

GERONTOLOGY

Slow Aging for Long Life

► WITH IMPROVED HEALTH and medical attention it may be possible for man to live to an active 80 years plus but not much more unless the clockwork called aging is slowed down.

This is the estimate of Dr. Alex Comfort, Nuffield Research Fellow in Gerontology of the University College, London. He said in San Francisco that gerontologists do not know exactly what this clockwork of age is, but that it may possibly be the loss of cells man cannot replace as he grows older.

"However, if we get in the position where we can interfere with the aging process, there may be no limit to how long we can live," he said.

That women generally live longer than men may be due to the muscular development of the male in acquiring strength hunting for food and protecting the female and young. It is possible the man lost some of his staying power in the process, Dr. Comfort said. It is generally true in all species that the female lives longer than the male. Another reason women live longer could be that the human female was better equipped by nature because she has to take care of the young.

However, some birds have the opposite arrangement, Dr. Comfort pointed out. The bustard quail female has the bright plumage usually found in male birds and it is she who goes courting for a male, not the other way around. When she has laid the eggs, she leaves them for the male to hatch and goes on to look for another mate. It is not known if the male bustard quail looking after the young lives longer than

the female, but such a study might give some interesting clues.

Why some animals live longer than others is also a puzzle gerontologists would like to solve. Goats live longer than sheep but it is not known why. It has also been found among 8,000 race horses, studied by Dr. Comfort and comprising all the animals foaled and registered in the General Stud Book of Race Horses going back to about 1790, that progeny of long-lived mares and stallions tend to be long-lived. Another interesting fact emerging from the same study was that progeny of old stallions were not shorter lived than those of young stallions.

Dr. Comfort remarked that fish keep growing all their lives and stay fertile until they die, but stories telling of carps several hundred years old are myths. Carps do not usually live to be more than 50 years old. Sturgeons are the longest-lived fish which endure to a probable 120 years plus. Halibuts are capable of living to at least 70.

No mammal is known to live longer than man. The closest competitor is the Indian elephant which gets to be 70 plus years old. The longest lived animal known from authentic records is Marion's Tortoise (*Testudo sumeirii*), known to have lived more than 150 years. The species, said Dr. Comfort, is probably extinct now, but he suspects that the tuatara also lives as long.

Dr. Comfort addressed a symposium on the Flow of Life in a session on aging. The meeting was sponsored by the Kaiser Foundation Hospitals in northern California.

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BIOPHYSICS

Ultrasonic Diagnosis

► ULTRASONOGRAMS (pictures taken with ultrasound) are a thousand times safer genetically than X-rays as a diagnostic tool, a team of scientists from the Columbia Presbyterian Medical Center working with a bioengineer from the University of Pennsylvania reported.

No adverse genetic effects were evidenced in litters of mice exposed to levels of four watts to the sonometer (capable of burning the limbs of the animals) even to the seventh generation. Comparable X-ray exposure would cause a high proportion of sterility, an increase in abnormalities as well as progressive declines in litters of surviving irradiated mice, Dr. Hans J. Zinsser of the Department of Urology at the New York medical center told SCIENCE SERVICE.

While ultrasonograms cannot yet be produced with the visual clarity of X-rays, they are effectively used to determine multiple births and to distinguish safely between a benign ovarian cyst and ovarian carcinoma in pregnant women whose unborn children might be endangered by X-rays.

U.S. scientists, Dr. Zinsser said, have not thus far mastered the technique of getting the ultrasonic pictures visualized at a rate rapid enough for full clarity. Russians who are working in this field may be ahead in this visualization. At least, reports from their scientists three years ago indicated this, Dr. Zinsser said.

Improvements in ultrasonograms would promote their substitution for X-rays in diagnosis, thereby sharply reducing total population exposure to medical irradiation.

Mice used in the experiments were newborn, exposed one to seven days after birth because this is the most susceptible period.

Dr. Edward Kirsten of the New York medical center and Dr. John Reid of the University of Pennsylvania in Philadelphia worked with Dr. Zinsser on the ultrasonic research.

Results of the research were discussed at the 1962 Ultrasonic Symposium at Columbia University, New York, sponsored by the Institute of Radio Engineers professional group on ultrasonics engineering.

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MEDICINE

Kidney Transplant Between Strangers

► NEW DRUG and radiation techniques have made possible an experimental kidney transplantation between strangers.

The experiment was reported by a team of doctors from the University of California, Los Angeles, Medical School who said that the drug and radiation may have helped neutralize the body's defense mechanisms which ordinarily reject such grafts.

The recipient of the kidney was a 17-year-old girl, who prior to the operation had only a few weeks to live because of seriously diseased kidneys.

The donor was a 47-year-old man who had to have a functioning kidney removed in the course of a complex operation not related to kidney disease. The two patients had the same type red and white blood cells.

The two operations were performed simultaneously at different hospitals. Removal of the donor's kidney was accomplished by a team of surgeons at the Los Angeles Veterans Administration Center. The kidney was rushed under refrigeration to the UCLA Hospital, where it was transplanted to the girl by another team of surgeons.

Kidney and other tissue transplantations between individuals other than identical twins are rejected because the body's defense mechanisms recognize the transplant as foreign tissue and produce antibodies to destroy it.

In recent years experimental techniques have been employed, with limited success, to try to neutralize antibody mechanisms. However, the graft recipients in such cases have usually died after a few months because their depressed defense mechanisms were incapable of protecting them against disease organisms or because the transplanted tissue was rejected anyway.

Steps designed to decrease the natural antibody reaction to the kidney graft in this case were: 1. The thymus gland of the recipient was irradiated. 2. Her spleen was removed. 3. She was treated by a new anti-cancer drug, developed to treat leukemia. This drug appears to act against the white blood cells presumed to be involved in the antibody response.

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PSYCHOLOGY

Confinement No Damage To Learning Ability

► A PERSON can undergo silent confinement for two days and two nights in a very confined space without effect on his ability to learn.

The tests on student volunteers were made by three University of Miami (Florida) School of Medicine experimenters, Franklyn N. Arnhoff, Henry V. Leon and Charles A. Brownfield, and reported in Science, 138:889, 1962. They were trying to check other sensory deprivation tests that showed a pronounced adverse effect.

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