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**COVER:** Falling water is a source of ions — so is the controversial ion generator. Recently, researchers intensified efforts to determine how the charged particles emitted by such ion makers affect living systems. See page 364. (Photo courtesy of U. S. Department of Interior/Ralph H. Anderson)

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# LETTERS

## Broad-brush revolution

For those of us working in agricultural fields in developing countries, broad-brush treatments of the effects of the "Green Revolution" (SN: 10/3/81, p. 213) are particularly grating. Micro studies of changes in agricultural technology rarely produce unequivocal results—or generalizations which a lay audience would find particularly gripping. Too often, scanty research has been mined for anecdotes to support hypotheses formed at a considerable distance from the field.

To be fair, I have not seen the evidence collected by scientists Chapin and Wasserman. These comments relate to your article:

1. The Green Revolution with which I am familiar has taken place in the production of food crops (primarily rice and wheat) in Asia. By doubling staple food crop yields in the most populous countries in the world, this "revolution" has had an enormous impact. Certainly its effects have extended beyond "luxury consumption at home or speculative investments abroad."

2. The authors apparently charge U.N. officials with allowing increased use of chemicals against pests other than mosquitos to produce a resurgence of malaria. Are they implying that U.N. officials should be allowed to decide how crops are to be produced on a worldwide basis; or that farmers the world over are voluntarily following U.N. guidelines, without regard to the evidence of their sickles and their senses?

3. My impression from work in Asia is that every agronomist and entomologist alive is acutely aware of and concerned about the problem of acquired resistance to agricultural chemicals. So are "Third World" agricultural officials, and even experts from the U.N.

Now if we can just alert the American middle class...

*Dan Conable*  
*Jakarta, Indonesia*

## A prophet with honor

I was much interested in the article on "Chandler's Wobble" (SN: 10/24/81, p. 268). It is refreshing to know that such a fundamental problem in physics and astronomy is still alive and kicking!

Lest Cheryl Simon's opening sentence give readers the impression that (a) Chandler was a prophet without honor in his profession, and (b) that American astronomy and astronomers were just emerging from Europe's shadow, I would like to point out the following: Princeton Professor C. A. Young, in the 1893 edition of his authoritative *General Astronomy*, states that observations made "during the last three years" have established the variation of latitude "beyond question" and that Chandler's observations have shown that both the period and the range of the motion are probably variable. Then, in 1898, a revised edition of Young's text, in the article on Variation of Latitude, makes reference to Chandler's "brilliant and laborious series of investigations." (Parenthetically, three dictionaries of science biography list Chandler as an *astronomer*, though he did spend the years 1870-1881—between positions at the U. S. Coast Survey and Harvard College Observatory—as an insurance actuary. Probably mathematical skill in handling vital statistics paid better than the same skill applied to astronomical ob-

servations!)

As far as "the fledgling community of professional astronomers" (presumably the USA is being referred to), it should be noted that work of the first rank was already being done at Harvard, Princeton and Yale as well as the U.S. Naval Observatory. Furthermore, the Lick Observatory of the University of California had just put into service its 36-inch refractor—"a telescope larger and more powerful than any other in the world!" Greenwich, Berlin, Paris and Pul-kowa—move over!

*Leon E. Salanave*  
*San Francisco, Calif.*

## Puzzling heresy

I was indeed puzzled by the peculiar "futurist heresy" espoused by Julian Simon (SN: 10/17/81, p. 245). Does Simon in fact maintain that more and more people necessarily leads to more problem-solving people? If so, where will this glut of potential prodigies be trained? How will these intellects be found among the increasingly crowded and wretched populace? More likely, the continued growth of population will result in stunted educational careers for virtually all of these nascent contributors. Relying on such random and accidental processes to bludgeon problems into submission is no longer a viable option; the world population has already far exceeded the point of declining returns.

A more intelligent approach would be to intensively train those people already alive, rather than to expect higher quality to occur by accident. A naive belief in the ability of technology to keep pace with a rapidly swelling population has been fostered by very fortunate events over the last three hundred years: the opening of the New World, unusually good weather, abundant fossil fuels and rich mineral wealth. It is unwise to assume that the technology curve will keep pace with the population curve simply because this has accidentally happened in the past.

*Kent Shelby*  
*Stillwater, Okla.*

## Keeping life in the dark

I was pleased that Kenneth Towe took sufficient interest in the write-up of clay luminescence (SN: 9/12/81, p. 166) to respond to the note (SN: 10/10/81, p. 227). It is certainly true that direct high frequency UV-irradiation is damaging both to living things and their molecular precursors. It is less true, however, that life cannot be kept in the dark forever. Some forms of single-celled organisms do manage to perpetuate themselves in the absence of light, given some other energy source, or nutrient medium. Although it is commonly considered that the original life forms were photosynthetically active, there is no proof of this.

Perhaps the most interesting aspect of the clay luminescence with respect to chemical evolution is that it suggests the potentiality of an additional gentle, chemically useful, energy source associated with natural cyclic variations in climate (although the photon yield associated with this particular process is very small). In addition, adsorption of biogenic molecules on clay surfaces could well protect them from just the solar ravages that Towe cautions against.

Although life was not kept in the dark forever, it is not unreasonable to presume that it could have been so kept until enough time had passed to develop a "leg up."

*Leila M. Coyne*  
*San Jose, Calif.*