

Unprecedented advice to the new President

"Global environmental change may well be the most pressing international issue of the next century," research leaders told George Bush last week. Calling this "quintessentially an issue for leadership at the level of heads of state," they provided Bush with a series of recommendations to help identify immediate and realistic policies to temper the pace of environmental change fostered by processes such as fossil-fuel combustion, deforestation and chlorofluorocarbon (CFC) use.

Prepared by the National Academy of Sciences, the National Academy of Engineering and the Institute of Medicine, these recommendations appear in one of four "white papers" delivered to Bush advisers before his inauguration. Volunteering advice to a President-elect "is unprecedented for us," noted National Academy of Sciences President Frank Press. But "that is a sign of the time," he added, because never have so many crucial issues confronting a President depended to such a degree on science and technology.

Focusing on space, AIDS, global environmental change and the role of the White House science adviser, these papers offer gently critical advice to the incoming President.

The recommendations on the civil space program, for example, support the development of President Reagan's \$30 billion space station — but only if the White House can justify it as essential to some clearly articulated research goal, such as purposeful, long-term manned space flight. To date, a serious commitment to such a goal has not been made. And, the academies point out, some would argue that such a commitment should not be made at this time — "particularly because a manned program would require a large commitment of U.S. scientific and technological resources, substantial government funding in quest of returns that are largely intangible, and political support that may not be forthcoming."

The academies also advise streamlining the roles of several NASA field laboratories to avoid overlapping research responsibilities, and transferring the management of these labs to private contractors wherever feasible. Finally, to ensure that funds for a stable research program at NASA are not eroded by the costly and escalating needs of special mission initiatives — such as building a space station or a return visit to the moon — the academies ask Bush to make it clear that he has a firm commitment to a base research program as well as large, expensive programs.

The AIDS paper also makes some strong recommendations, such as protecting HIV-infected persons from

discrimination — if necessary, by congressional fiat; developing a comprehensive plan for financing the astronomical costs of treating those who become infected; and ensuring that HIV-testing and other AIDS-monitoring measures are used "only when their purposes are clear and their results productive."

More vague are the recommendations on the environment and the science adviser's role. For example, at a press briefing last week, National Academy of Engineering President Robert M. White described the need for a complete phaseout of CFC use and a much-reduced reliance on fossil fuels. The paper presented to the Bush team, however, offers no timetable for the CFC phaseout. Nor does it offer goals or a timetable for a fossil-fuel phasedown.

Recommendations about the science adviser's role are broad indeed. Generally, they argue for "enhancing" the function — and presidential access — of the science adviser, appointing him or her quickly and accepting only someone of recognized stature. In addition, the academies would have the President's science adviser work more closely with the Office of Management and Budget and other

White House staff to see that national policies are translated into coordinated endeavors throughout the federal government. This point was described more fully in a related report the academies issued last month (SN: 12/24&31/88, p.407).

The academies are by no means the only science and technology organizations seeking to influence Bush. Early in November, for example, more than 30 environmental groups collaborated on a "blueprint for the environment," which they issued to Bush soon after his election victory. This coalition's more than 700 recommendations include a renewed call to elevate the Environmental Protection Agency to the cabinet level and the suggested development of a national "least cost" energy plan (SN: 5/7/88, p.296) emphasizing use of renewable resources and efficiency-enhancing technologies. Also in November, the General Accounting Office presented the Bush team with a more sweeping series of "transition" papers, including ones on energy, the environment and agriculture. These rather short — and highly critical — reports focused on problems that this watchdog agency of the Congress identified while investigating the activities and management of major federal agencies.

— J. Raloff

Tomato tumors: Red light means grow

Two scientists have discovered that visible red light induces tiny tumors on the leaves of tomato and certain other plants growing in an environment shielded from the sun's ultraviolet rays. Conversely, they report, barely visible infrared or "far-red" light suppresses the tumors. The findings may suggest ways for gardeners to illuminate their greenhouses to prevent the tumors — which slow growth, cause leaves to curl and occasionally kill plants — and could shed light on how organisms regulate cell division and enlargement, says study coauthor Theodore W. Tibbitts, a horticulturist at the University of Wisconsin-Madison.

Previous studies have suggested that, unlike humans and many other living things, certain genetically predisposed plants need a small amount of ultraviolet light to *prevent* nonpathogenic tumors, or those that are not induced by another organism. Many members of the Solanaceae family, including tomatoes, potatoes and eggplants, and several other plants such as sweet potatoes and pea pods are particularly susceptible to such tumors. Scientists also have suspected that visible wavelengths play a role in inducing the tumors, but Tibbitts and co-worker Robert Morrow say they are the first to determine the specific wavelengths involved and to suggest that a particular plant-pigment molecule,

known as phytochrome, mediates tumor growth.

Tibbitts and Morrow punched disks out of the leaves of healthy tomato plants and illuminated the disks with blue, green or red light from filtered lamps. They found that tumors afflicted 60 percent of the surface of red-illuminated disks, compared with 3 percent of the green-illuminated surfaces and none of the blue. The more red light, the more tumors. But far-red light (700 to 800 nanometers) reversed the effect, and the more far-red light the better, Tibbitts and Morrow report in the December *PLANT PHYSIOLOGY*.

These effects tipped the researchers off to phytochrome, known to switch on and off by changing its form in response to the balance of red and far-red light. The growth of nonpathogenic tumors is probably not linked to photosynthesis, they say, noting that blue and green light help drive photosynthesis and far-red light does not reverse or inhibit it.

— I. Wickelgren



Tumor-plagued tomato plant.

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