chernoff’s 1973 paper hints at a practical reason why his idea would not catch on immediately: “At this time the cost of drawing these faces is about 20 to 25 cents per face on the IBM 360-67 at Stanford University using the Calcomp Plotter. Most of this cost is in the computing, and I believe that it should be possible to reduce it considerably.”

---

*Chernoff faces representing data about a series of Swiss bank notes, some real, some forged, from Bernhard Flury and Hans Riedwyl’s 1981 study in the Journal of the American Statistical Association. The main variables are:*

- $X_1$: length of the bank note
- $X_2$: width of the bank note, measured on the left side
- $X_3$: width of the bank note, measured on the right side
- $X_4$: width of the lower margin
- $X_5$: width of the upper margin
- $X_6$: length of the print diagonal from the lower left to the upper right corner
Chernoff faces made from data gathered by measuring rocks, and presented in Chernoff’s original paper in the Journal of the American Statistical Association. The paper explains that “Eight measurements were made on each of 88 nummulited specimens from the Eocene Yellow Limestone Formation of northwestern Jamaica.”

Using Chernoff faces to present several years of a company’s financial data, from David L. Huff, Vijay Mahajan and William C. Black’s 1981 study in the Journal of Marketing.
References


“Use of Chernoff Faces to Follow Trends in Laboratory Data,” John A. Lott and Timothy C. Durbridge, *Journal of Clinical Laboratory Analysis*, 1990, pp. 459-63. The authors are at Ohio State University in the USA and the Institute of Medical and Veterinary Sciences in Adelaide, Australia.

“Graphical Representation of Multivariate Data by Means of Asymmetrical Faces,” Bernhard Flury and Hans Riedwyl, *Journal of the American Statistical Association*, vol. 76, no. 376, December 1981, pp. 757-65. The authors are at the University of Berne, Switzerland.

< Chernoff faces representing data about several American cities, also, from the Flury/Riedwyl 1981 study.

✓ The variables Flury and Riedwyl used in representing data about those American cities as Chernoff faces.
The applications of mathematics can be bizarre. Soon after I arrived in Bristol in the 1960s, a senior colleague called me, saying that someone in the veterinary school needed help with mathematics — or was it physics? — and I seemed just the person to help. Cursing inwardly, I agreed to see the fellow. He was Peter Darke, a graduate student near the end of a Ph.D. studying horses’ hearts.

He showed me a paper by Gabor (Dennis Gabor, who invented holography) and Nelson1 and asked me to explain it. It took a while to understand. The idea is that a heart is like a little battery, pushing weak electric currents in a three-dimensional pattern round the body. The battery has a strength and a direction: it acts as a current dipole, represented as a little arrow — the heart vector. During each heartbeat, the vector (tip of the arrow) draws a loop - the heart loop — whose shape is a powerful diagnostic of health. Therefore it is useful to measure this loop, in a way that doesn’t involve killing the horse. Gabor’s paper gave the theory of a way to do that, inferring the heart vector by measurements of the electric potential on the surface of the horse. It is an ingenious application of Gauss’s theorem.

Peter had spent three years preparing to implement this idea. He enveloped his horse in a coat he had made, of several hundred potentiometers, with electronics to measure the potential at each of them, fifteen times during each heartbeat, and he had arrived at the point where he had a huge file of all these measurements. But there was a difficulty: he knew only the most elementary high-school mathematics and so had no way to understand the formulas in Gabor’s paper. His specific question was: does the theory apply to a real horse, or only to an ideal cylindrical horse? Unlike the physicists’ mythical ‘spherical cow,’ this was real.

I learned that the formulas work for a horse of any shape, but they do assume uniform conductivity — a better approximation, apparently, for horses than for people. (Actually, it doesn’t have to be accurate: who cares whether the loop describes the real dipole inside the real horse? To be useful for diagnosis, it is necessary only that the loop be reproducible.)

**TOP:** Detail from the Darke/Holmes study.

**LEFT:** The Darke/Holmes study, which used the Berry approach to integrate over the surface of a horse.

---

Horse Calculus

by Michael Berry

H.H. Wills Physics Laboratory,
University of Bristol, Bristol, UK
The formulas involved integration, and Peter didn’t know what an integral was, so it was hard to explain how to add up all those measurements. A complication was that what had to be inferred was a vector, so he needed to know, at each point on the horse, the components of the perpendicular to the surface of the horse with respect to the three symmetry directions of the horse. After some discussion, we made a ‘cos-theta-meter,’ and I left him to it, and never saw him again.

But a year later, I received two papers from him, reporting the outcome of all that arithmetic. To my surprise, he had indeed calculated fifteen vectors for each heartbeat, and thereby deduced the heart loops for several horses in different states of health. At the end of the paper were the usual acknowledgements to colleagues and funding agencies. For technical help, he thanked me; and for financial support, he thanked the Horserace Betting Levy Board (financed by racecourse gamblers).

The moral of this is that applications of mathematical knowledge can be unexpected; you may find yourself taking a surface integral over a horse.

References
Cocker’s Arithmetick

A schoolbook that both postdated and outlived its time

by Stephen Drew, Improbable Research staff

Mathematics teaching has been cocked up — well and properly and officially — for a good long while, thanks to Edward Cocker and his amply-titled textbook Cocker’s Arithmetick: Being a Plain and Familiar Method Suitable to the Meaneast Capacity for the Full Understanding of That Incomparable Art, As It Is Now Taught by the Ablest School-Masters in City and Country.

Published in 1667, and later reprinted in more than 100 editions, the book was a standard in British grammar schools for several generations. Foreign schoolteachers also took Cocker to their bosom.

A Man of Words, Word, and More Words, Plus More Words

The 34-word title exemplifies the book’s approach to explaining things clearly. One could (although the author would probably not) sum it up in three words: don’t be terse.

Here, for example, is how the book takes the student in hand — nearly in handcuffs, really — to explain the so-called “Rule of Three.” This passage appears on page 88 of the book’s 47th edition, published in the year 1736:

Observe, that of the three given numbers, those two that are of the same kind, one of them must be the first, and the other the third, and that which is of the same kind with the number sought, must be the second number in the rule of three; and that you may know which of the said numbers to make your first, and which your third, know this, that to one of those two numbers there is always affixed a demand, and that number upon which the demand lieth must always be reckoned the third number.

The book’s very first page accustoms the student to what lies ahead. You might enjoy reading this aloud:

Unit is number; for the part is of the same matter that is his whole, the unit is part of the multitude of units, therefore the unit is of the same matter, that is the multitude of units; but the matter of the multitude of units is number; therefore the matter of units is number; or else, if from a number given no number but subtracted, the number given remaineth; as suppose 3 the given number, if as some suppose, 1 be no number, then if you subtract 1 from 3, there must remain 3 still; which is very absurd.

Words After Death

Scholars now debate whether Edward Cocker actually wrote the book (the first edition was published nine years after his death). Some suggest the whole thing is just a pastiche of other people’s writings, issued by a greedy publisher. No matter. Like many of today’s textbooks, authorities deemed it authoritative, and it came to enjoy widespread use. In that respect, as perhaps in others, this antique textbook is a very 21st-century piece of work.
References

Cocker’s Arithmetick: Being a Plain and Familiar Method Suitable to the Meanest Capacity for the Full Understanding of That Incomparable Art, As It Is Now Taught by the Ablest School-Masters in City and Country, Edward Cocker, 1677, John Hawkins [publisher], London.

Bonus

Cocker’s Life and productive death are the subject of an essay called “Who Was Cocker,” in the July 1884 issue of The Bibliographer. You can read it online at <http://books.google.com/books?id=ILZwAAAAIAAJ>.
Snow-Clearing from SUV Roofs and from Fire Hydrants: An Informal Look

by John Trinkaus, Baruch College, City University of New York

John Trinkaus was awarded the 2003 Ig Nobel Prize in literature for meticulously collecting data and publishing more than 80 detailed academic reports about things that annoyed him. Since that time, he has repeatedly gotten annoyed, collected data, and written monographs.


To glean some indication as to the number of drivers who clean the snow off their vehicle’s roof, and the number of people who shovel snow off fire hydrants, a small, informal enquiry was conducted during the first two days following a major snowstorm during the winter of 2010. The locale was a suburb of a large city in the Northeast.

What Was Noted When

On the morning of the first day following the storm evidence of passenger vehicle roof cleaning — as contrasted with merely clearing a viewing port for the front and rear windows — was observed.

On the second morning, fire hydrant snow clearing was noted. Some owners of homes near a fire hydrant sometimes choose to clear a working area around the hydrant — to permit fire persons access in case of an emergency.

Day 1 — Details

On the first morning the writer positioned himself beside the two city-bound lanes of a 4 lane state highway. As passenger vehicles passed their roofs were viewed for the presence of snow.

For the purpose of this study, they either had snow or they did not have snow. If a vehicle surface had both clear and snowy sections, it was not counted for there was no way of telling if some snow had been purposely cleared or simply had been blown off as the vehicle was driven. If the roof was clean and dry, without any trace of snow, again, for the purpose of this enquiry, it was not counted. It was assumed that the vehicle had been garaged during the storm. Of the 1,000 “qualifying” vehicles noted, 473 (47%) were sedans and 527 (53%) SUV’s (sport utility vans). One hundred forty-two (30%) of the sedans had roof snow, and 469 (89%) of the SUV’S had roof snow.

Day 2 — Details

On the second morning, the writer drove through the area consisting or modestly sized and priced single family homes observing fire hydrants. For the purpose of this enquiry, only two states of the world were considered: the area around the hydrant was purposely cleared, or it was not. If there was a question of “status,” no note was made. One hundred hydrants were observed. Nineteen (19%) were cleared; eighty-one (81%) were not.

Limitations

The methodological limitations of this study, such as subjective judgment, the use of only one observer, convenience sampling and the inability to replicate the enquiry, are recognized.

Similarly, acknowledged are such setting boundings as: use of a single community, absence of consideration of any applicable ordinances, lack of consideration of prevailing cultural norms and practices, and the want of factoring for other variables, such as day of the week and the prevailing weather following the storm.

Thoughts About The Findings

However, it might well be reasonable to advance some thoughts about what the findings or this enquiry could suggest about social morality. Ease seemingly plays an important part in the practice of social morality. If it is not too difficult for folks to do, they will probably do what society says is right. Removing snow from the roof of a sedan is certainly less of a job than clearing snow from the roof of a SUV. Too, leaving snow around a fire hydrant is easier to do than shoveling it away. Surprisingly, self interest does not appear to be too much of a modifier. Removing snow from a vehicle roof makes for safer driving. Removing the snow from a fire hydrant makes for more effective and efficient fire-fighting.
Satellite image, taken two days after a snow storm, of the general region containing the suburb (of a large city) where this study was conducted. Photo prepared by Jacques Descloitres, MODIS Land Rapid Response Team at NASA GSFC.
Hoola Hooping Update (2007)
“The Lower Extremity Kinetics of Hula-Hooping: An Exploratory Analysis,” Tyler Cluff, Ramesh Balasubramaniam and D.G.E. Robertson, *Journal of Biomechanics*, vol. 40, 2007, p. S234. Ramesh Balasubramaniam was half of the team that win the 2004 Ig Nobel Prize in Physics for exploring and explaining the dynamics of hula-hooping. Here, he and colleagues at the University of Ottawa, Ontario, Canada, extend that work:

The purpose of the present research was to conduct an inverse dynamic analysis to determine whether the mechanics of hula hooping generated conclusions similar to the decompositional kinematic analysis previously reported.

Hoola Hooping Update (2008)

This paper involved a biomechanical analysis of lower limb joint coordination during hula hooping.

Shiv: Lusting While Loathing
“Lusting While Loathing — Parallel Counterdriving of Wanting and Liking,” Ab Litt, Uzma Khan and Baba Shiv, *Psychological Science*, 21, no. 1, 2010, pp. 118-25, DOI: 10.1177/0956797609355633. Baba Shiv was part of the team that won the 2008 Ig Nobel Prize in medicine for demonstrating that high-priced fake medicine is more effective than low-priced fake medicine. The authors, at Stanford University, report:

We show how being “jilted”—that is, being thwarted from obtaining a desired outcome—can concurrently increase desire to obtain the outcome, but reduce its actual attractiveness. Thus, people can come to both want something more and like it less. Two experiments illustrate such disjunctions following jilting experiences.... These results demonstrate how dissociable psychological subsystems for wanting and liking can be driven in opposing directions.
Puzzling Solutions
Solution to Last Month’s Puzzler

by Emil Filterbag, Improbable Research staff

The key to solving this puzzle was to concentrate on the extremities. The bees, regardless of which of their body parts were visible, were, as per the hint from Little Audrey, not to be included in the count.

The drawings are from the book *The Apiary; or, Bees, Bee-Hives, and Bee Culture*, by Alfred Neighbour of the Charles C. Miller Memorial Apicultural Library [Kent & Co. (publishers), London, 1865].

Two (2) hands, and two (2) feet are visible, in whole or in part, in this drawing.

One (1) hand and no (0, i.e., zero, zed, zilch) feet are visible, in whole or in part, in this drawing.
It’s Hard: To Be a Bat

by Alice Shirrell Kaswell, Improbable Research staff

A new study helps answer the question raised in Thomas Nagel’s 1974 philosophy essay, “What Is It Like to Be a Bat?” A team of Chinese and British researchers focuses on an aspect of bat-ness that Nagel ignored: fellatio.

Nagel, a professor then at Princeton University, now at New York University, published his batty—batty in the truest, best sense—musings in a scholarly journal called *Philosophical Review*.

He explained that: “Bat sonar, though clearly a form of perception, is not similar in its operation to any sense that we possess, and there is no reason to suppose that it is subjectively like anything we can experience or imagine. This appears to create difficulties for the notion of what it is like to be a bat. We must consider whether any method will permit us to extrapolate to the inner life of the bat from our own case, and if not, what alternative methods there may be for understanding the notion.”

A quarter century later, Min Tan, Gareth Jones, Guangjian Zhu, Jianping Ye, Tiyu Hong, Shanyi Zhou, Shuyi Zhang, and Libiao Zhang came up with an alternate method. Based variously at three institutions in China (Guangdong Entomological Institute, Guangxi Normal University, and East China Normal University) and one in the U.K. (the University of Bristol), they published a report called “Fellatio by Fruit Bats Prolongs Copulation Time.” It appears in the journal *PLoS ONE*.

Tan, Jones, Zhu, Ye, Hong, Zhou, Zhang, and Zhang captured bats in Yuexiu Park in Guangzhou City, and then confined them in large cages—a male/female pair in each cage—and filmed the animals’ behavior.

The researchers say their intent was simple: “We wanted to know more about the nature of copulation in this bat species. We observed that females were not passive during copulation but performed oral sex, licking their mate’s penis during copulation.... A positive relationship exists between the length of time that the female licked the male’s penis during copulation and the duration of copulation. Furthermore, mating pairs spent significantly more time in copulation if the female licked her mate’s penis than if fellatio was absent.”

![Image 1](https://example.com/image1.jpg)

*Tan, Jones, Zhu, Ye, Hong, Zhou, Zhang and Zhang's 2009 study.*

![Image 2](https://example.com/image2.jpg)

^Data from Tan, Jones, Zhu, Ye, Hong, Zhou, Zhang and Zhang’s study.

< More data from Tan, Jones, Zhu, Ye, Hong, Zhou, Zhang and Zhang’s study.
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 h4IR-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.

But however much progress they did make in answering Thomas Nagle’s basic question, the team did not overcome every epistemological limit. While expressing pride in their achievement (“We believe that ours is the first large scale observational study of oral sex in non-humans”), they confess to at least one big deficit in their knowledge of what it is like to be a bat: “At present, we do not know why genital licking occurs.”

Tan, Jones, Zhu, Ye, Hong, Zhou, Zhang, and Zhang offer up various alternative theories, but admit that those are only guesses. Implicitly, these biologists echo for their own profession what Thomas Nagle wrote, back in 1974, for his: “Philosophers share the general human weakness for explanations of what is incomprehensible in terms suited for what is familiar and well understood, though entirely different.”

References

Boys Will Be Boys
Research by and for adolescent males of all ages and sexes
compiled by Katherine Lee, Improbable Research staff

Coming to Term

Eyeballs on Boobs, Tracked (2009)
The authors, at Victoria University of Wellington, New Zealand, report:

Female waist-to-hip ratio (WHR), breast size, and facial appearance have all been implicated in assessments by men of female attractiveness. However, very little is known about how men make fine-grained visual assessments of such images.

We used eye-tracking techniques to measure the numbers of visual fixations, dwell times, and initial fixations made by men who viewed front-posed photographs of the same woman, computer-morphed so as to differ in her WHR (0.7 or 0.9) and breast size (small, medium, or large). Men also rated these images for attractiveness.

The Gag Reflex and Fellatio

“If I-um-We?”
“‘Is It Alright If I-um-We Unbutton Your Pyjama Top Now?’ Pronominal Use in Bedside Teaching Encounters,” Charlotte Rees and Lynn Monrouxe, Communication and Medicine, vol. 5, no. 2, 2008, pp. 171-81. The authors, at the University of Sydney, explain:

We analysed the use and function of pronouns (I, we, you and they), pronoun shifts and the collocate ‘think’ in the talk of five tutors, ten students and six patients within six BTEs [bedside teaching encounters].... Further research is needed with a more diverse sample, including younger patients, and across different settings like general practice, to explore the full diversity of pronominal talk within BTEs.

Detail from the 2009 Dixson/Grimsha/Linklater/Dixson eye-tracking study.
The authors report:

While questionnaire studies have shown that men find female breasts visually attractive, there is very little information about how they make such visual judgments. In this study, we used eye-tracking technology to test two hypotheses: (1) that larger breasts should receive the greatest number of visual fixations and longest dwell times, as well as being rated as most attractive; (2) that lightly pigmented areolae, indicative of youth and nubility, should receive most visual attention and be rated as most attractive.... We conclude that areolar pigmentation, as well as breast size, plays a significant role in men’s judgments of female attractiveness. However, fine-grained measures of men’s visual attention to these morphological traits do not correlate, in a simplistic way, with their attractiveness judgments.
Ig Nobel Limericks: Pregnant Stand
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.

2009 Ig Nobel Physics Prize

The prize was awarded to Katherine K. Whitcome of the University of Cincinnati, USA, Daniel E. Lieberman of Harvard University, USA, and Liza J. Shapiro of the University of Texas, USA, for analytically determining why pregnant women don’t tip over.


Whitcome, et al., have shown here
An analysis making it clear
That a girl with a bun
In the oven is one
Who’s unlikely to fall on her rear.

2009 Ig Nobel Public Health Prize

The prize was awarded to Elena N. Bodnar, Raphael C. Lee, and Sandra Marijan of Chicago, Illinois, USA, for inventing a brassiere that, in an emergency, can be quickly converted into a pair of protective face masks, one for the brassiere wearer and one to be given to some needy bystander.

REFERENCE: U.S. patent # 7255627, granted August 14, 2007 for a “Garment Device Convertible to One or More Facemasks.”

It’s the dream of the red-blooded male —
In a sense, it’s the male’s holy grail —
To find someone near,
Remove her brassiere,
And then bury his face and inhale.

The beginning of Whitcome, Shapiro and Lieberman’s study.
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

A Fresh Approach to Sighing

“Is a Sigh ‘Just a Sigh’? Sighs as Emotional Signals and Responses to a Difficult Task,” Karl Halvor Teigen, *Scandinavian Journal of Psychology*, vol. 49, no. 1, 2008, pp. 49–57. DOI:10.1111/j.1467-9450.2007.00599.x. (Thanks to Martin Gardner for bringing this to our attention.) The author, at the University of Oslo, Norway, explains:

Sighing and the interpretation of sighs in everyday life seem never to have been the subject of psychological research. A questionnaire study of sighing showed that people associate sighing mainly with negative, low-intensity and deactivated emotional states. A second study investigated self/other differences in the interpretation of sighs in four hypothetical situations, revealing that sighs in other people are primarily perceived as signs of sadness, whereas own sighs are more often believed to express a state of “giving up” something or somebody. In a third experimental study participants worked on difficult (insoluble) puzzles, which generated many futile solution attempts, often accompanied by sighs.

Spontaneous Sighs vs. Intentional Sighs

“Take a Deep Breath: The Relief Effect of Spontaneous and Instructed Sighs,” Elke Vlemincx, Joachim Taelman, Ilse Van Diest and Omer Van den Bergh, *Physiology and Behavior*, vol. 101, no. 1, August 4, 2010, pp. 67-73. The authors, at the University of Leuven, Belgium, report:

Spontaneous sighing is related to subjective relief of negative emotional states. Whether this also applies to instructed sighing is not known. [Our results suggest that] a spontaneous sigh seemed to induce relief. An instructed sigh appeared to inhibit recovery from mental stress.

Anti-Social Persons Tend Not to Love Other Persons


This study compared the scripts of love among 60 prison inmates diagnosed with Antisocial Personality Disorder and those of [two other groups].... The inmates with Antisocial Personality Disorder showed more focus on themselves when they described love than [did] the other inmates and the controls.
Yet Another Mathematical Model of Marriage Woes

“A Mathematical Model of Sentimental Dynamics Accounting for Marital Dissolution,” José-Manuel Rey, Public Library of Science One. vol. 5, no. 3, March 2010, e9881. (Thanks to Sylvie Coyaud for bringing this to our attention.) The author, at Universidad Complutense, Madrid, Spain, reports:

Building on a simple version of the second law we use optimal control theory as a novel approach to model sentimental dynamics.... [The] apparent paradox that a union consistently planned to last forever will probably break up is explained as a mechanistic consequence of the second law.

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May We Recommend

Items that merit a trip to the library

compiled by Stephen Drew, Improbable Research staff

Mask Wiggling in Masked Bearded Men and Females


The authors, at Chelsea and Westminster Hospital, London, UK, report:

Surgical face masks prevent the dispersal of bacteria from the upper airway to surfaces immediately in front of and below the face during talking. However, mask wiggling has been reported to increase dermabrasion and bacterial contamination of surfaces immediately below the face. Facial hair and recent shaving may alter the quantity of particles shed by dermabrasion when the mask is wiggled. We investigated the effect of mask wiggling in 10 bearded and 10 clean-shaven male subjects, and 10 female subjects. Wiggling the mask significantly increased the degree of bacterial shedding onto agar plates 15 cm below the lips in bearded males (p = 0.03) and females (p = 0.03), but not in clean-shaven males. At rest without mask wiggling the bearded subjects shed significantly more bacteria than clean-shaven males (p = 0.01) or females (p = 0.001). To reduce the risks of contamination of the sterile field when face masks are worn females and bearded males should avoid wiggling the face mask. Bearded males may also consider removing their beards.

Further detail from the McLure/Mannam/Talboys/Azadian/Yentis study of masks and bacteria.
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What is this picture? (see page 1)