and Seattle—and are apparently being planned in 20 more. Companies that pollute less than officially permitted may register the resultant credits for future use or sale to another firm. Although 100 such credits have been registered, some worth millions of dollars, many of the firms are reluctant to sell to others. "The fear is that once the credits are posted, EPA will reduce their value by tightening the emission standards, or that the firm will need the credit itself for expansion at some point in the future," says Fry. John Palmisano, an EPA economist, says, "There is no question that companies are risking a lot by selling their credits, when they may later need the credits themselves. Every large corporation, however, routinely takes such risks, which are no different from those in the futures market. They can always maintain a diversified portfolio, selling part of the credit for cash, and keeping the rest."

William Lewis

No economic incentive is a panacea

Palmisano says that it is unlikely that EPA will require tighter controls in the future, and points out that the historical trend had been to weaken, not toughen, the original Clean Air Act requirements. He also notes that the agency has constrained its own ability to cut into the credits once they have been registered. William Lewis, director of the National Commission on Air Quality, a study group of public officials and private experts, says he doubts whether such assurances will help. "Trading in credits will work only in areas that are already considerably cleaner than current standards," Lewis says, "and there aren't many of those." Nevertheless, interest in credit trading is high, as evidenced by a turnout of several hundred attorneys, engineers, and state officials at an EPA conference in Washington on 26 January.

A third regulatory innovation being considered by EPA is the idea of issuing auctionable pollution permits. The agency has tentatively proposed to set a ceiling on U.S. production of asbestos and chlorofluorocarbons, at or below current levels; rights to manufacture within the total would be auctioned off to the highest bidders. The resultant high prices would force many out of the market and ensure that manufacturing rights would go to those firms to whom they are economically most important. Studies for EPA by the RAND Corporation conclude that such a system would cost the chlorofluorocarbon industry considerably less than simply barring production above current levels at each plant.

One option proposed by private economists that EPA is not considering is imposing emission fees or taxes on air pollution, an idea that academic economists have pushed for a long time. Theoretically, fees would be tied to the amount of pollutant emitted, and high enough to exceed the cost of pollution controls, leaving the firm with an economic incentive not to pollute. Levin, of EPA, says the idea is unrealistic because the equipment to continuously and precisely monitor pollutants at their source is in many instances not available. Lewis adds that the process of setting the fees would be highly contentious and beset by political wrangling.

"In reality, no economic incentive is a panacea," Lewis adds. "There is not one that is a logical substitute for the existing clean air program in its entirety." Other experts, including many in the Reagan camp, are not so sure. David Stockman, director of the Office of Management and Budget (OMB), and Murray Weidenbaum, director of the Council on Economic Advisors, are both on record in opposition to the current system of specific regulatory orders. To the extent that any of these programs grant more discretion to industry itself, they will be popular with the new Administration. To the extent that any of them enable industry to live more easily with the present standards, and thereby press less vigorously for changes to the current law, they will be popular with the environmentalists, too.—R. JEFFREY SMITH

Science Subcommittees Get New Chairmen

A shuffling of subcommittee chairmanships has resulted in some new faces at the House Committee on Science and Technology, which retains its chairman of 2 years, Don Fuqua (D–Fla.).

The subcommittee on space science and applications, which has been chaired by Fuqua for the past 8 years, will be taken up by Ronnie G. Flippo (D–Ala.), a member of the subcommittee since he won his seat in 1976 and only the third chairman in the subcommittee's 19-year history. Flippo's congressional district includes Huntsville, Alabama, home of the Marshall Space Flight Center and the old stomping grounds of Wernher von Braun, the father of U.S. rocketry. In the last congress, Flippo was the principal sponsor of the Solar Power Satellite bill.

The subcommittee on energy research and production, which oversees nuclear energy issues, will be chaired by Marilyn Lloyd Bouquard (D–Tenn.), whose district includes Oak Ridge, Tennessee, site of the Department of Energy's nuclear complex and prospective site of the Clinch River Breeder Reactor. Lloyd fought the Carter Administration's drive to scrap the Clinch River project, and is expected to use her new chairmanship to give the breeder a push. Former chairman Mike McCormack (D–Wash.), who in 1980 successfully sponsored a bill calling for stepped-up development of magnetic fusion, was defeated in his reelection bid.

The subcommittee on science, research, and technology, which has jurisdiction over the National Science Foundation (NSF) and was formerly chaired by George E. Brown, Jr. (D–Calif.), will be presided over by third-term congressman Douglas Walgren (D–Pa.). A Stanford Law School graduate, Walgren vows to focus subcommittee attention on improving U.S. productivity and innovation. "Better technology in the workplace," he says, "is one of the keys to solving our inflation problem." Walgren's suburban Pittsburgh district includes some of the area's smaller steel mills.

Former chairman Brown reportedly left the subcommittee in a huff, having

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received little support from scientists in his reelection campaign, which he narrowly won. The subcommittee is a focal point for science policy deliberations in the House, and Brown during his tenure as chairman came down hard on NSF for not putting more of its resources into applied research. Brown has now assumed the chairmanship of an Agriculture subcommittee.

The subcommittee on energy development and applications, which deals with solar, coal, and other nonnuclear energy matters, will be chaired by Fuqua, who, as chairman of the space subcommittee, saw the space shuttle through the difficult passage from drawing board to launch pad. Fuqua says he now wants to focus on renewable resources. In a jurisdictional shake-up, the subcommittee has also gained oversight of high energy physics as practiced at places like Brookhaven, Fermilab, and Lawrence Berkeley Laboratory. (Previously, high energy physics had been handled by McCormack's subcommittee.) As chairman of both the full science committee and the energy development subcommittee, Fuqua is the principal Democratic spokesman in Congress on matters of energy development and application.

Air Academy Drops Ban on Sickle Carriers

A class action suit initiated by a Minneapolis black man has helped end a ban that kept blacks with sickle cell trait from entering the Air Force Academy.

Steve Pullens was an aspiring pilot when he was expelled in 1979 from the Academy on the grounds that his just-discovered sickle cell trait might endanger his health during rigorous training at high altitudes. A star athlete, Pullens filed suit late in 1980 at the U.S. District Court in Minneapolis (*Science*, 16 January). The Air Force then announced on 3 February that it would start accepting applications from those with sickle cell trait, reversing an 8-year-old policy. An Air Force spokesman admitted that the class action suit was one consideration in the change, but also said the policy had been under review since being initiated in 1973.

Critics say the health problems associated with sickle cell trait have been exaggerated to the point that they restrict opportunities for blacks. In people who have the full-fledged disease, the distortion of red blood cells during a sickle cell crisis can block the flow of blood to vital organs. In carriers of the trait, however, the health effects are much more debatable.

In recognition of this, former Deputy Secretary of Defense W. Graham Claytor, Jr., in the final days of the Carter Administration, issued a service-wide order to drop any restrictions against individuals with sickle cell trait. Coming from an outgoing official, the order was mostly symbolic. So far, only the Air Force Academy has taken action, and the Air Force itself will continue to prohibit those with sickle cell trait from training as pilots or copilots. The whole policy, however, is under review throughout the services, and more restrictions are expected to be dropped.

The dropping of the ban at the Air Force Academy does not mean that black cadets who were expelled will automatically be readmitted. Pullens, for one, is still pursuing his class action suit, although his lawyer, in the aftermath of the Academy decision, expects that the Air Force will soon settle out of court and readmit Pullens.

Budget Cutters Clip Away at Science

Fat finders in the Office of Management and Budget have circulated a tentative "hit list" on Capitol Hill which contains the following:

- A $629 million cut in the budget of the National Aeronautics and Space Administration, a reduction that would cause production of a fifth space shuttle orbiter to be scrapped. Also eliminated would be Galileo, a project scheduled to probe the atmosphere of Jupiter in 1986 as a follow-up to the Pioneer and Voyager missions.
- A $240 million reduction in the budget of the National Science Foundation.

The list is tentative, and could change substantially before Reagan submits his budget message to Congress on 18 February.

Academy Hosts Meeting on Conservation of Monuments

In 1818, the King of England sent Sir Humphrey Davy to Naples so that the chemist could help unroll a cache of papyrus scrolls that had been discovered 60 years earlier in a villa near Herculanum. With the methods that had already been tried, centuries would elapse before the whole library was unrolled, and all of intellectual Europe was getting impatient. Davy used chemical methods on 11 scrolls, but when they were unrolled, the writing had been washed away.

From its equivocal start with Davy, the record of scientists working in the conservation of antiquities has improved, but conservators report a reluctance by scientists to get involved with practical conservation. This reticence of late has been unfortunate. Historical monuments around the world are deteriorating with ever more rapidity due to the onslaught of weather, ill-conceived preservation attempts, urban construction, acid rain, and admiring tourists.

Decaying sculpture at Brooklyn Museum

To highlight the problem, the National Academy of Sciences (NAS) sponsored a symposium from 2 to 4 February on the Conservation of Historic Stone Buildings and Monuments. About 200 scientists, professional conservators, and interested citizens attended. The meeting place? At the NAS, of course, itself a national historical monument faced with New York Dover marble, reportedly in a remarkable state of repair.

William J. Broad