Earth Day: Mapping Goals and Progress

What began 10 years ago on Earth Day as a festive "teach in" to clean up our act and our planet has developed into a strong and growing political force. This past Tuesday, millions again gathered to celebrate what the environmental movement has accomplished and to map a strategy for surviving the '80s (see also p. 269).

Emerging after a decade of battles — including many resounding victories — the environmental movement is losing a bit of its former kick. The momentum that led to creation of the Environmental Protection Agency, the Occupational Safety and Health Administration, the National Oceanic and Atmospheric Administration and the President's Council on Environmental Quality is losing steam. Congress has shown less support for the environment this term than for its fight against inflation, dwindling energy supplies and a perception of declining military superiority. In fact, several pieces of legislation proposed by this Congress would cut back on environmental strictures or waive compliance with existing laws so that "more important" goals might be met. And resentment over the cost of meeting environmental controls is fueling a strong backlash by business.

It is to regroup its forces and rekindle the spirit that made it so effective that the environmental community has sponsored Earth Day 80.

There is much to rally behind. The original Earth Day's legacy includes the Clean Air Act, the Toxic Substances Control Act, the Endangered Species Act, the Safe Drinking Water Act, the Water Quality Improvement Act, the Surface Mining Control and Reclamation Act, the Resource Conservation and Recovery Act and the Environmental Pesticide Control Act. While many critics charge that the regulations that put these acts in force are inflationary and needless, government officials and environmental advocates argue a net benefit to society.

And supporting that contention is a new report prepared for the President's Council on Environmental Quality by A. Myrick Freeman of Bowdoin College in Brunswick, Maine. Released this week, "Benefits of Air and Water Pollution Control" finds that investments in pollution control pay off handsomely. For example, about 14,000 lives were saved in 1978 as a result of air-quality improvements since 1970, it says. And the best estimate for annual benefits of air pollution control in 1978 is $21.4 billion — $4.8 billion more than CEQ's recent estimate of the costs for complying with the Clean Air Act that year and $2 billion greater than all spending on air pollution control in 1978 (including voluntary expenditures).

In fact, Freeman says that these assessments are probably a significant understatement "if, as many believe, the Clean Air Act has not only resulted in improved air quality ... but has also helped prevent further degradation." Nor does it account for benefits from increased visibility or pollution generated in the United States and exacting damage in Canada or Mexico.

Although estimates of current benefits from water pollution control programs are not yet available, Freeman projects benefits from the programs by 1985 to be on the order of $12.3 billion per year.

For a detailed look at domestic accomplishments and setbacks over the past decade, CEQ's tenth annual report paints a grim picture spanning more than 800 pages. At the same time, it offers a note of optimism: "What has changed in an important way is the nation's method of doing its business. ... While there is still much to learn, understand, and work out before the nation achieves ... [an] environment that can sustain people for centuries, we have embarked upon that journey." □

Naloxone: Reducing shock trauma

Naloxone, a drug commonly used to counteract heroin and other opiates, may reverse some potentially life-threatening complications that result from shock due to infection or injury, two army researchers reported last week. Among other results, the scientists found that the drug — when administered to an animal immediately after a spinal cord injury — appears to prevent or lessen the paralysis that often follows such injuries.

Though still experimental, the technique could provide a means of emergency treatment for certain spinal cord injuries (although not severed spinal cords), such as those caused by automobile crashes and diving board accidents. And, while other drugs are administered to prevent shock following an accident, naloxone, which works by restoring normal blood pressure, may be the "first drug that reverses ongoing shock" says John W. Holaday of the Walter Reed Army Institute of Research in Washington, D.C. Stressing its use in emergency treatment, Holaday and co-worker Alan I. Faden caution that the drug holds no hope for those already paralyzed.

Interestingly, the findings are another step — albeit a bit of a detour — along the road of research on endorphins, the opiate-like substances made in the brain. Shock due to infection, loss of blood or severe injury is accompanied by a rapid drop in blood pressure and heart rate, which may lead to death and which may deprive injured cells of their vital blood supply. Noting that morphine lowers the blood pressure and slows the heart rate, Holaday and Faden suggested in 1978 that the body's own morphine — endorphins — might have a similar effect and may be the agents that produce the cardiovascular effects associated with shock. If that were the case, the researchers reasoned, an opiate blocker such as naloxone might reverse those effects — "like an antihistamine blocks histamine" — and prevent shock-related complications.

In the first of a series of experiments, Holaday and Faden reported in 1978 that naloxone reverses the shock-related drop in blood pressure induced by a bacterial infection in rats. Further experiments in rats and dogs showed that naloxone had similar effects on shock induced by rapid blood loss.

More recently, the researchers reported at a meeting last week in Anaheim, Calif., of the Federation of American Societies for Experimental Biology, their experiments show that naloxone restores normal blood pressure in cats in a state of shock due to spinal cord injuries. Moreover, the normal blood pressure restores normal blood supply to the damaged spinal cord cells, thereby preventing their death and the resulting paralysis, says Holaday.

In one set of experiments, Holaday said in an interview, nine animals were treated with naloxone and 13 were injected with saline following injury. In order to simulate an emergency situation the cats were injected with naloxone 45 minutes after their injuries and later given a slow infusion of the drug. Three weeks later, of the nine naloxone-treated cats, two had died, three were "completely normal" and four were "somewhat spastic." Of the saline-treated animals, five died, one was normal and the rest were "very spastic or only able to stand and not able to walk," says Holaday.

The role of endorphins in relieving pain following severe injury is well known and Holaday speculates that their role in reducing blood pressure may have evolved in order to diminish the loss of blood and facilitate clotting. "But maybe we haven't evolved far enough to prevent death due to loss of blood pressure," he says. "What is exciting is that we are treating this [shock] at a positive level—preventing the body's own adverse reactions." What remains, he says, is testing in other animals and finding a mechanism for the proposed cardiovascular effects of endorphins and naloxone. □