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ADSL

Special Issue: **Snails & Cookies**



...and much more!



JULY | AUGUST 2005

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

Other Einsteins (Part 4)

by *A.S. Kaswell, with Jessica Girard, AIR staff*

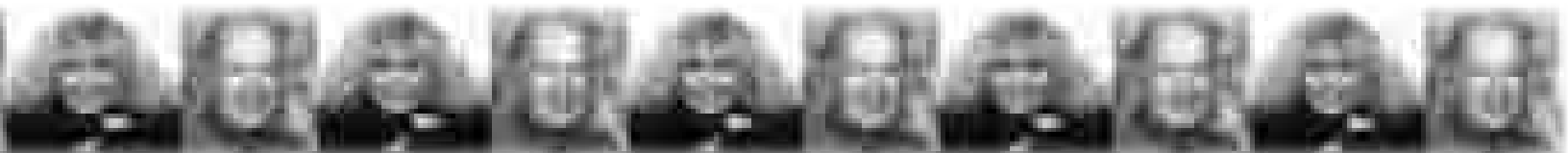
As reported in Parts 1, 2 and 3 of this series, people say “There is only one Einstein,” but of course that is not so. In this, the official, “Einstein Year,” when everyone celebrates Albert Einstein, we are giving happy nods also to some of the other Einsteins.

When Hans Met Sally

Dr. Hans E. Einstein is professor emeritus of clinical medicine at Barlow Respiratory Hospital in Los Angeles, California. In 2003, he and television actress Sally Struthers were honored at a gala dinner at which each of the other diners each paid \$250.

Dr. Einstein is co-author of the poetically titled research report “Tempest from Tehachapi Takes Toll on Coccidioides Conveyed Aloft And Afar,” which was published in 1978 in the *Western Journal of Medicine*.

Dr. Einstein should not be confused with the H.E. Einstein who co-wrote the paper “Design of Bipolar, Flowing-Electrolyte Zinc-Bromine Electric-Vehicle Battery Systems,” which was presented at the Society of Automotive Engineers Congress in Detroit, Michigan on February 28, 1983



Hans E. Einstein and
Sally Struthers

More to Come

Previously in this series, we examined these Einsteins.

Part 1 -- M.E. Einstein (pork carcass composition)

Part 2 -- Rosemarie Einstein (cannabis)

Part 3 -- Danielle A. Einstein (magical thinking and perfectionism)

In future installments, we will lovingly look at still other Einsteins.

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: Snails & Cookies

- 4 Sluggish Data Transport Is Faster Than ADSL*-- *Ami Ben-Bassat, Revital Ben-David-Zaslow, Shimon Schocken and Yossi Vardi*
- 9 Slug Research Review* -- *Nan Swift and Jessica Girard*
- 14 Slugs, Snails and Coffee -- *Grover Quist*
- 16 "Toll House" Recipe Cookies Do Not Maintain Their Morphology Under Heat Stress Conditions -- *Michael Cammer*

Improbable Research

- ifc Other Einsteins* (Part 4) -- *A.S. Kaswell, with Jessica Girard*
- 12 The Name Number(s) for Political Science* -- *Richard Neimi*

Recommended Research*

- 10 Soft is Hard* -- *Alice Shirrell Kaswell, G. Neil Martin, and Bissell Mango*
- 11 AIRhead Research Review* -- *Dirk Manley*
- 15 AIRhead Medical Review* -- *Bertha Vanatian*
- 25 Boys Will Be Boys* -- *Katherine Lee*
- 26 Icky Cutesy Research Review* -- *Tige Lament*
- 28 Scientists Now Know* -- *Olph DeShaies*
- 29 May We Recommend* -- *Stephen Drew*

News & Notes

- 2 AIR Vents (letters from our readers)
- 7 AIR books
- 28 HMO-NO News: Medicine Rocks!
- 20 Puzzling Solutions -- *Emil Filterbag*
- 29 Teachers' Guide
- 27 Ig Nobel Invitation
- 30 Bends on the Learning Curve -- *Richard Lederer*
- 31 "This Stupid Bush" -- *Nick Kim*
- 31 Back Issues
- ibc Unclassified Ads

On the Front Cover

A hybrid solution for the transport of data. For details see page 6. Photo: Herbert Bishko.

On the Back Cover

A mechanical device claimed to be in use by McVities. The company's press release says: "With its mechanical mouth and teeth the Crumb Test Dummy has been specially designed to munch biscuits and produce crumbs in the same way as the average human." Photo: McVities.

Coming Events

(see WWW.IMPROBABLE.COM for details of these and other events)

Cascadiacon, Seattle, WA -- SEPT 1-5, 2005

Ig Nobel Prize Ceremony -- OCT 6, 2005

Ig Informal Lectures -- OCT 8, 2005

Every Weekday

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Annals of Improbable Research

*The journal of record
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Volume 11, Number 4 • July/August 2005
ISSN 1079-5146

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.

Canned Crab

I collect anecdotes about hermit crab behavior. Colleagues have told me about the remarkable flexibility, or as some of them say, “desperation,” of these creatures in acquiring new, temporary shells. They prefer gastropod shells, but these are not always readily available. When juvenile coconut crabs can’t find one, they will stick their rear ends into film cans and walk around with them. Here is another anecdote that recently appeared in a collegial Internet discussion: “Steve Amesbury at the University of Guam once saw a rather creepier version of this on Saipan, I think it was. He was walking along the beach and spotted something moving along the shore. At first all he could make out was a doll’s head facing upward, with its movable eyes blinking open and shut as it bobbed along. It took him a moment to recover himself enough to notice the nervous *Coenobita* inserted into its neck.” Another colleague produced this tidbit: “I once observed a *P. longicarpus* that was using a Bic pen top. The problem was that the pen top is slightly buoyant, and the animal bobbed up and down as wavelets passed it. The plus side may have been that other hermit crabs actively avoided it as it walked by.”

If any of your readers have

information of this kind, perhaps they will share it with me.

*R.R. Liu
Independent hermit crab
researcher
Rethymno, Crete, Greece*

Wants Crab

The photograph of the crab on page 12 of your special “Crab, Crab, Crab” issue (*AIR* 10: 7) looks remarkably like my husband, Erland, whom I have not seen in more than seven years. I know that the photo is of a crab, not of Erland. But I would still love to meet that crab and spend at least a small amount of time with it. Could you please forward this letter to Theresa and Randall Escobar, the authors of your article? I hope they can help me arrange a meeting.

*Lina Artu
Marine Biological
Assessment Facility
Naples, Italy*

Rorschach Test Question

Here is a scientific puzzle that I hope you or your readers can solve. I found this photograph whilst cleaning out the study of my late wife, Arlene Bishop-Wise, the revered “Intellectual Mistress of the Rorschach Test.” Arlene used it with her classes and also with her patients. I call it a photograph, but Arlene always told her students and her patients that it was in fact an ink blot. Arlene spent more than thirty years gathering notes about the interpretations people put on this ink blot. Arlene never told me in direct language, but I always suspected that it is not an ink blot, but is in fact a photograph. To me it looks like a photograph of two elderly women. Indeed a certain percentage (12%) of Arlene’s students and patients told her that they thought it looked like two elderly women. I do not

know where Arlene obtained it. She was in the habit of constructing her own ink blots. She went so far, in most cases, as to first manufacture her own ink and also manufacture her own paper. She did this at night. We both were avid gardeners, and grew all the ingredients needed to make both ink and paper. But if this is a photograph and not an ink blot, I do not know where or how Arlene obtained it, or whether she made any of the ingredients (silver nitrate and the like). If anyone can help me identify the women (if they are women) or anything else about this blot or photograph, whichever it may be, or can at least help me determine whether it is an ink blot or whether it is a photograph, I would be grateful.

*Arnold Bishop-Wise
Hamper-on-Thames, U.K.*

The A---- Hypothesis 1

You have now wasted space in three issues (*AIR* Vents 11: 1 and *AIR* Vents 11:2 and *AIR* Vents 11:3) publishing letters by, and then about, that professor -- please do not publish his name again; let’s call him “Professor A---” -- who so cleverly named a hypothesis after himself and then wrote a letter about how he cleverly named a hypothesis about himself, and then had other people cleverly write in letters about that. And every time, he got to see his name in print. I think this stinks. Please do no waste any more space about this man. Whatever happened to modesty?

*Tracy Exton
SUNY Binghamton
Binghamton, NY*



The A---- Hypothesis 2

I advise Mr. Daniel T. Arcieri to do more thorough literature searches before proposing names for measures in the future. His proposal to call the number of Google hits a person has their "Arcieri Index" (AIR Vents 11:3) is six years too late. According to Schulman (AIR 5:3) and Schulman & Boissier (November 2001; AIR Online), the number of Google hits a person has is their fame. For example, Daniel T. Arcieri currently has a fame of 14 microLewinskies (uLw), which means he is 72,000 times less famous than Monica Lewinsky.

*Eric Schulman
Alexandria, VA*

Mel, Mel, Mel

Thank you for devoting that entire special issue to Mel, the little man whose photograph and beard so often graces your letters page. I really don't know why Mel appeals to me so. But he does, and it is good to know that I am not alone. Viva Mel!

*Connie Bracco, MD
Monte Carlo, Monaco*

It's the Little Things

I was touched and inspired by the letter from Ed Charles Moreau (AIR Vents 11:3) in which he volunteers to count all the occurrences of the letter "M" in your magazine. I volunteer to count the number of commas in your magazine. If you already have someone counting commas, I would be willing to count the occurrences of the lowercase letter "i."

*Charlene Gok, MD
Singapore*

It's the Little Things

Please disregard my letter about volunteering to count commas and occurrences of the lowercase letter "i."

*Charlene Gok, MD
Singapore*

It's the Little Things

Please disregard my second letter about volunteering to count commas and occurrences of the lowercase letter "i."

I stick with the convictions expressed in my first letter. My secretary somehow mixed up two unrelated pieces of correspondence and sent you that second letter, which is nonsensical. You can count on me to count commas and occurrences of the lowercase letter "i." Please do!

*Charlene Gok, MD
Singapore*

A Guide to the Stars

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

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Stochastic Processes

(selected at random from amongst our subscribers)

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Women's Health

Andrea Dunaiif, Northwestern U.

JoAnn Manson, Brigham & Women's Hosp.



Sluggish Data Transport Is Faster Than ADSL

by Ami Ben-Bassat, Israel

Revital Ben-David-Zaslow, Department of Zoology, Tel Aviv University

Shimon Schocken, Efi Arazi School of Computer Science, IDC Herzliya, Israel

Yossi Vardi, Israel

“If everything seems under control, you’re just not going fast enough.” (Mario Andretti)

We describe an experiment in which a Giant African Snail, acting as a data transfer agent, exceeded all known “last-mile” communications technologies in terms of bit-per-second performance, adding to the many paradoxes of broadband communications.¹ We discuss the unique motivational and guidance systems necessary to facilitate snail-based data transport, and observe with satisfaction that in a society that worships the fittest, fastest, and furthest, the meek and the slow can sometimes outperform all known competitors, giving rise to the new and exciting field of sluggish data networks.

The History of Snails as Communications Agents

The use of snails as data communications agents was not considered before now. As we show in this paper, the negative attitude towards using snails in communications networks is an example of bounded rationality² impeding bold and creative engineering.

Snails are widely assumed to be slow animals. Yet the literature on sluggish speed is surprisingly limited, and few have actually bothered to measure and record it formally. Further, reported gastropod speeds vary widely with species and circumstance, ranging from 0.000023³ to 0.0028⁴ meters per second.

Figure 1. The SNAP system in a feed-forward action. In keeping with the systems engineering principle that interfaces between modules should be transparent, the backend’s yoke is connected to the frontend’s shell with a piece of transparent scotch tape, not visible in the image. (Photograph by Herbert Bishko.)

Another cognitive limitation that hindered the employment of snails in data transfer is what we term a *data linearity bias*. As it turns out, most data communications experts are trained to think of a data stream in terms of a linear and logical flow of bits. And yet in reality, many massive data stores like CDs and DVDs are physically organized in *circular formats*. Owing to their spherical geometry, when such data stores fall on a flat surface they tend to roll like wheels for a short distance and then wobble and come to a rest -- a phenomenon that went completely unnoticed in the computer science and electrical engineering literature.

In sum, we observe that most data communications experts (i) are bound to think of snails as inherently slow, mindless, and stand-alone creatures and (ii) seem to ignore the wheel-like geometry of CDs and DVDs. It is therefore not surprising that the immense data transport potential embedded in slug-empowered traction has not been realized thus far.

Previous Work: Low-Level Experiments in Australia

Several sources indicate that in the early days of the Usenet, a certain segment of the network's backbone was implemented by shuffling magnetic tapes in a station wagon in the Australian outback. This has prompted Andrew Tanenbaum to note that one should "*never underestimate the bandwidth of a station wagon full of tapes.*"⁵ It is rather surprising that in spite of Tanenbaum's stature as a leading data communications expert, this penetrating insight about the feasibility of brute-force data transfer did not get much mileage.

Previous Work: High-Level Experiments in Norway and Israel

One notable exception has been a pioneering experiment carried out in Bergen, Norway, in 1999. The experiment demonstrated the feasibility of a *pigeon-based* data transport system, formulated by David Waitzman.⁶ This B2P (Back to Pigeons) line of research was significantly extended by Ami Ben-Bassat, Guy Vardi, and Yossi Vardi⁷ in Israel. In 2004, Ben-Bassat et al. sent three homing pigeons over a 100-kilometer distance, each carrying 1.3 gigabits on tiny flash memory cards, yielding a transfer rate faster than ADSL.⁸

Yet the *Wi-Fly TCP (Transmission by Pigeons)* protocol of wireless internet has had its limitations. First, pigeons cannot fly through Windows. Second, since they don't fly in darkness either, this method's bandwidth drops to zero 50 percent of the time. Finally, there's the problem of droppings download. We are pleased to report that all these shortcomings were resolved in our new data transfer protocol, as we will now describe.

System Architecture

We propose a data transfer system based on a hybrid integration of a mobile digital data store *backend* and an organically engineered *frontend*. The backend module consists of two CD or DVD disks, interconnected by a light-weight balsa axle and yoke, forming a two-wheeled cart. The frontend module consists of a single *Achatina Fulica*, also known as a *Giant African Land Snail*.⁹ We call the system *SNAP*, standing for *SNail-based data transfer Protocol*.¹⁰ (See Figure 1.)

The snails used for the experiment were supplied by Dr. Revital Ben-David-Zaslow, a marine molluscs expert. Although snails are not protected by the Helsinki committee, we wanted to make sure that the experiment does not compromise their welfare in any way. And indeed, Dr. Ben-David-Zaslow assured us that the effort required to haul the light SNAP cargo is far less than that exerted by snails in a vertical climb, which is what they normally do. Further, Dr. Ben-David-Zaslow pointed out that the participation in the experiment was a welcome diversion from the routine life that the snails normally lead in the university aquarium which is their regular habitat.

Since the snail proper is committed neither scientifically nor professionally to the advancement of data communications techniques, we had to contrive a way to entice it to get moving. After consulting the literature on utility theory^{11,12} and economic mechanism design,^{13,14} we proceeded to augment the platform with a unique incentive mechanism based on a fresh leaf of *Lactuca Sativa*, also known as iceberg lettuce, hereafter referred to as *LGS (Lettuce-based Guidance Sub-system)*.

And since data transfer always takes place between two well-defined source and destination points, we had to contrive a way to restrict the system's movement to a pre-determined trajectory. This was done by placing the LGS in the center of the snail's sensory field, and dragging it gently along the shortest path between the data's source and destination terminals. This particular task was carried out by a member of our research team who is also a commercial pilot with significant navigation experience.

Details of the Experiment

The experiment's goal was to demonstrate how the movement of the SNAP system from source to destination in t seconds results in transporting data at an overall rate of b/t bits per second (bps), b being the number of bits transferred. The actual venue of the experiment was a lunch break during *Kinnernet 2005*, an annual conference dedicated to Internet innovation and organized by Yossi Vardi.¹⁵

The experiment began with a few minutes of tense silence, disturbed by some cynical comments from the audience. Yet when the wireless LGS router was presented into the scene, the system's frontend module SNAPped into action (excuse the pun), and started moving slowly but consistently toward the LGS, data store gingerly in tow. In fact, at some point the frontend actually managed to bite a small fraction of the LGS. The experiment ended 34 minutes and 10 seconds later, when the data payload was delivered intact from source to destination. At the finish line, an astonishing 37 million bits-per-second data rate was recorded, to the delight of a cheering audience witnessing scientific history in the making.

We note in passing that all measured times were recorded conservatively by an observer on the ground. If measured by the moving snail itself, times would have been a bit shorter, according to Einstein's relativity theory,¹⁶ resulting in slightly greater bps rates.

Discussion

An inspection of Figure 2 reveals that SNAP is not only fast -- it is the fastest "last mile" data communications technology used today over the Internet:

Technology	Kbps
V.34 modem	28.8
ISDN	128
ADSL	1,500
Wi-Fi (pigeons)	2,270
SNAP (snails)	37,000

Figure 2: Benchmarking SNAP with other data transfer technologies.

It's important to note that the terrestrial distance covered by SNAP during the experiment (52 centimeters) is irrelevant. That is because data transfer is a continuous affair: once a communications channel is established between two points, packets of bits flow continuously from source to destination. In our case, it can be assumed that a new SNAP system leaves the source every second with a payload of 9.4 gigabytes, yielding a pure delivery rate of 37,000 Kbps.¹⁷ Needless to say, various circumstances such as LGS succulence and slug cross-talk can slow down a multi-SNAP system's actual performance. However, as all Internet users know, the actual speed of any data communications carrier varies around its advertised pure bps , and SNAP is no exception.

We conclude this section with some comments on several other characteristics of the SNAP protocol.

Security: Since the SNAP payload is a write-once / read-only CD/DVD media, there is virtually no way to compromise the transferred data. Although the protocol is not immune to data sniffing, we note that unauthorized reading of SNAP data requires stopping a highly motivated LGS-driven giant African snail in its tracks and then dismounting the disks from its harness -- a rather messy affair that potential intruders will most likely want to avoid.

Modularity: An inspection of Figure 1 reveals that the system's frontend and backend modules are completely independent of each other. As a result, each module can be replaced at will, requiring no changes in the rest of the SNAP system. For example, new DVDs with large data capacities can easily replace the backend module, leaving no impact whatsoever on the pulling snail. Likewise, the snail frontend can be replaced with no impact on the backend. For example, the combination of a *Red-Rimmed Melania Snail*¹⁸ with the latest generation DVD can result with a new *RGB* technology (*Red* snail, *Green* LGS, *Blue* ray data).

Scalability: With more than 30,000 snail species in nature, the range of possible SNAP system configurations is mind-boggling. It is safe to say that a SNAP system can be custom-tailored for every application and budget in terms of desired data speed and LGS consumption.

Quality of Service/Denial of Service: One unique feature of SNAP is that QoS can be easily regulated by the system's operator: the plumper the LGS, the larger will be the data transfer rate. Yet in some regions, most notably France, culinary habits may pose a denial-of-service (DOS) problem. In particular, French users will have to choose whether they want to be served a data cargo or an escargot. On the other hand, dietary kosher laws will ensure that DOS problems will never occur in DOS neighborhoods.

Given the attractive operational features of the SNAP system, we will not be surprised if some readers of this article will venture to turn SNAP into a for-profit data communications enterprise. A word of caution is in order. As it turns out, the use of *wheels* in any commercial application may be a violation of intellectual property law. In particular, in 2001, Mr. John Keogh, a lawyer, was issued patent #2001100012 from the Australian Patent Office for "*a circular transportation facilitation device*", more commonly known as *a wheel*.¹⁹ Therefore, commercial SNAP system operators may have to deal not only with the temperamental vagaries of a Giant African Snail, but also with possible law suites filed by an Australian patent lawyer.

Future Work

It is quite obvious that the weakest point in the current SNAP architecture is the LGS. In particular, the need to employ a skilled human LGS operator is clearly cumbersome and expensive. With that in mind, we are now working on a new, self-propelled version of the system, called SNAP II (see Figure 3). As can be seen from the figure, of the two design problems described in section 3 -- motivation and navigation -- SNAP II provides an elegant solution to the former while not addressing the latter.

We conclude that the navigation challenge of self-propelled SNAP II systems, as well as unstable levels of service in France, remain open problems for future work in sluggish data communications research.

Notes

1. "The Many Paradoxes of Broadband," A. Odlyzko, *First Monday*, vol. 8, no. 9, September 2003, http://firstmonday.org/issues/issue8_9/odlyzko/index.html.
2. *Judgment Under Uncertainty: Heuristics and Biases*, Daniel Kahneman, Paul Slovic and Amos Tversky (editors), Cambridge University Press, Cambridge, 1982.



The Ig Nobel Books!

Why Chickens Prefer Beautiful Humans, by Marc Abrahams, Orion Books, London

The Ig Nobel Prizes, by Marc Abrahams

[U.S. edition] Plume, New York

[U.K. edition] Orion Books, London

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The Best of Annals of Improbable Research, Chinese edition, Shanghai Scientific and Technological Education Publishing House

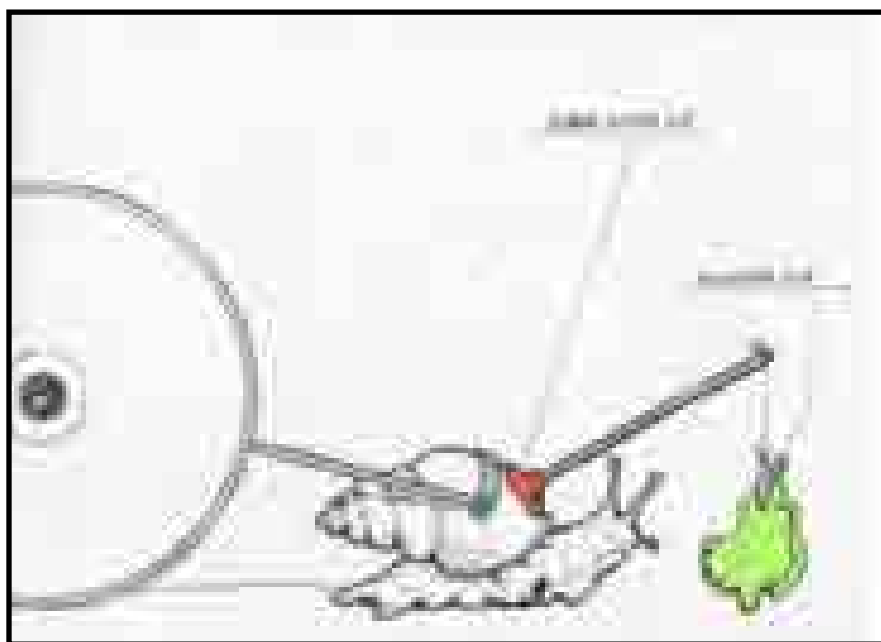
Der Einfluss von Erdnussbutter auf die Erdrotation, Marc Abrahams (ed.), Birkhäuser.

La scienza impossibile—Il meglio degli <<Improbable Research>>, Marc Abrahams (ed.), Garzanti

...And the book-length version of the famous AIR-birthed article: *A BriefER History of Time*, by Eric Schulman, W. H. Freeman.



3. "Snails Without Shells," Branley Allan Branson, *The World and I*, vol. 11, no. 5, May 1996, p. 166ff.
4. *The Guinness Book of World Records* 1998, C.T. Stanford, Guinness, 1997, p. 144.
5. *Computer Networks*, A. Tanenbaum, Prentice-Hall, 1988.
6. "IP Over Avian Carriers with Quality of Service," David Waitzman, RFC Archive, The Internet Society, April 1, 1999, <http://rfc.sunsite.dk/rfc/rfc2549.html>.
7. "PEI (Pigeon Enabled Internet) Is Faster Than ADSL," R. Ben-Bassat, Y. Vardi and G. Vardi, *Internet 2004 Conference Proceedings*, <http://www.notes.co.il/benbasat/5240.asp>.
8. "Pigeons Bandwidth Advantage Quantified," Timothy, *SlashDot*, March 31, 2004. <http://science.slashdot.org/science/04/03/31/2224227.shtml?tid=126&tid=133&tid=186&tid=95>.
9. *Giant African Land Snail Photo Gallery*, <http://achatina.ru/Photo/Page.Eng/Fulica.htm>
10. We decided to omit the "D" and the "T" from the SNAP acronym, since these letters are already overused in data communications protocols, e.g., TCP, TTY, DSL, DVD, etc.
11. *Theory of Games and Economic Behavior*, John Von Neumann and Oskar Morgenstern, Princeton University Press, 1944.
12. "Modular Utility Representation for Decision-Theoretic Planning," M.P. Wellman and J. Doyle, *Artificial Intelligence Planning Systems: Proceedings of the AIPS Conference*, 1992.
13. "Economic Mechanism Design for Computerized Agents," H. Varian, *Proceedings of Usenix Workshop on Electronic Commerce*, 1995.
14. "Algorithmic Mechanism Design," N. Nisan and A. Ronen, *Proceedings of the STOC Conference*, 1999.
15. The conference is held near the Lake of Galilee (Israel), whose Hebrew name is "Kinneret."
16. "On the Electrodynamics of Moving Bodies," A. Einstein, *Annalen der Physik*, vol. 17, no. 891, 1905.
17. Each Giant African Land Snail contains male and female reproductive organs and can produce up to 1,200 eggs a year. From "FAQs About Giant African Land Snails," <http://massnrc.org/pests/pestFAQsheets/giantafricanlandsnail.html>.
18. "Red-rimmed Melania Snails and Mosquitofish," <http://community.webshots.com/photo/20968533/20969994zGelyrDvJk>.
19. "Background to the Wheel Patent," <http://news.bbc.co.uk/1/hi/world/asia-pacific/1418165.stm>. [EDITOR'S NOTE: For this achievement, Mr. Keogh and the Australian patent office were awarded the 2001 Ig Nobel Prize for Technology.]



Acknowledgements

We thank Yedidya Vardi and Shlomo Abayoff from the Ron Vardi Center for Gifted Children in Rishon Lezion for constructing the cart module of the SNAP system, Talma Vardi for caring for the snails' well-being during the experiment, and Yossi Hod from El Al Airlines for operating the LGS during the experiment.

Figure 3. In SNAP II, the LGS router is attached to a look-ahead device mounted on the frontend's shell. When the snail moves forward, so does the LGS. (Drawing by Uriel Miron.)

Slug Research Review

A slow look at some research by, for, or about slugs

compiled by Nan Swift and Jessica Girard, AIR staff

SlugBot

“The Design of a Robotic Predator: The SlugBot,” Ian Kelly, *Robotica*, vol. 21, part 4, July-August 2003, pp. 399-406.

We are currently developing a robotic system that will attempt to sustain itself by hunting and catching slugs on agricultural land. ... This paper outlines the requirements for such a predator and describes the entire robot. Data is also presented from trials of the robot hunting and catching slugs in a situation similar to that found in agricultural fields.



Dating Tip for Hermaphrodites

“Mate Choice in a Hermaphrodite: You Won’t Score With a Spermatophore,” Martin Haase and Anna Karlsson, *Animal Behaviour*, vol. 67, part February 2004, pp. 287-91.



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Soft Is Hard

Further evidence why the “soft” sciences are the hardest to do well

compiled by Alice Shirrell Kaswell, G. Neil Martin, and Bissell Mango

Psychologist Sighs

“Why Summaries of Research on Psychological Theories Are Often Uninterpretable,” Paul E. Meehl, *Psychological Reports*, vol. 66, 1990, pp. 195–244. In this lengthy report, the author, who is at the University of Minnesota, explains, among other things, that:

I frequently have the experience where a student asks me to serve on a doctoral examining committee, tells me about a design aimed at testing a theory in soft psychology, and my heart sinks as I listen. A great cloud of cognitive gloom descends upon me, because the thought that keeps coming into my mind is “You can’t test it like that, you’ll just never manage to test it like that.”

Criminal Name Change

“Name Change Among Offender Patients: An English High Security Hospital Sample,” B. Vollm, et al., *Criminal Behaviour and Mental Health*, vol. 12, no. 4, 2002, pp. 269-81. The authors, who are at the University of Manchester, U.K., explain that:

This study was undertaken to establish the prevalence of name change among high security hospital patients and to compare those who changed name with those who did not. ... RESULTS: Seventy-one patients (17%) of the resident population changed names (exclusive of a woman changing her surname on marriage).

Staring at One Side of the Face

“Staring at One Side of the Face Increases Blood Flow on That Side of the Face,” Peter D. Drummond and Nadia Mirco, *Psychophysiology*, vol. 41, no. 2, March 2004, pp. 281–7. (Thanks to David Travis for bringing this to our attention.) The authors, who are at Murdoch University, Perth, Western Australia, explain that:

To investigate the effect of observation on blushing, an experimenter sat next to 28 participants and looked closely at one cheek while the participant sang (embarrassing) or read aloud (not embarrassing). Increases in cheek temperature were greater on the observed than the unobserved side during both tasks. ... These findings suggest that staring at one side of the face triggers an ipsilateral increase in facial blood flow.



Tales of the Unexpected: Exam-Time Stress

“Examination Stress, Salivary Cortisol, and Academic Performance,” V. Ng, D. Koh and S.E. Chia, *Psychological Reports*, vol. 93, no. 3, part 2, December 2003, pp. 1133-4. The authors, who are at National University of Singapore, report that:

Immediately before and after participation in a written final examination, 11 graduate students rated their self-perceived stress and provided saliva samples for cortisol assay. ... Students who reported higher stress and had higher cortisol levels before the examination tended to have significantly lower examination scores.

AIRhead Research Review

Improbable theories, experiments, and conclusions

compiled by Dirk Manley, AIR staff



Policewoman Prostitution Info

“The Information Needs of Female Police Officers Involved in Undercover Prostitution Work,” Lynda M. Baker, *Information Research*, vol. 10, no. 1, October 2004, paper 209. (Thanks to Richard Akerman for bringing this to our attention.)

Flyweight Fighters

“Fighting Fruit Flies: A Model System for the Study of Aggression,” Selby Chen, Ann Yeelin Lee, Nina M. Bowens, Robert Huber and Edward A. Kravitz, *Proceedings of the National Academy of Sciences*, vol. 99, no. 8, April 16, 2002, pp. 5664-8. The authors, who are variously at Harvard Medical School, Boston, Massachusetts, and at Bowling Green State University in Ohio, report that:

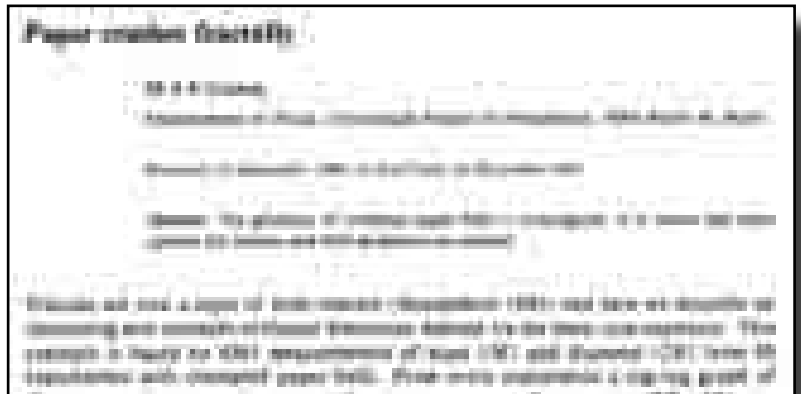
[W]e have developed a quantitative framework for studying aggression in common laboratory strains of the fruit fly, *Drosophila melanogaster*. In the present study we analyze 73 experiments in which socially naive male fruit flies interacted in more than 2,000 individual agonistic interactions. ... Only [a] few fights progressed to the highest intensity levels (boxing and tussling)...

Films of some of the fights can be viewed online at <<http://labworks.hms.harvard.edu/>>.

Geometry of Crumpled Paper 1

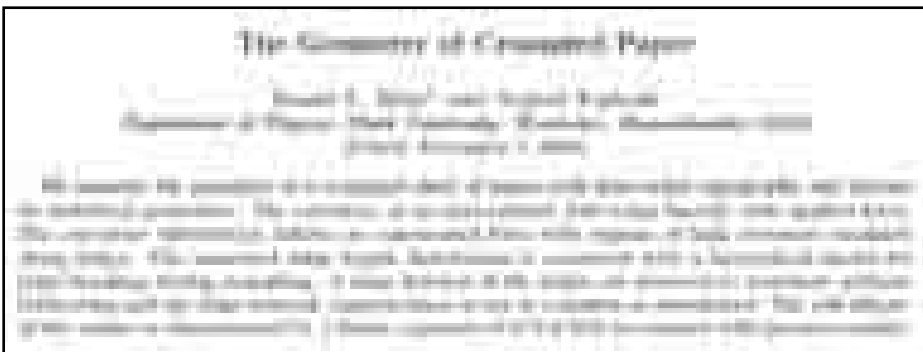
“Paper Crushes Fractally,” M.A.F Gomes, *Journal of Physics A*, vol. 20, no. 5, 1987, pp. L283-4. The author reports that:

The geometry of crumpled paper balls is investigated.



Geometry of Crumpled Paper 2

“Geometry of Crumpled Paper,” Daniel L. Blair and Arshad Kudrolli, *Physical Review Letters*, vol. 29, no. 16, April 29, 2005, pp. 166107-14. (Thanks to Jim Propp for bringing this to our attention.) The authors report that:



We measure the geometry of a crumpled sheet of paper with laser-aided topography and discuss its statistical properties.

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

AMERICAN

POLITICAL

SCIENTISTS

A Dictionary



Glenn H. Utter and Charles Lockhart

SECOND EDITION

A number of political scientists, especially American political scientists, are fascinated by the concept of the Name Number for political scientists. The names of many of them appear in this book.

LAYOUT NOTE: There is ONE image The Name Number(s) for Political Science

by Richard Neimi (*misspelled*)
Political Science Department
University of Rochester
Rochester, New York

In a recent issue of *AIR*,¹ Kevin Krajick pointed out that there are many scientists whose names closely match their fields of study. In doing so he calculated the Name Number (the percentage of such people) for his field, Geology. He challenged readers to mine data bases in their own professions, remarking that “it remains to be seen” whether Name Numbers for other disciplines will out-do geology.

Having made the count for my own field, I can report that political science does not quite reach the plateau set by geology if one considers only names that refer to governmental positions or to concepts studied by the discipline. But if one adds names of holders of governmental positions—even, perhaps, limiting them to heads of countries—then political science soars past geology and may be king of the Hill.

Following the procedures used in Krajick’s path-breaking work, I examined the 4,529 names (including those occurring more than once) appearing in the on-line index to the program for the 2005 national conference of the Midwest Political Science Association. Numbers below refer to times the name appears (numbers in parentheses are those of distinct persons):

6 King (4), 1 King Jr.; 2 Rey (1), 1 DeLeon, 1 Leon, 2 Primo (1)
2 Pope (1)
2 Prince (1), 2 Prins (1)

1 Duke
1 El Sherif
3 Khan

2 Power (1); 2 Powers
2 Guerra (but no War, and no Peace)
2 Canon (1)

1 Wise
3 Wiseman (1)
2 Fey (1)
2 Goodman (1)
1 Fair
2 Bliss (1)
(but no Justice, or Judge)

6 Hill (3)
2 Law
3 Lawless (1)
3 Levy (but no Tax)

The Name Number, calculated on the above list, is 1.26%, compared to geology’s 1.35%. However, we also find the following names of U.S. presidents:

1 Washington
3 Adams (2)
3 Monroe
4 Jackson (3)
1 Harrison
No Tyler, but a Tyler Johnson, who should probably count double
2 Pierce
1 A. Johnson, no L. Johnson
2 Grant (1)
2 Hayes (1)
8 Wilson
1 Harding
1 Kennedy
4 Nixon (1)
1 Carter
2 Clinton (1)

These names alone constitute 0.82%. Adding them to the above yields a new Name Number of 2.08%. Finally, one finds—with only casual inspection—the following names of present and former non-U.S. heads of state:

Callaghan
Heath
Gandhi
Brandt
Lee
Park
Kim
Mao
McDonald
Clark
Campbell
Martin

Were one to expand these lists to include other well-known politicians, political science, I argue, would almost certainly lead all other disciplines in the name game.

Discussion

Further study could look into the sub-specialties of the above-mentioned authors. Do Professors Washington, Adams, and so on study the presidency? Or at least American politics? Are Gandhi and Mao Indian and Chinese specialists, respectively? Do Wiseman, Goodman, Fair and Bliss study political philosophy? Do Power, Powers, and Guerra write about International Relations? From there, one could move on to consider whether persons take on any of the characteristics of the leaders (or kinds of leaders) whose names they bear. Are Law and Lawless opposites? Is Fair fair? And what should we expect from the Nixons? And, of course, one could see whether names and particular kinds of colleges and universities are linked. Are the Popes at Catholic institutions? Does Canon's school have an ROTC program? These and many other fascinating questions await more detailed analyses.

Note

Ironically, the author's name, Niemi (when not misspelled), is a Finnish word with a geological meaning. It refers to a "point" of land, as in Sandy Point.

Reference

Slugs, Snails and Coffee

by Grover Quist, The Hermitage Institute, Washington, D.C.

Three Hawaiian researchers demonstrated that coffee is a good way to repel slugs and snails. Inspired by their achievement, I have done the reverse experiment. I have shown that slugs and snails are a good way to repel coffee drinkers.

The "coffee repels slugs and snails" report, published in 2002, explains that: "solutions of caffeine are effective in killing or repelling slugs and snails when applied to foliage or the growing medium of plants."

I obtained slugs and snails, and put them on the counters of a several coffee shops in my neighborhood. More than forty people came into these shops while I was conducting my experiment. Everyone noticed the slugs and snails. Everyone left without purchasing coffee.

Reference

"Pest Control: Caffeine as a Repellent for Slugs and Snails," Robert G. Hollingsworth, John W. Armstrong and Earl Campbell, *Nature*, vol. 417, June 27, 2002, pp. 915-6.

AIRhead Medical Review

*Improbable diagnoses, techniques, and
research*

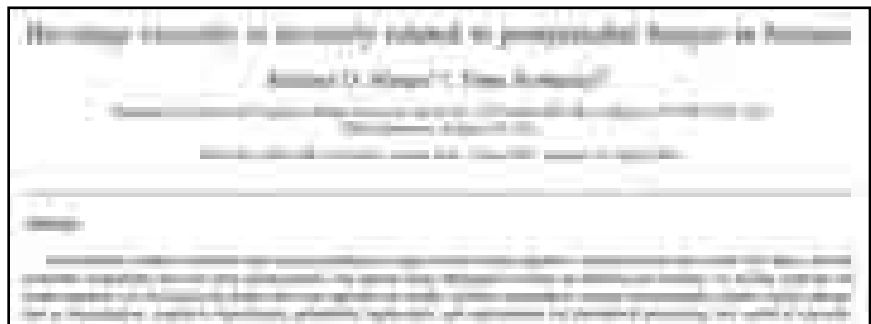
compiled by Bertha Vanatian, AIR staff



Thick Shakes Affect the Appetite

“Beverage Viscosity Is Inversely Related to Postprandial Hunger in Humans,” Richard D. Mattes and Danab Rothacker, *Physiology and Behavior*, vol. 74, nos. 4-5, November 12, 2001, pp. 551-7. (Thanks to Laurence Campbell for bringing this to our attention.)

At weekly intervals, 84 adults ingested 325-mililiter (220 kilocalory) shakes that ... varied in viscosity. Dietary intake was recorded over the 24 hours after shake ingestion. Significantly greater and more prolonged reductions of hunger were observed with the thicker shake.



Dynamic Digit

“A Moving Middle Finger,” Hideki Sudo, Manabu Ito, and Akio Minami, *Lancet*, vol. 361, no. 9376, June 28, 2003, p. 2202. (Thanks to Kristine Danowski for bringing this to our attention.)

Tap & Damn

“To Tap or Not to Tap in Convulsion (Free Will vs. Damnation),” N. Lewak, *Pediatrics*, vol. 53, no. 5, May 1974, pp. 766-7.

Porcine Whipworm Prescription

“Trichuris Suis Seems to Be Safe and Possibly Effective in the Treatment of Inflammatory Bowel Disease,” R.W. Summers, et al., *American Journal of Gastroenterology*, vol. 98, no. 9, September 2003, pp. 2034-41. (Thanks to Ron Josephson for bringing this to our attention.) The authors, who are at the University of Iowa Health Care, Iowa City, Iowa, conclude that:

This open trial demonstrates that it is safe to administer eggs from the porcine whipworm, *Trichuris suis*, to patients with [Inflammatory bowel diseases such as] Crohn’s disease and ulcerative colitis.

Duct Tape -- Before

“Duct Tape and Plastic Surgery,” R.J. Rohrich, *Plastic and Reconstructive Surgery*, vol. 109, no. 6, May 2002, pp. 2063-4.

Duct Tape -- After

“Use of Liquid Nitrogen to Remove Duct Tape From a Homicide Victim,” B.G. Stephens, et al., *American Journal of Forensic Medicine and Pathology*, vol. 20, no. 2, June 1999, pp. 154-7.

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

“Toll House” Recipe Cookies Do Not Maintain Their Morphology Under Heat Stress Conditions

*by Michael Cammer
Director of Light Microscopy and Image Analysis
Albert Einstein College of Medicine
Yeshiva University
The Bronx, New York*

We investigated the morphological behavior of chocolate chip cookies as reported by previous investigators.

A hallmark of the male-dominated scientific establishment is the disbelief in or marginalization of the outsider or other. Two children undertook to prove their hypothesis that the popular drop-cookie recipe¹ for chocolate chip cookies (known as “Toll House cookies”) would not yield preshaped cookies or that preshaped batter would not maintain its morphology through a trial of heat shock (a.k.a. “baking”).² Because their results were exclusively qualitative, i.e. based on exclusively descriptive data drawn from repeated experimentation and because the experimenters were mere children, we sought to disprove the results via quantitative computer analysis of batter under heat stress conditions.

We were unable to effectively challenge their results.



Methods

To challenge the results, we prepared the Toll House formulation in its standard form.^{1,2}

To assess area and shape continuity or flux over a ten-minute heat stress condition, we employed an endpoint assay. Morphology and area, measured from a vantage normal to the plane of plating, were quantified before and after baking conditions using the powerful image analysis package ImageJ.³ Index of roundness is measured as a ratio of perimeter to the square root of area with an adjustment by a constant based on $4 * \pi$ to yield 1 for a perfect circle.

Results

We confirm the qualitative analysis that dough both spreads and loses integrity of hard corners due to heat shock (see Figures 1a and 1b).

The dough is a suspension of starch, sucrose and lipid-based chips in butterfat, which is subjected to pretreatment and post-treatment by heat. Application of heat appears to alter morphology of the suspension, resulting in more spread and smoother-edged objects.

In addition, quantification of changes in absolute area and circularity confirm that dough loses its morphometric integrity when heated to 375 degrees F. Absolute area change is an index of spreading. All specimens spread typically by more than 100 percent each. Circularity is an index of variation from a perfect circle where 1 = perfect circle and, for our uses as it is known that area increases over time, 0 = perimeter approaching infinity. Circularity increases by approximately 25 percent which indicates the smoothing and loss of detailed edge features. Unfortunately, we were unable to establish a 1:1 correlation between area change and increase of circularity in individual specimens; however, the population study of each parameter isolated from the other is compelling (see Figures 2a and 2b).



Discussion

The de facto final arbiter on all things cooking in the United States, the Culinary Institute of America, says nothing in its popular press regarding the chemistry or stability of drop-cookie dough under heat stress conditions.⁴ Therefore, we established definitively that drop-cookie dough loses its morphometric integrity when subjected to heat.

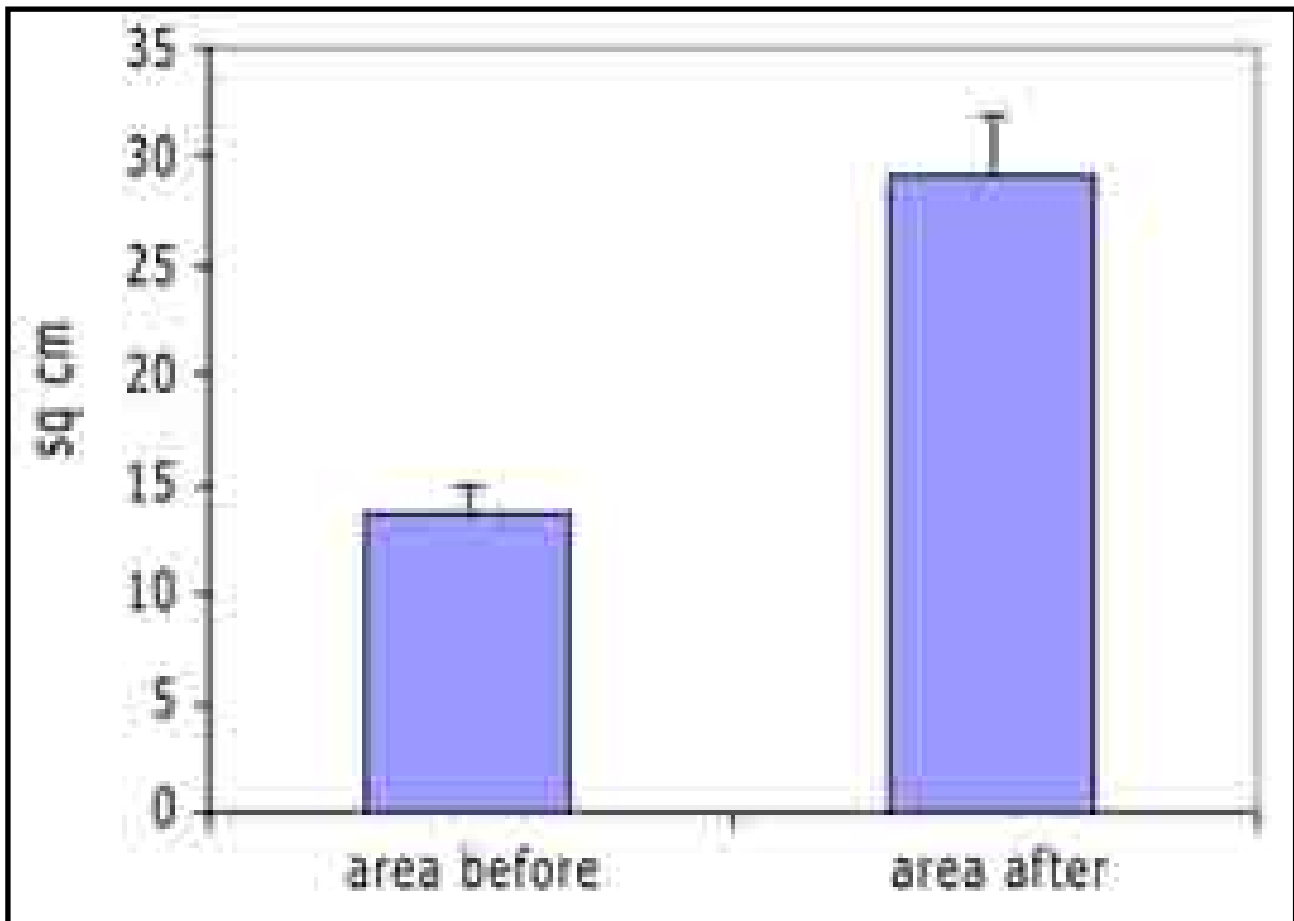
However, the mechanisms of action have not been identified. Yet to be determined is the cascade of chemical events leading to collapse, spreading and subsequent cessation of flux. What roles do sugar and starch suspended in lipid play to slow the spread of the fat, which loses viscosity when heated? Do chocolate chips play a significant role as physical barriers to heat and gravity induced flow? Does protein in flour crosslink to provide stability and at what point does protein in egg crosslink due to heat? Cookies develop crisp outer shells which may be involved in the cessation of flux. The relative roles dehydration or other chemical reactions contribute to this exoskeleton have yet to be investigated.

Our investigation lays a firm foundation for further study. It should also be especially noted that cookies are three-dimensional constructs and, therefore, need more rigorous study as objects in space.

Acknowledgements

Special thanks to Dr. Dianne Cox for tolerating this research and not complaining excessively about the laboratory being too messy or the results too crispy.

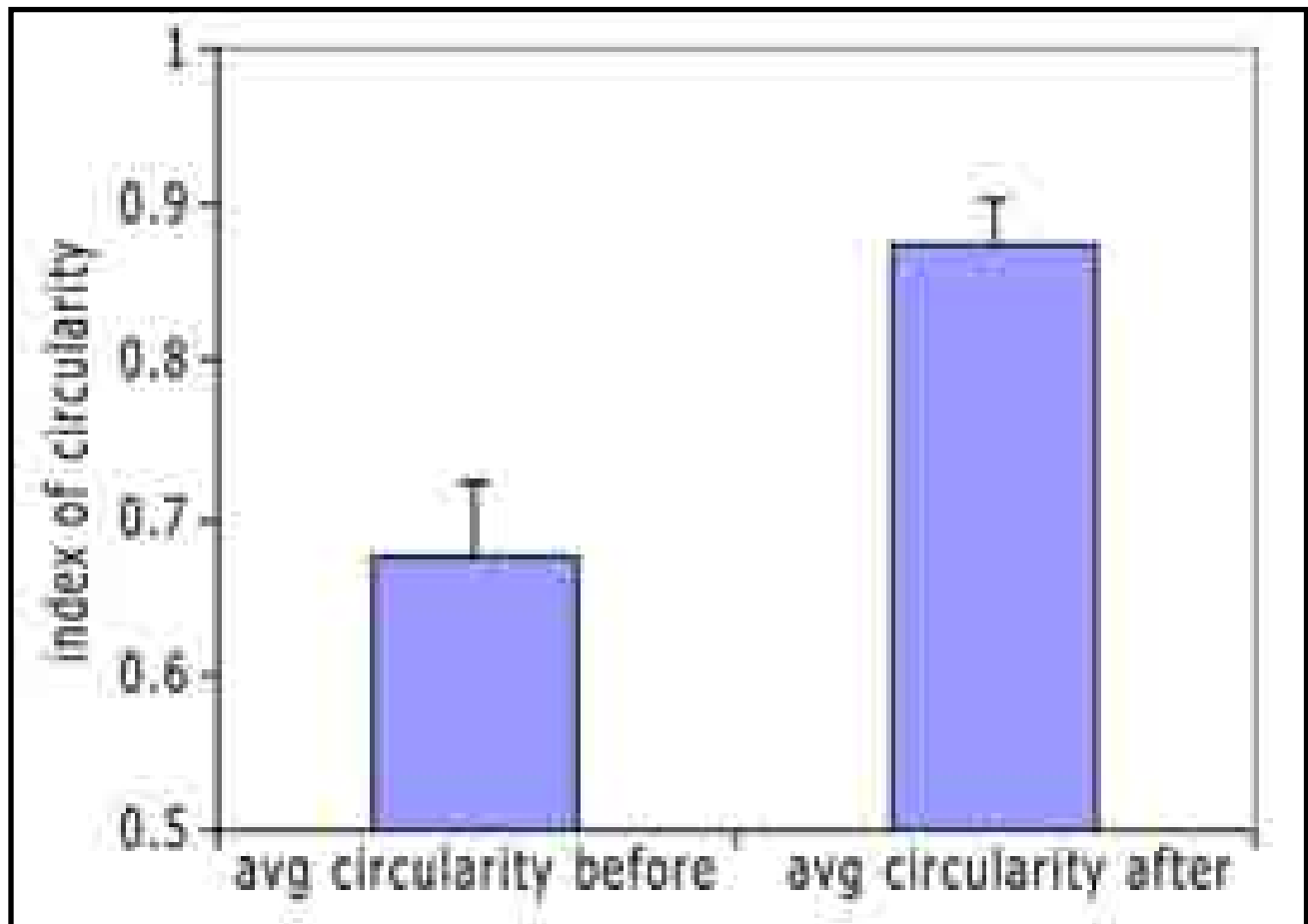
Area as measured by 2D projection from directly above. The thick colloid increases by 2X due to treatment by heat in standard convection oven.



Bibliography

1. R. Wakefield's 1930 Toll House Cookie recipe as published by Nestlé, <http://www.verybestbaking.com/recipes/detail.aspx?ID=18476>
2. *How does the Cookie Crumble?*, C. Deane and R.C. Cammer, 2005, Webster, New Rochelle, N.Y.
3. Image J 1.34g, W.S. Rasband, National Institutes of Health, Bethesda, Md., <http://rsb.info.nih.gov/ij/>, 1997-2005.
4. *Baking and Pastry: Mastering the Art and Craft*, Culinary Institute of America, John Wiley and Sons, Inc., Hoboken, N.J., 2004.

Approximate 25 percent loss of unique edge variation of features as measured by circularity of 2D projection from directly above due to treatment by heat in standard convection oven.



Puzzling Solutions

by Emil Filterbag, AIR staff

We have a large collection of puzzle solutions for which we have lost the puzzles. Here is a further selection.



SOLUTION: No problem, because the slide rule is marked in Braille. Photo: NASA.

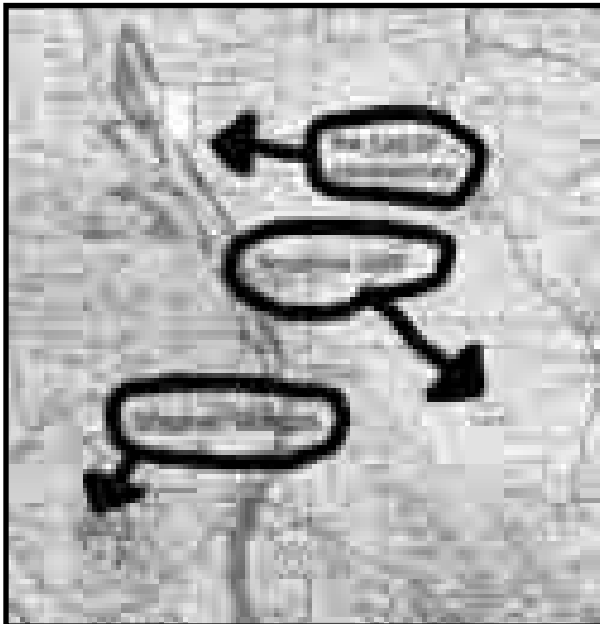


SOLUTION: Thomaso and the servomechanism are in Experimental Barrel 206. Polly's description was a red herring (Rufus did not solve the matrix; Brenda did not hurl her javelin at Leonid; Leonid did not paint Ralphie a brilliant shade of red, nor did he spill the beans; Esperanza did not liquefy Brenda, centrifuge Rufus, or feed the cat). Photo: NASA.

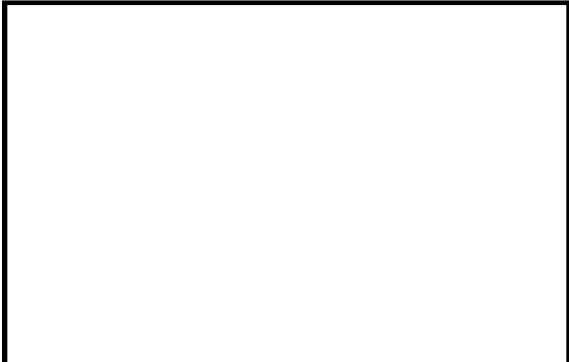
**SOLUTION: 42,000
dynes of force.**



SOLUTION: Only one of them.
Photo: U.S. Department of Defense.



SOLUTION: No. There is no way both of them could have lunch in Pariak and still arrive at the lecture on time.



SOLUTION: Option C and "No, do not spit."

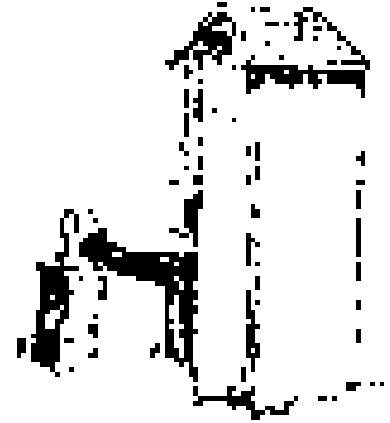


SOLUTION: The uniform rectangular plate of mass M has sides of length s and $2s$, and is free to rotate about corner D , which is held fixed. Re-calculate its tensor of inertia about the corner. Shake vigorously, and the bag of potato chips will appear in his left hand. Photo: NASA.

Boys Will Be Boys

Research by and for adolescent males of all ages and sexes

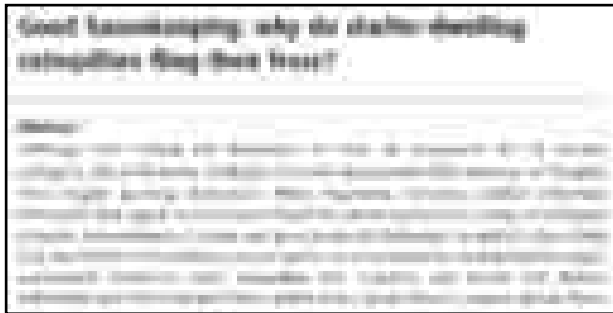
compiled by Katherine Lee, AIR staff



Ecological Niches

“Nudes on the Beach and Perverts in the Dunes,” Douglas Booth, *Journal of Australian Studies*, vol. 53, 1997, pp. 170-82. The author summarizes his work thus:

This article analyses the undressing of bathing bodies in New South Wales and their redressing with particular reference to Sydney’s Reef beach. It offers a case study in the politics of the revealed body and shows that bathing bodies constitute an historical site of struggle between pleasure and discipline.



Frass-Fling Inquiry

“Good Housekeeping: Why Do Shelter-Dwelling Caterpillars Fling Their Frass?” Martha R. Weiss, *Ecology Letters*, vol. 6, no. 4, 2003, pp. 361–70. (Thanks to Les Hearn for bringing this to our attention.) The author, who is at Georgetown University in Washington, D.C., reports that:

Larvae in a number of diverse lepidopteran families have evolved an unusual behaviour, whereby they ballistically eject individual faecal pellets (frass) great distances. Within the family Hesperidae, for example, larvae have been reported to shoot frass pellets a meter or more away; I have observed a 4-cm long *Epargyreus clarus* (silver-spotted skipper) larva launch a pellet a remarkable 153 cm, or 38 times its body length.

Pants Alarm Stoppeth One in Four

“Using a Pants Alarm for the Treatment of Day Wetting: Problems With Compliance,” H. Boelens, S. van den Broek and J. Beishuizen, *Psychological Reports*, vol. 93, no. 3, part 2, December 2003, pp.1073-6. The authors who are at Leiden University in The Netherlands, report that:

A treatment of day wetting was evaluated in four normally capable children (ages 4:9, 4:10, 6:3, and 10:1 years). The treatment combined the use of a pants alarm with rewards (praise and tokens) for urinating in the toilet. The treatment was effective for one child only.

Further Scrotal Scrutiny (Asymmetric)

“Right-Left and the Scrotum in Greek Sculpture,” I.C. McManus, *Laterality: Asymmetries of Body, Brain, and Cognition*, vol. 9, no. 2, April 2004, pp. 189-99. (Thanks to 2000 Ig Nobel Biology Prize winner Richard Wassersug for bringing this to our attention.) The author, who is at University College London, follows up his 2002 Ig Nobel Medicine Prize-winning research. Here he explains that:

The scrotum in humans is asymmetric, the right testicle being visibly higher than the left in most men. Paradoxically, it is also the case that the right testicle is somewhat larger, rather than smaller, as might be expected. Greek classical and pre-classical art, which took great care in its attention to anatomical detail, correctly portrayed the right testicle as the higher, but then incorrectly portrayed the left testicle as visibly larger. The implication is that the Greeks used a simple mechanical theory, the left testicle being thought to be lower because it was larger and hence more subject to the pull of gravity. The present study examines data on scrotal asymmetry in more detail, and puts them in the context of Greek theories of functional differences between the right side and the left side.

Icky Cutesy Research Review

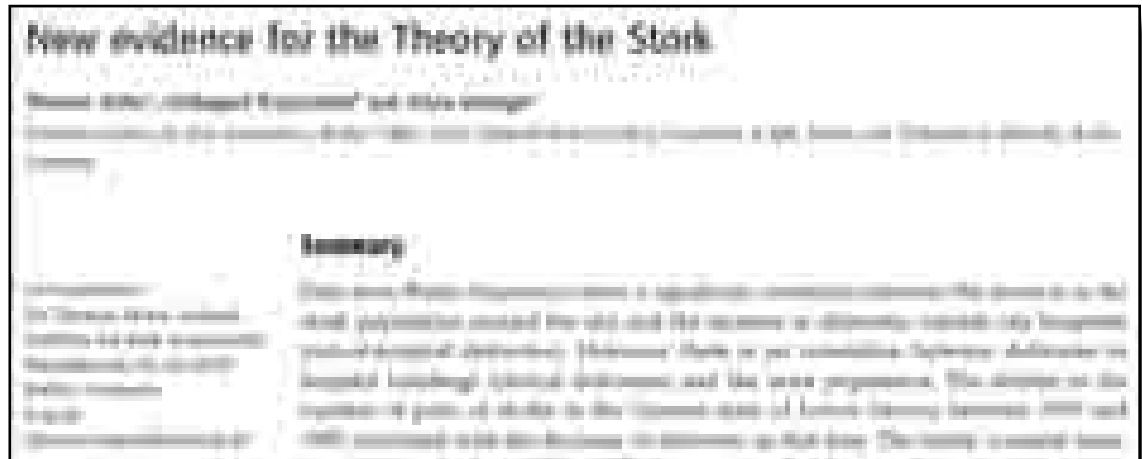
Research reports that are icky and/or cutesy

Compiled by Alice Shirrell Kaswell, AIR staff

Cutesy

“New Evidence for the Theory of the Stork,” T. Hofer, H. Przyrembel, and S. Verleger, *Paediatric and Perinatal Epidemiology*, vol. 18, no. 1, January 2004, pp. 88-92. *(Thanks to Michael Willis for bringing this to our attention.)*

The authors, who are at the Federal Institute for Risk Assessment, Berlin, Germany, report that:



Data from Berlin (Germany) show a significant correlation between the increase in the stork population around the city and the increase in deliveries outside city hospitals (out-of-hospital deliveries). However, there is no correlation between deliveries in hospital buildings (clinical deliveries) and the stork population. The decline in the number of pairs of storks in the German state of Lower Saxony between 1970 and 1985 correlated with the decrease of deliveries in that area. The nearly constant number of deliveries from 1985 to 1995 was associated with an unchanged stork population (no statistical significance). However, the relevance of the stork for the birth rate in that part of Germany remains unclear, because the number of out-of-hospital deliveries in this area is not well documented. A lack of statistical information on out-of-hospital deliveries in general is a severe handicap for further proof for the Theory of the Stork.

Cutesy

“The Act of Creating Humorous Acronyms,” Oliviero Stock and Carlo Strapparava, *Applied Artificial Intelligence*, vol. 19, no. 2, 2005, pp. 137-51. *(Thanks to Don Nilsen for bringing this to our attention.)*

Icky

“Traumatology of the Traffic Accident -- Dead People for the Safety in Traffic,” R. Mattern, F. Schueler and D. Kallieris, *Forensic Science International*, vol. 144, nos. 2-3, September 10, 2004, pp. 193-200. *(Thanks to Kristine Danowski for bringing this to our attention.)* The authors, who are at the University of Heidelberg, Germany, explain that:

Some traumatomechanical insights can only be gathered from human corpses. Legal prerequisites and ethical problems of experiments with corpses are discussed.

Icky

“Pink Teeth Resulting From Russian Endodontic Therapy,” J.D. Matthews, Jr., *Journal of the American Dental Association*, vol. 131, no. 11, November 2000, pp. 1598-9.



Above: The winners and the Nobel Laureates gather at center stage at the conclusion of the 2004 Ig Nobel Prize Ceremony at Sanders Theatre, Harvard University. Photo: Eric Workman / Annals of Improbable Research.

* * *

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Scientists Now Know...

Startling discoveries by social scientists, as announced in press releases issued by them and their proud institutions

compiled by Olph DeShaies, AIR staff

Students Who Get Drunk Weekly Have Higher Risk of Injuries

College students who get drunk at least once a week are significantly more likely to be hurt or injured than other student drinkers, according to new research from Wake Forest University School of Medicine. ... The results, part of an ongoing, five-year research project to develop effective strategies for reducing problem drinking on college campuses, were reported today at the annual meeting of the Society for Academic Emergency Medicine in New York City.

Contact Information: Karen Richardson <krchrdsn@wfubmc.edu>

(Thanks to Steve Nadis for bringing this press release to our attention.)

Judges Think Children More Honest But Less Reliable Than Adults

Judges perceive child witnesses as being more honest than adults when testifying in court, but recognize that children's limited memory and communication skills, and greater suggestibility may make them less reliable than adults. The multi-disciplinary research, the first of its kind to examine judges' perceptions of child witnesses, was led by Queen's Child and Family Law scholar Nick Bala.

Contact Information: Lorinda Peterson <lorinda.peterson@queensu.ca>

May We Recommend

Items that merit a trip to the library

compiled by Stephen Drew, AIR staff

Dickman's Consistent Love Numbers

"Rotationally Consistent Love Numbers," S.R. Dickman, *Geophysical Journal International*, vol. 161, no. 1, April 2005, p. 31. (Thanks to Tom Gill for bringing this to our attention.)

Nuclear-Industrial-Strength Cleaning Fluids

"Nuclear Laundry Using Supercritical Fluid Solutions," J.S. Wang, M. Koh and C.M. Wai, *Industrial and Engineering Chemistry Research*, vol. 43, no. 7, March 31, 2004, pp. 1580-5. (Thanks to Allan H. Harvey for bringing this to our attention.)

Random Ruin

"Randomly Weighted Sums of Subexponential Random Variables with Application to Ruin Theory," Qihe Tang and Gurami Tsitsiashvili, *Extremes*, vol. 6, no. 3, September 2003, pp. 171-88.

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



AIR Teachers' Guide

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

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

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

Bends on the Learning Curve

Improbable ideas and explanations collected from classrooms

by Richard Lederer

Medical transcriptions show us some unexpected styles of medical reasoning. Here are some examples:

- The baby was discharged to home after being given written and verbal instructions.
- The patient's vision is 20-20 in both ears.
- She has never been married and I think was divorced.
- When asked which knee was operated on, he cannot recall, but he notes that whichever knee it was, he still has a problem with it.
- She usually has a bowel movement three times a day following meals and diarrhea.
- Her implants were placed somewhere else.
- The patient is a very active and independent liver.

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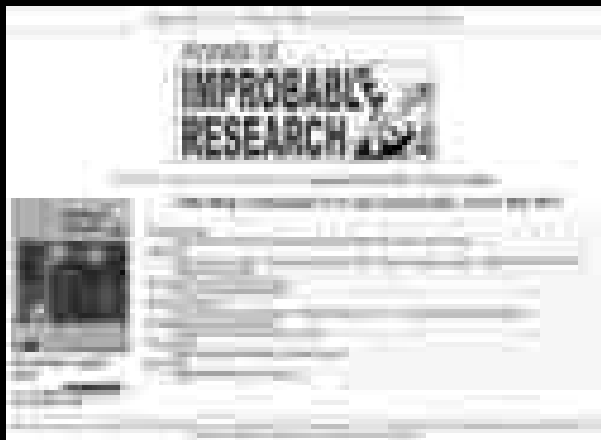
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Annals of Improbable Research (ISSN 1079-5146) is published six times per year (Jan./Feb., Mar./Apr., May/June, July/Aug., Sep./Oct., Nov./Dec.) by Improbable Research, Inc., 44-C Sacramento St. P.O. Box 380853, Cambridge, MA 02238 USA 617-491-4437 FAX: 617-661-0927 <air@improbable.com>

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ISSN 1079-5146
Volume 11, Number 4
July/August 2005

Annals of Improbable Research

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