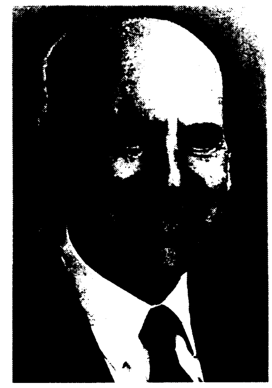
Courtesy: Lasker Foundation

Köhler

Lauterbur

Milstein

Potter



Heimlich

cell tumor that produced antibodylike molecules, and later found that some of these tumors produced a single kind of antibodylike molecule. Milstein and Köhler brought the concept into the realm of mass production with a seminal paper published in 1975 describing the fusion of a normal antibody-producing cell with a malignant one, resulting in a dedicated antibody-producing factory with the immortality of a tumor cell.

Using a normal cell gives control over the product — a mouse can be immunized with a specific substance, and when its antibody-producing cells are fused with malignant cells, hybridomas producing monoclonal antibodies against that substance can be selected.

In one of the understatements of modern science, Milstein and Köhler noted at the end of their paper that "such cultures could be valuable for medical and industrial use." Monoclonal antibodies are becoming widely used in medical diagnostic tests (SN: 5/7/83, p. 296), with people now talking of a billion-dollar market.

Lauterbur's award was also for a finding that turned out to have great clinical significance. Lauterbur, of the State University of New York at Stony Brook, figured out how to convert NMR data into a three-dimensional picture. While NMR had been a powerful spectroscopic tool for biologists and chemists, divulging the concentrations of compounds in molecular environments such as the body or a solution, it was Lauterbur's work that turned the process into an imaging system that gives clearer, more detailed pictures of the human body than X-rays or CT scans and allows clear visualization of soft tissue and bone marrow.

Heimlich, of Xavier University in Cincinnati, received his award for a finding that was immediately practical. In the early 1970s, he became aware of the large number of choking deaths. He checked the medical literature and found that what *shouldn't* be done when a person is choking is to slap them on the back, reach in and dislodge the object, or shake the person upside down — exactly what was commonly recommended. He reasoned that compressing the air in the lungs would dislodge an object, and after successfully testing the procedure on animals he published his findings in 1974, describing how a quick upward thrust to the diaphragm dislodges an object.

Heimlich is now working on a new means of providing oxygen to people with chronic lung disease. Currently, many people with diseases such as emphysema, pulmonary fibrosis and black lung disease are tethered by a tube in their nose to an oxygen tank. Heimlich's new system incorporates a small catheter inserted through the neck into the trachea. The process uses less oxygen, and is more easily portable and far less noticeable. He expects to publish soon on initial trials in 150 people. — *J. Silberner*

Trickle-down effects of carbon dioxide rise

As carbon dioxide levels go up, so will the global temperature. That's the longstanding prediction — dubbed the greenhouse effect — affirmed by a 1983 National Academy of Sciences report (SN: 10/22/83, p. 260). But the total repercussions of the atmospheric carbon dioxide rise — triggered by fossil fuel combustion — are less certain and still under analysis. Two recent studies have looked at two environmental factors likely to be affected by the increase: river water supplies and insect appetites.

River levels in certain areas could rise dramatically in a carbon dioxide-enriched atmosphere, according to a report in the Nov. 1 NATURE, because of more runoff from soils. When carbon dioxide levels rise, plants tighten their leaf pores and transpire less, so they don't draw as much water from the soil.

Sherman B. Idso of the U.S. Water Conservation Laboratory in Phoenix and Anthony J. Brazel of Arizona State University in Tempe included a measure of this effect in their calculations of runoff into 12 Arizona streams. They estimated the amount of vegetation near the drainage basins, then calculated its effect on runoff if carbon dioxide levels were doubled. Even when Idso and Brazel included the drying effect of a "greenhouse" temperature increase, they figured that stream flows could increase 40 to 60 percent because of reduced plant transpiration.

This estimate contrasts with the one included in the 1983 report that calculated about a 50 percent *decrease* in western river water supplies in general. That study, says coauthor Paul E. Waggoner of the Connecticut Agricultural Experiment Station in New Haven, showed the influence on rivers of higher temperatures and less rain that would accompany the greenhouse effect. For the Colorado River, which receives most of its runoff from snow-covered mountains and is a major water source for the West, there is little effect from plant transpiration, although, Waggoner concedes, greener river basins might be altered to a greater degree.

Idso and Brazel write that the amount of vegetation — and however it might change in a high carbon dioxide atmosphere — is difficult to measure exactly. According to a forthcoming report in the December ENVIRONMENTAL ENTOMOLOGY, yet another factor to complicate that measurement might be insect feeding. Caterpillars, it seems, will eat more leaves from plants grown in high carbon dioxide atmospheres.

Boyd R. Strain of Duke University in Durham, N.C., and colleagues grew soybeans in greenhouses with different concentrations of carbon dioxide, then fed the leaves to larvae of a soybean pest. They found that the insects ate 80 percent more of leaves grown under the levels of carbon dioxide (about 600 parts per million) projected for the next century.

The reason, according to the study, is less nitrogen. Given lots of carbon dioxide, plants will photosynthesize more, but this dilutes the amount of nitrogen per leaf—a necessary nutrient for any organism — so the caterpillars eat more. "This suggests," the authors write, "that the increased levels of plant productivity at higher carbon dioxide concentrations may be offset by higher herbivory [insect feeding] and could even be reduced below the current levels."

— *C. Mlot*

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