

ZOOLOGY

Female Bats Disappear To Bear and Rear Young

WHAT HAPPENS to the 200,000 bats that disappear every year in southern Indiana and northern Kentucky? John S. Hall, a University of Illinois zoologist who has studied the Indiana cave bat *Myotis sodalis* for the past three years, is still baffled by the mystery of where the females go during the summer to bear and rear their young. During the winter the bats hibernate in caves, hanging to the roof and walls in clusters of as many as 10,000. In mid-March and April the pregnant females disappear.

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MEDICINE

Appendix May Help Save Cancer Victims

THE APPENDIX, long considered an obsolete organ, may have a purpose after all. It may help save cancer victims.

Research conducted by Dr. Dieter H. Sussdorf of the California Institute of Technology indicates that the appendix may play an important role in the body's defenses against infection. This fact is particularly relevant to radiation therapy for cancer, in which high doses of total body radiation often temporarily paralyze the infection-fighting system.

Before the body recovers enough to fight back, bacteria and foreign substances called antigens may run rampant, and the victim may die—not of cancer but of infection. For this reason, paralysis of the antibody-producing mechanism is a major cause of radiation deaths.

By systematically covering with lead shields one organ and then another during radiation treatment for cancer, Dr. Sussdorf found that shielding only the appendix gave greater protection than did shielding of any other organ.

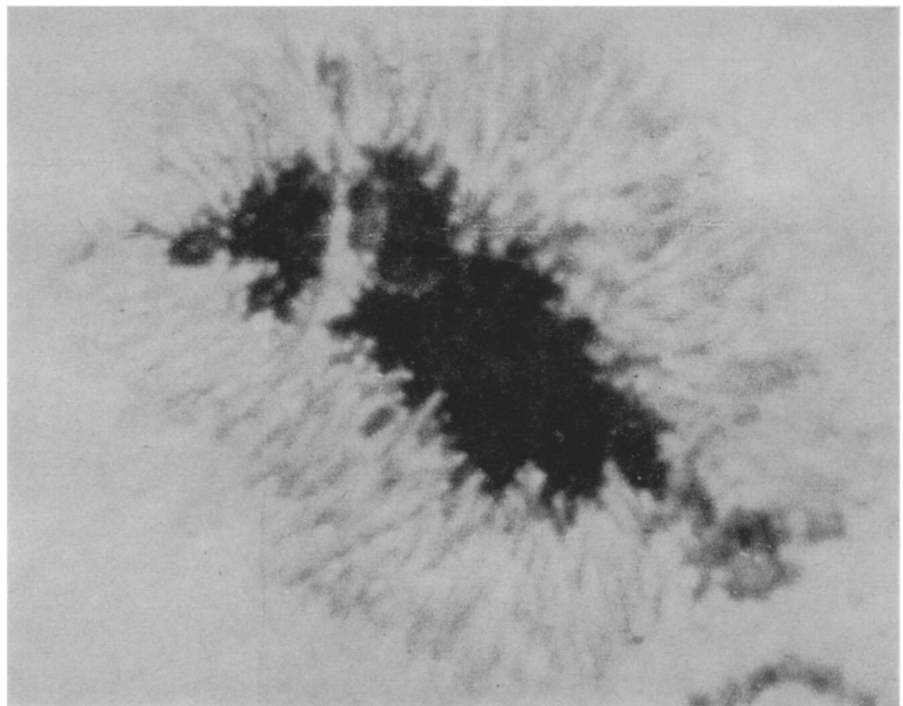
The puzzling thing was that the appendix itself is not directly involved in antibody formation. From this Dr. Sussdorf concluded that the appendix somehow had something to do with the spleen's ability to recover from radiation damage.

The spleen is a blood-storing organ rich in lymphoid tissue and is usually the first organ to react against infection by producing antibodies. After the spleen has triggered the defense mechanism, the lymphoid cells in some other organs and in the lymph glands take up the task.

From a series of radioisotope tracer studies, Dr. Sussdorf found that his reasoning was correct. Lymphoid cells in the shielded appendix migrate to the radiation-damaged spleen, repopulate that organ and manufacture antibodies there. By shielding the appendix and spleen with lead, the dangers of infection after irradiation for leukemia and certain other forms of cancer are reduced considerably.

Dr. Sussdorf began his research at the University of Chicago with Dr. Laurence R. Draper, under sponsorship of the Atomic Energy Commission.

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WHITE DOTS—The dots in the center of this sunspot are shown clearly for the first time. The photograph was taken 80,000 feet above the earth with STRATOSCOPE I, a 12-inch balloon-borne telescope.

ASTRONOMY

Dots in Sunspots

THE FIRST CLEAR PHOTOGRAPHIC EVIDENCE that sunspots, dark-appearing regions on the solar surface, contain white gaseous dots has been obtained from a balloon flown high above the earth's surface.

The photograph was taken by a Princeton University astronomy team, headed by Dr. Martin Schwarzschild, during the final balloon observations last Sept. 24. Earlier flights during last summer produced the clearest sequences of photographs ever taken of the solar surface and the areas immediately surrounding sunspots.

Because sunspots are more than a thousand degrees cooler than the sun's visible surface, or photosphere, they produce much less visible light. A different film was therefore used in the telescope-camera during the final flight to bring out

the characteristics of the umbra, or main dark section.

The white dots in the sunspot are believed to be less than 200 miles in diameter, compared to the 8,000-mile diameter of the umbra in which they were found. The dots may be convection cells.

Although previous astronomical observations had suggested the existence of such dots, clear photographic evidence had never before been obtained.

The photographs were taken with STRATOSCOPE I, a 12-inch balloon-borne telescope launched from Lake Elmo, Minn., in a project jointly supported by the National Science Foundation and the Office of Naval Research.

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ELECTRONICS

Electronic Transmission

AN ELECTRONIC TRANSMISSION method that reduces telegraph and data transmission costs 60% is being tested.

Named "thin route tropo," because only a thin radio band is needed to carry signals to their destination, the new system uses tropospheric-scatter—a method of bouncing radio signals off the troposphere, several miles above the earth—as the main transmission method.

Previous scatter equipments have been thick route systems engineered for multi-

voice channel capacity. This includes the world's longest one-hop scatter system, a 700-mile Air Force message carrier.

Unlike this Arctic design, which uses 120-foot antennas, the "thin route" employs an antenna only four feet wide and eight feet high, weighing less than 50 pounds. The new system on the route between Washington, D. C., and General Electric in Lynchburg, Va., also reduces power cost, as it uses only a 170-watt transmitter.

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