having declared that any restriction on energy use that inhibits economic growth "should be viewed with caution."

Three things seem clear to me. First, growth of energy consumption cannot continue indefinitely.[1] Second, by further increasing the annual emission of greenhouse gases, we are continuing a global experiment whose outcome is unknown.

Third, if our activities do bring about changes in the global climate, (a) we don't know if the changes will be reversible, and if they prove to be, we don't know on what time scale; (b) the costs of those changes most likely will not fall on us, but on our children and grandchildren.

Two paths are possible: Either we continue to increase the annual production of greenhouse gases or we reduce their production. With so much at stake, wisdom suggests that we be conservative and choose the path that leaves us in the less precarious position in case we choose the wrong path.

The suggestion that a conservative path would "impact mainly on the world's poor" seems disingenuous for two reasons. One is that a number of recent reports have indicated that the present world path of economic growth is increasing the economic gap between the well-to-do and the poor, both in the US and worldwide. If that is true, the benefits of our present path are increasingly being denied to the world's poor. The other reason is that if continued population growth and economic growth do produce significant changes in the global climate, one can be quite certain that the impact of such changes will fall "mainly on the world's poor."

The most effective way to stabilize emissions of carbon dioxide is to stop population growth. The US has the highest population growth rate of any industrialized nation, and we have the world's highest per capita consumption of resources, especially fossil fuels. Thus, one can make the case that the world's worst population problem is right here in the US. We have the responsibility—and fortunately also the jurisdiction and resources—that allow us to deal with our population problem.[2]

Accordingly, I propose that we pursue two immediate goals. First, we should stabilize US emissions of carbon dioxide by using improved energy efficiency to achieve at least a 1% annual reduction of the US per capita consumption of fossil fuels, to match the annual 1% increase in US population. Second, we should initiate a national dialogue on the population problem in the US, with the aim of establishing a consensus population policy for the US that would be an example for the rest of the world.

The first goal should not be so difficult to accomplish. As reported earlier this year, a group called Redefining Progress "scored a major coup in February when it released a statement signed by more than 2,000 economists, including six Nobel laureates, acknowledging climate change as a 'significant environmental, economic, social, and geopolitical' challenge and urging action in the form of market-based policies. Such an approach, according to the statement, would 'slow climate change without harming American living standards, and . . . may in fact improve U.S. productivity in the long run.' "[3]

References

1. A. A. Bartlett, Am. J. Phys. **46**, 876 (1978).
2. A. A. Bartlett, Wild Earth (fall 1997).
3. Rocky Mountain Institute Newsletter, **13** (2), 6 (1997).

ALBERT A. BARTLETT
(bartleta@stripe.colorado.edu)
University of Colorado
Boulder, Colorado

Borosilicate Glass Is an Option for Plutonium Disposal

Richard Garwin has brought to my attention a potentially misleading phrase in my PHYSICS TODAY article entitled "Nuclear Waste Disposal: The Technical Challenges" (June, page 32), in which I wrote, "Plutonium does not bind strongly to the matrix of borosilicate glasses, and thus can be loaded only in trace amounts to prevent the possibility of criticality or recovery for illicit uses."

Garwin correctly points out that borosilicate glass can accommodate several percent of plutonium by weight, which is more than a trace amount, and that one of two options for plutonium disposal recommended in a 1995 National Research Council report (*Management and Disposition of Excess Weapons Plutonium: Reactor-Related Options*) is vitrification in borosilicate glass in combination with high-level radioactive waste. My statement was based on ongoing research—sponsored by the Department of Energy—on alternative glass and ceramic waste forms that would permit much higher loadings (up to about 10% Pu by weight) than is currently thought possible for conventional borosilicate glasses.

KEVIN CROWLEY
(kcrowley@nas.edu)
National Research Council
Washington, DC ■

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION

(Act of 12 August 1970; Section 3685, Title 39, USC)

1. *Title of publication:* PHYSICS TODAY
2. *Publication no.:* 0031-9228
3. *Date of Filing:* 1 October 1997
4. *Frequency of issue:* Monthly
5. *No. of issues published annually:* 12
6. *Annual subscription price:* $165.00
7. *Location of known office of publication:* 500 Sunnyside Blvd., Woodbury, NY 11797-2999
8. *Location of the headquarters or general business offices of the publisher:* One Physics Ellipse, College Park, MD 20740-3843
9. *Names and addresses of publisher, editor and managing editor:*
   Publisher: Charles Harris, American Institute of Physics, One Physics Ellipse, College Park, MD 20740-3843
   Editor: Stephen G. Benka, American Institute of Physics, One Physics Ellipse, College Park, MD 20740-3843
   Managing Editor: None
10. *Owner (if owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual, must be given. If the publication is published by a nonprofit organization, its name and address must be stated.):* American Institute of Physics, One Physics Ellipse, College Park, MD 20740-3483
11. *Known bondholders, mortgagees and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages or other securities:* Guardian Life Insurance Company of America (mortgagee), 201 Park Ave. South, New York, NY 10003
12. *The purpose, function and nonprofit status of this organization and the exempt status for Federal income tax purposes:* Has not changed during preceding 12 months
13. *Publication name:* PHYSICS TODAY
14. *Issue date for circulation data below:* June
15. *Extent and nature of circulation:*

	Average*	June**
A. *Total number of copies (net press run)*	125 058	132 144
B. *Paid and/or requested circulation*		
1. *Sales through dealers and carriers, street vendors and counter sales*	none	none
2. *Paid or requested mail subscriptions*	118 876	126 155
C. *Total paid and/or requested circulation (sum of B1 and B2)*	118 876	126 155
D. *Free distribution (samples, complimentary and other free)*	1 224	1 174
E. *Free distribution outside the mail (carriers or other means)*	none	none
F. *Total free distribution (sum of D and E)*	1 224	1 174
G. *Total distribution (sum of C and F)*	120 100	127 329
H. *Copies not distributed*		
1. *Office use, leftovers and spoiled*	4 958	4 815
2. *Returns from news agents*	none	none
I. *Total (sum of G, H1 and H2—should equal net press run shown in A)*	125 058	132 144
Percent paid and/or requested circulation (C/G × 100)	98.98%	99.08%

* *Average number of copies of each issue during preceding 12 months.*

** *Actual number of copies of single issue published nearest to filing date.*

I certify that the statements made by me above are correct and complete.

Richard Baccante, Treasurer