

implant, and Chinese studies have found it may cause reductions in serum potassium. If a good Gossypol pill does not materialize, said Segal, "the outlook is bleak."

Speakers reiterated that the best way to reduce the number of abortions is through contraception. Jacqueline Forrest of the Guttmacher Institute said that according to a U.S. study, 67% of unwanted pregnancies occurred with nonusers of contraceptives. She said that if all the nonusers switched to a highly effective contraceptive, abortions would drop by 58%.

Eliminating unwanted pregnancies does not solve the larger problem of motivation, particularly in sub-Saharan Africa. For example, Esther Boohene of the Zimbabwe National Family Planning Council said family planning services now cover 85% of Zimbabwe. But women are still averaging seven births apiece and, because of advances in curbing infant mortality, there has been no decline in fertility. Birth control pills are in great demand, but women use them for spacing children rather than having fewer of them. Condom use is limited, as it is throughout Africa.

Speakers said cultural values and attitudes are critical in determining contraceptive acceptance, and misinformation and myths can easily sabotage a program. In Bangladesh, for instance, there has been resistance to vasectomy because men believe it will prevent hard work, disqualify them from an Islamic burial, and impair potency.

In Kenya, said Susan Philliber of the State University of New York (New Paltz), over 50% of women believe both oral contraceptives and sterilization to be harmful. Other fears relate to religious taboos, as in Tunisia where irregular bleeding may interfere with fasting and praying.

Philliber related that in many countries women do not like to touch their own genitals, which rules out vaginal inserts. Skin implants are well accepted in cultures where scarification is common, and monthly injections (which have been available for years) are appropriate in areas where immunization is associated with good health.

Worldwide, education seems to be the most important variable in predicting family size. The more educated a woman is, the fewer children she will have.

Despite the advances in contraceptive technology, then, the overall picture is not bright. The potential demand for services promises to become overwhelming in the coming years. Malcom Potts of Family Health International said half the world population is now below marriage age. "I predict there will be more abortions in the next 10 years than any decade in human history."

■ CONSTANCE HOLDEN

Let 100 Million Trees Bloom

With the hot summer of 1988 still smoldering in memory, researchers, legislators, and conservationists increasingly are turning to reforestation as a potential answer to offsetting the greenhouse effect (*Science*, 7 October, p. 19).

Last week, the American Forestry Association unveiled an effort called Global ReLeaf to encourage the American public to plant 100 million new trees over the next 4 years. The association launched the program by planting a willow oak tree on Pennsylvania Avenue near the White House, one of 12,000 empty spaces in the nation's capital that the association says could use a tree. Officials of the U.S. Forest Service and the Department of Agriculture were on hand to endorse the program.

An additional 100 million trees would remove about 18 million tons of carbon dioxide from the atmosphere each year, association executive vice president R. Neil Sampson said. Those planted in urban areas would also help shade residences, leading to a savings in air conditioning costs of \$4 billion a year, he said.

Since an estimated 6 billion tons of carbon dioxide from fossil fuels enters the atmosphere each year, Global ReLeaf is only a modest beginning.

"We won't . . . halt the current trend of global warming in its tracks by planting trees," Sampson said. "But we'll change our own lives, and the quality of our communities, for the better. And we will take a small

step toward curing a worldwide environmental problem."

Norton D. Strommen, chief meteorologist for the Agriculture Department's World Agricultural Outlook Board agrees that Global ReLeaf "won't make a big dent. It's only a start, but if you never start, you never reach your goal." Strommen recommends planting long-lived trees such as oaks to tie up the carbon that much longer.

Global ReLeaf also hopes to mobilize public opinion behind legislation such as the National Energy Policy Act, introduced by Senator Timothy E. Wirth (D-CO), and the Global Warming Prevention Act of 1988, introduced by Representative Claudine Schneider (R-RI). The Wirth bill calls for the federal government to monitor existing tropical forests and develop country-by-country reforestation plans. The Agency for International Development would have new money to aid tropical countries in reforestation efforts. Countries that do not develop an acceptable plan for conserving forests would find the U.S. officers of international development banks, such as World Bank, opposing their loan applications.

Schneider's bill echoes much of Wirth's, and mandates a study of existing forest use in the United States. It also calls for study of the value of increased urban tree planting to reduce air conditioning needs in buildings and cool off urban heat islands, which are 3° to 5°C hotter than surrounding areas.

■ GREGORY BYRNE

NSF Pauses to Assess Engineering Centers

The National Science Foundation has asked for an outside evaluation of its engineering research centers before deciding on the future of the program. NSF director Erich Bloch says he has asked National Academy of Engineering president Robert M. White, in effect, to reconvene the NAE panel that helped NSF shape the program to undertake a comprehensive review of the centers.

Bloch said at a National Science Board meeting on 14 October that NSF has established 18 of the centers over the last 4 years and "It is time to draw back a little" and take a careful look at the program. He noted that the foundation was getting toward the end of the program "as envisioned in the beginning." The NAE panel suggested that NSF establish 25 of the centers in a first round. Bloch says the question the foundation hopes that the panel will help answer is "What should the strategy be after we reach

25 [centers]."

The engineering research centers have been the subject of continued controversy mainly because they were perceived as potentially diverting resources from NSF's traditional support of research by individual investigators. The centers were established to encourage interdisciplinary research and are based on partnerships involving universities, industry, and state and local government.

Bloch said the NAE panel will have broad latitude in conducting its review, but will be asked to evaluate how well the program has fulfilled the purposes laid down for it, and in particular how well it has served the universities, industry, engineering education, and the engineering profession generally. The group has been asked to complete its work and make its recommendations by late spring.

■ JOHN WALSH