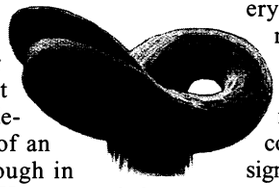
In light of the 1998 Nobel Prize for Physiology or Medicine for the discovery that nitric oxide is a signaling molecule in the cardiovascular system, a plant biologist points out that ethylene was recognized as a gas that affects growth in 1901 and as a signal molecule produced by plant cells in 1934. An Indian geologist reports a discovery that calls into question a recent finding of "more than 1-billion-year-old triploblastic animal trace fossils from...Chorhat Sandstone...of central India." Faculty at the recently sold Allegheny University of the Health Sciences express concern about their status. "Omic" research is discussed. A way to give scientific advice to the U.S. Department of State is proposed. And a Paraguayan rainforest tribe is declared not "vanished."

Plant Biology and the Nobel Prize

The awarding of the 1998 Nobel Prize in Physiology or Medicine to R. F. Furchgott, L. J. Ignarro, and F. Murad for their discoveries of nitric oxide as a signaling molecule in the cardiovascular system is, without question, a highly deserved recognition of an important breakthrough in biomedical research. However, the citation by the Nobel Assembly is one more testimony to the fact that pioneering discoveries in plant biology are not counted among the milestones in biological research. The Nobel Assembly asserts, with respect to nitric oxide, that "signal transmission by a gas that is produced by one cell, penetrates through membranes and regulates the function of another cell represents an entirely new principle for signalling in biological systems" and that "this was the first discovery that a gas can act as a signal molecule in the organism." In fact, ethylene, the simplest unsaturated hydrocarbon, was recognized by the Russian plant physiologist Neljubow in 1901 as a gas that affects plant growth, and by Gane in 1934 as a signal molecule produced by plant cells. Endogenously produced ethylene regulates many basic plant processes, ranging from seed germination to senescence. Most important from an agronomic aspect is the role of ethylene as inducer of fruit ripening and as a mediator of defense responses in plant pathogenesis. The enzymes that catalyze the biosynthesis of ethylene have been isolated and characterized biochemically. The genes that encode these enzymes have been cloned, and their regulation has been described (*1*). The ethylene receptor has been identifed, and the ethylene signal transduction pathway is being elucidated in detail (*2*). These discoveries serve as the basis for biotechnological applications, for example, the genetic engineering of fruits whose ripening can be controlled and whose spoilage is, thereby, prevented. The discovery of ethylene as an endogenous signal molecule should be recognized as the first demonstration—by plant biologists—that a gas can serve as a signal molecule in the organism and that this constitutes an entirely new principle for signaling in biological systems.



Ethylene response in seedling

CREDIT: J.R. ECKER, G. AHLSTRAND, AND J. HAYDEN

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Fossil Discoveries in India

A. Seilacher, P. Bose, and F. Pflüger (Reports, 2 Oct., p. 80) state that they have recorded more than 1-billion-year-old triploblastic animal trace fossils from the Lower Vindhyan (Chorhat Sandstone of the Semri Group) of central India. They suggest that the metazoa evolved much earlier (about 400 million years) than the previous records. For this claim, they have depended solely on the published radiometric ages from the Vindhyan succession. Although the age of the Vindhyan Supergroup remained an unsolved problem of Indian stratigraphy for more than a century because of inconsistent biostratigraphic evidence and radiometric dates, the age is generally accepted by most as Mesoproterozoic-Neoproterozoic (approximately 1400 to 550 million years old). I have just published a report (*1*) of the discovery of abundant, small, shelly fossils from the uppermost limestone and shale layers of the Rohtas Formation (Semri Group, Lower Vindhyan), the unit which conformably overlies (without apparent interruption of sedimentation) the trackbearing unit in the Son Valley. Because such small, shelly fossils represent a part of the "Cambrian explosion" (of approximately 545 million years ago), it was necessary that I propose a major chronostratigraphic revision for the Vindhyan succession. The revision suggests that the Lower Vindhyan Semri Group would range from Vendian (Vindhyan sedimentation begins with a "basal conglomerate") to early Cambrian and that the unconformably overlying Upper Vindhyan (Kaimur, Rewa, and Bhander groups, in ascending order) is of early Paleozoic age. To me, therefore, the occurrence of the triploblastic animal traces in the Lower Vindhyan is not a surprise, as they fall within the period of Ediacara biota. In fact, the finding of Seilacher and his team enlarges the scope of a better search for the remains of the Ediacaran soft-bodied animals in the Lower Vindhyan immediately below the appearance of the Precambrian-Cambrian boundary of small, shelly fossils.

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Dismissal of Faculty

The Allegheny University of the Health Sciences (AUHS) and eight of its hospitals in Philadelphia, all affiliates of the Allegheny Health Education and Research Foundation (AHERF) in Pittsburgh, are in the process of reorganization in the U.S. Bankruptcy Court in Pittsburgh (Random Samples, 9 Oct., p. 227). On 29 September, the court approved an offer by Tenet Healthcare, a for-profit corporation that owns 122 hospitals nationwide, to buy the eight hospitals and the university for $345 million. As part of the sale, Tenet outlined a plan for the reorganization of the university as a nonprofit organization, which will remain associated with the for-profit hospitals and managed by another university. Tenet will contribute up to in its first fiscal year and $33 million in addition in its second year. The infusion of capital by Tenet should be more than sufficient to cover deficits for the foreseeable future.

Nevertheless, a large number of tenured and nontenured faculty members have been informed that they would not be retained by the university. The administration refuses to discuss this issue with the faculty and has not indicated what the criteria are that were used to determine who is going to be retained and who is going to be dropped from the payroll. The administration has not followed the university bylaws regarding termination of faculty appointments and has not provided any mechanism for grievance by the hastily dismissed faculty. In fact, the uni-

versity did not provide a list of the faculty members they plan to dismiss. Today (14 October), Tenet spokesman announced that "notices to laid-off faculty would begin going out early next week."

Apparently, the lawyers advising the university believe that this plan is legal, under bankcruptcy laws, and will be approved by the court. However, there is no precedent in the United States for a university reorganizing itself by arbitrarily dismissing, without due process, a large number of tenured and nontenured professors.

If this plan succeeds, this precedent will offer a temptation to other universities in financial difficulties to follow the same course. We urge all faculty and academic organizations to voice their strong objection to the destruction of the academic integrity of our university.

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Scientist-Diplomats

When I worked in the State Department in the 1980s, one of the foreign service officers in my office took advantage of my scientific expertise by asking me how to spell "Superconducting Super Collider" for a memo he was drafting. I told him and, almost as an afterthought, he asked, "What *is* a Superconducting Super Collider?" That said, I read the National Research Council's report (*1*) on improving the State Department's scientific expertise with some interest (D. Malakoff, News of the Week, 25 Sept., p. 1937).

Two of the report's recommendations for systematizing the use of personnel from other agencies (for example, the National Science Foundation or the Centers for Disease Control) and expanding the use of outside advisors and experts are cost-effective and imminently doable. However, there was no suggestion in the report to use Diplomacy Fellows from the AAAS. Since 1981, the AAAS has supplied the State Department (and the Agency for International Development) with more than 230 scientists (*2*). The fellows have Ph.D.s in a variety of fields, are put through a careful screening process, have to pass a background check, and often have language skills and international experience as former Peace Corps volunteers. State typically takes one or two fellows each year for a stint of 1 to 2 years. Most fellows then return to academia or move to other federal agencies. Preventing this annual loss of experienced scientists would help the foreign policy establishment shore up its scientific and technical base.

The AAAS could also assist the State Department in recruiting outside experts and advisers. A database of already vetted scientists—along with their technical and policy expertise—currently exists in the *Directory of AAAS Science and Engineering Fellows* (*3*). The State Department's efforts to integrate science with foreign policy can be accelerated by tapping into the pool of former and current fellows, many of whom are still in the Washington area.

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Ache puberty ceremony

CREDIT: PIERRE CLASTRES/LIBRAIRIE PLON

Among the Guayaki (Ache)

I have worked with the Guayaki (usually referred to as the Ache) in Paraguay for the past 21 years and have published nearly 40 articles about them (with almost a dozen different colleagues), as well as a 500-page book about their demographic patterns (*1*). Thus, I was surprised to find that two of the four groups that I have been studying are pronounced "vanished" in the review of the translation of Pierre Clastres's book *Chronicle of the Guayaki Indians* (*Science*'s Compass, 18 Sept., p. 1813). This appears to result from an error in the translator's introduction.

Furthermore, it is asserted in the review that remaining Ache "have lost much of their culture and traditional knowledge." Exactly how this loss was measured or what "much" means is unclear to me, but I saw the same puberty ritual illustrated in the book review take place in 1998. The Ache have changed in 20 years, but still spend considerable time in their ancestral forest environment and adhere to many of the cultural practices that characterized them before first peaceful outside contact.

Are Ache beliefs and behaviors accurately portrayed by Clastres? On the basis of years of interviews in the Ache language, and thousands of hours of data collection, I would reply, "partially." But since Clastres does not specify methods, operationalize or measure variables, or have a systematic sampling procedure, it is difficult to know how accurate his accounts are or how he reaches the many interpretive conclusions in his book. The Clastres work is good literature and provides many fascinating hypotheses about Ache cultural patterns. However, it is not science, and answers to important anthropological questions can not be obtained using the method that Clastres illustrates.

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Fishing Expeditions

There appears to have been a remarkable increase since last year in the prominence of what might loosely be termed "omic" research in biology. Following the definition (*1*) of "-ome" as an "abstract entity, group, or mass," "omics" would be the study of entities in aggregate, in this case the DNA, RNA, protein, or other molecular complement of a cell, tissue, or organism.

Beyond semantics, omic research appears to require a different mind-set from the more traditional study of one gene, gene product, or process at a time. Often, one generates a database of molecular information with only limited ability to predict what about it will prove most useful. A 1984 position paper on sequencing the genome (*2*) offered the candid opinion that

> In some respects, like the journeys to the moon, it is simply a "tour de force"; it is not at all clear that knowledge of the nucleotide sequence of the human genome will, initially, provide deep insights into the physical nature of man. Nevertheless, we are confident that this project will provide an integrating focus for all efforts to use DNA cloning techniques in the study of human genetics.

Despite obvious excitement about the genome project, some referees, editors, site visitors, and study sections have tended to disparage other omic studies as