

Moses and the birds

“. . . and there went forth a wind from the Lord, and brought quails from the sea and let them fall by the camp . . . two cubits high upon the face of the earth" [*Numbers, 11:31*].

The quotation describes the birds delivered to the Israelites as they wandered over the desert with Moses after leaving Egypt. It also describes a still-occurring phenomenon which Dr. Samuel Bessman, chairman of the pharmacology department of the University of Southern California, is going to try to explain.

Dr. Bessman, a specialist in sugar metabolism, says the birds, a migrating species of quail, fly some 1,500 miles from Europe, arriving in Gaza every September. Because of larger competing species of birds along the way, the quail go without nourishment for the entire trip. When they arrive, they fall exhausted, sometimes in piles, along the Gaza beaches.

Even more remarkable, says Dr. Bessman, is that 12 hours later, they somehow generate enough energy, without having taken any nourishment, to resume their journey.

This September, Dr. Bessman plans to use a machine he invented, to measure the intermediates of sugar metabolism in the birds' muscles and blood. He has arranged for Israeli military protection while in the dangerous region.

His speculation is the birds may be able to synthesize carbohydrates from the protein in muscle tissue. But this does not explain, he adds, why the birds' muscles show few signs of emaciation.

He says the work may be particularly useful in studying the biochemistry of death—which, in part, is the result of too long a period of an energy deficit, or, more simply, of exhaustion.

Environmental blackmail

Threats by companies that they will have to close down factories if pollution laws are enforced is "environmental blackmail of the worst sort," says I. W. Abel, president of the United Steelworkers of America in the August issue of *ENVIRONMENTAL SCIENCE AND TECHNOLOGY*.

Records of employers making such threats should be subject to subpoena by the public, including unions, Abel says. Then public hearings could be held to determine the validity of company claims that pollution control cannot be afforded.

According to Abel, many obsolete plants use environmental control as a "public relations tool to justify a production decision to terminate operation and rationalize past failures to modernize facilities."

Sharks are from the Atlantic

It had been thought for years that the sharks, sawfish and tarpon in Lake Nicaragua's fresh water were descendants of Pacific species that had become landlocked in a geologic upheaval. This assumption has been questioned in recent years by zoologists who have pointed to similarities between the Lake Nicaragua species and Atlantic species.

The University of Nebraska and the U.S. Bureau of Commercial Fisheries, under contract to the Office of

Naval Research, carried on a shark-tagging program which indicates that the sharks migrate up the Rio San Juan and other rivers from the Caribbean. Dr. Thomas B. Thorson of the University of Nebraska reports on the study in the June 1 *COPEIA*.

In 1969, says Dr. Thorson, three sharks earlier tagged on the east coast of Costa Rica were recovered in Lake Nicaragua. One, with an ultrasonic tag, was recorded on a monitor on Aug. 1, 1969, where Rio San Juan leaves the lake's eastern end. A total of 38 sharks were tagged at Caribbean river mouths between July 7 and 29.

The studies indicate the sharks also migrate back to the ocean, although Dr. Thorson says individual sharks may stay in the lake for long periods.

Garbage by pipeline

Environmentalists' ultimate goal for garbage disposal is complete recycling; all materials, including even human wastes, would be prepared in various ways for re-use. Research and development of recycling techniques are getting increasing attention and financial support.

But the problem of collecting solid wastes and transporting them to processing centers—or, currently, to landfill dumps—is a serious one, partly because of the labor-intensive nature of present systems.

The July 26 issue of *CHEMICAL ENGINEERING* reports on a Stanford Research Institute study of piping of solid wastes, a technique that is increasingly attractive because of its capital-intensive nature.

There are three possibilities: slurry pipelines, pneumatic pipelines, and pipelines which propel compacted "slugs" of garbage.

The prime candidate, say the researchers, is the "slug" method (which, like the slurry method, would use water as a propellant) but the other techniques might also be used in an integrated system.

No more dirty birds

Cleaning waterfowl soaked with oil from spills has been singularly unsuccessful; almost all the birds cleaned die anyway.

The National Wildlife Health Foundation of Pleasant Hill, Calif., says it has come up with the first successful technique for cleaning the birds.

The problem in the past has been that all cleaning agents tried were difficult to rinse from feathers. The residues left were hydrophilic, or water-attracting, and they thus destroyed the natural water repellency of feathers. Then the birds died of exposure.

Dr. Allen Pittman of the U.S. Department of Agriculture Western Regional Research Laboratory, working with the NWHF under a Standard Oil Co. grant, says use of an isoparaffin solvent to remove oil, followed by application of an oil-wax mixture, waterproofed the birds in laboratory tests. Next step will be field tests.

Scientists have disagreed about the reasons for the natural water-repellency of seabirds. Dr. Pittman says he has demonstrated that feather structure is the prime reason. But the oil-wax mixture apparently serves as a temporary substitute repellent device.