

CHLORINATED PESTICIDES

Eggshell defects photographed

DDT and other chlorinated pesticides have rendered some large bird species nearly extinct. The pesticides interfere with calcium metabolism and cause eggshell thinning. The shells break before the embryos mature.

Using a scanning electron microscope, Dr. L. Z. McFarland and R. L. Garrett of the University of California School of Veterinary Medicine at Davis have precisely located and photographed the structural defects in the eggshells of Japanese quail that were fed DDT.

The two scientists say the middle layer of the multi-layered eggshell contributes the most toward structural strength, and it is this layer which was most adversely affected by DDT. The pesticide was added to the bird's food in amounts comparable to those that might be ingested under natural conditions.

The two researchers plan similar work with polychlorinated biphenyls. This is a group of chlorinated hydrocarbons with wide industrial uses that has also been implicated in eggshell thinning.

THERMAL EFFECTS

Forest irrigation feasible

A serious problem of steam-turbine electric generation, whether nuclear or fossil-fueled, is the discharge of excess heat. Transferred into waterways, the heat can have adverse effects on the ecological balance.

Battelle Pacific Northwest Laboratories reports that Dr. Bruce W. Cone of its staff has shown a good probability for the economic feasibility of using water heated in the Atomic Energy Commission's Hanford, Wash., reactors to irrigate a 100,000-acre hardwood forest on the Hanford Reservation.

The forest would provide hardwood chips to be processed in an adjacent pulp mill. The heated water would thus be put to useful work without polluting the Columbia River.

DEEP DIVING

Respiratory heat loss limiting

The problems associated with deep dives in oceans are large and numerous. Helium has to be substituted for nitrogen in breathing gases, for instance, because of nitrogen narcosis. But that does not end the problems.

Hyperbaric research done for the Office of Naval Research and the Navy Bureau of Medicine and Surgery by Westinghouse Corp., shows that respiratory heat loss by divers at great depths may exceed heat produced by the body. Thus, say the researchers, unless the gas mixture breathed can be heated, respiratory heat loss will sharply limit the deep dives.

Aquanauts "Skip" Zeller, Ken Conda and Bill Armstrong were the subjects for the Westinghouse tests, conducted at the company's hyperbaric facility on Chesapeake Bay. Most tests were conducted at the pressure of 850 feet of water but there were simulated "excursion dives" to 1,000 feet. The divers spent 23 days in the chambers, including 10 days for decompression.

There are two reasons for the greater respiratory heat loss at great depths. One is that temperatures are

lower at these depths. The other is that helium has a higher heat-transfer ratio than heavier gases. This increases as the pressure is increased.

Also tested in the experiments were helium effects on speech and other physiological effects of deep diving. The Westinghouse Abalone rebreather system, a completely closed system that scrubs CO₂ from exhalations and recirculates oxygen and the expensive helium through the divers' lungs, was also tested.

SOIL CONSERVATION

A tale of two watersheds

Poor conservation of soils in grazed, farmed, strip-mined or timber-production areas has cascading effects. Silt runoff from eroded land clogs waterways and reservoirs far downstream.

Edgar Baumann of the Soil Conservation Service in Pendleton, Ore., reports in the May SOIL CONSERVATION magazine that poor conservation practices in one eastern Oregon watershed destroyed a downstream reservoir and irrigation project. He also reports that good practices in a nearby project assured that project's survival.

McKay Reservoir, the successful one, was built by the U.S. Bureau of Reclamation in 1920 to supply irrigation water to 18,000 acres. Almost no sediment has accumulated in the reservoir, and it continues to provide irrigation water. The prime reason: In the McKay watershed, the 12,000 acres of dryland farms practiced good conservation, including stubble-mulching, strip-cropping, slope tillage and use of diversion waterways with grassed slopes. On the remaining 107,000 acres in the watershed, most of it timber and grazing land, conservation-oriented grazing and timber management practices were followed.

But in the watershed feeding the Furnish-Coe Reservoir, built in 1909 on the Umatilla River, there were thousands of acres of dryland crops unprotected by conservation practices. Five years after the dam was built, the reservoir filled with silt and was no longer usable for irrigation, Baumann reports.

THREATENED SPECIES

Alligators could be "belly-printed"

Whether the alligator in the southeastern United States is in danger of extinction is a matter of contention. But one thing is certain: There is no excess; one estimate is that there are about a million alligators in the region, a fairly small population.

John S. Street of the University of Florida has come up with what he believes to be a surefire way to stop poaching of alligators and to protect legitimate alligator farmers.

Street says that the pattern of belly scales for every alligator is unique. His suggestion is that dealers would be required to maintain identification—in the form of a photograph of the belly—of every alligator wherever it was shipped and as long as the hide was intact.

Authorities then would be able to identify any unregistered hide. Street's proposed system has been studied by fingerprint experts, who say it would be foolproof if properly organized.