cally. From concern about "the population bomb" in the late 1960s and the environmental movement of the early 1970s, arguments by revisionist writers began to appear saying that population was coming under control and was no longer a matter of serious concern.

Nevertheless, the Population Reference Bureau reported that world population in 1980 was 4.414 billion. The equation had predicted 3.969 billion. Hence, 20 years after the equation was proposed and after many years of family planning efforts, the equation had proven to be drastically conservative. We were then 445 million people ahead of schedule!

Just how far ahead of schedule we were can be seen by looking at what would have happened if a nuclear war had occurred between the United States and the Soviet Union in 1980 and had destroyed seven-eighths of the populations of both countries. Such an event would have removed about 425 million people from the world population. Thus a nuclear war would merely have served to put us back on schedule.

In the past 7 years the press has reported the success of family planning efforts in China and elsewhere. But given that in 1980 world population was ahead of the historical trend by almost twice the population of the United States, how much progress have we made? The Population Reference Bureau now estimates that world population in mid-1987 was 5.026 billion. However, the Worldwatch Institute says that world population passed 5 billion in July 1986. The equation predicts a population of 5 billion in 1989. As we head into the equation's fourth of six and one-half decades, we are comfortably ahead of schedule.

The current discussion of world population growth lacks a firm foundation. Optimists say that the rate of population growth is diminishing. Pessimists say that more action is urgently needed. The layman or policy-maker is left wondering whom to believe. The doomsday equation has so far provided a useful benchmark for judging what progress we have been making in controlling population growth. It seems that we have not been doing as well as we thought.

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Math Anxiety

Constance Holden (News & Comment, 8 May, p. 660) and Sanford L. Segal (Letters, 24 July, p. 350) assert, respectively, that female math anxiety is on the wane and that female math anxiety may have been a fiction all along. Since I was among those who originally formulated the problem of female math avoidance as having to do with anxiety (*1*), your readers may be interested in my reflections on the subject.

My staff and I did not tell the students we attracted to the Wesleyan Math Anxiety Clinic, which I codirected in the mid-1970s, that they had "math anxiety." Rather they told us, and not by means of any paper and pencil tests. (We did not use the much quoted Mathematical Anxiety Rating Scale questionnaire. We found it neither useful among our very sophisticated math avoiders nor predictive of their particular problems.) Instead, our counselors and math instructors conducted intake interviews (we called them "math autobiographies") among hundreds (and elsewhere thousands) of students, walking them back through their earliest to their most recent recollections of sweaty palms, stomach upset, and panic.

We did not claim that math anxiety was peculiar to females but found, rather, that while some males admitted fear of math, fear was more debilitating to females. One study (*2*) quoted in my book found a correlation between women students' final grades in an introductory college-level math course (at Ohio State University) and their levels of anxiety; but no such correlation existed for young men. Boys who measured high in math anxiety scored across the board on finals.

The existence of math anxiety among females was supported by the response of current and former students to this new explanation of their difficulties. Operationally, the concept was productive in that it gave counselors and math instructors some new techniques to employ in helping previously unsuccessful math students succeed (*3*).

In the environment at the time, lay people and math instructors alike believed that students had to have a special talent—one not generally distributed over the population and one that was particularly underrepresented in females—to do even elementary college-level math. My interviews of mathematics instructors in the period from 1974 to 1978 revealed that they thought our math avoiders to be quite simply "dumb in math" or lazy; in any case not worthy either of research or of special recruitment. Better, I thought at the time, to believe ourselves "anxious," even "traumatized," than "dumb." At least we can do something about the emotional static that intrudes on concentration. We can do nothing about our brains.

As long as the college math community was letting math avoiders slip through, someone had to help. Reformulating the problem as one of anxiety rather than incompetence was the first—and indeed a most constructive—step.

As a feminist who really believes that once all barriers are removed women will show themselves to be equal to men in all mental endeavors, I would be the first to welcome any evidence that female math anxiety is on the wane, so long as it is not replaced, yet again, with circumstantial evidence—the kind served up year after year by some researchers—of female inferiority.

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Feline Navigation

No wonder "El Blanco" Glassauer (cover, 14 Aug.) is no longer with us. Any object with red on the starboard and green on the port side is bound to run into something as it moves around at night! It is an "eye-catching" cover.

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Erratum: In the Research News article "New family of growth factor genes identified" by Jean L. Marx (7 Aug., p. 602), the researcher Mitchell Goldfarb of Columbia University College of Physicians and Surgeons was incorrectly given the first name Martin.

Erratum: In figure 1 (p. 528) of the Report "Identification of a family of muscarinic acetylcholine receptor genes" by T. I. Bonner *et al.* (31 July, p. 527), the entire deduced amino acid sequence of the human M2 receptor and the sequences corresponding to the third cytoplasmic loops of all the receptors were omitted. A correction appears on page 1628.