Concerned by declining catches of freshwater fish and outbreaks of cholera in southern river basins, Kremlin leaders added an environmental division to the State Planning Committee, consolidated enforcement powers in the Ministry of Reclamation and Water Management (Minvodkhoz), and boosted funding (the equivalent of $11 billion for 1976–80).

Deterioration of the Volga River has been halted and Moscow's water quality slightly improved, writes Gustafson, a Harvard government professor, but the clean water effort still lacks clout; "the water quality program has simply not been given the weapons to fight with the large ministries in charge of industrial and agricultural development." Although Minvodkhoz, in principle, can levy fines, cancel the bonuses of plant managers, and shut down polluting enterprises, the ministry, in practice, cannot interfere with high-priority industries or local employment.

In 1975, only 23 of 38 Soviet ministries and agencies fulfilled their goals for physical and chemical treatment of wastewater. Bureaucratic resistance aside, the blame falls largely on the Soviet leaders, writes Gustafson. The new water control program did not stem from conservationist sentiment or public pressures, as in the West. The Kremlin sought only to promote economic growth by securing clean water for farm and industrial use. Given that objective, however, Soviet leaders will still have to give increasing political support and resources to the water quality program.

Outsmarting the 'Climatic Factor'

"Climate as an Obstacle to Development in the Tropics" by Jayantanuja Bandyopadhyaya, in *International Social Science Journal* (vol. 30, no. 2, 1978) UNESCO, 7 Place de Fontenoy, 75700 Paris.

The tropics' heat, humidity, and rainfall patterns have long been known to curb economic activity. Studies have shown that man's capacity for work declines and his susceptibility to disease increases when the mean annual temperature rises above 70°F. "The climatic factor," says Bandyopadhyaya, professor of international relations at Jadavpur University, Calcutta, accounts for much of "the wide divergence in labor productivity between the North and South."

Tropical climates, moreover, affect soil conditions (e.g., by hastening organic decomposition and leaching out soil nutrients), as well as water supply, plant reproduction, and the raising of lifestock. High temperature and humidity cause rapid deterioration of factories and equipment, while heavy monsoon rains disrupt transport and communications.

Bandyopadhyaya argues that no amount of Western industrial technology, even if available and affordable, can offset the harmful local effects of tropical weather patterns in the Third World. What is needed is an international effort, under United Nations auspices, to alter climatic conditions, either regionally or globally, through the ap-

plication of modern science. One extreme proposal worth further study, he contends, is the suggestion of Soviet scientist P. Borisov (*Can Man Change the Climate?*, 1973) to enlarge the earth's temperate climate zone, where all successful industrialization in modern times has taken place. This would be done by pumping surface waters from the Arctic Basin through the Bering Strait to the Pacific, thereby pulling the warm waters of the Atlantic through the Arctic and making worldwide ocean temperatures more uniform.

Hot Satellites in Space

"Don't Look Now But . . .: The Soviet Satellite Accident and Some Lessons from It" by Milton Leitenberg, in *Commonweal* (Sept. 15, 1978), 232 Madison Ave., New York, N.Y. 10016.

Until recently, public attention has been focused on the peaceful and scientific uses of outer space—cosmic ray research, weather reconnaissance, and exploration of the universe. The January 19, 1978, accident in which a Soviet military satellite containing a small nuclear power reactor re-entered the earth's atmosphere and spread radioactive debris over remote parts of Canada reveals the reluctance of governments to discuss candidly the dangerous side of space satellite programs.

Some 900 U.S. and Soviet space satellites are now orbiting the earth, says Leitenberg, a scholar at Cornell's Center for International Studies. Perhaps 90 percent of them serve military purposes, including reconnaissance, surveillance, and communications. The mission of the Soviet Cosmos 954, which ended over Canada's Northwest Territory, was to track the movements of U.S. Navy vessels, particularly aircraft carriers.

U.S. officials knew that Cosmos 954 was having problems remaining in orbit from four to seven weeks before it fell to earth. They queried the Russians in mid-January about the amount and nature of the radioactive material aboard and also notified NATO allies, Japan, Australia, and New Zealand. After Cosmos 954 fell, U.S. authorities released few details and, Leitenberg contends, never pointed out that at least five other space objects carrying some kind of radioactive materials have re-entered the earth's atmosphere since 1964. Three were U.S. satellites without reactors but using plutonium-238 as a power source; two were Soviet space vehicles carrying unspecified radioactive materials.

While the United States has only one satellite now in orbit containing a nuclear reactor, there are orbiting the earth between 24 and 32 U.S. and Soviet satellites that contain some sort of radioactive substance.

None of the proposals currently before the United Nations to ban nuclear reactors in space or provide "fail-safe" methods for keeping radioactive materials from re-entering the earth's atmosphere will effectively limit the number of satellites carrying some form of nuclear material. With satellite programs growing and antisatellite systems likely soon to follow, Leitenberg warns that we can expect more frequent and more serious Cosmos 954–type incidents.