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Scientists find new danger to life chain

By ALAN MASSAM

A GROUP of scientists, working in a remote laboratory on the North Yorkshire coast, have made a discovery which has profound implications for mankind.

It is that pollution—an inevitable product of all industrial processs—affects living things at much lower concentrations than was previously thought.

This means that, even in areas of no apparent pollution—that is places where known pollutants cannot be detected—quite fundamental changes in the ecosystem may be taking place.

MAN'S SURVIVAL

The ecosystem is the complex and delicately-balanced structure of animals and plants and how they inter-relate. Maintaining it is of fundamental importance to the health, indeed the very survival, of the most specialised of animal species, man.

At Leeds University's Wellcome Marine Laboratory, Robin Hood's Bay, Yorkshire, marine biologists John Gray and Ronald Ventilla and their colleagues have been studying this overall picture in relation to pollution.

Gray and Ventilla decided to concentrate their attention on lower forms of life, the protozoa (single-celled creatures just visible through a microscope).

Man is dependent on protozoa because, through what the biologists call the food chain, it provides essential nutrients which keep him alive.

Marine protozoa exist at the second stage of a food chain. They live on the simplest of all life forms the bacteria, and in turn provide food for worms and snails.

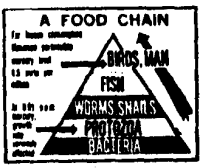
MAN AT THE APEX

The worms and snails are the food of fish which in turn provide food for birds and man. So this food chain starts with bacteria at the bottom of a natural pyramid and ends with birds and man at the apex.

Most pollution research so far has been concerned with the influence which pollutants have on the higher animals in the food chain so Government agencies have been able to set limits or "permissible levels" of toxic substances which they will allow to escape into the environment.

The recent tuna scare illustrated this when stocks of the fish in the United States were withdrawn because they contained more than the permissible limit of mercury at 0.5 parts per million.

A tuna fish appears to live and reproduce quite normally carrying this level of mercury,



but doctors consider that it would be dangerous to eat because mercury accumulates in tissues as it moves up the food chain.

The experiments of Dr. Gray and Mr. Ventilla, however, have shown that at levels as low as .01 parts per million—a concentration lower than most sophisticated apparatus could actually detect—mercury has a serious effect on the protozoa breeding rate.

And at 10 times higher a concentration—still only one-fifth of the allowable level in fish—the protozoa die.

COMBINED EFFECTS

The sea is often regarded as a potentially rich source of extra protein, yet we are currently using it as a dumping ground for every waste product under the sun.

Dr. Gray says: "The public has been made aware of the dangers of mercury pollution in the sea (tuna fish). Our results have shown that on very low concentration mercury is highly toxic, and is even more toxic when mixed with lead or zinc. In the sea, itself, these chemicals form only a small fraction of the total of pollutants discharged.

"Amongst these pollutants potentially the most dangerous are the man-made chemicals such as DDT, and P.C.B. which is a by-product of the plastics industry), with which nature has no way of dealing.

"The chemicals themselves are present at exceedingly low concentrations and are for the most part undetectable by present methods. Nevertheless these chemicals may still produce deleterious effects, as the animals in the sea are subjected to the combined concentration of them all.

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