

## 'Reverse transcriptase' does an about-face?

DNA polymerases are enzymes that translate DNA, the genetic material of life, into RNA. RNA then translates the genetic message in DNA into different kinds of proteins. Such activities take place continually in all cells, from the lowly virus or bacterium up to man. Several years ago researchers found that one kind of DNA polymerase was able to do the opposite—make DNA out of RNA. They named the enzyme "reverse transcriptase." Because such an action runs counter to orthodox biology, it created considerable excitement. Now it looks as if some DNA polymerases might be able to act both in the standard and reverse way.

In the March 21 *NATURE NEW BIOLOGY*, Lawrence A. Loeb and his colleagues at the Institute for Cancer Research, Fox Chase, Philadelphia, report that a DNA polymerase taken from bacteria can make DNA from RNA in the laboratory. The enzyme used the same building blocks and magnesium ion catalyst that some reverse transcriptase enzymes use. But the bacterium enzyme has also given evidence, when present in a bacterium, of transcribing DNA into RNA. So it looks as if DNA polymerases, or at least this particular one, might be able to fulfill two functions—make RNA from DNA, and vice versa.

## Structure of sickled hemoglobin

Sickle cell anemia is a fairly common disease among blacks. It is due to a mutation in the globin gene that causes one pair of amino acids to be replaced in the hemoglobin molecule. This replacement makes hemoglobin clump and disrupt red blood cells, so they become sickled.

If a method could be found to keep abnormal hemoglobin from clumping, it might lead to a possible therapy. But first the structure of abnormal hemoglobin must be understood. J. T. Finch of the Laboratory of Molecular Biology in Cambridge, England, and colleagues there and at Columbia University now report that they have deciphered the structure. Their results are in the March *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES*.

They found that sickled hemoglobin aggregates into long, straight fibers that may extend most of the length of the red blood cell. Each fiber is a tube of six thin filaments. Each filament is a string of single hemoglobin molecules linked end to end at intervals. Such filaments rarely appear in normal adult red blood cells, and when they do, it is in much lower concentrations than in sickled cells.

## Cystic fibrosis and mucus clearance

Cystic fibrosis, an inherited disease, is typified by chronic respiratory infection and lung obstruction. Obstruction is thought to result from the resistance of mucus to be cleared from the lungs. Although the abnormality of mucus is still controversial, various studies have produced some evidence in favor of chemical differences and of physical abnormalities of mucus in patients with cystic fibrosis. But there has been little information about the transport and clearance of mucus from the lungs of these patients. So Joaquin Sanchis and his colleagues at St. Joseph's Hospital in Hamilton, Ontario, studied the removal of mucus from the lungs of 13 children with cystic fibrosis, compared with clearance in nine healthy adults.

They report in the March 29 *NEW ENGLAND JOURNAL OF MEDICINE* that the cystic fibrosis patients not only matched but surpassed healthy persons in mucus clearance. The authors conclude that in adequately treated patients, lung clearance of mucus is well maintained.

## A deadly peacock for Panama

Like a tough new kid in town who sends all the local bullies running, the peacock bass is raising havoc in the quiet lakes and streams of Panama. Through a strange chain of environmental events, this newly introduced predator, technically called *Cichla ocellaris*, may wind up bullying man also.

Ecologically, *Cichla* comes from a rough neighborhood, the Amazon basin, where survival depends on aggressive attack and sustained pursuit. There the Indians call him *pavon*, "The Peacock," and have made him famous as the best fighting, best-tasting sport fish in South America.

Aware of this reputation, a Panamanian developer stocked the private lake of his new housing complex with *Cichla*. Sportsmen later moved some of the fish to the pond of a cement plant, from which they were washed into local lakes and rivers by floods, giving Panama new popularity as a "fisherman's paradise."

Now trouble has begun to develop. The peacock bass is such an efficient predator that some species of smaller fish are endangered, along with the animals that depend on them. As the population of a fish called *Melaniris* has decreased by half, the great tarpon that come from the sea to feed on them have also decreased. Young black terns, which perch on stumps and channel buoys to feed on the *Melaniris* leaping from the water to escape the tarpon, are no longer common where *Cichla* stalk their prey.

The most immediate threat to man comes from the virtual extinction of the *Gambusia*, or "mosquito fish," so called because of its welcome habit of eating mosquito larvae. The two University of Washington ecologists now attacking the problem, Thomas Zaret and Robert Paine, say the mosquito population of Panama may be rising, and malaria, which was first controlled there during construction of the Panama Canal, may once again become a scourge.

## Radioactive pollution in the Far North

The Swedes called them "Lapps," or nomads, those high cheeked, Mongolian wanderers driven ever farther north and west by fiercer tribes. Finally they found their land of peace in the barren arctic regions of Scandinavia, where many of them still roam with their herds of reindeer. But radiochemists from the University of Helsinki have found the Lapps threatened by an invisible contaminant in their pristine wilderness.

Reporting in *ARCHIVES OF ENVIRONMENTAL HEALTH*, Tua Rahola and Jorma Miettinen show that because of their unique food chain, the Lapps are subjected to some of the world's highest doses of radiation from fallout. Though fallout from atmospheric testing does not pollute the atmosphere of Lapland much more than anywhere else, the lichens that make up 90 percent of reindeer winter diet concentrate the long-lived isotope cesium 137. Over a period of years, herders who eat the reindeer may receive as much as 40 times the radiation dose from the isotope as temperate zone dwellers.

The results of the study have important implications for the roughly one million people of the world who live above the Arctic Circle.

## Obituary for 'Junior'

Dead, at the ripe old age of 15 years, 7 months, "Junior," longest living king cobra on record, at the Bronx Zoo, after a prolonged illness. Deceased was a bachelor—having eaten all prospective mates.