

## BIOLOGY

# Crowding Brings Anxiety

Anxiety due to overcrowding in animal populations causes chemical changes in the body, thus reducing the production of antibodies and increasing susceptibility to disease.

► AS THE POPULATION increases, overcrowding appears to touch off chemical changes within a person, cutting down his ability to fight disease. This is apparently a natural method for halting the population explosion.

The crowding of any animal population, including man, increases the disease and ultimately the death rate, a study indicates. The anxiety produced by crowding appears to release hormones that reduce production of antibodies, the substances carried by the blood to battle infections.

Two researchers, studying the crowding of mice, found a correlation between living among crowds and the lack of ability to ward off diseases.

Stephen H. Vessey and Prof. David E. Davis of the zoology department at the Pennsylvania State University, University Park, injected mice living in groups of six with beet serum, a substance that normally stimulates production of antibodies.

The mice living in groups produced significantly less antibodies than the mice living alone, Mr. Vessey said.

In another experiment mice were given shots of tetanus toxoid, a protein that causes production of antibodies against tetanus. Ten days later they were injected with tetanus toxin, a disease-producing substance. Some of the mice were placed in groups and others were isolated.

"After the toxin, 33 of the 40 grouped mice died," Mr. Vessey reported. "Only 11 of the 30 isolated died."

Crowding in mice brings an increase in the size of the adrenal cortex and an increase in the output of certain adrenocortical hormones. These hormones interfere with the antibodies, vital in the body's fight against infectious diseases.

Mr. Vessey reported these findings at the Joint Meeting of Biological Societies at the University of Colorado, Boulder.

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## Chagas' Disease Vaccine

► VACCINATION against insect-transmitted Chagas' disease, long thought impossible, is now conceivable, a medical researcher told a Joint Meeting of Biological Societies in Boulder, Colo.

Dr. Frans C. Goble, CIBA Pharmaceutical Company, Summit, N. J., said he and co-workers have developed a vaccine that immunized mice for four months against experimentally produced infection. This gives a ray of hope to more than seven million persons in South and Central America who are afflicted with this often fatal sickness.

Chagas' disease, which usually begins in the first ten years of life, starts by affecting the eye in 25% to 75% of the cases. While

pain is mostly mild, the skin around the eyes reddens and swells.

These first symptoms are followed by two main stages of the disease, acute and chronic. In the acute period, fever strikes, eruptions of various types break out on the skin and the lymph nodes become enlarged. At the later chronic level, serious heart problems become evident.

The new experimental vaccine, which keeps its potency for at least three months when deep frozen, is made by "physically" killing *Trypanosoma cruzi*, the parasite that causes Chagas' disease. Previous attempts at chemically killing the disease-causing parasite have not produced immunity in experimental animals.

Three different methods were used in physically killing the parasite: breaking the parasite cells by pressure, subjecting them to sonic vibration, and violently shaking the cells with small glass beads in a steel cylinder. The last way proved the most successful, Dr. Goble said.

Scientists have been wary of using live vaccine from strains of the parasite because they cannot predict what might happen to humans inoculated with it.

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## Secret of Growth Sought

► IN ORDER to find out how a complex organism develops from one tiny cell, biologists are trying to discover the "program" or "code" contained in the chemical structure of cells.

It is this "program," a biological equivalent of the programs used by electronic computers, that regulates and controls biological development.

Problems facing biologists in this field were outlined by Dr. James Bonner, professor of biology at the California Institute of Technology, Pasadena, before the Joint Meeting of Biological Societies in Boulder, Colo.

Dr. Bonner said biologists today know that the processes of development in complex organisms are controlled by chemical signals. The complex DNA and RNA molecules are present in all cells, and contain the key to every organism's development. Just how they do this is not known, however.

Biologists are trying to learn how the cells are "programmed." Specifically, they want to find out three things:

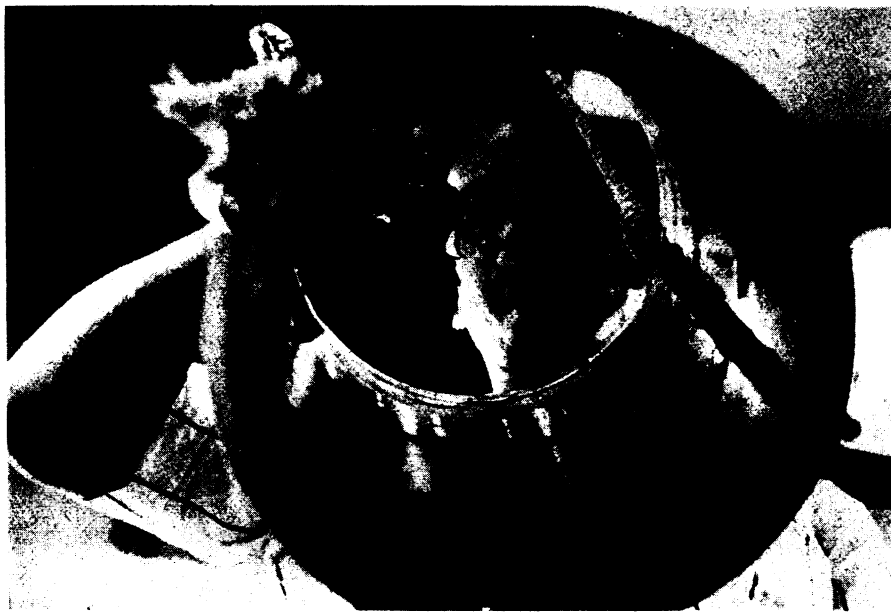
First, what keeps cells from "running wild?" What represses the genes and makes sure that the right type of cells are produced at the right time and place in a developing organism?

Second, how is genetic activity "turned on and off?" What are the chemical signals that operate the genetic control system?

Finally, how do cells know what other cells are doing? How are all the signals and mechanisms coordinated?

Dr. Bonner believes the answer is in a chemical "testing system" whereby cells react to their chemical environment. He thinks the presence or absence of certain chemical stimuli from other cells and from outside the organism control the pattern and sequence of cell development.

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University of Rhode Island

**LOBSTER DETECTION**—Dr. Saul B. Sails, associate professor of oceanography at the University of Rhode Island, has invented an internal tagging system that remains intact even after the lobsters have shed their shells. Here he demonstrates an electronic detector for these lobster tags.