They thrive on chaos. Fleming let experiments pile up in his laboratory for three weeks at a time, in the hope of collecting interesting types of bacteria. A scientist must also be capable of leaping to grand conclusions from trivial premises. Biochemist Albert Szent-Györgyi based his discovery of how organisms use oxygen on the fact that, when bruised, lemons stay yellow and bananas turn brown. The reason: Lemons have ascorbic acid (vitamin C), which reacts with oxygen to prevent decay. From this premise, he extended his research to a formulation of how respiration works. "Discovery," Szent-Györgyi wrote, "consists of seeing what everybody has seen and thinking what nobody has thought."

The best scientists learn how to "surprise themselves purposely." Hence, Root-Bernstein deplores the fact that today most U.S. science courses test students' abilities to reach *predictable* conclusions. How can the next generation of scientists make discoveries, he asks, when all they are taught is how to verify what is already known?

RESOURCES & ENVIRONMENT

Back to Nature?

"From Promenade to Park: The Gregarious Origins of Brooklyn's Park Movement" by Daniel M. Bluestone, in *American Quarterly* (Winter 1987), Johns Hopkins Univ. Press, 701 West 40th St., Ste. 275, Baltimore, Md. 21211.

Most scholars have assumed that urban parks were established to satisfy city-dwellers eager to create pastoral oases in the middle of the bustling metropolis. For example, Lewis Mumford, in *Sticks and Stones* (1924), argued that such parks were designed as a "means of escape" from "the soiled, bedraggled works of man's creation."

Bluestone, a historian at Columbia University, disagrees. Urban parks, he contends, were established to help city-dwellers enjoy crowds, not avoid them. Witness the genesis of parks in 19th-century Brooklyn, New York.

There, during the early 1820s, the preferred Sunday recreation was the "promenade," a stroll along the shore of the East River in semirural Brooklyn Heights. As Brooklyn Heights became built up, however, new landowners put up fences, denying promenaders access to the once-communal waterfront. Led by the *Long Island Star*, citizens began to call for a *public* promenade. Otherwise, warned an 1830 *Star* editorial, Brooklynites would have "nothing to give us a unity of feeling."

The promenade was never built; but 11 public squares were created, and, in 1847, after a campaign led by poet Walt Whitman (then editor of the Brooklyn *Daily Eagle*), a park was established at Fort Greene. When it proved too small for Brooklyn (America's third largest city in 1855), officials hired architect Frederick Law Olmsted (1822–1903) to design a larger communal site.

Olmsted, the noted planner of Manhattan's Central Park, envisioned Brooklyn's 526-acre Prospect Park, which opened in 1866, as a *mixture*

of urban and rural settings. Promenades, arcades, refectories, and bandstands alternated with areas inaccessible by carriage to produce what Olmsted described as a "concourse of animated life." The goal was not Arcadia, but an attractive and diverting "spectacle."

Nor did the people who flocked to Prospect Park for concerts and ice cream seek unspoiled nature, according to Bluestone. He agrees with architect Horace Cleveland, who wrote in 1889 that "to the great mass of the so-called cultivated people, nature has no attraction except when aided by the merest clap traps of fashionable entertainment."

Feeding the Third World

"Feeding the Earth: An Agroecological Solution" by Michael J. Dover and Lee M. Talbot, in *Technology Review* (Feb.-Mar. 1988), Massachusetts Institute of Technology, Cambridge, Mass. 02139.

The high-tech Green Revolution of the 1960s and '70s enabled some Third World nations (India, the Philippines) to increase food production. But the United Nations Food and Agriculture Organization predicts that, despite these successes, 64 countries—29 in Africa—will be unable to feed their people by the year 2000 using present farming techniques.

For most such countries, say consulting ecologists Talbot and Dover, traditional farming methods, carefully modified, remain the best hope. Misapplied "industrial methods" not only damage fragile ecologies, but are also too costly.

In Sri Lanka, for example, "modernization" saw the tractor replace the water buffalo as the farmer's main power source. An annual saving of eight to nine "worker-days" per acre resulted. But cash expenses climbed: Fuel prices skyrocketed; the milk and curd once produced by the buffalo had to be purchased; inorganic fertilizers were needed to replace animal dung and urine. Buffalo wallows that once yielded 350 to 400 pounds of edible fish per acre were removed; some of the fish had helped control malaria by eating disease-carrying mosquitoes. The wallows had also been home to snakes and lizards that fed on the rats and freshwater crabs that destroy crops and levees.

The authors suggest that Third World farmers be taught to refine, not eliminate, time-honored practices. For instance, "polyculture"—the combining of crops—increases yields. In Mexico, it was found that 4.33 acres of maize must be planted to equal the amount of food grown on 2.5 acres of maize, beans, and squash.

In Africa, Sudanese farmers who leave their *Acacia albida* trees in place raise crops of millet for 15 to 20 years; without the trees, whose leaves fertilize the soil and provide fodder and shade for cattle, fields are exhausted in three to five years. In Rwanda, West German researchers have developed a "mixed crop-tree system" combining eucalyptus trees, coffee, maize, and other species; it provides firewood, plus 54 percent more calories, 31 percent more protein, and 62 percent more carbohydrates than do one-crop fields.

In most of the Third World, the authors believe, aid programs should "substitute indigenous resources for imported industrial ones."