

GENERAL SCIENCE

Warning to Mankind

Dr. Thomas Park, retiring president of the AAAS, stresses the dangers of overpopulation and warns that unless man manages biology it will manage him.

► LEARNING from studies upon millions of flour beetles competing for food and living space in laboratory glass jars, Dr. Thomas Park, University of Chicago zoologist, in delivering the retiring presidential and principal address of the American Association for the Advancement of Science in Philadelphia warned:

"If man does not manage his biology, it will manage him."

Although reluctant to draw direct parallels between insects and men, Dr. Park is apprehensive that the world's human population explosion is very dangerous. Facts that emerge from his studies are:

Overexploitation of scarce resources and intense interference from crowding are perilous and the peril increases as the population increases.

The largest population, if exposed to stress, does not necessarily enjoy the best prospect of survival.

Man, as we all know and pontificate, has the intellectual talent and the technical skill to avoid such coleopterous (beetle-like) hazards.

He has the capacity to manage his own population and, of equal importance, to conserve those myriad other populations on which he depends.

Dr. Park created "an indoor model of an outdoor experience" in laboratory experiments with small flour beetles known technically as *Tribolium*.

Tribolium is one of the oldest insect pests known to man. Remains of the little insects were found in a jar of milled grain entombed with an Egyptian pharaoh more than 4,000 years ago.

While the flour beetles are a major nuisance to the housewife and the grain man, they are suited for ecological and genetic studies. Their habit of living—and multiplying—in flour makes them useful.

In his laboratory, the beetles are kept in glass containers with measured amounts of flour. Every 30 days—the average span of a beetle generation—the old flour is sifted through a series of graded sieves, and a census is taken of the adult beetles and their young to determine how well the population is doing. After the beetles are counted, they are put in another container with fresh flour, and the study continues.

To solve one population problem, Dr. Park and his staff spent four years simply making the observations needed for analysis; 400 individual populations were sifted and examined every 30 days, and some 3,000,000 beetles were counted.

Dr. Park uses two species of flour beetles, *Tribolium confusum* and *Tribolium castaneum*, to find out how each thrives under

varying conditions and what happens when the two species are together.

He has found that when the two species are put together, one is always eliminated, and the other survives and thrives.

When the beetles are tested under varying conditions, he said, "common sense" could predict that "the species superior by itself should retain that superiority when with its rival."

However, by testing the two species under differing conditions of temperature and moisture, he found the prediction was rarely entirely fulfilled.

In a cool, arid climate, for example, the species that did better by itself always proved to be the survivor when both species were together.

But in a cool, moist climate it was the species that did less well by itself that usually survived when the two species were together.

And in a hot, moist climate, the two species did equally well alone—but when they were placed together only the *Tribolium castaneum* survived.

"Competition, even under supervision, is a complex phenomenon," Dr. Park observed. "It is clear that intraspecies processes can be deeply modified by those new types of interference and exploitation which emerge as a consequence of togetherness."

• Science News Letter, 83:3 January 5, 1963

PSYCHOLOGY

Critical Periods Decide Babies' Later Attachment

► THE CRITICAL period for babies as far as social attachments in later life are concerned occurs between about six weeks and six months of age.

Dr. J. P. Scott of the Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine, said that in all highly social animals so far studied there is this critical period when primary social attachments are made. The effect of such a period is to determine which animals will be close social relatives.

Dr. Scott told the American Association for the Advancement of Science meeting in Philadelphia that the critical period in puppies occurs from about three to 14 weeks of age, reaching its peak between six and eight weeks after birth. The emotional disturbance produced by taking a puppy away from its litter mates at this age and adopting it as a pet affects the attachment of puppies to human beings.

Even separating puppies only for overnight during this period makes them become attached to humans more rapidly. Comparing this result with other experiments involving hunger and disciplinary punishment during these stages suggests that any form of emotional arousal speeds up the process of attachment, Dr. Scott reported.

He said the results of his puppy experiments agree with similar experiments on young birds during the critical period, which is known as imprinting in the bird world. Imprinting at the proper time can make a duckling follow a human as if he were its mother.

The critical period mechanism may have evolved, Dr. Scott suggested, because the infant animal of a highly social species must

(Continued on page 4)



Goodyear

AMPHIBIAN—This latest of the "go-anywhere" vehicles was designed by the Borg-Warner Corporation for the Marine Corps. The amphibian military carrier receives its maneuverability from unique tracks composed of 26 high-flotation tires by Goodyear. In water, the tires keep the carrier afloat while the moving track provides propulsion. On land, the strings of tires operate like conventional tank tracks.

quickly form a strong attachment to its own kind if it is to survive. If this process is found in human infants and if it persists into adult life, it will explain many previously puzzling relationships.

Two areas of further research are needed, Dr. Scott said. One is the collection of information on critical periods from as many social species as possible to determine whether or not such a period is a basic law of behavior.

The other is to obtain additional information about human development in relation to education, where the possible existence of critical periods for learning has great practical importance.

• Science News Letter, 83:3 January 5, 1963

MEDICINE

Arthritis Pain Affected By Change in Weather

➤ AT LEAST one type of weather change makes the pain of arthritis worse. When the humidity goes up and the barometric pressure goes down, as happens before a rain-storm, arthritic pain actually does increase.

Many other combinations of weather changes may also affect arthritic patients, Dr. Joseph Lee Hollander of the University of Pennsylvania School of Medicine, Philadelphia, told the American Association for the Advancement of Science meeting in Philadelphia.

Arthritic patients have claimed for years that they could predict weather changes because their pain became worse before storms and cold snaps, but it took scientific tests in a controlled climate chamber (Climatron) to give credibility to what was believed to be an "old wives' tale."

The first studies Dr. Hollander and his assistants made were with changes of one climatic factor at a time. None of the 14 patients tested felt any worse after the change of any single climatic variable. But 10 of 11 arthritic patients who endured the synthetic storm conditions felt worse most of the times such changes were made.

In 29 out of 40 trials, these patients felt worse although they were completely unaware of the timing or type of climate changes arranged by the researchers.

During a four-hour period, the barometer went from a high of 31.5 inches down to a low of 28.5 inches, while the humidity rose from a low of 25 per cent to a high of 80 per cent with a constant temperature of 76 degrees.

In all, 30 arthritics lived in the Climatron for periods of two to four weeks. This study is the first part of a long-range program to discover effects of climate not only on arthritis, but on chest diseases, bronchial asthma and other illnesses. Dr. Hollander's team is working under a grant from the National Institute of Arthritis and Metabolic Diseases, Bethesda, Md.

• Science News Letter, 83:4 January 5, 1963

TECHNOLOGY

Tough Plastic So Good Almost Discarded

➤ WHEN IT WAS discovered a quarter century ago, it was almost discarded because

it was unaffected by any chemical, so slick nothing stuck to it, hot irons would not melt it, electric arcs would not char it and moisture would not rot or swell it.

Now this fluorocarbon resin plastic has won for the Du Pont Company the Industrial Science Achievement Award of the American Association for the Advancement of Science. After the discovery, millions of dollars were spent on research and development. Now, Dr. Samuel Lenher, Du Pont vice president, told the scientists in Philadelphia that this Teflon fluorocarbon and its modifications are used for such applications as:

Artificial blood vessels and heart valves for the human body.

No-stick coatings on cookware.

Bearings and brushings that run for life-time of machinery without lubrication.

Gaskets that withstand even nitric acid. Airtight suits for rocket men that safely withstand flash temperatures of 1650 degrees Centigrade and sustained heat of 260 degrees.

Coatings for building materials that promise to last longer than the two decades so far experienced.

Hoses, seals, insulation and other components of bombers, satellites and industrial products.

In addition to the discovery of the group of fluoroelastomers, Du Pont chemists found how to limit the number of atoms that link together to form a long-chain molecule, creating telomers in contrast to the long-chain polymers of earlier plastics.

Other reports to the annual AAAS sessions included:

Fish are responsible parents, taking care of babies—Prof. George W. Barlow, University of Illinois zoologist.

Arid western America may have to change its ways of living because of a shrinking water supply—Dr. Terah L. Smiley of the University of Arizona.

Expansion of cities and living mostly confined to indoors create new health problems, including monotony that affects mentality, productivity and creativity—Dr. Igho Hart Kornbluh of University of Pennsylvania Graduate Hospital.

• Science News Letter, 83:4 January 5, 1963

SPACE

Magnetic Field of Venus Undetectable by Mariner

➤ VENUS does not have a magnetic field detectable at a distance of 21,594 miles from its surface, the closest point reached by the U.S. probe Mariner II, or from anywhere else along the probe's path.

Dr. P. J. Coleman of the University of California at Los Angeles reported this to the American Association for the Advancement of Science meeting in Philadelphia, the first official result of the Mariner II scan of Venus.

Dr. Coleman said that no rise in magnetic field higher than that of interplanetary space was found by Mariner II as it swept near Venus last Dec. 14. However, he reported that "interplanetary space is not

(Continued on p. 13)

Questions

ARCHEOLOGY—Where is an ancient worship site used by Joseph and Abraham located? p. 2.

CLIMATOLOGY—Where is the world's greatest rainfall in one minute recorded? p. 8.

COMMUNICATION—How many words per minute were transmitted in the world's fastest communication across television channels and telephone lines? p. 5.

PUBLIC HEALTH—What location in the U. S. has an excess of radioactivity in milk? p. 9.

TECHNOLOGY—What plastic is used for such diverse applications as artificial blood vessels and airtight suits for rocket men? p. 4.

ZOOLOGY—How long have beavers been in southeastern New England? p. 6.

SCIENCE NEWS LETTER

VOL. 83 JANUARY 5, 1963 NO. 1

Edited by WATSON DAVIS

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N.W., Washington 6, D. C., NORTH 7-2255. Cable Address: SCIENSERVC.

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00; 3 yrs., \$14.50; ten or more copies in one package to one address, 7/2 cents per copy per week; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage. Change of address: Three weeks notice is required. Please state exactly how magazine is addressed. Include postal zone number.

Copyright © 1962 by Science Service, Inc. Republication of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicated services issued by Science Service. Science Service also produces and distributes THINGS of science (monthly), produces and publishes books, and conducts the National Science Youth Program.

Printed in U.S.A. Second class postage paid at Washington, D. C. Established in mimeograph form March 13, 1922. Title registered as trademark, U.S. and Canadian Patent Offices. Indexed in Reader's Guide to Periodical Literature, Abridged Guide, and the Engineering Index. Member of Audit Bureau of Circulation.



SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees—Nominated by the American Association for the Advancement of Science: William W. Rubey, University of California at Los Angeles; Wallace R. Brode, Washington, D. C. (Treasurer); Douglas Whitaker, Rockefeller Institute for Medical Research. Nominated by the National Academy of Sciences: Harlow Shapley, Harvard College Observatory; Philip Bard, Johns Hopkins University; Henry Allen Moe, John Simon Guggenheim Memorial Foundation. Nominated by the National Research Council: Leonard Carmichael, Smithsonian Institution (President); John R. Dunning, Columbia University; Benjamin H. Willier, Johns Hopkins University. Nominated by the Journalistic Profession: Michael J. Ogden, Providence Journal-Bulletin; O. W. Riegel, Washington and Lee University; Ralph B. Curry, Flint Journal. Nominated by the Scripps Estate: Edward J. Meeman, Memphis Press-Scimitar; Ludwell Denny, Washington, D. C.; Charles E. Scripps, Cincinnati, Ohio (Vice President and Chairman of Executive Committee).

Staff—Director: Watson Davis. Assistant Director: Dorothy Schriver. Writers: Ann Clarke, Ann Ewing, Faye Marley, Judy Viorst, Ruby Yoshioka. Science Youth Division: Joseph H. Kraus, Leslie V. Watkins, Forrest L. Snakenberg. Photography: Fremont Davis. Production: Priscilla Howe, Marcia Nelson. Syndicate Sales: Hallie Jenkins. Conferences: Jane Marye. Librarian: Margit Friedrich. Interlingua Division in New York: Alexander Gode, 80 E. 11th St., GRamercy 3-5410. Advertising Manager: Fred A. Moulton, METropolitan 8-2562, Washington, D. C.