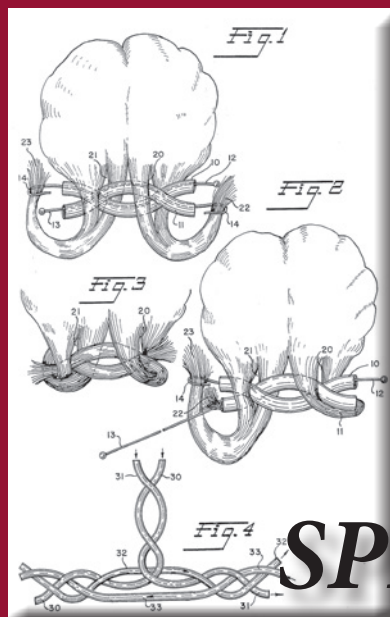




ANNALS OF

IMPROBABLE RESEARCH



SPECIAL Hair Twists ISSUE

Coriolis-forced moustache,
Dr Klar's scalp whorls,
Daum's hair-twist compulsion...

MARCH | APRIL 2015 (VOLUME 21, NUMBER 2)

NEW!

Improbable Research Weekly Podcast

CBS is distributing the Improbable Research podcast, both on the new CBS Play.it web site, and on iTunes.



*The 25th First Annual
Ig Nobel Prize Ceremony*
Thursday, September 17, 2015 6pm
Sanders Theatre, Harvard University

*Celebrating research that makes
people LAUGH and then THINK.*

Live webcast
www.improbable.com

Annals of Improbable Research

© 2015 Annals of Improbable Research
ISSN 1079-5146 print / 1935-6862 online



AIR, P.O. Box 380853, Cambridge, MA 02238, USA
"Improbable Research" and "Ig" and the tumbled thinker
logo are all reg. U.S. Pat. & Tm. Off.
617-491-4437



www.improbable.com
subscriptions@improbable.com
EDITORIAL: marc@improbable.com

Research that makes people LAUGH and then THINK



Co-founders
Marc Abrahams
Alexander Kohn



Editor
Marc Abrahams
marc@improbable.com



Bureaus and Desks
Kees Moeliker, European Bureau Chief
Dr. Yoshiro Nakamats, Japan General Bureau Chief
Steve Farrar, Edinburgh Desk Chief
Dariusz Jemielniak, Warsaw Desk Chief
Magnus Wahlberg, Scandinavian Desk Chief
Martin Gardiner, Rio de Janeiro Desk Chief
Reto Schneider, Swiss Desk Chief
Sid Rodrigues, London Organiser



Erwin J.O. Kompanje
Willem O. de Jongste



Commutative Editor
Stanley Eigen, Northeastern U.



Associative Editor
Mark Dionne



Dissociative Editor
Rose Fox



Psychology Editor
Robin Abrahams



Contributing Editors
Otto Didact, Stephen Drew, Ernest Ersatz, Emil Filterbag,
Karen Hopkin, Alice Kaswell, Nick Kim, Katherine Lee,
Bissel Mango, Nan Swift, Marina Tsipis, Bertha Vanatian



Research Researchers
Kristine Danowski, Tom Gill, Mary Kroner



Circulation Engineer
Michael Kerpan



Bookmaster
Lauren Maurer Trew



Design and Art
Geri Sullivan, PROMote Communications
Lois Malone, Rich & Famous Graphics



Art Director emerita
Peaco Todd



Improbable Facilitator
Katherine Griffin



WEB TEAM
Editor
Marc Abrahams



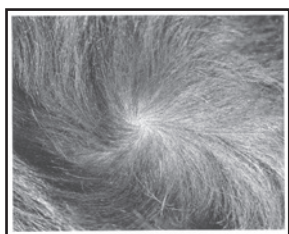
Webmaster
Julia Lunetta

*"When all other contingencies fail, whatever remains,
however improbable, must be the truth."
—Sherlock Holmes*

*"Science is the belief in the ignorance of experts."
—Richard Feynman*

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.

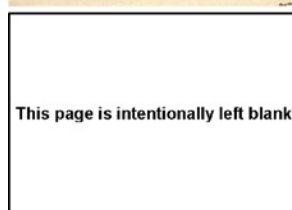


SPECIAL SECTION: HAIR TWISTS

Influence of Coriolis Force on the Growth of Body Hair – John W. Woods, Jr.	6
Hair Piece: An Unexpected Twist* – Marc Abrahams	8
Hair Twist Research Review* – Alice Shirrell Kaswell	9
With-a-Twist Research Review* – Alice Shirrell Kaswell	13

IMPROBABLE RESEARCH*

This Study is Intentionally Left Blank* – Glen Wright, F.X. Coudert, Martin Bentley, Graham Steel, Sylvain Deville 14



Page 14

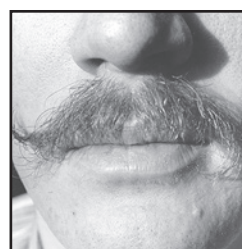
IMPROBABLE RESEARCH REVIEWS*

Improbable Research Review* – Dirk Manley	4
Improbable Medical Review* – Bertha Vanatian	5
Improbable Sex* – Marc Abrahams	20
Boys Will Be Boys* – Katherine Lee	22
Soft Is Hard* – Alice Shirrell Kaswell and Bissell Mango	23
Icky Cutesy Research Review* – Alice Shirrell Kaswell	25
Ig® and Beyond: Worm Crawling and Arm-Crossing* – Nan Swift	26

NEWS & NOTES

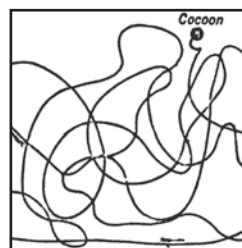
NEW! Improbable Research Weekly Podcast and The 25th First Annual Ig Nobel Prize Ceremony	IFC
AIR Vents (letters from our readers)	2
Editorial Board	12
Puzzling Solutions: Rats! – Emil Filterbag	21
Teachers' Guide	22
Ig® Nobel Limericks: Apostrophes, Shorts, Cheese* – Martin Eiger	24
Subscriptions and eBooks for You and Your Colleagues	27
KIM CARTOON: "Fly Eyes" – Nick Kim	28
Index of Special Issues	28
Unclassified Ads	IBC

On the Front Cover



A moustache subjected to coriolis forces. See page 6.

On the Back Cover



The route taken by one spider as it sought and found a cocoon, as documented in the study "Some Observations on the

Mental Powers of Spiders," George W. and Elizabeth G. Peckham, *Journal of Morphology*, vol. 1, no. 2, 1887, pp. 383-419.

Some Coming Events

See WWW.IMPROBABLE.COM for details of these and other events:

January 2015
Premiere of the Improbable Research weekly podcast

June 2015
Tokyo, Japan

September 17, 2015
25th First Annual Ig Nobel Prize Ceremony, Cambridge, MA, USA & live webcast

March 2015
Ig Nobel Europe Tour



April 2015
San Antonio, TX, USA

September 19, 2015
Ig Informal Lectures
Cambridge, MA, USA

EVERY DAY

Read something new and improbable
every day on the Improbable Research blog, on our web site:
WWW.IMPROBABLE.COM

AIR VENTS

Exhalations from our readers

NOTE: The opinions expressed here represent the opinions of the authors and do not necessarily represent the opinions of those who hold other opinions.

The Piper, the Penguin, But Not the Poet



William McGonagall, the great bad poet from Dundee (“The Tay Bridge Disaster” was his excruciating masterpiece — I was one of the passengers who joined you in performing it on the train crossing the Tay when you and the Ig Nobel Prize winners visited Dundee several

years ago), died two years before this photo was taken. Would that he had been alive and in Antarctica to write a horrendous poem about the meeting of the piper and the penguin, that fateful day in 1904 when the Scottish National Antarctic’s piper and the penguin discovered each other.

*Fiona Prentice MacDougal, MD
Dundee, Scotland*



One-to-Five for the Level-of-Anger Angry Letter-Writer Scale

Count me as another enthusiastic supporter of the triple “heads up” modification you published (AIR Vents, AIR 20:6) to Fiona Ai’s guidelines for graphically indicating the level of anger of different letter-writers, as modified by the system proposed by Vanida Surihani (AIR 20:5), using one or more miniature copies of the famous photograph of men testing an American football helmet in 1912. I hope, sometimes pray, that you will begin using it consistently with all the letters you publish. A possible problem is that the images are not so evocative when they are tiny, and you probably will have to make them tiny — especially when you use five of them to indicate that a particular letter-writer wrote an intensely angry letter — because if you print them large there will be not much room for the actual letters. I am eager to see how you resolve this big/small set of tradeoffs. I believe Edward Tufte proposed a similar, though inferior, system in one of his books about displaying information. Tufte never

solved the big/small problem for this. Mutual colleagues tell me that the question vexes him.

*Prof. Eashla Farou, retired
Lima, Peru*



Another Mel Photo Unearthed, Corrected, Again Still

It happened yet again, again, again. Like so many of your past correspondents, I have fallen victim—now four times—to the temptation to too-hastily identify the location of Mel, the famous “little guy” who always appears in your letters column. Thank you for printing the photo I sent you from my institution’s photographic archives. In my first letter I said that you can plainly see Mel in the 31st row, standing next to the man with a squint. This photograph dates from 1918, according to our records; that is the only information we have about this particular image. But I was wrong about the location of Mel. I have now crossed out the circle that I drew around the region which I mistakenly believed contains him, and indicated the genuine location, and then crossed that out when it proved to be mistaken. I have put in a new indicator. I am pretty sure this one does point to Mel (whom I now think of as “Mel the Elusive”). I’m afraid the photo is now a bit of a mess.

*Gry Nielsen
Horsens, Denmark*

Remembering Mickey

It gave me a thrill to see that photograph you published of Mickey the polisher. When I was a young child in Cincinnati, my parents took me once a month to see Mickey, who was then a very old man who sort of knew where he was and sort of didn’t, working in the little shoeshine stand a block away from the public library. He still, always, wore that lovely “M” shirt, though what was left of it had seen better days long before. For years I thought it was an “N” shirt. My parents every time told me the story of how when Mickey was young he worked in the library, wearing that shirt and polishing books. I never did learn why he polished the books, or why he was no longer polishing books inside the library but instead was polishing shoes a block outside the library. To me he was just “Mickey,” and still is except that he died many years ago.

*Alicia Desroberts
Stoupa, Greece*



Mickey, the M Man of Letters

Dr. Gireesh Madhava Siddalingaiah is in for a treat if he pursues the stories of the Letter Tenders who are celebrated in the series of souvenir “Letter Tenders” picture cards produced and distributed by the Bogosian Lenonade Company of Cincinnati during the years when the “Letter Tenders” system was the city’s primary source of civic pride and the chief element of its tourism “boosting.” The “M” card is a favorite of mine. That’s “Mickey” Rapoli in the picture. He was the son of Florence (“Mickey”) Rapoli and her husband Isaiah (who also liked to be called “Mickey.” All the members of that family liked to be called Mickey. They were celebrated in their day. Cincinnatians of a certain age all recall fondly reading the book *Call Us Mickey*, copies of which were awarded to schoolchildren if we visited the public library on our eleventh birthdays and went up to the circulation desk and said the magic phrase “Who’s Mickey?”

Anyway, Mickey Rapoli was, to my way of thinking, the best of the Mickeys and, more important to the library, the best of the Letter Tenders. He liked to polish the spines of the books. He loved to polish the spines of the books. He lived to polish the spines of the books. One of the library directors told him to stop, that too much polishing was damaging the spines of the books. But Mickey was unstoppable, until that director fired him.

*Todd Saylor
University of Cincinnati
Cincinnati, Ohio, USA*

IMPROBABLE RESEARCH REVIEW

Improbable theories, experiments, and conclusions

compiled by Dirk Manley, Improbable Research staff



When Your Fat Melts, Point by Point

"Melting Points of Human Fats as Related to their Location in the Body," Knut Schmidt-Nielsen, *Acta Physiologica Scandinavica*, vol. 12, no. 2-3, June 1946, pp. 123–129. (Thanks to Nailah Dean for bringing this to our attention.) The author reports:

Melting point in human fats varied between 41° C and 0.5°C. The largest variations in the individual person was about 30° C.

The melting point of visceral fat was 30° C–35° C. In the more peripheric parts the melting points were lower. At the foot melting points of from 0° C–10° C were often found, in 11 out of 15 persons the melting point was below 10° C.

Measurements of the temperatures at men's feet show that low temperatures often occur. Since Henriques experimentally demonstrated the connection between temperature and the melting point in subcutaneous fat, it can be supposed that the temperature at men's feet influence the melting point of the fat.

One single person was examined in whom the results were widely different from the others. He was a sea stoker, exposed to high temperatures in his daily work, and all the melting points observed in this man were extremely high.



Knut Schmidt-Nielsen, author of the study "Melting Points of Human Fats as Related to their Location in the Body," measuring aspects of the physiology of a camel. Drawing, from a photo, by Nan Swift.

Measure for Measure for Error

"Statement of Retraction," *Measurement in Physical Education and Exercise Science*, vol. 18, no. 4, 2014. (Thanks to the Retraction Watch blog for bringing this to our attention.) This short article says:

Due to errors, the statistical analyses of the manuscript titled "Comparing Measurement Error Between Two Different Methods of Measurement of Various Magnitudes" by Gerald S. Zavorsky (volume 14, issue 4, pages 265–274) are incorrect. For this reason, the aforementioned published article is officially retracted from this journal.

Readers who are interested in a corrected version of the manuscript can contact the author directly....

The retracted article will remain online to maintain the scholarly record, but it will be digitally watermarked on each page as RETRACTED.

We welcome your suggestions for this and other columns. Please enclose the full citation (no abbreviations!) and, if possible, a copy of the paper.

STATEMENT OF RETRACTION

Article title: Comparing Measurement Error Between Two Different Methods of Measurement of Various Magnitudes

Authors: Zavorsky, G. S.

Journal: Measurement in Physical Education and Exercise Science

Bibliometrics: Volume 14, Issue 4, pages, 265–274

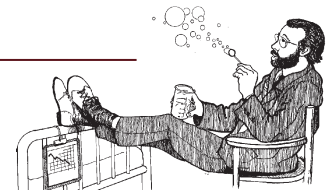
DOI: 10.1080/1091367X.2010.519963

Due to errors, the statistical analyses of the manuscript titled "Comparing Measurement Error Between Two Different Methods of Measurement of Various Magnitudes" by Gerald S. Zavorsky (volume 14, issue 4, pages 265–274) are incorrect. For this reason, the aforementioned published

IMPROBABLE MEDICAL REVIEW

Improbable diagnoses, techniques, and research

compiled by Bertha Vanatian, Improbable Research staff



Too Much Wine, From the Wrong Direction

“Self-Administered Ethanol Enema Causing Accidental Death,” Thomas Peterson, Landen Rentmeester, Bryan S. Judge, Stephen D. Cohle, and Jeffrey S. Jones, *Case Reports in Emergency Medicine*, vol. 2014, 2014, article ID 191237. The authors, at Michigan State University and Spectrum Health Hospitals, Grand Rapids, Michigan, report:

Emergency medical services were summoned, and on arrival the presence of a middle aged white male, lying on his left side in bed, was noted. The patient was in fixed rigor and livor mortis, was asystolic, and was pronounced dead. An enema bag was hanging from a coat rack next to the bed and contained a yellow colored fluid. A tube was connected to the enema bag and the other end inserted into the patient’s rectum. Several empty boxes of white wine were also discovered during the scene investigation. The patient was wearing a condom and women’s underwear, and numerous pornographic materials were found throughout the room.

Case Report

Self-Administered Ethanol Enema Causing Accidental Death

Thomas Peterson,¹ Landen Rentmeester,² Bryan S. Judge,²
Stephen D. Cohle,³ and Jeffrey S. Jones²

¹ College of Human Medicine, Michigan State University, Grand Rapids, MI 49503, USA

² GRMEP/Michigan State University Program in Emergency Medicine, Grand Rapids, MI 49503, USA

³ Department of Pathology, Spectrum Health Hospitals, Grand Rapids, MI 49506, USA

Correspondence should be addressed to Jeffrey S. Jones; jeffjones44@comcast.net

Received 11 August 2014; Revised 18 October 2014; Accepted 21 October 2014; Published 11 November 2014

Physics of Ingrown Big Toe Nails

“Physics of Nail Conditions: Why Do Ingrown Nails Always Happen in the Big Toes,” Cyril Rauch and Mohammed Cherkaoui-Rbati, *Physical Biology*, vol. 11, 2014.

Detail from the study “Self-Administered Ethanol Enema Causing Accidental Death.”

Phys. Biol. 11 (2014) 066004

C Rauch and M Cherkaoui-Rbati

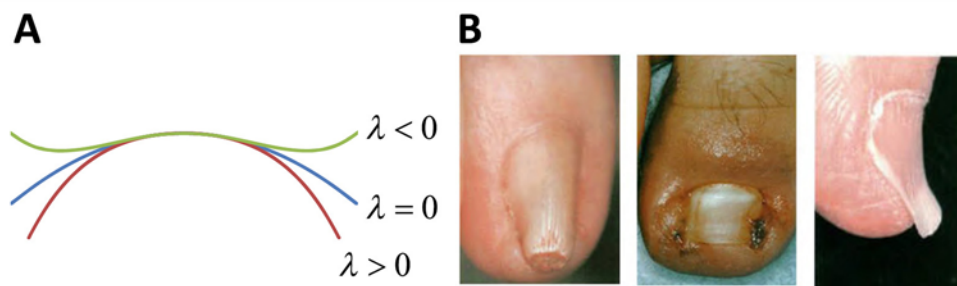


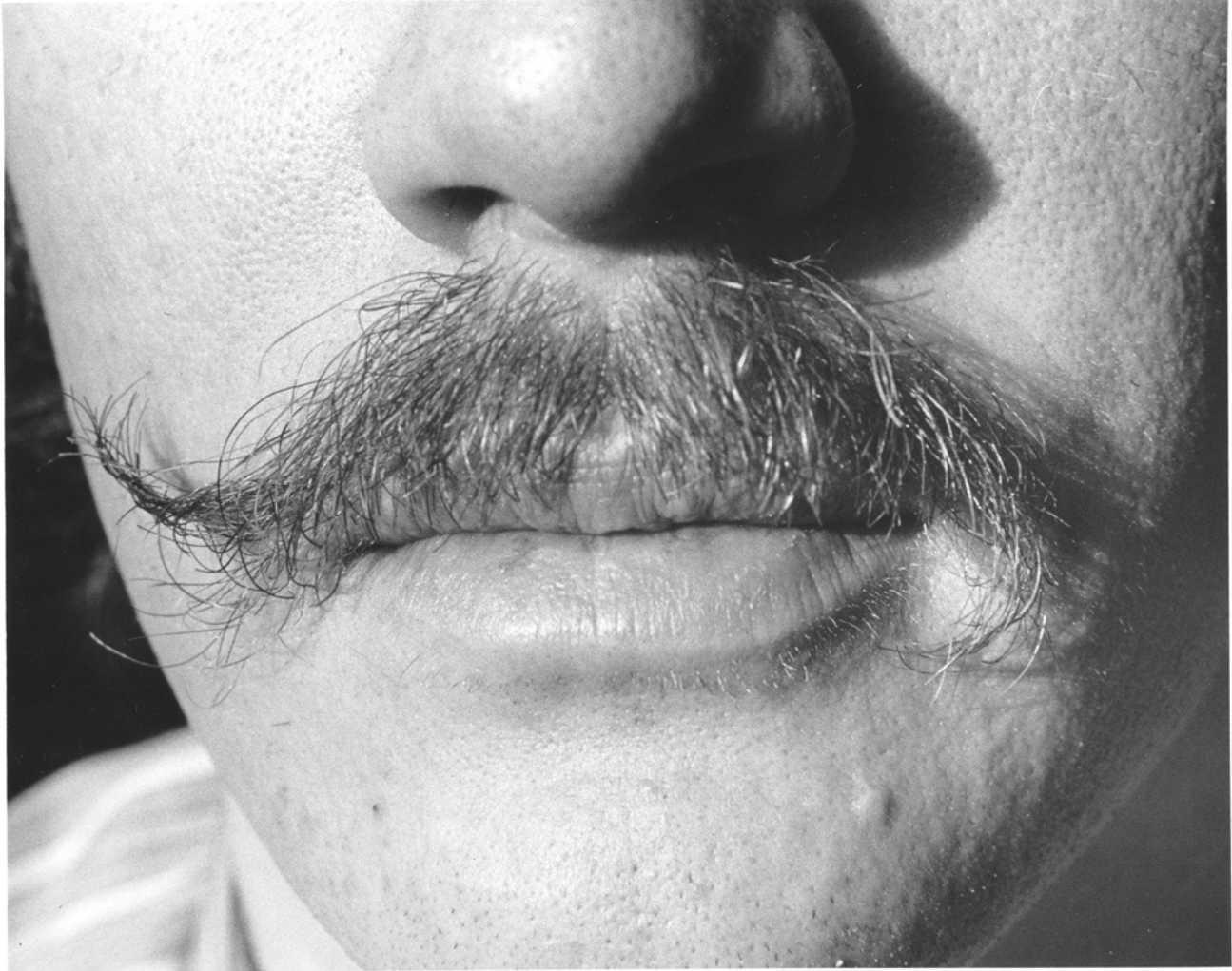
Figure 4. Nail shape and related conditions. (A) Transverse profile of the distal part of a nail for different sign of λ . (B) Photos of nail conditions: pincer nail (left), ingrown nail (middle) and spoon-shaped nail (right); photos from Baran R *et al* (2014).

Application to ingrown nails: why the big toe?

The ingrowing nail or ‘onychocryptosis’ is a condition causing much discomfort and morbidity in school children/adolescents/young adults (Khunger and Kandhari 2009) and is diagnosed in 15% of pregnant women (Ponnappula and Boberg 2010). Though recognized for a long time, a satis-

Ventsel and Krauthammer 2001): $E_2 = \frac{D}{2} \iint (C_x - C_0)^2 dS$, where the integration is performed over the nail surface and where, $D = Ye^3/12(1 - \nu)$, is the flexural rigidity of the nail plate (Y , is the Young modulus assumed to be isotropic across the nail and; ν the Poisson’s coefficient), C_x , the transverse curvature of the nail surface along the x -axis and, C_0 , the spontaneous curvature of the nail that is identical to the cur-

Detail from the study “Physics of Nail Conditions: Why Do Ingrown Nails Always Happen in the Big Toes.”



INFLUENCE OF CORIOLIS FORCE ON THE GROWTH OF BODY HAIR

by John W. Woods, Jr.

Watertown, Massachusetts, U.S.A.

The effect of Coriolis force on the formation of weather patterns is well known. Recent research indicates that this phenomenon further exerts itself in previously undiscovered manners.

Any body moving over the surface of the earth is subject to an apparent force that deflects its path to the right in the northern hemisphere and to the left in the southern hemisphere. Its motion in space is a combination of its motion relative to the earth and the motion of the Earth. Because of the rotation of the Earth, principally, the path is a curved one.

The apparent force and the resulting acceleration were first discussed before the middle of the 19th century by Gaspard Gustave de Coriolis, a French civil engineer. Because of Coriolis force, wind blowing from an area of high atmospheric pressure does not flow directly toward a low pressure area, but is deflected to the right, in the northern hemisphere, and circulates counter-clockwise around the low. Related phenomena occur in the drift of ice at sea and the erosion of river banks.

Current investigation has shown that certain biological phenomena, previously not understood, are caused by

TOP: Figure 1. Mustache curl caused by Coriolis force in the Northern Hemisphere.

Coriolis force. The pieces of a long-unsolved puzzle in biokinetics first began to fall into place when this researcher noted that his mustache consistently curled up on the right side of his face and down on the left side. Simple deduction shows that the direction of hair growth conforms to a body under the influence of Coriolis force in the northern hemisphere. Photographic documentation is illustrated in Figure 1.

The first insight led to a generalized investigation of the growth patterns of body hair. The direction of growth from the well-known "cowlick" is of particular interest. The fact that the spiral pattern emanating from the cowlick origin can occur in both clockwise and counter-clockwise orientations was known to the ancients. However, no relationships in frequency of occurrence have previously been established.

Through the examination of a large sample of human and bovine cowlicks, it may be stated that an almost perfect correlation exists between the direction of rotation and the effect of Coriolis force. Subjects born in the northern hemisphere invariably exhibit a clockwise spiral rotation, the reverse being true in the southern latitudes. Figure 2 illustrates the clockwise rotation in a North American steer cowlick.

Let us briefly examine the mathematics of the process. Coriolis force manifests itself as a deflection in the motion of a body in an amount given by:

$$Z = 2.62 V \sin(L) + 0.146 V^2 \sin(T) \tan(L) - 5.2 VT'$$

where Z is deflection in minutes of arc, V is speed in knots, L is latitude in degrees, and T' is rate of change of true course in degrees per minute. Since the rate of hair growth is relatively slow and the true course is random, the equation may be reduced to the first term through the use of Cassini's Division. We may conclude that Coriolis force increases from zero at the equator to a maximum at the poles, and increases with growth rate.

The properties of hair growth in a spiral pattern have been extensively studied in the mathematics of topology. In the early 1930s three Italian researchers, Capelli, Ricciuto, and Pelato, proposed the Sbaglio Theorem. The concept is now well accepted in spite of early criticism. The principle describes the volume which hair occupies on the head as a function of the degree of spiral. When no spiral is present, the hair grows straight out of the head and occupies maximum volume. As the degree of spiral increases, the volume decreases as the hair forms an orderly matted

pattern. Some asymmetry does, however, exist between clockwise and counter-clockwise spiral volumes due to anisotropic hysteresis of the hair follicle. Attempts by the authors of the Sbaglio Theorem to correlate population hair volume with the 11-year sunspot cycle were inconclusive, and no further research was conducted.

In considering the effects of Coriolis force, two relationships concerning the volume occupied by the hair on a person's head are immediately obvious. The volume depends almost solely on the latitude of the subject and his rate of hair growth.

The high Coriolis force associated with high latitudes ensures a strong spiral growth pattern. An outgrowth of this research has been the discovery of the cause of a rare disease, previously unexplained by the medical profession. Rapid hair growth rates accompanied by high Coriolis force leads to hyperspiralosis, a condition in which a three- to six-stranded rope is produced on the patient's head. The heavy loxodrome can cause severe diamethesis.

As research is continued through additional funding, other phenomenological relationships to Coriolis force will no doubt be discovered. Of particular interest are several unanswered questions in the field of archaeology. For instance, was the left-handed screw thread developed first in the southern hemisphere?

[Editor's note: This article was originally published in the now-defunct National Weather Digest, in 1977.]

Figure 2. Clockwise spiral pattern in the cowlick of a North American steer. Note the polysyncloidal symmetry about the center.



HAIR PIECE: AN UNEXPECTED TWIST

by Marc Abrahams, *Improbable Research staff*

Amid the swirls of controversy that buffet other sexuality researchers, one man focuses, quietly, on swirls. In a monograph called “Excess of Counterclockwise Scalp Hair-Whorl Rotation in Homosexual Men,” Dr. Amar J.S. Klar announces a subtle discovery. “This is the first study,” he writes, “that shows a highly significant association of biologically specified counterclockwise hair-whorl rotation and homosexuality in a considerable proportion of men in samples enriched in gays.”

Dr. Klar heads the Developmental Genetics Section of the Gene Regulation and Chromosome Biology Laboratory at the National Cancer Institute in Frederick, Maryland. His hair-swirl study appears in a 2004 issue of the *Journal of Genetics*:

“Excess of Counterclockwise Scalp Hair-Whorl Rotation in Homosexual Men,” Amar J.S. Klar, *Journal of Genetics*, vol. 83, no. 3, December 2004, pp. 251–5. (Thanks to Claudio Angelo and Hanne Poulsen for bringing this to our attention.)

The phenomenon is easy to overlook. Dr. Klar explains:

Since the hair whorl is found at the top (“crown”) of the head and thereby it is difficult to observe one’s own whorl and the direction of orientation is seemingly an unimportant feature, most people are oblivious to the direction of their hair-whorl rotation. It takes two mirrors to observe one’s own hair-whorl.

His monograph includes a photograph showing the “scalp hair whorl of an anonymous man selected from the general public,” and directs the reader to hold that picture in front of a mirror in order to “appreciate the counterclockwise orientation”.

How difficult is it to collect hair-whorl-direction data? Dr. Klar explains that he, for one, got lucky:

By chance I happened to be vacationing at a beach where preponderance of gay men was fortuitously noticed. The subjects were considered to be homosexuals because of their public display of stereotypical interpersonal relationship deemed typical of homosexual men. This assessment was reinforced by the dearth of females and children on the beach.... Conveniently, the gay men were highly concentrated in one area of the beach. Such considerations made it relatively easy to collect the data on groups of predominantly gay men with great confidence even though the subjects were not asked for their sexual preference.

A year later Dr. Klar returned to the same beach and collected another load of data.

Excess of counterclockwise scalp hair-whorl rotation in homosexual men

AMAR J. S. KLAR*
Ijamsville, MD 21754, USA

Abstract

While most men prefer women as their sexual partners, some are bisexual and others are homosexuals. It has been debated for a long time whether a person’s sexual preference is innate, learned, or due to a combination of both causes. It was recently discovered that the human right-versus-left-hand use preference and the direction of scalp hair-whorl rotation develop from a common genetic mechanism. Such a mechanism controls functional specialization of brain hemispheres. Whether the same mechanism specifying mental makeup influences sexual preference was determined here by comparing hair-whorl rotation in groups enriched with homosexual men with that in males at large. Only a minority of 8.2% ($n = 207$) unselected ‘control’ group of males had counterclockwise rotation. In contrast, all three samples enriched with homosexual men exhibited highly significant ($P < 0.0001$), 3.6-fold excess (29.8%, $n = 272$) counterclockwise rotation. These results suggest that sexual preference may be influenced in a significant proportion

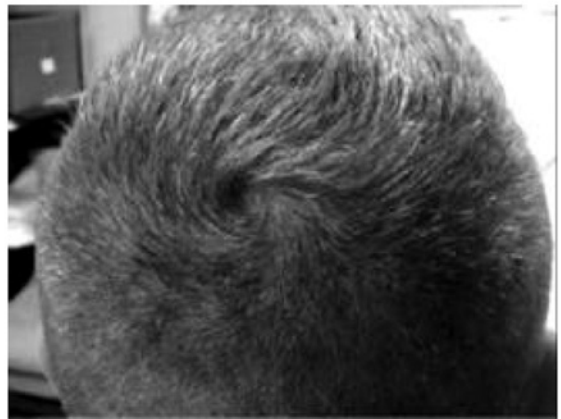


Figure 1. The hair-whorl phenotype. The picture shows scalp hair whorl of an anonymous man selected from the general public showing clockwise orientation. By holding the picture in front of a mirror and looking at its image, the reader can appreciate the counterclockwise orientation.

Detail from the study “Excess of Counterclockwise Scalp Hair-Whorl Rotation in Homosexual Men.”

He reports, “Altogether in a combined sample of 272 mostly gay men observed, 29.8% exhibited counterclockwise hair-whorl orientation.” This, he says, is “vastly different from the value of 8.4% counterclockwise rotation found in the public at large, which included both males and females.”

The study does not take account of the erstwhile hair-whorl directionality of persons who are now bald. Dr. Klar explicitly excluded them from consideration, along with anyone who was “wearing a sun cap.”

Dr. Klar suggests a direction for further exploration: “It should be equally interesting to compare the proportions of clockwise and counterclockwise hair-whorl orientations in lesbian women with those in females at large.”

The report ends with a simple notice that deftly fends off the research-is-a-waste-of-government-money crowd: “Author’s personal funds were used for the study.”

HAIR TWIST RESEARCH REVIEW

Angular approaches to, or with, hair

by Alice Shirrell Kaswell, Improbable Research staff

Daum's Hair Twists

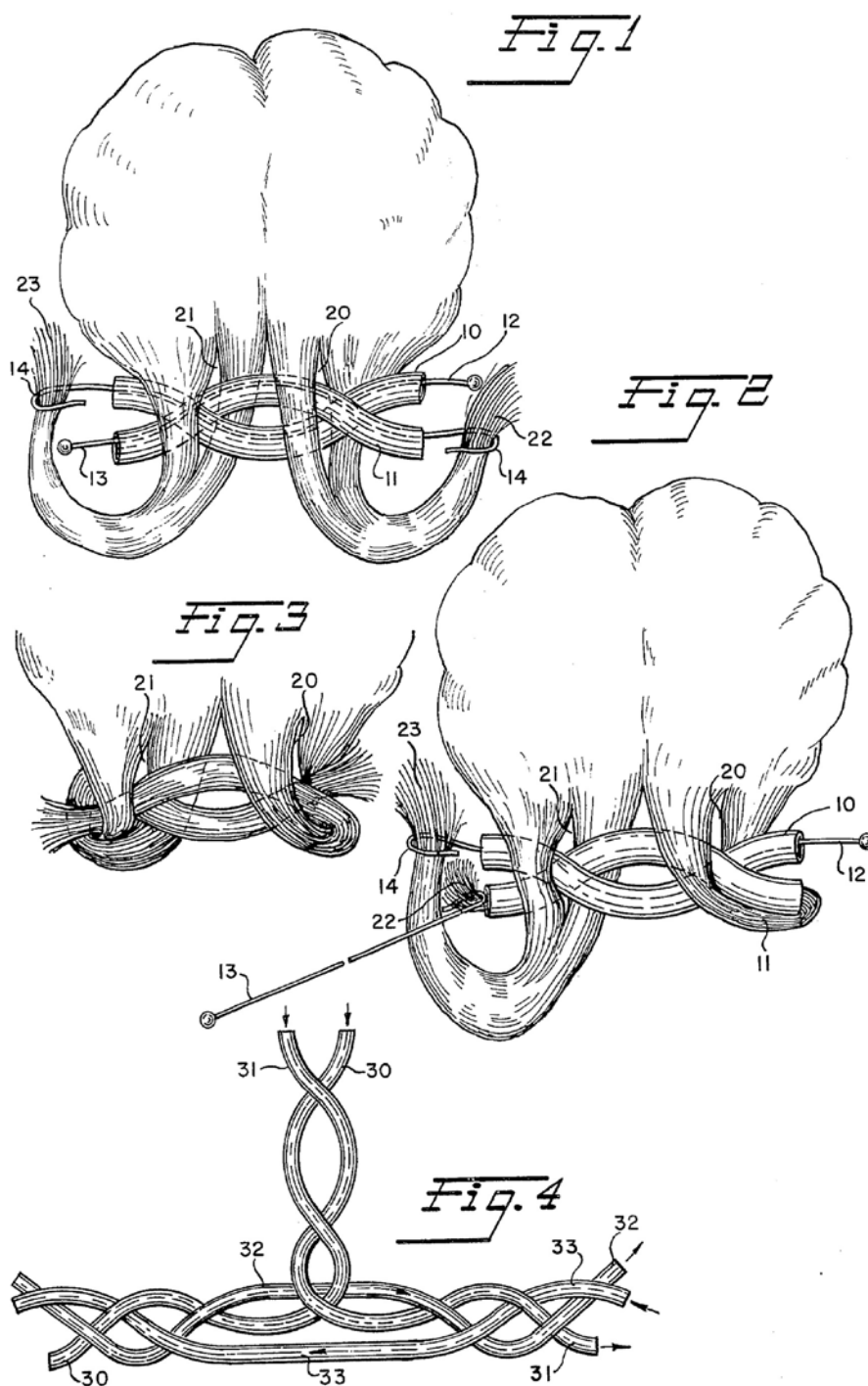
"Wordless Thoughts: Entering the Knot of Compulsive Hair Twisting," Melissa A. Daum, master's thesis, Pacifica Graduate Institute, 2012. The author begins thus:

In this thesis, I will be exploring my own habit of twisting my hair. I want to formulate an understanding of what motivates my hair twisting habit and what its purpose is in my life. By understanding the specifics of my own personal fixation, I am assuming that I will better understand the more general, commonplace phenomenon of bodyfocused repetitive behaviors.... To begin this journey, I will illustrate my habit and its origins in detail.

Redrow's Twist

"Hair Dressing Method and Device," U.S. patent 3889692, issued June 17, 1975 to Redrow Allan Raymond. The inventor explains:

To use this invention, the hair to be manipulated is first combed and separated into a number of strands and the free end of each strand is engaged with one of the leaders to be drawn into and through one of the respective guide means. Each separate hair strand is thus led into the intertwined position of its guide with respect to the other guides and their hair strands. When all of the strands to be intertwined have been led into and through their respective guides their leaders are detached from the strands and the tubes are pulled longitudinally off of the free end of each strand to leave the several hair strands intertwined in the pattern that the guides originally occupied.



Detail from Redrow's patent for a "Hair Dressing Method and Device."

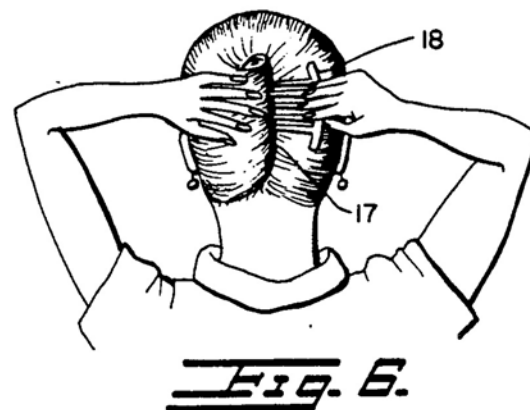
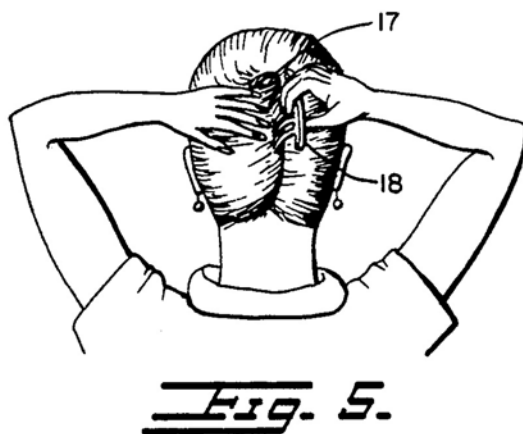
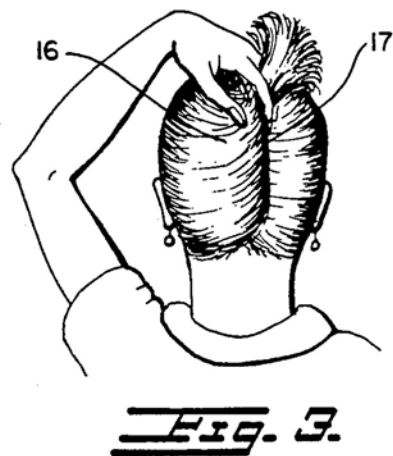
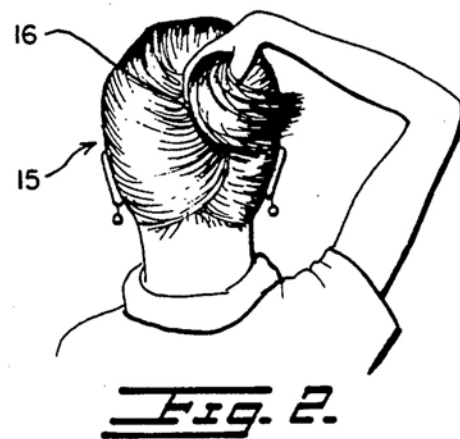
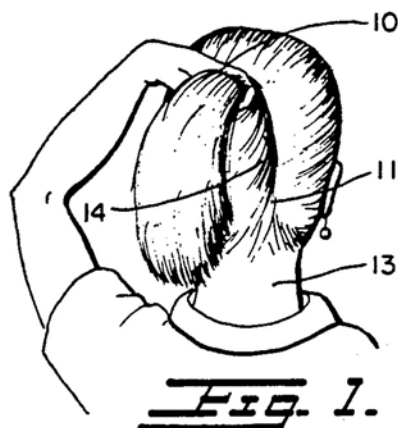
continued >

HAIR TWIST RESEARCH REVIEW (CONTINUED)

Moore's Twist

"Method for Setting a Hair Twist," U.S. Patent 5249589, issued October 5, 1993, to Melanie Moore. The inventor explains:

[This is a] method for setting a hair twist on a head having hair on its top and a neck at its bottom, comprising the steps of: pulling a full handful of hair back at the nape of said neck; holding of said hair in one hand; making a large twist going up against the back of the head; making a plurality of twists against the head and moving it upward toward the top of the head and into a roll having an edge; pinching the top of the roll so the roll will not loosen up; bringing all remaining hair under the roll; pushing said remaining hair under the roll; keeping pressure on the roll so that it does not loosen; placing a hair comb, having wide teeth at one end and a top part at the other, into the edge of the roll, at its teeth, at a 90 degree angle to the head; turning the top part of the comb down toward the head; and finally pushing the comb into the roll.



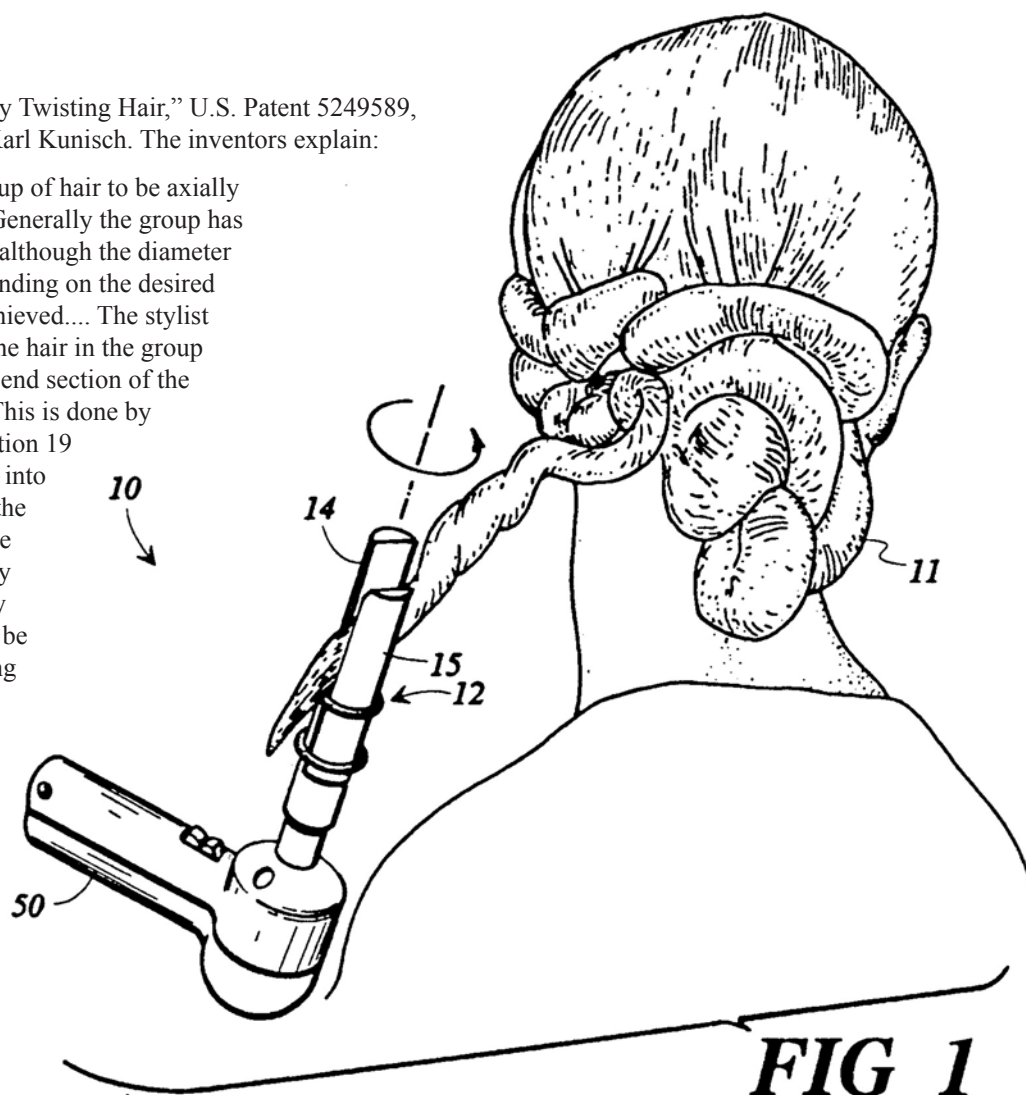
Detail from Moore's patent for a "Method for Setting a Hair Twist."

Powell and Kunisch's Electro-Powered Twist

"Apparatus and Method for Axially Twisting Hair," U.S. Patent 5249589, issued 1993, to Terri Powell and Karl Kunisch. The inventors explain:

In use, the stylist grasps a group of hair to be axially twisted into loops and curls. Generally the group has a diameter of about one inch, although the diameter may be larger or smaller depending on the desired style or design effect to be achieved.... The stylist pinches together the ends of the hair in the group and then the stylist places the end section of the group of hair into the probe. This is done by placing hair on the sloped section 19 and slidably inserting the hair into the slot 23. The stylist aligns the probe 19 longitudinally with the group of hair extended radially from the head and then axially rotates the hair. Rotation may be accomplished by either holding the shaft 18 in a stylist's hand and manually rotating the shaft 19, or preferably by inserting the shaft 19 into the electrically powered drive unit 50, for powered rotation.

During power rotation, the powered drive unit 50 acts to slowly twist the group of hair held by the probe.



Black Holes, No Hair

"Metric for Rapidly Spinning Black Holes Suitable for Strong-Field Tests of the No-Hair Theorem," Tim Johannsen and Dimitrios Psaltis, *Physical Review D*, vol. 83, no. 12, 2011, p. 124015.

Detail from Powell and Karl Kunisch's patent for an "Apparatus and Method for Axially Twisting Hair."

A Metric for Rapidly Spinning Black Holes Suitable for Strong-Field Tests of the No-Hair Theorem

Tim Johannsen and Dimitrios Psaltis

Physics and Astronomy Departments, University of Arizona, 1118 E. 4th Street, Tucson, AZ 85721, USA
(Dated: May 24, 2011)

According to the no-hair theorem, astrophysical black holes are uniquely characterized by their masses and spins and are described by the Kerr metric. Several parametric deviations from the Kerr metric have been suggested to study observational signatures in both the electromagnetic and gravitational-wave spectra that differ from the expected Kerr signals. Due to the no-hair theorem, however, such spacetimes cannot be regular everywhere outside the event horizons, if they are solutions to the Einstein field equations; they are often characterized by naked singularities or closed time-like loops in the regions of the spacetime that are accessible to an external observer. For observational tests of the no-hair theorem that involve phenomena in the vicinity of the circular

continued >



Fig. 1. French braiding, suitable for use in surgical approach to endoscopic brow lift.



Fig. 2. Conspicuous aesthetic effect of shaving before tissue expander insertion from previous operation. Hair was braided to allow straightforward removal of infected expanders by authors (M.C.L.B. and C.R.D.).

HAIR TWIST RESEARCH REVIEW (CONTINUED)

Baker-Fox-Davis's Surgical "French Twist"

"A 'French Twist': Practical Hair Control in Plastic Surgery," Michelle L. Baker, Leanne C.J. Fox, and Christopher R. Davis, *Plastic and Reconstructive Surgery*, vol. 131, no. 3, 2013, pp. 456e–7e. The authors, at Frenchay Hospital, Bristol, U.K., explain:

Hair control is paramount for optimizing the surgical approach and subsequent wound closure during head and neck surgery, craniofacial surgery, and neurosurgery....

We describe the use of French braiding as a simple, free, and versatile alternative with many positive features. This technique is particularly applicable to patients with longer hair to enable a precise surgical approach, clear operative field, and straightforward wound closure. Braids are adaptable to many surgical approaches, allowing all strands of hair to be neatly controlled away from the surgical incision, particularly for larger volumes of hair. There is no additional trauma to the scalp or hair during the procedure, and the braids may be left in postoperatively for ease of wound care.

Detail from the study "A 'French Twist': Practical Hair Control in Plastic Surgery."

ANNALS OF

IMPROBABLE RESEARCH EDITORIAL BOARD

Anthropology

Jonathan Marks, U. North Carolina

Archaeology

Angela E. Close, U. Washington

Astrochemistry

Scott Sandford, NASA/Ames

Astronomy

Robert Kirshner, Harvard U.
Jay M. Pasachoff, Williams Coll.
Eric Schulman, Alexandria, Virginia
David Slavsky, Loyola U., Chicago

Biology

Dany Adams, Tufts U.
Lawrence Dill*****, Simon Fraser U.

Biomaterials

Alan S. Litsky, Ohio State U.

Biophysics

Leonard X. Finegold, Drexel U.

Biotechnology

A. Stephen Dahms, Alfred E. Mann
Foundation

Bureaucracy

Miriam Bloom, SciWrite, Jackson, MS

Cardiology

Thomas Michel*****, Harvard Med. School

Chemistry

Dudley Herschbach*, Harvard U.

Computer Science

Robert T. Morris***, MIT
Margo Seltzer, Harvard U.

Economics

Ernst W. Stromsdorfer, Washington St. U.

Engineering

Dean Kamen, DEKA Research

Food Research

Massimo Marcone, U. of Guelph

Forensic Biology & Criminalistics

Mark Benecke, Int'l Forensic Res., Köln

Functional Biology & Morphology

Frank Fish, West Chester U.
Rebecca German, Johns Hopkins U.
Richard Wassersug*****, Dalhousie U.

Genetics

Michael Hengartner, U. of Zürich

Geology

John C. Holden, Omak, WA
John Spletstoesser, Waconia, MN

Immunology

Falk Fish, Orgenics, Ltd., Yavne, Israel

Infectious Diseases

James Michel*****, Harvard U.

Intelligence

Marilyn Vos Savant**, New York, NY

Law

William J. Maloney, New York, NY
Ronald A. May, Little Rock, AR

Library & Info Sciences

Regina Reynolds, Library of Congress
George Valas, Budapest, Hungary
Norman D. Stevens, U. of Connecticut

Marine Biology

Magnus Wahlberg*****, U. of
Southern Denmark

Materials Science

Robert M. Rose, MIT

Medical Ethics

Erwin J.O. Kompanje, Erasmus MC
University, Rotterdam

Methodology

Rod Levine, National Insts of Health

Molecular Biology

Walter Gilbert*, Harvard U.
Richard Roberts*, New England Biolabs

Molecular Pharmacology

Lloyd Fricker, Einstein Coll. of Medicine

Neurology

Thomas D. Sabin, Tufts U.

Nutrition

Brian Wansink*****, Cornell U.

Ornithology

Kees Moeliker*****, Natuurhistorisch
Museum Rotterdam

Obstetrics & Gynecology

Pek van Andel*****, Medical Faculty
Groningen, The Netherlands
Eberhard W. Lisse, Swakopmund State
Hospital, Namibia

Orthopedic Surgery

Glenn R. Johnson, Decorah, IA

Paleontology

Sally Shelton, Museum of Geology,
South Dakota School of Mines and
Technology
Earle Spamer, American Philosophical
Society, Philadelphia, PA

Parasitology

Wendy Cooper, Australian Pest &
Vet. Med. Auth.

Philosophy

George Englebreton, Bishop's U., Quebec

Physics

Len Fisher*****,
Bristol U., UK
Jerome Friedman*, MIT
Sheldon Glashow*, Boston U.
Karl Kruszelnicki*****,
U. Sydney
Harry Lipkin, Weizmann Inst.
Douglas Osheroff*, Stanford U.
Frank Wilczek*, MIT

A Guide to the Stars

- * Nobel Laureate
- ** world's highest IQ
- *** convicted felon
- **** misspelled
- ***** sibling rivalry
- ***** six stars
- ***** Ig Nobel Winner

Political Science

Richard G. Neimi*****, Rochester, NY

Psychology

Dan Ariely*****, Duke U
Louis G. Lippman, Western Wash. U.
G. Neil Martin, Regents U., UK
Chris McManus*****, University Coll.
London

Neil J. Salkind, U. of Kansas

Richard Wiseman, U of Hertfordshire

Pulmonary Medicine

Traian Mihaescu, Iasi, Romania

Research

James Harkin, QI, London, UK

Science Policy

Al Teich, American Assn for the
Advancement of Science

Stochastic Processes

(selected at random from amongst
our subscribers)
Jorma Louko, Nottingham, UK

Swordswallowing

Dan Meyer *****, Cutting Edge
Innertainment

Women's Health

Andrea Dunaif, Northwestern U.
JoAnn Manson, Brigham & Women's Hosp.

WITH-A-TWIST RESEARCH REVIEW

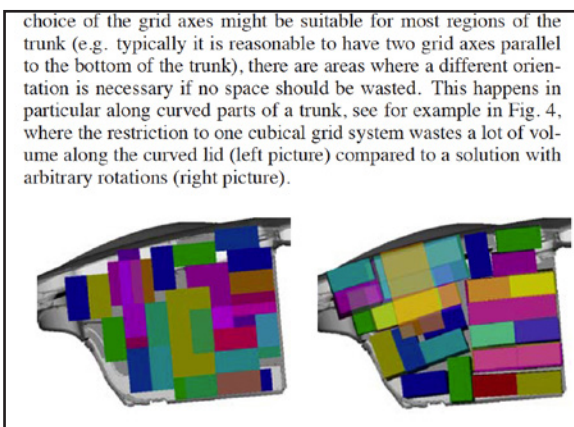
Sundry investigations, each with a twist

by Alice Shirrell Kaswell, *Improbable Research staff*

Packing a Trunk With a Twist

“Packing a Trunk: Now With a Twist!” Friedrich Eisenbrand, Stefan Funke, Andreas Karrenbauer, Joachim Reichel, and Elmar Schömer, in *Proceedings of the 2005 ACM Symposium on Solid and Physical Modeling*, pp. 197-206. The authors, at MPI für Informatik and Johannes Gutenberg University in Germany, and Stanford University, report:

In an industry project with a German car manufacturer we are faced with the challenge of placing a maximum number of uniform rigid rectangular boxes in the interior of a car trunk. The problem is of practical importance due to a European industry norm which requires car manufacturers to state the trunk volume according to this measure. No really satisfactory automated solution for this problem has been known in the past.... In this paper we present a new approach.



Detail from the study “Packing a Trunk: Now With a Twist!”

Member with a Twist

“Treatment of Congenital Penile Curvature with Penile Torsion: A New Twist,” K.M. Slawin and H.M. Nagler, *Journal of Urology*, vol. 147, no. 1, 1992, pp. 152-154.

Lightbulb Removal With a Twist

“Foreign Body (Light Bulb) in the Rectosigmoid Colon,” Robert C. Hunter Jr., *United States Armed Forces Medical Journal*, vol. 5, no. 7, 1954, pp. 1058-1060.

Purpura on the Rocks—With a Twist

Robert R. Siroty, MD

THE ENTITY of quinine-induced purpura is well recognized and has been described many times. On several occasions, its relation to the ingestion of cocktails mixed with quinine

water—so-called cocktail purpura or gin-and-tonic purpura—has been reported.^{1,2} We recently encountered a well-disguised case with potentially serious consequences.

with chills and the rapid development of purpura, including buccal mucous membrane hemorrhages. Platelet count was 1,000/cu mm; other laboratory data were normal. The patient had had a recent episode of acute gastroenteritis but was otherwise well. She denied taking any drugs except a mixture of chlorpheniramine maleate, aspirin, and caffeine (Coricidin) and aspirin and denied drinking quinine-con-

From the Department of Hematology, Dover General Hospital, Dover, NJ.
Reprint requests to 77 Union Street, Dover, NJ 07801.

Report of a Case

A 27-year-old woman was admitted to Dover General Hospital in January 1973

Purpura on the Rocks—with a Twist

“Purpura on the Rocks — With a Twist,” Robert R. Siroty, *Journal of the American Medical Association*, 235, no. 23, 1976, pp. 2521-2522. The author reports:

The entity of quinine-induced purpura is well recognized and has been described many times. On several occasions, its relation to the ingestion of cocktails mixed with quinine water—so-called cocktail purpura or gin-and-tonic purpura—has been reported. We recently encountered a well-disguised case with potentially serious consequences.

Report of a Case: A 27-year-old woman was admitted to Dover General Hospital in January 1973 with chills and the rapid development of purpura, including buccal mucous membrane hemorrhages. Platelet count was 1,000/cu mm; other laboratory data were normal. The patient had had a recent episode of acute gastroenteritis but was otherwise well. She denied taking any drugs except a mixture of chlorpheniramine maleate, aspirin, and caffeine (Coricidin) and aspirin and denied drinking quinine-containing cocktails.

Bitemark with a Twist

“A Bitemark Case With a Twist,” I.O. Thompson and V.M. Phillips, *Journal of Forensic Odonto-Stomatology*, vol. 12, no. 2, 1994, pp. 37-40. The authors, at the University of Stellenbach, South Africa, report:

This is a case report in which the bite patterns of two suspects were compared to a bitemark on the breast of a murder victim. Each suspect had sufficient concordant features to have been found guilty of producing the bitemark. The irony in this case is that the bitemark was not inflicted by the murderer.

THIS STUDY IS INTENTIONALLY LEFT BLANK

A systematic literature review of blank pages in academic publishing

by Glen Wright, F.X. Coudert, Martin Bentley, Graham Steel, and Sylvain Deville
CNRS and Chimie ParisTech, Paris, France

The phrase “This Page Is Intentionally Left Blank,” common in all areas of publishing, has been found in peer reviewed academic articles costing \$30 to access. To the best of our knowledge, this paper represents the first known review of Intentionally Blank Pages (IBPs).

We looked at the variations in samples from the existing literature, and quantified the amount of blankness on such pages using a new metric, the “Blankness Defect Rate” (BDR). After showing that most blank pages are defective, we suggest a number of alternatives, factually correct or less ambiguous. Then we offer some possible explanations for this phenomenon.



Figure 1. Comparison of self-referentialism in surrealist art and academic literature.

version of René Magritte’s surrealist work *The Treachery of Images* (Figure 1).

The U.S. Code of Regulations (1984) actually mandates that blank pages in certain books and pamphlets must be marked as such.[1] As such, they are especially common in technical works. This has led to a large number of people attempting to solve the philosophical conundrum such non-blank blank pages create. The Office of the General Counsel at the U.S. General Accounting Office, acutely aware of the distress caused, purported in 2001 to have resolved the conundrum in its *Principles of Federal Appropriations Law* (second edition, volume IV).[2] Text on page ii, which is otherwise blank, reads, “This page is intended to be blank. Please do not read it.” However, this appears to have only further entrenched the philosophical contradictions, and the subsequent third edition contained no such text on its blank page.

Context

The phrase “This Page is Intentionally Left Blank” is ubiquitous in the world of printed text, appearing most notably in instruction manuals and exam papers. It is generally accepted that its purpose is to indicate that the page on which it appears is purposely bereft of content. Yet the very inclusion of this phrase nullifies its intent: the page is no longer blank. Indeed, it is now intentionally *not* blank. By virtue of self-reference, the phrase denies its own existence, despite the fact that we know it is there. This is, essentially, a rather banal, academic

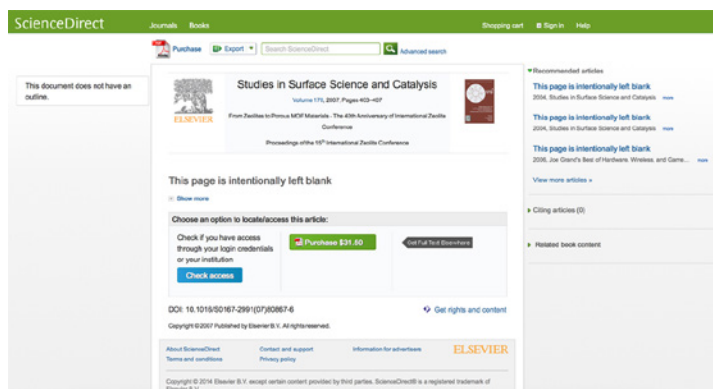


Figure 2. Screenshot of the ScienceDirect checkout page, accessed via an institutional login from Sciences Po, showing the cost of an IBP taken from Verified Synthesis of Zeolitic Materials (2001).

In October 2014, François-Xavier Coudert reported that a number of peer-reviewed academic “articles,” priced at \$30 each on the website ScienceDirect, consist solely of one blank page apiece (Figure 2).[3] In order to determine what value was being added to these pages by the peer review process that they have undergone, we set out to investigate their blankness.

Methodology

A total of 56 individual IBPs were found on the online ScienceDirect platform, 24 of which were immediately available for purchase and study. These appear to be a cross-disciplinary selection, so it is felt that this will give a good indication of the treatment of IBPs over a wide range of subjects. It is notable that these IBPs are largely from books. It appears that journals generally do not leave pages blank on purpose.

Analysis

Out of 24 PDFs, only one was truly blank. This was checked by rendering of its contents at high resolution (600 dpi) followed by a search for non-white pixels. The remainder were manually examined, showing some variety in their style (Figure 3). One used a sans-serif font, although the majority (22 out of 24) used rasterized serif fonts in varying sizes and positioning.

Blankness

Despite their claim to have been “intentionally left blank,” our analysis shows that almost none of the IBPs have, in actual fact, been left blank: all but one of them contain the

This page is intentionally left blank

This page is intentionally left blank

This page is intentionally left blank

This page is intentionally left blank

Figure 3. Variability in font family, size, and resolution of the text on intentionally blank pages.

text “This Page Is Intentionally Left Blank.” The exception is an IBP from Parallel Computational Fluid Dynamics 2000 (2001). The reason for the omission of the informative text on this page remains wholly unclear.

The prevalence of text on these “blank pages” will either disappoint readers who have paid \$30 for a product that was falsely advertised, or raise existential questions such as “What is a blank page?” and “Why did I choose a career in academia?”

The amount of blankness varies, and can be quantified using a factor we have named the “blankness defect rate” (BDR). The BDR is the amount of space on the page that is in fact not blank, primarily caused by the presence of text. Automated determination of the BDR was undertaken using custom Mathematica scripts. The primary factor affecting the BDR was the size of the informative text (Figure 4), with larger text leading to a higher BDR. The font used may also affect the BDR; fonts with serifs cause higher BDRs, as they occupy more space. Additional interference effects may also be present. The average BDR of the sampled IBPs is 0.163% ($\pm 0.04\%$), while the average amount of non-blank space (i.e. ink), measured in cubic centimeters (cm^3), is 0.830 cm^3 (± 0.204).

File Size

The total size of the 24 IBPs is 237 kilobytes (KB), averaging almost 10 KB per page. Individual IBPs varied from 7 KB to an impressive 19 KB, as can be seen in Appendix 1. By contrast, our control has a size of merely 365 bytes. Even the peer-reviewed genuinely blank IBP was 8.2 KB in size. To put this into perspective, only 144 average IBPs provided by journals can be stored on one standard 1.44-megabyte floppy disk; our control allows for the storage of 3945 IBPs. Printing these would certainly provide enough blank pages for most practical purposes.

Positioning of Text

Visual observation shows that most pages have their text placed centrally, both horizontally and vertically. There is some variation, however, most commonly horizontal displacement of the text to the right and downwards vertical displacement. This distribution can be seen in Figure 5.

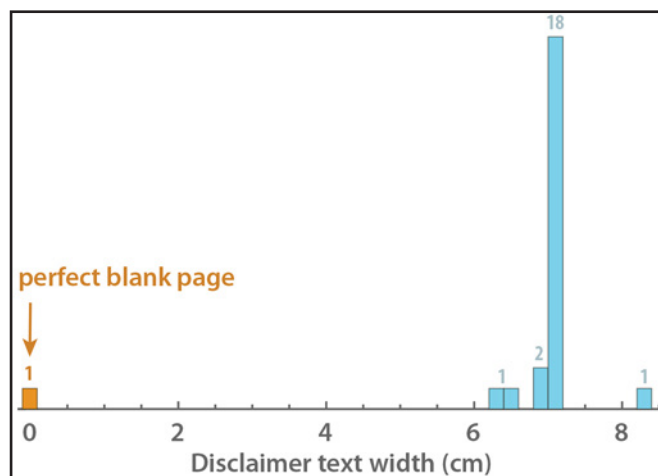


Figure 4. Histogram of disclaimer text width on IBPs. The data point corresponding to the single perfectly blank page in our sample is highlighted in orange.

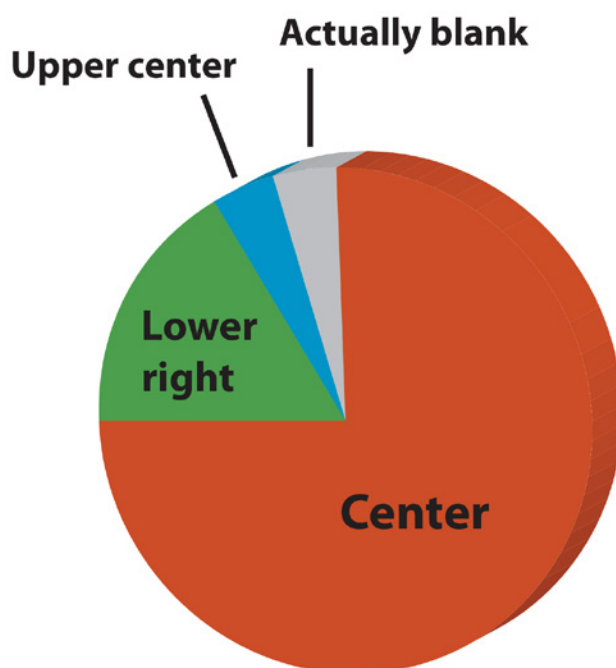


Figure 5. Chart showing text alignment across the sampled IBPs.

continued >

THIS STUDY IS INTENTIONALLY LEFT BLANK [CONTINUED]

The pages are all designed to be viewed in portrait mode, with no line breaks being used. What is intended to occur if pages are purchased for use in landscape orientation is unclear, but the text will be misaligned in such situations, causing readers to have to turn either their heads or their reading material in order to confirm that the page is indeed blank.

The IBP from Parallel Computational Fluid Dynamics 2000 (2001), the only truly blank IBP sampled, has no predetermined orientation or alignment. In fact, it may be rotated and/or reversed at will, maintaining its original character at all times.

Cost

The publisher-provided IBPs furnish 31 characters to the reader for \$30 (Figure 2), a cost of approximately \$1.33 per character. Our control was created in a matter of minutes, for free, using a simple text editor. Considering the current pressure on research funding, and to ensure no unnecessary spending of taxpayer money is undertaken, we recommend the use of our control IBP in future. We have therefore placed it under the Creative Commons CC0 license, and made it available online (DOI: 10.5281/zenodo.12593).

At \$30 per PDF, anecdotally a common price point for “scientific” papers, readers pay an average of \$33.58 per square centimeter of ink. There is some variability in this price, owing to variations in the BDR. The most expensive blank page costs \$46.35/ cm² (page 16 of *Joe Grand’s Best of Hardware: Wireless and Game Console Hacking*); the least expensive is a mere \$23.21/ cm² (page 129 of *Electronics Reliability and Measurement Technology*).

Given that the publisher’s costs are partly linked to the size of files hosted on their web servers, a further perspective to consider is the price per megabyte (MB). These PDF copies of the sample IBPs are sold at \$3,331.85 per MB ($\pm$ \$640.97). We note that publishers could substantially increase profit margins by selling truly blank IBPs. Our defect-free IBP, fully compliant with PDF 1.1 and later standards, is a mere 365 bytes (0.000348 MB). If sold at the same nominal price of \$30, that would represent \$86,184 per MB. Alternatively, if sold at the same price per MB as the sampled IBPs, a true IBP need cost only \$1.16. This would greatly alleviate the heavy financial burden borne by academic institutions that frequently require blank pages.

Possible Explanations

One possible explanation for the inclusion of text in the IBPs is that the stock phrase used in the majority of the sampled papers is, in fact, intended as a *kōan*, i.e., a statement used in Zen practice to provoke the “great doubt” and test a student’s progress. If this is the case, the absence of any philosophy or religious texts from the sample is surprising. Such a

hypothesis would suggest that the readers of publications such as *Frontiers in Dusty Plasmas* and *Asymptotic Methods in Probability and Statistics* are well ahead on the Zen-curve, an unlikely conclusion.

Our preferred hypothesis is that the blank PDFs provided by journals have a higher file size and cost due to their “added value.” This value has been added through a rigorous process of peer review and professional copy editing, and usually takes the form of the added text. By contrast, our control IBP lacks this additional text and has not been peer reviewed according to normal procedures. The publisher-supplied pages are therefore less confusing to most readers, who would otherwise be left to infer for themselves that the pages are, in fact, blank. We are considering the addition of similar text to all blank pages in our possession.

There is nevertheless an alternative, intriguing explanation. As all writers are well aware, writer’s block is a well-established phenomenon among both professional and amateur writers. Could this be the first reported case of editor’s block? The presence of blank pages in multiple domains may imply that several editors have succumbed to this creative impairment. Indeed, given the volume of published academic texts, it is unlikely that just one editor would be responsible for this series of blank pages. Unfortunately, it is not a standard practice to report the name of the editor associated with each IBP and it is therefore impossible to draw a firm conclusion. We hope that this work might engage the interest of social and behavioral specialists who could further investigate this intriguing possibility.

Alternatives

Our analysis suggests the intentionally blank pages are flawed in a number of ways. Here we suggest some alternatives, the use of which will vary depending on the desired outcome.

Where the intention is to reassure the reader that they have come to the end of the current text, some syntactically meaningless symbols at the end of said text can indicate that it was not left blank accidentally. “Dingbats” (*♥♦♣ etc.) have been successfully used for this purpose. We propose that the dingbats method may now be modernised through the use of emoji, small images designed to evoke an emotional response. Emoji may provide a novel method of conveying to the reader that the text has ended.

Otherwise, the traditional blank page paradigm may be maintained with some alteration to the current standard phrase. “*There are only eight words on this page*” provides a neat solution, or the text may be more comprehensively reformulated thus:

The page on which this statement has been printed has been intentionally left devoid of substantive content, such that the present statement is the only text printed thereon.

If using typesetting software, such as LaTeX, it may also be possible to automatically state exactly how much blank space is present on a page. This would render a message such as “*This Page Intentionally Left 99.855% Blank.*” A proof of concept was developed (see additional resources) by calculating the BDR in an iterative manner, meaning that this could (in theory) be applied to all intentionally blank pages. This method eliminates the usual existential questions posed by self-reference, and is satisfyingly accurate.

If the primary intention is indeed to provide the reader with a blank page, all text should be omitted. *Parallel Computational Fluid Dynamics 2000* (2001) and the control page from this study provide examples that may be replicated in other contexts.

It should be noted that a number of interesting alternatives are found outside the traditional scientific literature. Andy Griffiths’s book *Just Stupid!* (1999) begins with a cartoon snail saying: “*This page would be blank if I were not here telling you that this page would be blank if I were not here telling you that...*” on an endless loop. Don Novello’s *The Lazlo Letters* (1977) ends with several pages marked “FREE PAPER!” Iranian novelist Reza Amirkhani’s book *Man-e-oo* (*His Ego*) reportedly contains an entire chapter consisting of blank pages. However, we have been unable to verify whether the pages remain blank when translated into English from the original Persian.

Directions for Future Research

In light of the significance of these new findings, we suggest that this paper represents the dawning of a brave new era in the field of bibliometrics. In addition to their prevalence in English, we suspect that IBPs are found in other languages. Whether non-English IBPs are present in the scientific literature is unknown, since the scientific community largely uses English as a lingua Franca. Further investigation may reveal further insights that should be examined in much more detail.

Personal communication from ScienceDirect indicates their intention to remove these pages. This would hamper future efforts to analyse IBPs. However, blankness itself may be an interesting topic of further study, and prevalence of blankness in other areas remains unclear at this juncture. Further avenues of research that may prove fruitful include the blankness of: the digital world, such as websites and tweets; the physical world, such as walls and signs; and other aspects of academic publishing, such as footnotes[4] and even entire academic articles.

Conclusion

We recommend the use of our blank control page for situations where a truly blank page is desired, or where a landscape orientation is required, since publishers have not allowed for their blank pages to be used in such situations. Alternatively, the blank page from *Parallel Computational Fluid Dynamics 2000* (2001) provides a peer-reviewed

alternative for high-quality applications. Where there is a need to maintain the functionality of the additional text, any of the options proposed in this paper are appropriate.

* * *

Afterword

It has subsequently come to our attention that ScienceDirect has taken the drastic step of removing all IBPs from its search results. In response to this development, we have taken the decision to make these papers publicly available to ensure that these important contributions to science are not lost to future generations of researchers.

While we are aware that this action is in violation of copyright laws, we beg ScienceDirect, and the publishers of the IBPs, not to seek legal redress.

Notes

1. The Code of Federal Regulations of the United States of America (1984), Section 47, §61.93.
2. <http://www.gao.gov/special.pubs/d01179sp.pdf>.
3. Tweet dated October 13, 2014, @fxcloudert: <https://twitter.com/fxcoudert/status/521675319322112000>
4. This footnote is intentionally left blank.

Additional Resources

Intentionally blank pages: <http://dx.doi.org/10.6084/m9.figshare.1230060>

Accurate intentionally blank page: <http://dx.doi.org/10.6084/m9.figshare.1230170>

Minimal-size perfectly blank PDF page: <http://dx.doi.org/10.6084/m9.figshare.1230066>

Bibliography

- “” in *Parallel Computational Fluid Dynamics 2000*, 2001
- Search for “This page intentionally left blank”, *ScienceDirect* (accessed November 2014)
- This Page Intentionally Left Blank, <http://www.this-page-intentionally-left-blank.org/>
- “This Page Is Intentionally Left Blank” in *Asymptotic Methods in Probability and Statistics*, 1998
- This Page Intentionally Left Blank, *BBC* (accessed November 2014)
- “This Page Is Intentionally Left Blank” in *Brain Theory, What Is a Brain?*, 1996
- “This Page Is Intentionally Left Blank” in *Collection of Simulated XRD Powder Patterns for Zeolites*, 2001
- “This Page Is Intentionally Left Blank” in *Conservation Biological Control*, 1998

continued >

THIS STUDY IS INTENTIONALLY LEFT BLANK [CONTINUED]

“This Page Is Intentionally Left Blank” in *Electronics Reliability and Measurement Technology*, 1998

“This Page Is Intentionally Left Blank” in *Estimator’s Electrical Man Hour Manual Third edition*, 1999

“This Page Is Intentionally Left Blank” in *Estimator’s Piping Man Hour Manual Fifth Edition*, 1999

“This Page Is Intentionally Left Blank” in *Frontiers in Dusty Plasmas, Revisited*, 2000

“This Page Is Intentionally Left Blank” in *Handbook of Optical Constants of Solids*, 1997

“This Page Is Intentionally Left Blank” in *Handbook of Palladium Catalyzed Organic Reactions*, 1997

“This Page Is Intentionally Left Blank” in *Hedge Fund Investment Management*, 2006

“This Page Is Intentionally Left Blank” in *Industrial Hygiene Engineering Second Edition*, 2000

“This Page Is Intentionally Left Blank” in *Intelligent Production Machines and Systems*, 2006

“This Page Is Intentionally Left Blank” in *Joe Grand’s Best of Hardware: Wireless and Game Console Hacking*, 2006

“This Page Is Intentionally Left Blank” in *Metal Nanoclusters in Catalysis and Materials Science*, 2008

“This Page Is Intentionally Left Blank” in *Parallel Computational Fluid Dynamics* 1996, 1997

“This Page Is Intentionally Left Blank” in *Parallel Computational Fluid Dynamics* 1999, 2000

“This Page Is Intentionally Left Blank” in *Programmer’s Ultimate Security DeskRef*, 2004

“This Page Is Intentionally Left Blank” in *Projects for Calculus Second Edition*, 1998

“This Page Is Intentionally Left Blank” in *Recent Research Towards Advanced Man Machine Interface*

“This Page Is Intentionally Left Blank” in *Science Progress in China*, 2003

“This Page Is Intentionally Left Blank” in *Stealing the Network How to Own an Identity*, 2005

“This Page Is Intentionally Left Blank” in *Through Spoken Language*, 1996

“This Page Is Intentionally Left Blank” in *World Fuel Cells*, 2002

Appendix 1: Summary of IBPs obtained, detailing size, ordered by year of publication

Size	Publication Publication	Year
8.6 KB	Brain Theory: What Is a Brain?	1996
8.6 KB	Recent Research Towards Advanced Man Machine Interface Through Spoken Language	1996
19 KB	Handbook of Optical Constants of Solids	1997
13 KB	Handbook of Palladium Catalyzed Organic Reactions	1997
9.3 KB	Parallel Computational Fluid Dynamics	1997
8.9 KB	Asymptotic Methods in Probability and Statistics	1998
8.9 KB	Conservation Biological Control	1998
7.1 KB	Electronics Reliability and Measurement Technology	1998
12 KB	Projects for Calculus, Second Edition	1998
8.6 KB	Estimator’s Electrical Man Hour Manual, Third Edition	1999
11 KB	Estimator’s Piping Man Hour Manual, Fifth Edition	1999
7.0 KB	Frontiers in Dusty Plasmas, Revisited	2000

Size	Publication Publication	Year
8.5 KB	Industrial Hygiene Engineering, Second Edition	2000
8.1 KB	Parallel Computational Fluid Dynamics	1999 2000
11 KB	Collection of Simulated XRD Powder Patterns for Zeolites	2001
8.2 KB	Parallel Computational Fluid Dynamics	2000 2001
8.6 KB	World Fuel Cells	2002
11 KB	Science Progress in China	2003
8.6 KB	Programmer’s Ultimate Security DeskRef	2004
8.6 KB	Stealing the Network: How to Own an Identity	2005
8.4 KB	Hedge Fund Investment Management	2006
12 KB	Intelligent Production Machines and Systems	2006
7.9 KB	Joe Grand’s Best of Hardware: Wireless and Game Console Hacking	2006
13 KB	Metal Nanoclusters in Catalysis and Materials Science	2008

Appendix 2: Sample reformulated IBP

The page on which this statement has been printed has been intentionally left devoid of substantive content, such that the present statement is the only text printed thereon.

IMPROBABLE SEX

Improbable, stimulating investigations

compiled by Marc Abrahams, Improbable Research staff

Fishermen's Penis Length Predicts Wife's Propensity for Extra-marital Intercourse

"Predictors of Extra-Marital Partnerships Among Women Married to Fishermen along Lake Victoria in Kisumu County, Kenya," Zachary Kwen¹, Isaac Mwanzo², Chris Shisanya³, Carol Camlin⁴, Janet Turan⁵, Lilian Achiro¹, Elizabeth Bukusi¹, *PLoS ONE*, vol. 9, no. 4, 2014, e95298. (Thanks to Roger Kautz for bringing this to our attention.) The authors, at the Kenya Medical Research Institute, Kenyatta University, the University of California at San Francisco, and the University of Alabama at Birmingham, report:

Results: The prevalence of extra-marital partnerships among women was 6.2% within a reference time of six months.

Factors that were independently associated with increased likelihood of extra-marital partnerships were domestic violence, women reporting being denied a preferred sex position and spouse longer erect penis....

Surprisingly, spouse longer fully erect penis was associated with increased likelihood of the women having extra-marital partnerships. From these results, every one inch longer penis increased the likelihood of women being involved in extra-marital partnership by almost one-and-half times.

Predictors of Extra-Marital Partnerships among Women Married to Fishermen along Lake Victoria in Kisumu County, Kenya

Zachary Kwen¹*, Isaac Mwanzo², Chris Shisanya³, Carol Camlin⁴, Janet Turan⁵, Lilian Achiro¹, Elizabeth Bukusi¹

¹ Center for Microbiology Research, Kenya Medical Research Institute, Kisumu, Kenya, ² Department of Community Health, Kenyatta University, Nairobi, Kenya, ³ Department of Geography, Kenyatta University, Nairobi, Kenya, ⁴ Department of Obstetrics, Gynecology and Reproductive Sciences, University of California at San Francisco, San Francisco, California, United States of America, ⁵ Department of Health Care Organization and Policy, University of Alabama at Birmingham, Birmingham, Alabama, United States of America

Abstract

Background: The vulnerability of women to HIV infection makes establishing predictors of women's involvement in extra-marital partnerships critical. We investigated the predictors of extra-marital partnerships among women married to fishermen.

Methods: The current analyses are part of a mixed methods cross-sectional survey of 1090 gender-matched interviews with 545 couples and 12 focus group discussions (FGDs) with 59 couples. Using a proportional to size simple random sample of fishermen as our index participants, we asked them to enrol in the study with their spouses. The consenting couples were

Table 2. Relationship and sexual attributes by extra-marital partnership status among women married to fishermen along Lake Victoria in Kisumu County.

Categorical variables	Overall (n = 545)		Not involved in extra-marital sex (n = 511)		Involved in extra-marital sex (n = 34)		p-value
	Freq	percent	Freq	percent	Freq	percent	
Involved in extra-marital sex	34	6.2	n/a	n/a	n/a	n/a	n/a
Previously married	31	5.7	28	5.5	3	8.8	0.43
Physically separated from spouse part of the year	215	39.4	200	39.1	15	44.1	0.59
Suspects spouse of involvement in extra-marital sex	148	27.2	130	25.4	18	52.9	0.01
Denied sex in the preceding month	119	22.4	99	21.3	9	30.2	0.03
Denied preferred sex position	51	9.4	41	8.0	10	29.4	0.01
Achieved orgasm at last sex	402	73.8	384	75.1	18	52.9	0.01
Ever used condoms	358	65.7	333	65.2	25	73.5	0.36
Continuous variables	Median	IQR	Median	IQR	Median	IQR	p-value
Number of days had sex per week	2	2–3	2	2–3	2	2–3	0.91
Spouse time to orgasm	15	5–30	15	5–30	12	5–30	0.97
Spouse fully erect penis size (inches)	5	5–6	5	5–6	6	5–6	0.16
Women's sexual satisfaction score	78	72–84	78	72–85	72	67–78	0.01
Men's domestic violence score	2	1–3	2	1–3	3	2–4	0.01
Men's male dominance script score	10	7–13	10	7–13	12	8–15	0.03

Freq – frequency; n/a – not applicable; IQR – interquartile range.
doi:10.1371/journal.pone.0095298.t002

Detail from the study “Predictors of Extra-Marital Partnerships Among Women Married to Fishermen along Lake Victoria in Kisumu County, Kenya.”

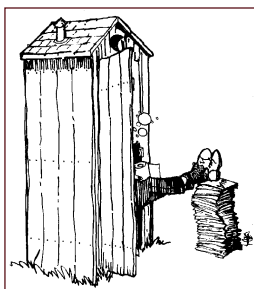
PUZZLING SOLUTIONS: RATS!

Solution to Last Month's Puzzler

by Emil Filterbag, Improbable Research staff



Because one of the human heads is still alive.



BOYS WILL BE BOYS

Research by and for adolescent males of all ages and sexes

compiled by Katherine Lee, Improbable Research staff

Two Lawyers' Innovative Way to Treat Constipation

"Effect of Perineal Self-Acupressure on Constipation: A Randomized Controlled Trial," Ryan Abbott MD, JD, MTOM, Ian Ayres PhD, JD, Ed Hui MD, and Ka-Kit Hui MD, *Journal of General Internal Medicine*, epub November 18, 2014. (Thanks to Mei Sing Ong and Marc Natter for bringing these to our attention.) The authors, at the University of California, Los Angeles, Southwestern Law School, Los Angeles, and Yale Law School, New Haven, CT, explain:

The efficacy of perineal self-acupressure in treating constipation is uncertain.

We aimed to evaluate whether perineal self-acupressure would improve patient reports of quality of life and bowel function at 4 weeks after training.

CONCLUSION: Among patients with constipation, perineal self-acupressure improves self-reported assessments of quality of life, bowel function, and health and well-being relative to providing standard constipation treatment options alone.

Effect of Perineal Self-Acupressure on Constipation: A Randomized Controlled Trial

Ryan Abbott, MD, JD, MTOM^{1,2,4}, Ian Ayres, PhD, JD³, Ed Hui, MD¹, and Ka-Kit Hui, MD¹

¹Department of Medicine, Division of General Internal Medicine and Health Services Research, David Geffen School of Medicine at University of California, Los Angeles, CA, USA; ²Southwestern Law School, Los Angeles, CA, USA; ³Yale Law School, New Haven, CT, USA; ⁴Department of Medicine, University of California, Los Angeles, CA, USA.

BACKGROUND: The efficacy of perineal self-acupressure in treating constipation is uncertain.

OBJECTIVE: We aimed to evaluate whether perineal self-acupressure would improve patient reports of quality of life and bowel function at 4 weeks after training.

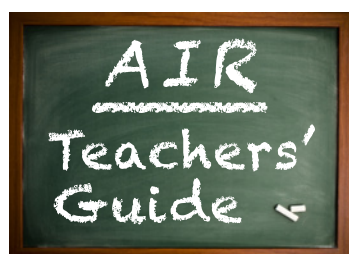
relative to providing standard constipation treatment options alone.

KEY WORDS: perineum; constipation; acupressure. J Gen Intern Med 2014;29:3084-6.

Using Weights to Gather Hard Data

"Penile Rigidity in Erectile Dysfunction Treated with Alprostadil," Ermanno Greco and Paolo Polonio-Balbi, *The Lancet*, vol. 350, no. 9092, 1997, pp. 1682-1682. The authors, at Center for Impotence and Fertility, Rome, Italy, report:

Axial rigidity was assessed by penile buckling test—positive when a downward axially directed strength of 1 kg did not buckle the penis. Radial rigidity was assessed by an electronic rigidometer RIGICOMPT (Androsystems, Rome, Italy), with a pressure transducer in contact with the side wall of the penis, to measure its hardening.⁴ Rigidity was judged to be complete when pressure was more than 75 mm Hg after visual erotic stimulation.



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.

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

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?

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

The Weirdest People in the World

“The Weirdest People in the World,” Joseph Henrich, Steven J. Heine, and Ara Norenzayan, *Behavioral and Brain Sciences*, vol. 33, no. 2-3, 2010, pp. 61-83. The authors, at the University of British Columbia, report:

Behavioral scientists routinely publish broad claims about human psychology and behavior in the world’s top journals based on samples drawn entirely from Western, Educated, Industrialized, Rich and Democratic (WEIRD) societies ...

[Our] findings suggest that members of WEIRD societies, including young children, are among the least representative populations one could find for generalizing about humans.

The Weirdest People in the World?

Joseph Henrich
University of British Columbia
Department of Psychology
Department of Economics
joseph.henrich@gmail.com
<http://www.psych.ubc.ca/~henrich/home.html>

Steven J. Heine
University of British Columbia
Department of Psychology
heine@psych.ubc.ca

Ara Norenzayan
University of British Columbia
Department of Psychology
ara@psych.ubc.ca

Abstract: Behavioral scientists routinely publish broad claims about human psychology and behavior in the world’s top journals based on samples drawn entirely from Western, Educated, Industrialized, Rich and Democratic (WEIRD) societies. Researchers—often implicitly—assume that either there is little variation across human populations, or that these “standard subjects” are as representative of the species as any other population. Are these assumptions justified? Here, our review of the comparative database from across the behavioral sciences suggests both that there is substantial variability in experimental results across populations and that WEIRD

The Weirdest Brains in the World

“The Weirdest Brains in the World,” Joan Y. Chiao and Bobby K. Cheon, *Behavioral and Brain Sciences*, vol. 33, no. 2-3, 2010, pp. 88-90. The authors, at Northwestern University, report:

Henrich, Norenzayan & Heine provide a compelling argument for a bias in the behavioral sciences to study human behavior primarily in WEIRD populations. Here we argue that brain scientists are susceptible to similar biases, sampling primarily from WEIRD populations, and discuss recent evidence from cultural neuroscience demonstrating the importance and viability of investigating culture across multiple levels of analysis.

The WEIRD Languages

“WEIRD Languages Have Misled Us, Too [Comment on Henrich *et al.*],” Asifa Majid and Stephen C. Levinson,

Behavioral and Brain Sciences, vol. 33, nos. 2-3, 2010, p. 103. The authors, at the Max Planck Institute for Psycholinguistics, Nijmegen, The Netherlands, report:

The linguistic and cognitive sciences have severely underestimated the degree of linguistic diversity in the world. Part of the reason for this is that we have projected assumptions based on English and familiar languages onto the rest. We focus on some distortions this has introduced, especially in the study of semantics.

Many WEIRD Researchers

“It’s Not Just the Subjects – There Are Too Many WEIRD Researchers,” Michael Meadon and David Spurrett, *Behavioral and Brain Sciences*, vol. 33, nos. 2-3, 2010, p. 104-5. The authors, at the University of KwaZulu-Natal, South Africa, report:

A literature in which most data are outliers is flawed, and the target article sounds a timely alarm call for the behavioural sciences. It also suggests remedies. We mostly concur, except for arguing that the importance of the fact that the researchers themselves are mostly outliers has been underplayed.

WEIRD Walking

“WEIRD Walking: Cross-Cultural Research on Motor Development,” Lana B. Karasik, Karen E. Adolph, Catherine S. Tamis-LeMonda, and Marc H. Bornstein, *Behavioral and Brain Sciences*, vol. 33, no. 2-3, 2010, pp. 95-96. The authors, at NICHD, Bethesda, MD and New York University, report:

Motor development—traditionally studied in WEIRD populations—falls victim to assumptions of universality ... However, cross-cultural research illustrates the extraordinary diversity that is normal in motor skill acquisition ...

WEIRD infants sit at 6 months, but African infants sit at 4 months. WEIRD mothers would never dream of leaving their young infants unattended, but mothers in Cameroon leave their 5-month-olds (for 20+ minutes!) sitting alone on high stools. These sorts of phenomena can only be revealed with cross-cultural work, and provide the impetus for laboratory investigations to consider and test hypotheses previously not envisioned.

IG® NOBEL LIMERICKS: APOSTROPHES, SHORTS, CHEESE

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 www.improbable.com/ig/winners

2001 Ig Nobel Literature Prize

The prize was awarded to John Richards of Boston, England, founder of The Apostrophe Protection Society, for his efforts to protect, promote, and defend the differences between plural and possessive.

DO APOSTROPHES CAUSE YOU DISTRESS?

USE THEM ONLY FOR NOUNS THAT POSSESS.

FOR PRONOUNS, FORSAKE THEM.

CONTRACTIONS, THOUGH, TAKE THEM.

AND IF YOU'RE UNCERTAIN, THEN GUESS.

1999 Ig Nobel Chemistry Prize

The prize was awarded to Takeshi Makino, president of The Safety Detective Agency in Osaka, Japan, for his involvement with S-Check, an infidelity detection spray that wives can apply to their husbands' underwear.

A GREAT MANY MEN FEEL THEY MUST

FIND AN OUTLET AND ACT OUT THEIR LUST.

SO MY WIFE SPRAYED MY SHORTS.

I'M CLEAN, SHE REPORTS.

BUT NOW I HAVE ISSUES WITH TRUST.

2006 Ig Nobel Chemistry Prize

The prize was awarded to Antonio Mulet, Josi Javier Benedito and Josi Bon of the University of Valencia, Spain, and Carmen Rossells of the University of Illes Balears, in Palma de Mallorca, Spain, for their study "Ultrasonic Velocity in Cheddar Cheese as Affected by Temperature."

IN RESEARCH, PROFOUND AND RENOWNED,

ON WHAT'S BETTER FOR CHEDDAR, THEY FOUND

THAT WHEN IT IS HOT,

BUT NOT WHEN IT'S NOT,

MORE SPEEDILY, SOUND GETS AROUND.

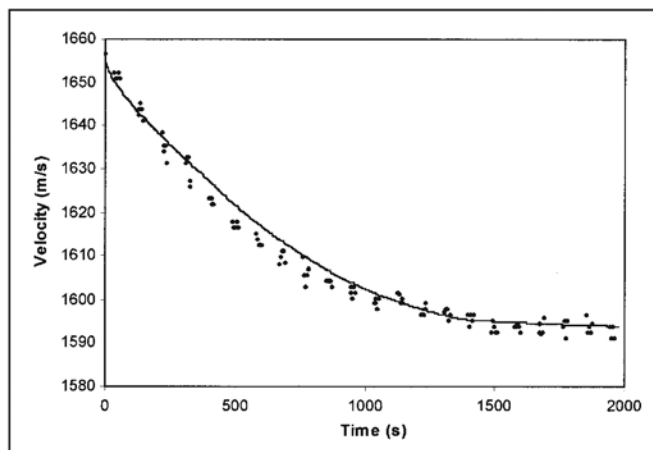


Fig. 5—Comparison of the experimental and calculated ultrasonic velocities in cheese.

Detail from the study "Ultrasonic Velocity in Cheddar Cheese as Affected by Temperature."

See it. Read it.

GRAPHIC DESIGN FOR COMMUNICATION AND PROJECT SUCCESS

PROmote
COMMUNICATIONS

Geri Sullivan | info@PROmoteCommunications.com | www.promotecommunications.com

ICKY CUTESY RESEARCH REVIEW

Research reports that are icky and/or cutesy

compiled by Alice Shirrell Kaswell, Improbable Research staff

Cutesy: A Code in the Nose (1968)

"A Code in the Nose," R. C. Gesteland, J. Y. Lettvin, W. H. Pitts, and S. H. Chung, in *Cybernetic Problems in Bionics*, ed. Hans L. Oestereicher and Darrell R. Moore, 1968, pp. 313-322.

Cutesy: A Code in the Nose (1998)

"A Code in the Nose," Rodney M. Goodman, *Communications and Coding*, vol. 2, 1998, p. 237.

Cutesy: A Code in the Nose (2000)

"A Code in the Nose," E.C. Posner, *Computers and Mathematics with Applications*, vol. 39, no. 11, 2000, p. 127.

Icky: Blowfly Access to Bodies in Suitcases

"Factors Affecting Accessibility to Blowflies of Bodies Disposed in Suitcases," P. Bhadra, A.J. Hart, and M.J.R. Hall, *Forensic Science International*, vol. 239, June 2014, pp. 62-72.

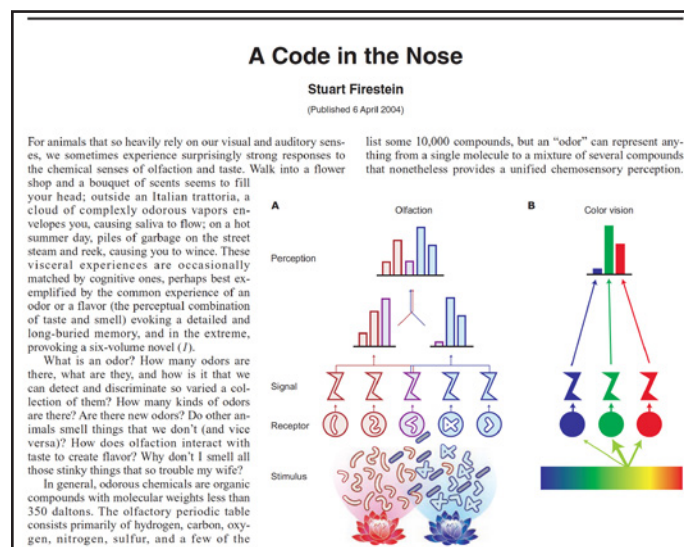
The authors, at King's College London, the Metropolitan Police Service, Evidence Recovery Unit, London, and the Natural History Museum, London, UK, report:

Criminals have been known to dispose of bodies in zipped suitcases in an attempt to conceal murder. In order to investigate the forensic implications of this mode of disposal on calculating time of death, it is necessary to study the accessibility of bodies in suitcases to blowflies (Diptera: Calliphoridae) and the possibility of oviposition and infestation under these circumstances. An experimental apparatus was designed that incorporated different zips (toothed and coil) of various gauges (4-6 mm) above a chicken liver bait. Gravid *Calliphora vomitoria* and *Calliphora vicina* females were attracted to and oviposited on and through these zips, both under laboratory and field conditions....

Coiled zips are the most common type of zip found on luggage and are also commonly found on body bags used at crime scenes. Infestation of bodies within body bags after recovery from crime scenes could potentially be a source of confusion, but the high likelihood of some degree of delay of flies locating an odour source once it is zipped into a bag and the usually swift transfer of bodies from scene to mortuary suggest that bodies in a body bag are unlikely to be infested by blowflies after recovery from standard crime scenes.

Cutesy: A Code in the Nose (2004)

"A Code in the Nose," Stuart Firestein, *Science Signaling*, no. 227, 2004, pe15.



Factors affecting accessibility to blowflies of bodies disposed in suitcases

P. Bhadra^a, A.J. Hart^b, M.J.R. Hall^{c,*}

^aDepartment of Forensic and Analytical Science, School of Biomedical and Health Sciences, King's College London, Franklin Wilkins Building, 150, Stamford Street, London SE1 9NH, United Kingdom

^bMetropolitan Police Service, Evidence Recovery Unit, 109 Lambeth Road, London SE1 7LP, United Kingdom

^cDepartment of Life Sciences, Natural History Museum, Cromwell Road, London SW7 5BD, United Kingdom

ARTICLE INFO

Article history:
Received 21 January 2014
Received in revised form 7 March 2014
Accepted 10 March 2014
Available online 26 March 2014

Keywords:
Forensic entomology
Blowflies
Suitcases
Zips

ABSTRACT

Criminals have been known to dispose of bodies in zipped suitcases in an attempt to conceal murder. In order to investigate the forensic implications of this mode of disposal on calculating time of death, it is necessary to study the accessibility of bodies in suitcases to blowflies (Diptera: Calliphoridae) and the possibility of oviposition and infestation under these circumstances. An experimental apparatus was designed that incorporated different zips (toothed and coil) of various gauges (4-6 mm) above a chicken liver bait. Gravid *Calliphora vomitoria* and *Calliphora vicina* females were attracted to and oviposited on and through these zips, both under laboratory and field conditions. Egg laying was significantly more frequent and with greater numbers of eggs when zips were in contact with the bait than when they were placed approximately 6 cm above the bait. In the absence of bait, adult females could be stimulated to lay eggs on moistened zips, although the presence of blood accelerated egg laying compared to water alone.

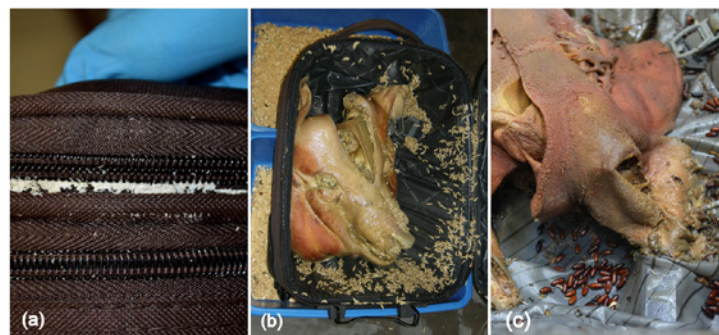


Fig. 4. (a) Eggs laid on and in-between the teeth of the zip of the suitcase. (b) Larval colonisation of pig's head inside the suitcase at the end of 7 days (first suitcase). (c) Third instar larvae enter pupation stage inside the suitcase after 27 days (second suitcase).

Detail from the study "Factors Affecting Accessibility to Blowflies of Bodies Disposed in Suitcases."



IG® & BEYOND: WORM CRAWLING AND ARM-CROSSING

Some further research adventures of Ig Nobel Prize winners

compiled by Nan Swift, Improbable Research staff

Keller: Crawling of Worms

“Crawling of Worms,” Joseph B. Keller and M.S. Falkovitz, *Journal of Theoretical Biology*, vol. 104, 1983, pp. 417-442. Joseph Keller shared the 1999 Ig Nobel physics prize with Jean-Marc Vanden-Broeck for calculating how to make a teapot spout that does not drip (that 1999 prize was also shared with Len Fisher, who calculated the optimal way to dunk a biscuit). Keller also shared the 2012 Ig Nobel physics prize with Raymond Goldstein, Patrick Warren, and Robin Ball, for calculating the balance of forces that shape and move the hair in a human ponytail. In this 1983 paper with another colleague, he reports:

The mechanics of a worm crawling along a flat surface is analyzed. The external forces of friction and gravity, and the internal pressure and tension, are taken into account. An equation of motion is formulated, and solutions are sought in which both the tension and the linear density are required to lie between prescribed bounds. Pulse and periodic travelling wave solutions are constructed. The maximum crawling velocity is determined, as well as the wave form which achieves it. Comparison of the results with experimental observations shows that the theory yields a maximum crawling velocity which is much larger than the observed velocity.

Balasubramaniam: Crossing the Arms, and Rhythmic Tapping

“Crossing the Arms Confuses the Clocks: Sensory Feedback and the Bimanual Advantage,” Breanna E. Studenka, Kinga L. Eliaz, David I. Shore, and Ramesh Balasubramaniam, *Psychonomic Bulletin and Review*, vol. 21, no. 2, 2014, pp. 390-397. Balasubramaniam shared the 2004 Ig Nobel physics prize with Michael Turvey for exploring and explaining the dynamics of hula-hooping. In this 2014 paper with other colleagues, he reports:

The bimanual advantage refers to the finding that tapping with two fingers on opposite hands exhibits reduced timing variability, as compared with tapping with only one finger ... we investigated the role of crossing the arms in the bimanual advantage. Participants tapped unimanually or bimanually with their arms crossed or uncrossed on a tabletop or in the air ... A significant bimanual advantage was observed for the uncrossed, but not the crossed posture in tabletop tapping.

Detail from the study “Crossing the Arms Confuses the Clocks: Sensory Feedback and the Bimanual Advantage.”

Crawling of Worms

JOSEPH B. KELLER AND MEIRA S. FALKOVITZ

*Departments of Mathematics and Mechanical Engineering,
Stanford University, Stanford, California 94305, U.S.A.*

(Received 12 November 1983, and in revised form 18 April 1983)

The mechanics of a worm crawling along a flat surface is analyzed. The external forces of friction and gravity, and the internal pressure and tension, are taken into account. An equation of motion is formulated, and solutions are sought in which both the tension and the linear density are required to lie between prescribed bounds. Pulse and periodic travelling wave solutions are constructed. The maximum crawling velocity is determined, as well as the wave form which achieves it. Comparison of the results with experimental observations shows that the theory yields a maximum crawling velocity which is much larger than the observed velocity.

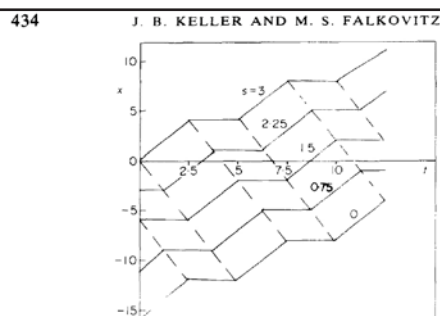


FIG. 4. Position $x(s, t)$ as a function of time of five points on the worm, based upon the periodic motion of equation (7.3). The points are $s = 0, M/4, M/2, 3M/4, M$. The parameters of the worm are: mass $M = 3$ g, length while in motion 16 cm, period $P = 5$ sec, ratio of elongated segment length to contracted segment length $= 5/3$. From these values we calculate $\beta = 8/3$ cm/g, $c = 0.6$ g/sec, $V = 1.6$ cm/sec and step length $= 4$ cm. At $t = 0$ the front end $s = M$ is at $x = 0$ and the rear end $s = 0$ is at $x = -16$ cm. The solid lines are the paths of the points, which move upward as t increases. The dashed lines are the boundaries between resting and moving parts of the worm, which move downward as t increases, with the velocity $c/m_2 = 2.4$ cm/sec.

Detail from the study “Crawling of Worms.”

The experimenter met the participant outside the laboratory, where the experiment was explained and consent was obtained.

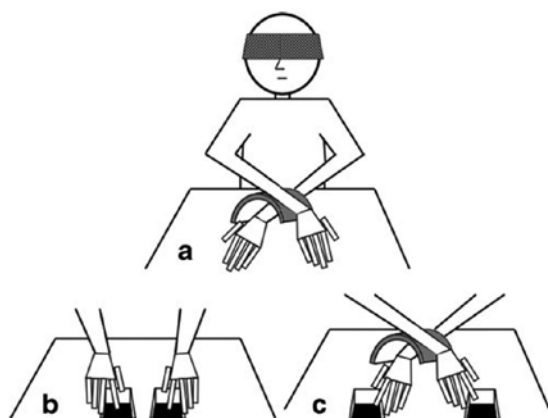


Fig. 1 Experimental setup for a crossed table tapping, b uncrossed air tapping, and c crossed air tapping. The right arm was crossed over the pipe for both table and air tapping



E-books are in the AIR (and vice versa)

Download a *free issue* of the
Annals of Improbable Research at
www.improbable.com

Get additional issues from Barnes & Noble, Amazon, iTunes, or Kobo.
Comfy to read on big devices (computers) and tiny ones (phones), too.

Mel says: "It's swell."



Or subscribe to the lovely paper edition:

Please:

___ start or ___ renew a subscription FOR ME (___ 1 year (6 issues) ___ 2 years)

___ start or ___ renew a GIFT SUBSCRIPTION (___ 1 year (6 issues) ___ 2 years)

Print version (in US dollars) rates.

	1 year	2 years
USA	\$49	\$89
Canada/Mex	\$61	\$114
Overseas	\$79	\$147

My name, address, and all that:

Name: _____

Addr: _____

City: _____

State/Province: _____ ZIP: _____

Country: _____

Phone: _____

E-mail: _____

Payment

Total payment enclosed: _____

Method: ___ Check (drawn on US bank) or int'l money order

___ Mastercard ___ Visa ___ Discover

CARD #: _____

EXP. DATE: _____

I am giving a GIFT SUBSCRIPTION to:

Name: _____

Addr: _____

City: _____

State/Province: _____ ZIP: _____

Country: _____

Phone: _____

E-mail: _____

SEND TO: *AIR*



PO Box 380853

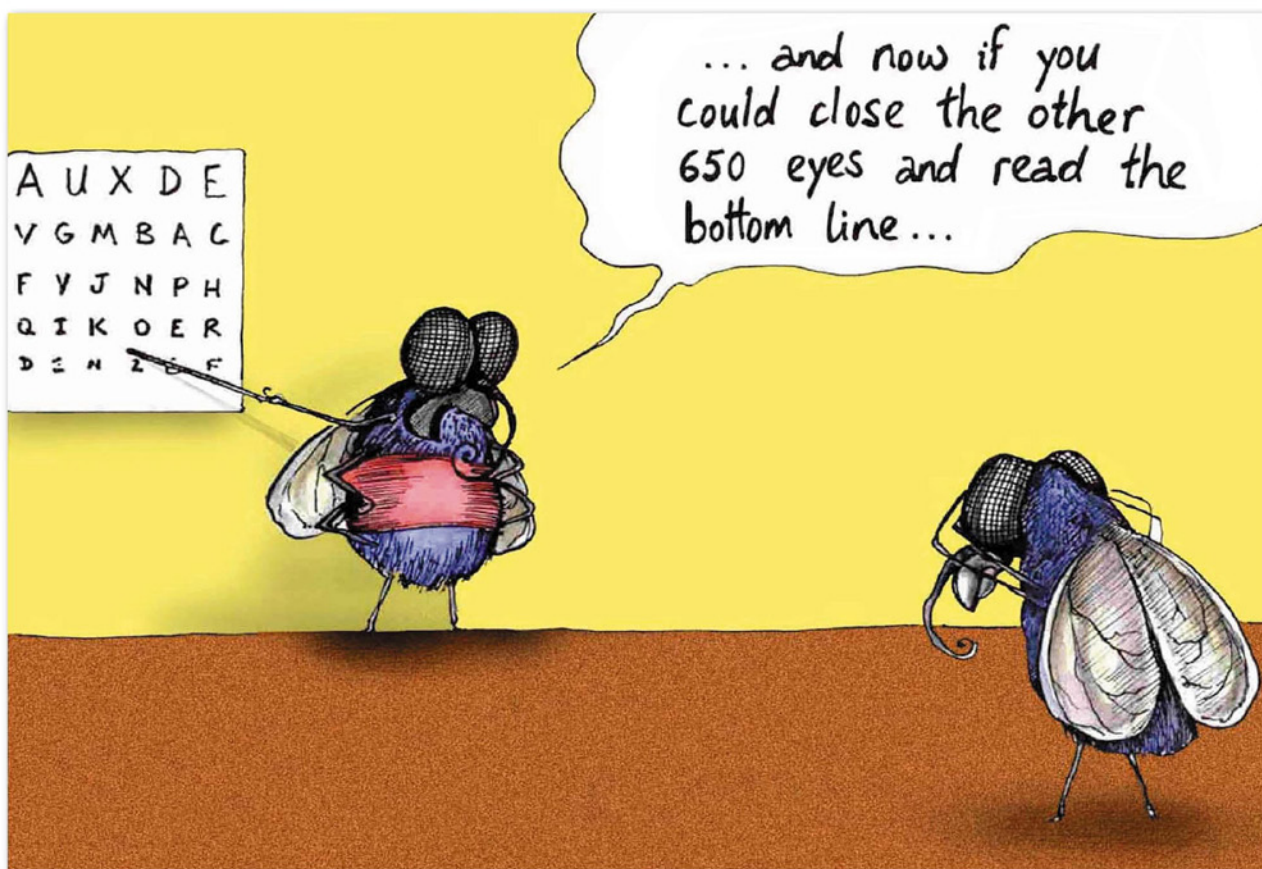
Cambridge MA 02238 USA

telephone: (+1) 617-491-4437

WHEN DOES YOUR SUBSCRIPTION EXPIRE?

Your mailing label tells the final YEAR and ISSUE NUMBER of your current subscription. **FOR EXAMPLE:** "2016:5" or "201605" indicates the fifth issue of the year 2016.

subscriptions@improbable.com
www.improbable.com



Fly hell

INDEX of SPECIAL ISSUES

AIR 1:1 – Premier Issue
 AIR 1:2 – Teachers' Issue
 AIR 1:3 – Food Issue
 AIR 1:4 – Paleontology Issue
 AIR 1:5 – Pediatrics Issue
 AIR 1:6 – Animal Behavior Issue
 AIR 2:1 – 5th First Annual Ig Nobel Prizes
 AIR 2:2 – Annual Swimsuit Issue
 AIR 2:3 – Symmetra Cover Issue
 AIR 2:4 – Typo Issue
 AIR 2:5 – Generic Issue
 AIR 2:6 – Martian Meteorite Issue
 AIR 3:1 – 6th First Annual Ig Nobel Prizes
 AIR 3:2 – Annual Swimsuit Issue
 AIR 3:3 – Managed Health Care
 AIR 3:4 – Peculiar Patents
 AIR 3:5 – How-To
 AIR 3:6 – Parapsychology
 AIR 4:1 – 7th First Annual Ig Nobel Prizes
 AIR 4:2 – Annual Swimsuit Issue
 AIR 4:3 – Cough & Apology
 AIR 4:4 – Animal Behavior
 AIR 4:5 – Social Science
 AIR 4:6 – Math & Money
 AIR 5:1 – 8th First Annual Ig Nobel Prizes
 AIR 5:2 – Annual Swimsuit Issue
 AIR 5:3 – Movie Issue
 AIR 5:4 – Coffee & Tea
 AIR 5:5 – Bearded Men
 AIR 5:6 – Education
 AIR 6:1 – 9th First Annual Ig Nobel Prizes
 AIR 6:2 – Crabs & UFOs
 AIR 6:3 – Crime & Punishment
 AIR 6:4 – Postage & Handling

AIR 6:5 – Bomby the Bombardier Beetle
 AIR 6:6 – Eccentrics Issue
 AIR 7:1 – 10th First Annual Ig Nobel Prizes/Sweetie-Poo Issue
 AIR 7:2 – YAVIS Psychology
 AIR 7:3 – Physics
 AIR 7:4 – Behavior
 AIR 7:5 – Animal & Vegetable
 AIR 7:6 – Holy Grail
 AIR 8:1 – 11th First Annual Ig Nobel Prizes/Wedding Issue
 AIR 8:2 – Pizza, Sex & TV (and Cheese)
 AIR 8:3 – Nano-Friendship
 AIR 8:4 – Wiener Sausage
 AIR 8:5 – Smelly Issue
 AIR 8:6 – Art & Science
 AIR 9:1 – 12th First Annual Ig Nobel Prizes
 AIR 9:2 – Dismal Science
 AIR 9:3 – Everything
 AIR 9:4 – Chicken & Fish
 AIR 9:5 – Murphy's Law
 AIR 9:6 – 13th First Annual Ig Nobel Prizes
 AIR 10:1 – Beauty
 AIR 10:2 – Way To Go
 AIR 10:3 – Loss of Innocence
 AIR 10:4 – Astronomy
 AIR 10:5 – Cats
 AIR 10:6 – 14th First Annual Ig Nobel Prizes
 AIR 11:1 – Yawning
 AIR 11:2 – Puzzling Solutions
 AIR 11:3 – Security
 AIR 11:4 – Snails & Cookies
 AIR 11:5 – Harry Potter & the Exploding Toads

AIR 11:6 – 15th First Annual Ig Nobel Prizes
 AIR 12:1 – Fame & Fortune
 AIR 12:2 – Painting
 AIR 12:3 – Fish & Chips
 AIR 12:4 – The Issue
 AIR 12:5 – Anatomy
 AIR 12:6 – 16th First Annual Ig Nobel Prizes
 AIR 13:1 – Coke & Pepsi & Coli
 AIR 13:2 – Theoretical Figures
 AIR 13:3 – Rivalry
 AIR 13:4 – What's in Your Head
 AIR 13:5 – Meaning of the Finger
 AIR 13:6 – 17th First Annual Ig Nobel Prizes
 AIR 14:1 – Reclassification/Renaming
 AIR 14:2 – Writing Research
 AIR 14:3 – Anti-Terrorism
 AIR 14:4 – Colorful Research
 AIR 14:5 – Dots and Spots
 AIR 14:6 – 18th First Annual Ig Nobel Prizes
 AIR 15:1 – Mummies, Zombies, & Bagels
 AIR 15:2 – Navel Lint Issue
 AIR 15:3 – Accounting Issue
 AIR 15:4 – Instructions & Executions
 AIR 15:5 – Helmets & Lost Planets
 AIR 15:6 – 19th First Annual Ig Nobel Prizes
 AIR 16:1 – Beards & Bagels & Paper Airplanes
 AIR 16:2 – Geography & Teabagging
 AIR 16:3 – Orgy & Handwashing

AIR 16:4 – Mathematics
 AIR 16:5 – Skunk & Canyon
 AIR 16:6 – 20th First Annual Ig Nobel Prizes
 AIR 17:1 – Missing Pieces
 AIR 17:2 – Head & Brain
 AIR 17:3 – Mathematicians & Bears
 AIR 17:4 – Professor Lipscomb
 AIR 17:5 – Animal Oddities
 AIR 17:6 – 21st First Annual Ig Nobel Prizes
 AIR 18:1 – Body Parts
 AIR 18:2 – And More Body Parts
 AIR 18:3 – Randomness vs. Stupidity
 AIR 18:4 – Projectiles
 AIR 18:5 – Alcohol Consumption
 AIR 18:6 – 22nd First Annual Ig Nobel Prizes
 AIR 19:1 – Sloths & Vampires
 AIR 19:2 – Blushing
 AIR 19:3 – Boring Machines
 AIR 19:4 – Italian Hand Gestures
 AIR 19:5 – Tolstoy's Rifles
 AIR 19:6 – 23rd First Annual Ig Nobel Prizes
 AIR 20:1 – Miscreant Trapping
 AIR 20:2 – Cloning & Evolution
 AIR 20:3 – Centrifugal Research
 AIR 20:4 – Chewing Gum
 AIR 20:5 – Feathers
 AIR 20:6 – 24th First Annual Ig Nobel Prizes
 AIR 21:1 – Teeth

Get NEW ISSUES and some BACK ISSUES as delightful E-BOOKS. Download a FREE ISSUE at IMPROBABLE.COM



Annals of Improbable Research

PO Box 380853, Cambridge, MA 02238 USA

(+1) 617-491-4437 <air@improbable.com>

Teachers:

You have our permission – and encouragement – to photocopy *AIR* articles and hand them out in your classroom.



Annals of Improbable Research (ISSN 1079-5146 print / 1935-6862 online) is published six times per year (Jan./Feb., Mar./Apr., May/June, July/Aug., Sep./Oct., Nov./Dec.) by

Improbable Research, Inc.,
44-C Sacramento St.
P.O. Box 380853,
Cambridge, MA 02238 USA
617-491-4437

<subscriptions@improbable.com>

©Copyright 2015 *Annals of Improbable Research*.

Subscription rates for the paper edition:
US — \$49; Canada and Mexico — \$61;
Overseas — \$79.

PERIODICALS postage paid at Boston MA and additional mailing offices.

Change of address: Postmaster please send address changes to: *Annals of Improbable Research*, PO Box 380853, Cambridge MA 02238.

Claims for missing issues: Claims will be serviced at no charge if received within 90 days of the cover date for domestic subscribers and six months for subscribers outside the US. Duplicate copies cannot be sent to replace issues not delivered because of failure to notify publisher of change of address.

Cancellation: Subscription cancellations will not be accepted after the first issue has been mailed.

Mastication: *AIR* is not necessarily printed on edible stock. Mastication is not recommended except under a physician's care.

Language of this notice: This notice is printed in English.

IMPORTANT: *AIR* was created by the founders and entire former editorial staff (1955-1994) of *The Journal of Irreproducible Results*. However, *AIR* is in no way associated with that publication or with its publisher, nor should *AIR* in any way be confused with either of those entities.

UNCLASSIFIED ADS

The Annals of Improbable Research disclaims any and all responsibility for the veracity, existence, safety, or sense of any or all contents or consequences of these advertisements. Proceed at your own risk.

Knots of hair, twisted, [excess gathered for experimental purposes]. BOX 2

Knots of hair, possibly twisted, [excess gathered for experimental purposes]. BOX 4.

Historic crumbs from strudel gathered in Vienna. BOX 5.

Dog, hairless. BOX 6.

101 Favorite Piccolo Solos for Tinnitus Sufferers [sheet music]. BOX 7.

Contents of Box 10 (Guaranteed no more than four leeches!). BOX 10.

Dirty books. Soil ideal for growing legumes. BOX 17.

Book—*The Religious Impulse in Bacteria*, by B.H. and L.L. ("Petit Homme") Legrande, signed second edition. BOX 19.

Detritus. Box 20.

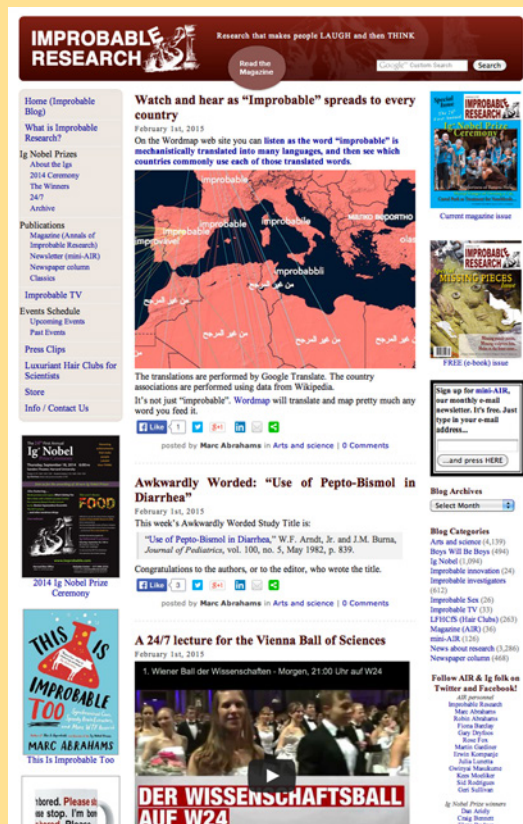
MOOCS for Mooks (3-DVD set, includes cleaning fluid). Box 21.

Lug nut extravaganza. Write for our catalog. BOX 22.

Book—*The Indecent Docent*, fourth edition, signed by a reader. BOX 45.

Homemade zygotes. Just like Mom's. BOX 48.

...and more, on our web site
www.improbable.com



- daily blog
- weekly podcast
- newspaper column*
- monthly newsletter (mini-AIR)

* Appearing in *The Guardian* (London) and online

What is this picture? (see page 1)

