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## Letters

### Fertility linked to cycle length

Menstrual cycle length has a major impact on fertility, contrary to the report dismissing any impact of PCB-induced shorter menstrual cycles on fertility ("Fishy PCBs shorten menstrual cycle," SN: 12/20&27/97, p. 410). The difference between short cycles (26 days or less) and normal cycles (27 days or more) is most noticeable in in vitro embryo transfer programs. A study of 173 patients in the October 1988 FERTILITY AND STERILITY showed a significantly higher pregnancy rate (30.2 percent versus 9.4 percent) in women with longer cycles.

Women should decline to eat PCB-laden fish from Lake Ontario.

*Mattie Coxe  
Baton Rouge, La.*

### EMFs attract controversy

The article on the effects of electromagnetic fields ("EMFs' Biological Influences," SN: 1/10/98, p. 29) contains little news and less science.

Dismissing in one sentence the expert panel convened by the National Academy of Sciences, which pronounced after a 3-year study that "the current body of evidence does not show that exposure to these fields presents a human health hazard" and ignoring other studies with the same finding, such as that of the American Physical Society, the author cites at length EMF consultant Cindy Sage, whose claims include, on the basis of unspecified studies, an "up to sixfold increase in childhood leukemia" on exposure to 4- to 5-milligauss magnetic fields.

*Peter Palffy-Muhoray  
Kent, Ohio*

While the NAS report found no evidence that fields present a hazard to human health, it did conclude that EMFs can induce effects on biological systems. Nowhere in the SCIENCE NEWS story does it say that EMFs cause harm—the jury is still out. However, a host of studies have pointed statistically to the possibility of adverse effects, including several that have been reported in SCIENCE NEWS. The "up to sixfold increase"

*Sage mentions comes from data published in a report by Martha S. Linet et al. in the July 3, 1997 NEW ENGLAND JOURNAL OF MEDICINE. —J. Raloff*

**My husband and I** wonder why the fields given in the chart do not follow the inverse square law. If a person is twice as far away from a source of EMFs, we would expect the magnetic field to be one-fourth as strong. Instead, it seems to be one-tenth as strong, one-third as strong, one-seventh as strong, etc., depending upon the appliance.

Can you clarify this?

*Elaine Woodall  
Jermyn, Pa.*

According to the Environmental Protection Agency, EMFs don't always follow so predictable a rule. For large power lines, they may fall off proportionally to the distance, but for fields associated with home appliances, they may be tempered by factors such as the size and shape of the appliance and how the

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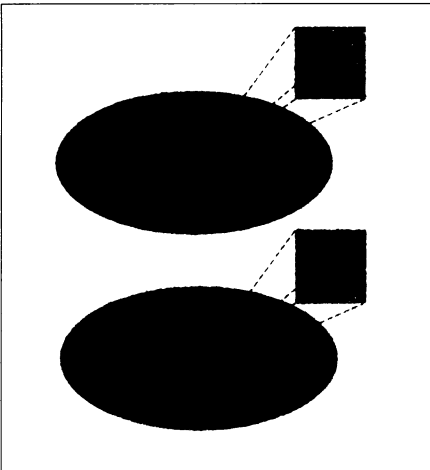
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**Cover:** Health experts have spent decades trying to curb the public's appetite for high-fat foods, alcohol, and sex. New research suggests a welcome change in direction. Recent findings indicate that moderate indulgence in certain no-nos may actually improve longevity. **Page 142**  
(Image: Super Stock)

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These simulations indicate temperature fluctuations in the cosmic microwave background in two models of a flat universe. Hot spots are shown in red, cold spots in blue. The map at left portrays a universe in which the density of matter equals the critical density, the amount required to keep it flat. The map at right shows a universe in which the density of matter is only 40 percent of the critical density; the rest is provided by a type of energy known as quintessence.

Thus, at some point, the density of energy may equal or even exceed the density of matter. This model could explain why

the energy density varies over time and why it becomes more important later. Spergel and Pen summarize their model in the Dec. 20, 1997 *ASTROPHYSICAL JOURNAL LETTERS*.

It's always possible that the universe isn't flat.

Some recent models of inflation actually predict a negatively curved cosmos. In these hypotheses, "the amount of expansion has to be rather carefully chosen, and it's hard to see how that would fall out naturally," Frieman says. If expansion proceeds unchecked, you still end up with a flat universe. "So purely from an aesthetic view, these models are less compelling."

In a few years, adds Spergel, scientists will have the instruments they need to deduce the universe's true geometry, whether curved or flat, as well as its topology, whether infinite or finite.

To test these ideas, researchers have been examining the cosmic microwave background—that is, the radiation left over from the Big Bang. This effort will get a major boost in 2000, when NASA's MAP (Microwave Anisotropy Experiment) satellite is expected to join the fray.

MAP will record the tiny temperature fluctuations in this whisper of radiation over patches of sky about  $1^\circ$  across. In patches this small, differences between

the various models of the cosmos should be apparent. The European Space Agency's Planck satellite, scheduled for launch in about 2005, will scan the microwave background on even finer scales.

In a negatively curved universe, notes Marc Kamionkowski of Columbia University, pronounced temperature fluctuations in the microwave background should occur across smaller patches of sky than in a flat universe.

Models like quintessence, which adds a cosmic energy density that varies both in time and across space, would leave their own imprint on the cosmic microwave background. For example, spatial variations in the energy density would tend to enhance fluctuations already present in the microwave background. As a result, hot and cold spots in the microwave background would most likely be larger.

Temperature fluctuations in the microwave background might also show whether the universe has a simple or complex topology (SN: 2/21/98, p. 123). "What's great is that all this stuff is testable in the next few years," Spergel says.

Although he finds the mathematical richness of a negatively curved universe particularly intriguing, "I view this as not a matter I have much choice on," Spergel chuckles.

"I'm willing to accept whatever the universe turns out to be." □

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electric currents are distributed within it.

—J. Raloff

In glancing at the table of EMF values, I became curious as to what the author was doing between about 8:00 p.m. and 9:05 p.m. The readings during that span were quite low.

I ask this with some trepidation, for fear that the answer will be "watching TV" and that the cable industry will seize upon such an admission with an ad campaign asserting that "TV is good for you!"

Denny Miller  
Columbus, Ohio

According to my log, I was working at my home computer from 8:12 p.m. until 8:59 p.m. I didn't settle down for a little television until 9.

—J. Raloff

It is curious that the ubiquitous electric shaver, which is held at zero distance from the skin, is omitted from the table.

Isadore Nicholson  
San Diego, Calif.

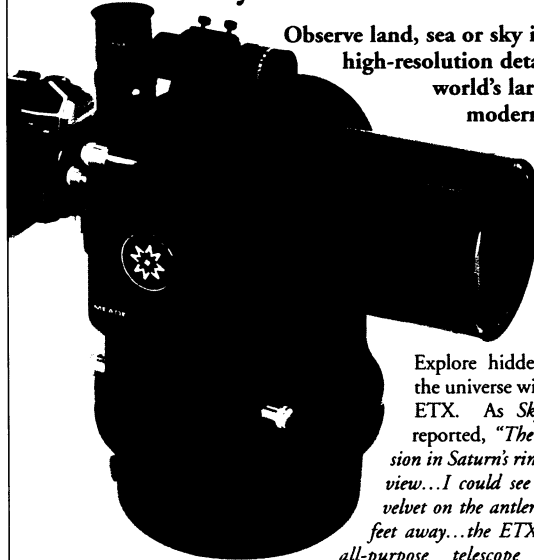
Electric shavers ranged from 4 to 600 milligauss at 6 inches.

—J. Raloff

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