

ly being subpoenaed, I doubt that most reviewers would take that possibility into consideration when writing reviews.

STEVE BECKER

Bucknell University

Lewisburg, Pennsylvania

3/90

The article "In Defense of Confidentiality" overlooked one most important aspect of the case in question—whether or not the referees had any association with a competing company. In my opinion it is less important to keep referees confidential than it is to keep research confidential. However, I do see that undue influence could be applied if referees were known during reviews. Lack of confidentiality might discourage some referees from continuing in that capacity.

It is essential that scientists and their companies have the knowledge that up-to-date research and ideas are protected from procurement prior to and during the publication process. If this cannot be guaranteed, one thing is certain: Companies will not allow research to be published until all the legal and commercial strangleholds are applied. This will stifle the dissemination of current information and effectively put a brake on rapid evolution of ideas.

RICHARD J. E. PARROTT

BHP Petroleum Pty Ltd

Melbourne, Australia

12/89

New Device Lets You Un-Water Your Lawn!

Mark Kuzyk (November 1989, page 129), motivated by John Wheeler's account of the "busted bottle" (February 1989, page 24), performed an interesting experiment to settle the Feynman inverse sprinkler problem. However, we must disagree with his conclusion that the sprinkler moves when water is forced out (the normal mode), but not when water is drawn in (the inverse mode). We suggest that the margaritas Kuzyk and his colleagues had drunk may have impaired their judgment.

Kuzyk and his colleagues were apparently unaware of a body of literature published in the *American Journal of Physics*² that culminated in our paper³ of July 1989. In our paper, we describe an experiment designed to resolve the inverse sprinkler problem and conclude that when the sprinkler is operated in the inverse mode, the sprinkler head rotates in a direction opposite to that of the normal sprinkler, with an angu-

lar momentum equal and opposite to that of the water. Only when the magnitude of the water velocity in the sprinkler nozzle is changing is there a net torque on the sprinkler head. In steady state, the sprinkler head moves at whatever angular frequency it acquired prior to attaining steady state.

We see no contradiction between Feynman's and Wheeler's accounts of the "busted bottle." Clearly Feynman's account indicates that the flexible tubing used to simulate the sprinkler head did move. Wheeler is more specific. He states that the tubing only twisted when the pressure was increased, that is, when the magnitude of the water velocity in the tubing was increasing, generating a net torque on the tubing.

In our experiment, the sprinkler head was mechanically isolated, in contact only with the water bath. This resulted in a very low external torque and allowed us to verify that angular momentum is conserved. We suggest that Kuzyk's experiment was subject to sufficient friction to render it insensitive to the inverse sprinkler effect.

References

1. R. P. Feynman, 'Surely You're Joking, Mr. Feynman,' Norton, New York (1985), pp. 63-65.
2. H. S. Belson, Am. J. Phys. **24**, 413 (1956). A. T. Forrester, Am. J. Phys. **54**, 798 (1986); **55**, 488 (1987). A. K. Schultz, Am. J. Phys. **55**, 488 (1987). L. Hsu, Am. J. Phys. **56**, 307 (1988).
3. R. E. Berg, M. R. Collier, Am. J. Phys. **57**, 654 (1989).

RICHARD E. BERG

MICHAEL R. COLLIER

University of Maryland

College Park, Maryland

11/89

Greenhouse Effect's Glacial Pace

There is some irony in the juxtaposition of Philip W. Anderson's Reference Frame column on research strategy for theorists (February, page 9) and the news story "Climate Modelers Struggle to Understand Global Warming" in the same issue (page 17).

Anderson quotes Francis Crick on the problems of theoretical work: "The principal error... is that of imagining that a theory is really a good model for... nature rather than being merely a demonstration (of possibilities)—a 'don't worry' theory.... It is difficult to believe that one's cherished theory, which really works rather nicely, may be completely false." The news article, when

OPTICAL RAY TRACERS

for IBM PC, XT, AT,
& PS/2 computers

BEAM TWO \$89

- for students & educators
- traces coaxial systems
- lenses, mirrors, irises
- exact 3-D monochromatic trace
- 2-D on-screen layouts
- diagnostic ray plots
- least squares optimizer
- Monte Carlo ray generator

BEAM THREE \$289

- for advanced applications
- BEAM TWO functions, plus:
- 3-D optics placement
- tilts and decenters
- cylinders and torics
- polynomial surfaces
- 3-D layout views
- glass tables

BEAM FOUR \$889

- for professional applications
- BEAM THREE functions, plus
- full CAD support: DXF, HPG, PCX, and PS files
- twelve graphics drivers
- PSF, LSF, and MTF
- wavefront display too
- powerful scrolling editor

EVERY PACKAGE INCLUDES
8087 & NON8087 VERSIONS,
MANUAL, AND SAMPLE FILES

WRITE, PHONE, OR FAX US
FOR FURTHER INFORMATION



STELLAR SOFTWARE

P.O. BOX 10183
BERKELEY, CA 94709
PHONE (415) 845-8405
FAX (415) 845-2139

Circle number 12 on Reader Service Card

TEMPERATURE'S RISING.

AIR CONDITIONER'S BROKEN.

THEY'RE DRILLING NEXT DOOR.

TIME'S RUNNING OUT.

Not to worry. Your experiment's safe. Because you're using the BeamLok™ 2040E, the first high-power ion laser with built-in autopilot.

BeamLok does exactly what it says. It locks your beam on target. Instantly. There's no wander during warmup. And no drift later. Under any conditions. For as long as the laser's on.

Which means, of course, your experiments become a lot more predictable. And tweaking, just a memory.

See how a single button can simplify your life. Contact your Spectra-Physics representative. Call 1 (800) 227-8054 in the U.S.A., or any of our sales and service centers worldwide.

BeamLok™
2040E
High-Power Ion Laser

 Spectra-Physics

ION TUNABLE CW He-Ne ULTRASHORT PULSE HIGH-ENERGY PULSE OEM

All things considered in lasers.™

YOU'RE BEAMLOCKED.

Australia: (03) 7236600 Belgium: (03) 541-7515 Canada: (416) 671-4180 England: (0442) 232322 France: 01 69 07 99 56 Germany: (06151) 7080 Hong Kong: 5-264183 Italy: (02) 953-00600 Japan: (03) 462-4531 The Netherlands: (040) 45 18 55 Switzerland: (061) 63 84 00 U.S.A.: (415) 961-2550

Circle number 13 on Reader Service Card

considered in the light of the findings of glaciologists, demonstrates the truth of this statement.

The greenhouse effect, attributed to mankind's flooding of the atmosphere with carbon dioxide, chlorofluorocarbons, methane and so on, is supposed to bring about a large rise in the temperature of the atmosphere, which will cause the melting of icebergs and the polar ice caps and the retreat of mountain glaciers. In less than 100 years this great volume of added water will supposedly raise sea level by anywhere from 0.5 to 2 meters above its present level and flood large areas of lowlands, like Louisiana or Bangladesh. As empirical proof, the proponents of this theory cite a possible increase in air temperature of 0.4 °C, based on temperature measurements going back as much as 100 years, and an observed increase in atmospheric carbon dioxide of about 25% during the same period. All well and good.

Based on this information and the results of computer models we are supposed to spend billions of dollars to reduce the use of fossil fuels, reduce irrigation (water vapor is a greenhouse gas), drive smaller, more dangerous cars, reduce air conditioning, reduce the use of power, stop eating meat (cows produce megatonnes of methane) and embark on a war against termites (termites also produce megatonnes of methane), to name just a few of the expensive steps proposed to reduce the sea level rise.

But when the glaciologists look at their data, here are the findings: Fred B. Woods of the Office of Technology Assessment published a paper¹ stating that the proportion of glaciers that are advancing increased from about 5.7% in 1960 to more than 57% in 1980, hardly a sign that things are getting warmer. *Science* had a paper² on the growth of the Greenland ice sheet as determined from satellite measurements of surface elevations at more than 5900 points on the Greenland ice cap between 1978 and 1985: The elevation of the ice increased by approximately 0.2 meters a year. Charles R. Bentley of the University of Wisconsin, Madison, who has been studying the Antarctic ice pack over the past 30 years, has reported that as far as he can determine, the accumulation of snow there is outpacing the rate at which ice is melting or is discharged into the ocean.³ He thinks, based purely on this, that the sea level should be falling at about 0.4 mm a year.

So actual field data do not support the global warming theory, which is predicated on primitive and un-

fied computer models. While verifiable models are being developed, we can devote our funds to something useful, like filling potholes, repairing highway bridges or improving education. There is nothing like taking a little time before placing all of our bets on a theory that, more than likely, is so inadequate as to be completely wrong when applied to the real world.

References

1. F. B. Woods, in *Arctic and Alpine Research* in 1988, U. Colorado, Boulder (1989), p. 404.
2. H. J. Zwally, A. C. Brenner, J. A. Major, R. A. Bindshadler, J. G. Marsh, *Science* **246**, 1587 (1989).
3. C. R. Bentley, *Trans. Am. Geophys. Union* **70**, 1002 (1989).

RAPHAEL G. KAZMANN
Baton Rouge, Louisiana

2/90

Was Stan Ulam Lost in 'The Lost Café'?

Peter Lax reviewed in *PHYSICS TODAY* (June 1989, page 69) *From Cardinals to Chaos*, the republication of the memorial issue of *Los Alamos Science* dedicated to Stanislaw Ulam. The book is a magnificent homage to a unique and very complex person; however, the interesting opening essay by Gian-Carlo Rota, "The Lost Café," strikes me as written about somebody else and not the Stan that I had known since our Harvard days half a century ago.

I visited the Ulams when they lived in Wisconsin. I do not remember any impression of Stan "tortured" and at "the end of the world" in a "nonexistent" ambience, as Rota describes. I remember that there were financial problems connected in part with Stan's brother Adam's education, but also that Stan enjoyed immensely the company of the French physicist Leon Brillouin, whom the fortunes of war had also brought to Madison.

Another discrepancy has to do with Stan's condition before and after his operation for encephalitis. Rota states that after the operation Stan had difficulty with a quadratic equation—that is, with high school mathematics. Being a chemist, I never had much occasion to discuss mathematics with him. I remember, however, that the last time I saw him, a couple of years before his death, he bragged of still being able to recite the alphabetical roll call of his high school class. Well, memory may be that selective, but I doubt it.

continued on page 93

SET IT & FORGET IT



- Forget about oscilloscopes and screwdrivers with our new Automatic Fine Tuning (AFT) Amplifier.
- Triangular shaping improves signal to noise ratio and Ballistic Deficit Sensitivity.

Circle number 14 on Reader Service Card



CANBERRA
NUCLEAR PRODUCTS
GROUP



Canberra

One State St., Meriden, CT 06450
(203) 238-2351