

PHYSIOLOGY

Hypoxia: A Medical Aid?

► **EXPERIMENTS ON MICE** in an altitude chamber indicate that hypoxia, or low oxygen content, may be a valuable medical technique.

The mice in the chamber were shown to retain skin grafts longer than mice outside the chamber.

This and other studies by Dr. Adam Anthony, professor of zoology at Pennsylvania State University, could have medical applications to humans. Hypoxia occurs at high altitudes and, although exerting severe effects on bodily functions, reduces the demand for oxygen as the body adjusts to the low supply. This reaction is similar to that caused by illness or injury.

Dramatic changes, designed to make more efficient use of the oxygen that is present, are triggered within the body during early hypoxia. For example, a tissue chemical known as erythropoietin, which is released during low oxygen exposure, is credited with causing the production of more blood and the stimulation of blood vessel growth.

This factor, Dr. Anthony believes, may when isolated become a major weapon against heart disease or blood vessel problems, since injections might stimulate repair of blood vessels in the heart and other body tissues.

An equally striking effect of hypoxia is the mobilization of endocrine defense mechanisms of the body, the physiologist believes. The endocrine system produces antibodies and other substances that ward off disease bacteria, viruses and toxic chemicals in the body. The adrenal glands are key organs in this defense response. Their secretions, called corticoids, are markedly increased during hypoxia.

"All of the findings of the effects of altitude on body physiology seem to hold hope for medicine, since the successful treatment of most human disorders ultimately depends upon knowledge about the natural mechanisms of defense," Dr. Anthony said. "Altitude exposure, as a stimulus to the living body, provides us with one of the most useful experimental tools for investigating the efficiency of regulatory systems within the body."

The National Institute of General Medical Sciences of the National Institutes of Health, the Pennsylvania Heart Association and the Centre County (Pa.) Heart Association are all cooperating in Dr. Anthony's research projects in the hope that new medical approaches may evolve from the results.

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AERONAUTICS

Medical Flying Problems

► **AVIATION** medicine, with some 70 million passengers a year flying in scheduled planes in the United States alone, is the concern of all physicians.

Dr. Robert L. Wick, formerly with the Office of Aviation Medicine, Federal Aviation Agency, Washington, D.C., and now in Los Angeles, advises general practitioners that their practices are very much affected by aerospace medicine. At some time or other 400,000 civil airmen are patients in the family doctor's office. Literally thousands of pilots in this country are amputees, blind in one eye or have severe handicaps of some kind. When their patients are pilots, doctors should be careful in prescribing medicines that could affect their flying skill.

For the pilot who is also a scuba diver, there is a special hazard, Dr. Wick points out. Diving to a depth of 33 feet in the water and returning to the surface involves a pressure change by a factor of two.

Flight at any altitude after swimming to this relatively shallow depth can bring on a case of the bends. A recent incident occurred in which two pilots who had been scuba diving took off in a plane and both were incapacitated by the bends. A third crew member was able to land the plane and prevent a serious accident. All pilots should be cautioned against flying after scuba diving for a minimum of 12 and preferably 24 hours.

Middle-ear trouble can occur when a plane lands, and Dr. Wick says prevention is more satisfactory than cure.

"A wise traveler who is accompanied by small children may prevent the youngsters from having an ear block by ensuring that they are awake when any descent is started. Very small children should be pinched and deliberately made to cry. This should prevent ear blocks. A few minutes of crying while coming down to land are infinitely preferable to hours of crying on the ground until an ear block can be relieved."

Dr. Wick reported his observations in *Medical Times*, March, 1965.

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SURGERY

Total Surgery Effective For Some Blue Babies

► **TOTAL CORRECTION** of heart defects in blue babies may now be possible in youngsters under five years old.

In 14 operations on children suffering from the tetralogy of Fallot, a combination of four defects in the heart and great vessels which interferes with the passage of blood, three British physicians reported 11 successes and only three fatalities.

Although Dr. C. Walton Lillehei of the University of Minnesota, Minneapolis, re-

ported successes with this total correction technique on children under five as early as 1955, many centers have avoided using it because of high operating mortality.

Drs. I. K. R. McMillan, consultant thoracic surgeon, A. M. Johnson, consultant cardiologist, and E. S. Machell, consultant anesthetist, Wessex Cardiac and Thoracic Center, Southampton Chest Hospital, reporting in the *British Medical Journal*, Feb. 6, 1965, point out that although the number of cases they treated is small, the results show that total correction is possible with certain risks.

"It should be emphasized again that we do not recommend total correction as a routine in all cases of Fallot's tetralogy, but only in those in whom an operation at this time is necessary to maintain life," the physicians stressed. Often, total surgery can be postponed until a child is older.

The treatment for total correction involves the use of a heart-lung machine after the child's body temperature has been lowered.

With improved techniques in cooling the heart, Drs. McMillan, Johnson and Machell were able to operate on children weighing as little as 15.4 pounds. Previously, unless an infant weighed at least 33 pounds this procedure was not used.

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BIOCHEMISTRY

Cholesterol Reduced By Pancreatic Extract

► **A PANCREATIC EXTRACT** can reduce cholesterol levels in medical treatment.

The extract is an insulin-free, enzyme-free and protein-free substance which is taken orally. Its molecular makeup is complex and the chemical formula has not yet been established.

Drs. Seymour Fiske, Y.C. Chu and Paul Chang of City Hospital, Elmhurst, N.Y., reported two ten-month studies in *Medical Times*, February 1965. Cholesterol levels in the group of patients averaging age 50 were reduced 30% to 40% by the use of Lipo-K. Lipo-K, trade name for an extract from the pancreas, is manufactured by Marcen Laboratories, New Rochelle, N.Y. The doctors also studied persons averaging 70 years, in the geriatric ward.

The younger patients, who had pulmonary tuberculosis, were put on a high-protein, high-vitamin, high-calorie diet that caused high cholesterol levels before they were given Lipo-K successfully.

The older patients, who already had developed hardening of the arteries, were kept on a regular diet and showed no significant changes in cholesterol levels after the drug was given.

During the Korean War, a report showed that although the average age of the young soldiers killed was 22 years, 77.3% showed evidence of coronary arteriosclerosis, attributed to a regular U.S.-type diet. The Elmhurst investigators say the dietary inclusion of pancreatic extract might have been helped in controlling this tendency.

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