LETTERS

edited by Jennifer Sills

Sowing the Seeds of Soil Conservation

IN THEIR PERSPECTIVE ("MONITORING EARTH'S CRITICAL ZONE," 20 November 2009, p. 1067), D. deB. Richter Jr. and M. L. Mobley argue for the importance of monitoring Earth's belowground critical zone for sustaining life and humanity. Their message echoes a similar call from a different era. "The Nation that destroys its soil destroys itself." These words of President Franklin Delano Roosevelt in his 1937 letter to all state governors referred to the Soil Conservation Act of 1935, which recognized the need to sustain soil resources. The Standard Soil Conservation District law was subsequently adopted by all 50 states, plus Puerto Rico and the Virgin Islands. Historical aerial photos across the country from 1947 to 2004 (*1*) provide evidence that the law has been effective in protecting many farmlands and show that visible erosion in the form of gullies is now almost nonexistent in comparison with the erosion that occurred in the 1930s. In the decades since the Natural Resources Conservation Service started the National Resources Inventory in 1982, soil erosion on U.S. croplands has decreased 43% (*2*).

Fighting erosion. Contour stripcropping is one method used to protect soils.

Laws like the one President Roosevelt championed in the 1930s are more important today than ever. Urban sprawl, land degradation, environmental pollution, and anthropogenically accelerated erosion (to name just a few) are detrimental to sustainable food production and quality water supply for the growing world population. Modern soil vulnerability to global change and anthropogenic threats (beyond just croplands) is unprecedented. This issue was not addressed in the 1930s law but could have devastating effects. Monitoring and protecting the belowground critical zone is a crucial step to ensure that we do not lose ground for sustainability.

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Spain's Budget Neglects Research

RESEARCH AND INNOVATION ARE CRUCIAL for the development and well-being of society. Now, in times of economic downturn, the urgency of changing the economic model to provide sustainable growth has become apparent. However, investment in R&D is the first collateral damage in the Spanish national budget, and many regional governments have also cut spending; all this in spite of the fact that Spain only dedicates 1.35% of its gross national product to R&D (*1*). These cuts will deeply affect aspiring researchers; researchers with temporary contracts will find that, after years of work and training, their contracts may not be renewed.

R&D has been completely neglected in the recent special anti-crisis measures, referred to as "Plan-E" (*2*), even though funds dedicated to science and its infrastructure would have met the same goals and been profitable in subsequent years. A training program for future researchers and technicians would have provided opportunities for laid-off workers from other sectors. It would also have been an excellent time to promote R&D in the private sector.

Unfortunately, the Spanish science system also has endemic deficits, such as continuous changes in management personnel and structure; lack of a fixed calendar of calls; bureaucratic delays; arbitrariness in the selection, promotion, and stabilization of personnel; and paralysis of necessary legislative initiatives.

We believe that it is time to demand a binding, long-term commitment from all parties to equip the Spanish science system with stability and prestige; a real increase in funding for R&D, so that spending first equals and then exceeds the European average; and rational planning to support the different stages of scientific careers.

The authors of this Letter have written a manifesto (*3*), summarized here, that has the support of many scientific groups. We believe that the moment has arrived for the scientific community to join forces. Learn more about our mission at www.investigaresfuturo.org.

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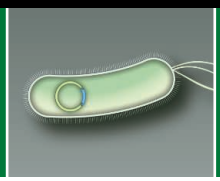

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LIFE IN SCIENCE

The Cow Ate My Fieldwork

Life is easier today than when I studied stream temperature more than half a century ago. Unlike today, when scientists can collect data with automatic loggers, we had to be in the stream for every data point, night and day.

Back then, during winter nights, a fire and an improvised shelter made life more comfortable. An alarm clock rang when it was time to read the thermometer. During summertime, we set up shelters in haystacks. I have good memories of those nights: shooting stars, nocturnal birds, and moonlight. However, I eventually realized that I had to choose between good data and pleasant memories. So I went high-tech: a mercury thermograph. The device was clumsy and heavy, but it could paint a week's temperatures on paper on a rotating drum. I had decided to investigate a weak trend in my haystack data with the new equipment. Four weeks of extraordinary high summer had confirmed an increasing trend. Now, at the last and most critical station, the thermograph had painted the temperatures of another high-summer week. How exciting it was to remove the paper from the drum and discover the trend that I had suspected—data destined for future textbooks! Eager to duplicate the findings, I changed the paper on the drum, leaving the saved graph safe under the weight of a stone. Busy and excited, I was not aware that I had company. No, it was not a farmer's young daughter, but a farmer's young and very inquisitive calf. In a split second, he snatched my paper graph from under the stone with his long tongue and ran.

I pursued the fleeing beast, got a firm hold on its tail, lost my balance, and was drawn through water and dirt, only to watch the mischievous creature slowly and deliberately consume my data.

Needless to say, this was the end of the high summer. And of my venture into fluvial temperature regimes.

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EDITOR'S NOTE
This is an occasional feature highlighting some of the day-to-day humorous realities that face our readers. Can you top this? Submit your best stories at www.submit2science.org.

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The Permanence Debate

E. KINTISCH ("DEFORESTATION MOVES TO THE fore in Copenhagen," News of the Week, 11 December 2009, p. 1465) identifies a number of issues hindering an agreement on Reducing Emissions from Deforestation and Forest Degradation (REDD). However, he does not mention permanence, which has dogged the REDD discussions for some time (*1*). Many negotiators fear that reductions in loss of forest carbon stocks may be credited and rewarded now, but that the forest may later disappear (whether cut or affected by die-off due to climate changes). They contrast this scenario with that of fossil fuels, for which they argue that savings are permanent.

This argument is flawed. There is a finite quantity of fossil fuel underground. Clean technology slows the rate at which it is extracted and burned, but eventually it will all be converted to CO_2. REDD will slow the rate at which carbon is emitted from forests in an analogous way. The conceptual muddle about permanence occurs when people confuse "stocks" with the "rate of change of stocks." Reduced emissions from deforestation and forest degradation are, like fossil fuel reductions, calculated on the basis of lowered annual losses compared to business as usual, not on the basis of stock remaining.

There is only one difference between stocks of fossil carbon and stocks of living carbon, in terms of permanence. Carbon lost due to deforestation or forest degradation in one place can be replaced by reforestation or enhancing carbon stocks in degraded forests elsewhere, whereas fossil fuels cannot be replaced at all.

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Letters to the Editor

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