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**SCIENCE & TECHNOLOGY**


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**Biological Crock**

"Age and Infertility" by Jane Menken, James Trussell, and Ulla Larsen, in *Science* (Sept. 26, 1986), 1333 H St. N.W., Washington, D.C. 20005.

Is infertility among women on the rise?

To judge by the number of physicians specializing in fertility problems, and the media's attention to the matter, inability to bear children is a spreading phenomenon, particularly for career women who delay starting a family until their 30s. Indeed, a widely noted 1982 French study showed alarming proportions of women unable to conceive by the end of 12 "insemination cycles," or one year—26 percent of those below age 30, 35 percent in the 30–34 age group, and 44 percent of those between ages 35 and 39. The message: Increasingly, women who wait risk waiting forever.

Nonsense, say Menken and Trussell, professors of sociology and economics at Princeton, and Larsen, a researcher at Sweden's Lunds University. Among other flaws in the French study, they note, was its one-year standard. That is too short: Research has shown that the mean time required for conception is about eight months, and that at least 14 percent of women who become pregnant take more than a year to do so.

While ability to bear children *does* decline with advancing age, the rate of decline has remained roughly stable since 1965. The chance of a woman not being able to bear a child rises from about five percent for those aged 20 to 24 to 16 percent at most for those aged 30 to 35. In later years, the proportion of women who cannot conceive does rise sharply—to 30 percent by age 40, and 60 percent by age 44.

Why has fear of infertility risen? The authors think that the effectiveness of fertility *control*—which in 20 years has lowered the rate of unwanted births in the United States from above 20 percent to below seven percent—has led people to believe, mistakenly, that "controlling fertility was the real problem" and that "having children is easy."

For women of childbearing age who suspect infertility, the authors prescribe patience and persistence. One study has shown that 41 percent of such women who obtained professional treatment subsequently became pregnant. But so did 35 percent of the women who did not.

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**A Safe Dose?**

"The Microwave Problem" by Kenneth R. Foster and Arther W. Guy, in *Scientific American* (Sept. 1986), 415 Madison Ave., New York, N.Y. 10017.

Microwaves are everywhere. Occupying a band of the electromagnetic spectrum between radio signals and visible light, they emanate from such common sources as air traffic control systems, police and military radar, earth-to-satellite television broadcasting equipment, telephone lines, medical devices—and, of course, microwave ovens.

At high levels of intensity, the kind one endures while standing near a

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big TV transmitter, microwaves are clearly dangerous; they cause animal (including human) tissues to overheat and, in some cases, to develop tumors. But what about low-level exposure, such as the microwave bathing someone gets when he walks under overhead power lines, or cooks with a microwave oven? After 6,000 studies over 40 years, such exposure has not been *proved* to be risk-free. But while a few studies have found links to changes in the brain, blood, heart, and immune system, as well as to chromosome damage and cancer, most researchers have found no danger, observe Foster and Guy, biophysicists at the Universities of Pennsylvania and Washington.

Although physicians have used microwaves for heat therapy (i.e. diathermy) to loosen up stiff backs and to ease the pain of arthritis since the 1950s, they largely ignored the possible side effects. Then the U.S. military (particularly the Navy) began testing the biological effects of radar, invented during World War II. In 1953, a University of Pennsylvania researcher proposed a limit on human microwave exposure—a level one-tenth as intense as that of bright sunlight, or 100 watts per square meter of flesh; it was not until 1966 that Washington recognized this standard, on the recommendation of the American National Standards Institute (ANSI), a private advisory organization.

By 1982, better methods of measuring energy absorbed by the body prompted ANSI to set more precise limits for exposure to high-intensity sources such as large antennae and military radars. Determined by calculations involving such factors as the position of people relative to the microwave source, the new limits are intended to ensure an energy dose that heats the body more slowly than does moderate exercise.

Still, doubts about such "safe" limits persist. Some recent U.S. experiments have produced disturbing results. One study has suggested that the "microwave auditory effect" (the "clicks" that people sometimes hear when exposed to microwave pulses) is due to vibrations within the brain. Another investigation has raised the possibility that microwaves cause tumors in rats.

So far, however, neither recent federally funded research (\$10 million per annum) nor a review of the basic studies has convinced the authors that low-level microwave radiation will hurt anyone.

### *Zoning Out Ozone*

"The Ozone Deadline" by Rochelle L. Stanfield, in *National Journal* (Sept. 13, 1986), 1730 M St. N.W., Washington, D.C. 20036.

It is just a colorless, odorless gas, and a natural one too. And in its proper place, the upper stratosphere, it is beneficial: Ozone shields the Earth's inhabitants from the sun's ultraviolet rays.

Environmentalists have long worried that the ozone layer aloft is being thinned out by certain gases used in aerosols drifting up from the ground. Now, observes Stanfield, a *National Journal* reporter, specialists at the U.S. Environmental Protection Agency (EPA) are concerned about *too much* ozone at the Earth's surface.

Ozone forms in the surface air when hydrocarbons (e.g., gasoline vapors and paint fumes) combine with nitrogen oxide spewed out of smoke-