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Letters

Cold fusion, continued

"Cold ConFusion" (SN: 6/22/91, p.392) will go a long way toward helping the open-minded see where we stand in this field. However, it is too bad that residual skepticism requires that so much time and so many words be spent defending the field rather than getting on with understanding this extraordinary phenomenon.

An increasing number of scientists have now accepted cold fusion as real and are investigating it in a normal scientific manner. Their work will result in useful insights, in spite of the skeptics. But because of the skeptics, the advantages gained by this discovery will not be as readily available to the United States as they will be to Japan and India, for example. We will then have another example of an important discovery being made in the United States and developed elsewhere.

*Edmund Storms
Materials Scientist
Los Alamos National Laboratory
Los Alamos, N.M.*

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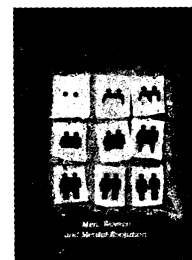
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Cover: In an increasing number of often-controversial studies, researchers are attempting to uncover mental rules of thumb that have evolved in the human species, such as patterns of jealousy and mate selection in men and women, widely shared ideals of facial beauty, and the built-in capacity for language. (Illustration: Randy Fletcher)



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My research into related phenomena suggests that one of the primary ingredients necessary to obtain the desired results in cold fusion experiments is a direct current pulsed at a very high frequency. As Thomas N. Claytor points out, current is more important than voltage.

I suspect that what is happening in studies such as those conducted by Liebert and Liaw is that the materials in the experiment tend to pulse the current by alternating between being very conductive and resistive. The pulsing current jolts the materials into a state of disequilibrium. As a result, orbiting electrons are stripped off atoms and release a large amount of energy.

If this is true, then the unpredictability of the results stems from the extreme difficulty of creating the right conditions for obtaining a stable, pulsed current at high frequencies by relying on the properties of the materials being used in the experiment.

The results should be much more predictable if a very high-frequency pulsed DC input current were used. It may be necessary to vary

the frequency somewhat from test to test because of variations in test materials used.

*Al Leedahl
Mechanical Engineer
Engineering Design Concepts
Benson, Minn.*

Fire in the greenhouse

John Travis' article on potential climatic impacts of the Kuwaiti oil fires ("A Legacy of War," SN: 7/13/91, p.24) apparently overlooked a key factor: carbon dioxide emissions. According to a report by the British Parliamentary Office of Science and Technology, assuming that 6 million barrels a day are burned in the first year and 3 million in the second, CO₂ emissions over Kuwait could reach 170 and 57 million tons over the same respective periods. These amounts, which correspond to about 3 percent and 1 percent, respectively, of global CO₂ emissions, will undermine — if not nullify — all efforts to curb greenhouse-induced climate change.

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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 CO₂ from the oil fires will represent about 1 percent of global CO₂ 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 CO₂ 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.

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