

biological sciences

Gathered at the American Institute of
Biological Sciences meeting in Columbus, Ohio

POLLUTION

Algae may combat pesticide

One of the more serious threats posed by overuse of pesticides is to aquatic environments.

The majority of these chemicals, not easily broken down by natural processes, end up being washed into streams. There they are concentrated in the bodies of marine organisms, more and more as they move up the various aquatic food chains, breaking down and losing toxicity only slowly, until eventually they are concentrated enough to injure or kill something.

A blockade of this process is proposed by Dr. R. A. Sweeney, Director of the Great Lakes Laboratory of the State University College of Buffalo, N.Y. He finds that two species of algae, *Chlorella vulgaris* and *Chlamydomonas reinhardtii*, are able to metabolize the pesticide lindane, causing its disappearance from contaminated water nearly five times faster than normal.

Dr. Sweeney suggests that by inoculating a lindane-contaminated water supply with these algae, the water could be made less toxic or, with caution, algae might be introduced into drainage ditches around treated fields.

POLLUTION

Crops and forests as sewage filters

The most difficult problem faced by sewage treatment engineers is the removal of nitrogen and phosphorus compounds. Available methods are difficult or expensive, or both. As a result, such compounds most often are discharged in the effluent, to overfertilize and upset the ecology of the receiving waters.

Dr. Herbert Cole Jr., a Pennsylvania State University plant pathologist, discussed an approach to the problem that is being tested there by soil scientist Dr. Louis T. Kardos and associates. The system diverts effluents to irrigation of forest and crop lands (SN: 1/7/67, p. 5).

Both higher plants and soil micro-organisms appear successful in metabolizing nitrogen, phosphorus and organic compounds found in waste water. The program has been under way five years and so far there has been no signs of overfertilization or poisoning of the land by trace compounds. Clean water is returned to the ground water table instead of being lost to rivers and estuaries.

CONSERVATION

Overprotection can spoil species

In the fight to protect threatened species from extinction, the most usual approach has been simply to relieve the species from as many threats, both natural and man-made, as possible. The logical extreme of this proposal, often advocated and put in practice, is to depend on zoo stocks of the species which can be kept and bred under controlled, benign conditions.

These conditions, however, may be so benign as to rob the species of its genetic diversity and man of the valuable resource embodied in this diversity, warns Dr.

Frederick E. Smith of the University of Michigan, a member of the executive committee for the U.S. part of the International Biological Program.

Dr. Smith says that in the protected, uniform, controlled environment "many genes become useless and tend to disappear. Only in the un-managed, high-risk, variable natural system can the full diversity of genes be preserved." This diversity is becoming increasingly important to man, he says, noting that the United States spends millions annually screening wild species in a search for new genes to breed into domestic stocks.

"For this reason alone we are concerned with the conservation of whole ecosystems, the only systems in which species maintain the genetic heritage of their past."

EMBRYOLOGY

Gestation may depend on day length

The pacing of the biological clock in almost all organisms has been much studied and discussed. Now there is evidence that this circadian rhythm may also operate in unborn animals, pegged on the length of the day.

Dr. Dale Clayton of Michigan State University in East Lansing reports experiments with fruit fly eggs incubated in closed boxes with varying light-dark cycles.

Larvae from eggs exposed to the longer cycles are found to emerge later than larvae from short-cycle eggs. Larvae from other batches of eggs, exposed either to constant light or constant darkness, show much higher mortality rates. Furthermore, unexpectedly, the length of the twilight period between the artificial dawn and dusk strongly affects time of emergence.

Dr. Clayton believes his results may indicate that regularity of habits during pregnancy are much more important than is generally supposed, and that interruption of the rhythm might produce deformities.

ORNITHOLOGY

Canaries think nesting a song

Unfortunately for romance, bird song is not an expression of the joys of being a bird. Birds, particularly males, sing mainly during the breeding season. The primary purpose is to stake out a breeding territory and establish the singer as a suitable mate. Other males are warned away at the same time as unmated females are attracted.

Not so easily explained, however, is the fact that singing often continues unabated after pairs are formed and mating and nesting are well along. The Rev. James A. Mulligan, S. J., assistant professor of biology at St. Louis University, suggests that continued song has an important bearing on the success of a breeding attempt.

In a study of canaries Father Mulligan compared the nesting successes of a group of surgically deafened hens with controls. It was observed that the operated birds took an average of 12 to 13 days to complete a nest, the normal birds five. In two instances the deaf birds built no nest at all. Both groups laid their first eggs about two days after the nest was complete.