

Your subtitle's assertion that "the global climate breathes easier" may be true where sooty smoke is concerned; but the climate system has in fact been further destabilized by the fires. Our national energy policy must now more than ever reflect a serious commitment to eliminate fossil fuels.

Nathaniel Mead  
Blounts Creek, N.C.

Many experts do estimate that CO<sub>2</sub> from the oil fires will represent about 1 percent of global CO<sub>2</sub> emissions and that this will hinder current efforts to curb such emissions. However, since the fires are a transient phenomenon, most researchers do not expect them to exacerbate greenhouse warming or exert any long-term effect on global CO<sub>2</sub> levels.

— J. Travis

**Chuckle and chide**

Surely the computer scientists realize that there is more to checkers than just winning the game ("The Checkers Challenge," SN: 7/20/91, p.40).

When Chinook, Checkers Experimental, Colossus or the Robot wins, does it *chuckle*?

F.C. Rozear Jr.  
Marietta, Ga.

No way! Can't be done! A checker game played by the rules of international checkers cannot produce the board positions shown in your cover photo.

Malcolm Orchard  
Aurora, Colo.



You're right. The University of Rochester sent us a selection of photos and inadvertently included a test photo shot without a real game in progress. Unfortunately, that's the one we happened to choose.

— I. Peterson

**Intuitive ups and downs**

In the Aug. 22 NATURE, Paul Horowitz and I presented a mechanical network of strings and springs where cutting a supporting string would cause a weight to rise, not to drop. This was counterintuitive to us and to others we asked. We emphasized, and Ivars Peterson was careful to point out in his article, that this rise occurs only "for certain combinations of springs, string lengths and weights" ("Strings and springs net mechanical surprise," SN: 8/24/91, p.118).

To Fredric Blum (Letters, SN: 9/21/91, p.179), "the effect on weight height is... not surprising in the least" because cutting the supporting string obviously changes the arrangement of springs from series to parallel. The trouble with this engineering intuition is that it appears to imply that cutting the supporting string should *always* cause the weight to rise. In fact, the combinations of weight and string lengths and spring constants for which the weight rises are fairly special. Intuition (at least ours) is too weak to distinguish the usual circumstances when the weight will drop from the unusual circumstances when the weight will rise. Only a detailed calculation will do. This may be why the phenomenon we described apparently had not been noticed before.

There is a story that when trolley cars in Munich were cooled by two small ceiling fans, a student asked the great physicist Arnold

Sommerfeld why these fans nearly always rotated in opposite directions. "That is very easy to explain," said Sommerfeld, who went on to give an explanation of why the fans should rotate in the same direction. The student protested, "But the opposite is true: The fans rotate in different directions!" "Ah," replied Sommerfeld, "that's even easier to explain."

Joel E. Cohen  
Rockefeller University  
New York, N.Y.

The "strings and springs" surprise seems to support a proposition derived decades ago from an analysis of a study comparing diversity in book topics in the United States and Switzerland. The study turned up many more titles published in the United States but much more diversity in the Swiss titles.

The proposed rule, which I've never encountered since, holds that the more energy flowing through a closed system, the less diversity that system will contain.

Mary Carter  
Eureka, Calif.

The paradoxical behavior of "strings and springs" reminded me of an observation I once made in the field of administrative science.

My paradox said, briefly, that in a complex organization, the creation of an additional subunit (to deal with work that currently does not get done on time) may, contrary to expectations, cause more rather than less delay in the reaching of targets.

This, of course, runs counter to the desires of any true Organization Man, whose prestige rises in proportion to the troops he commands.

Walter H. Oettinger  
South Royalton, Vermont

**Vexing vaccine**

It is highly questionable whether adverse reactions to rubella vaccine are extremely rare, as pediatrician Mary L. Coady asserts ("Misfiring magic bullets," SN: 7/20/91, p.45). Pediatricians may be aware only of the arthritis caused by the vaccine, but if they had time to read the literature outside their own specialty, they would learn that live rubella virus, which is contained in the vaccine, can cause a wide variety of problems, including neurologic damage, heart disease, thyroid disease and even diabetes. Probably the most common adverse reaction is fibrositis or fibromyalgia (one of the diseases the CDC refers to as "chronic fatigue syndrome"). Since I first reported this in 1988, other researchers have independently confirmed that rubella vaccine can cause fibrositis.

Allen D. Allen  
Director of Research  
Biomedical Sciences Division  
Algorithms, Inc.  
Northridge, Calif.

**Wright and wrong**

While mathematician Robert McCullough praises the Wright brothers for laying the mathematical foundation of aeronautics as they developed the airplane, he neglects to mention a serious oversight in their early calculations ("Calculating the Wright stuff," SN: 7/20/91, p.47). Because of this oversight, their first flights on that cold, windy day in December 1903 were as much the result of remarkable luck as remarkable research. If the weather had been better for flying, they might not have flown.

The Wright brothers had not yet discovered density altitude, a phenomenon that makes aircraft less efficient in hot air. Wings develop less lift, and propellers less thrust, as the air temperature rises. The 1903 *Wright Flyer* was a "marginal" airplane that could *only* have flown on a cold day with a strong headwind — something the Wrights didn't understand when they flew it. Six months later, in the pleasant, balmy summer of 1904, they tried twice to fly for the press and failed. The public scoffed, and their claim to having flown was ignored.

It wasn't until 1908, when the Wrights demonstrated a much-improved *Flyer*, that they gained recognition for their accomplishments — both mathematical and aeronautical.

Nick Engler  
West Milton, Ohio

Wilbur and Orville Wright were not the first to "attempt flight in a heavier-than-air, powered and manned plane," as you state.

About 1857, French naval officer Felix Du Temple began his experiments with powered, heavier-than-air flight. In 1874 he was able to pilot his steam-driven monoplane in a short flight in which he traveled farther under power than he would have in a glide. Purists disqualify this piloted, powered flight from being a "first" because of the use of a downhill decline to assist in takeoff and the inability of the steam engine to provide enough horsepower, relative to its weight, to sustain the whole system in extended flight. However, it does qualify as an "attempt." Samuel P. Langley, Clement Ader and many others preceded the Wrights in such attempts, but Du Temple seems to be the only clearly recorded, albeit partial, success.

I can find little that the Wright brothers contributed to modern aviation except the engine/propeller gearing linkage and a lot of inspiration.

Robert Warner  
Etna, Calif.

**CORRECTION**

In the comparison of TPA concentrations in milk from two transgenic goats ("Milking engineered 'pharm animals,'" SN: 9/7/91, p.148), 3 milligrams per milliliter is 1,000 times the concentration of 3 micrograms per milliliter, not 10 times as stated.

**Statement of Ownership, Management and Circulation**  
(Required by 39 U.S.C. 3685)

1A. Title of Publication	1B. PUBLICATION NO.	2. Date of Filing
Science News	0 0 3 6 8 1 4 2 3	9/27/91
3. Frequency of Issue	4A. Issue Frequency	4B. Annual Subscription Price
Weekly	51	\$39.50
5. Complete Mailing Address of Known Office of Publication (Street, City, County, State and ZIP+4 Code) (Do not include P.O. Box)		
1719 N. Street, N.W., Washington, D.C. 20036-2888		
6. Complete Mailing Address of the Headquarters or General Business Office of the Publisher (Do not include P.O. Box)		
1719 N. Street, N.W., Washington, D.C. 20036-2888		
7. Full Names and Complete Mailing Addresses of Publisher, Editor, and Managing Editor (Do not include P.O. Box)		
Publisher: Alfred Scott McLaren Science News, 1719 N. Street, N.W., Washington, D.C. 20036-2888		
Editor: Rodney E. Young, Jr. Science News, 1719 N. Street, N.W., Washington, DC 20036-2888		
Managing Editor: Laurie Jackson Vaughan Science News, 1719 N. Street, N.W., Washington, D.C. 20036-2888		
8. Owner (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of all stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If the publication is published by a partnership or other unincorporated firm, its name and address as well as that of each individual must be given. If the publication is published by a sole proprietor, his name and address must be given.)		
Full Name: Complete Mailing Address: SCIENCE SERVICE, INC. 1719 N. STREET, N.W., WASHINGTON, D.C. 20036-2888		
9. Known Bondholders, Mortgagees, and Other Security Holders Owning or Holding 1 Percent or More of Total Amount of Bonds, Mortgages or Other Securities. (If none, check None)		
None		
10. For completion by nonprofit organizations authorized to mail at Special Rate (PSN 624-720): a) Purpose, function, and nonprofit status of this organization and the exempt status for Federal income tax purposes (Check one) <input checked="" type="checkbox"/> This is a nonprofit organization. <input type="checkbox"/> This is not a nonprofit organization. b) Name and address of the organization (Do not include P.O. Box) c) Full name and complete mailing address of the individual officer (Do not include P.O. Box) d) Title and complete mailing address of the individual officer (Do not include P.O. Box)		
11. Publication Title: Science News		
12. Issue Date for Circulation Data Below: 9/27/91		
13. Extent and Nature of Circulation Average No. Copies Each Issue During Preceding 12 Months		
A. Total No. Copies (Net Press Run)	246,812	227,144
B. Paid and/or Requested Circulation 1. Sales through dealers and other vendors and counter sales	0	0
2. Mail Subscriptions	243,387	223,725
C. Total Paid and/or Requested Circulation	243,387	223,725
D. Free Distribution by Mail: Carriage or Other Means	1,123	1,163
E. Free Distribution Outside of Mail: Carriage or Other Means	244,526	224,894
F. Copies Not Distributed (Office use, left-hand column; unpaid after printing)	2,293	2,250
G. Return from News Agents	0	0
H. Total (Sum of 11, 12 and 13—should equal net press run shown in 11)	246,812	227,144
14. I certify that the statements made by me above are correct and complete. Signature of Publisher: Donald R. Hatcher		

PS Form 3526, January 1985. Use instructions on reverse.