

thermonuclear explosion. This work was theoretical, involving the use of computers, as well as paper and pencil.

After 1952 when the first hydrogen bomb was tested, Dr. Rosenbluth's interest shifted to problems concerning the controlled release of thermonuclear energy. Since then, he has made many significant contributions to theoretical understanding of how thermonuclear plasmas are confined, a requirement for a successful fusion power reactor.

The Einstein Award, established in 1949 on Einstein's 70th birthday, consists of a gold medal and a prize of \$5,000.

Mummies' Teeth

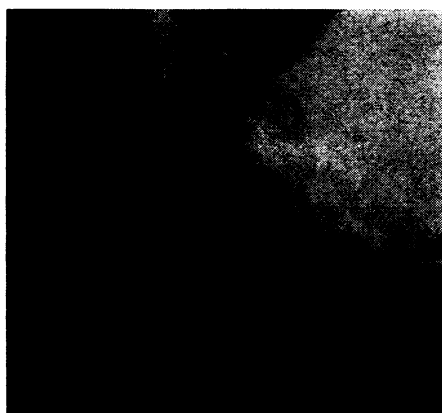


University of Michigan

Some of their jaws show a distinct malocclusion, or bite, which could be due to the embalming process, though Dr. Harris believes this is unlikely.

Lateral X-rays of the full head were made with a portable unit using a nuclear energy power source, radioactive ytterbium 169. Most pictures were shot through the glass and oak display cabinets that protect the mummies in the Cairo National Museum, but the pictures of Amenhotep I were taken through his closed sarcophagus.

Assisting Dr. Harris in taking the X-rays was Dr. Samir Loutfy, professor of orthodontics at the University of Alexandria, Egypt. Historians, museum officials and security agencies of the



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Rameses II: Royal Egyptian periodontal problem; he had worn teeth as well.

The pharaohs and queens of ancient Egypt had the same dental problems people have today—only they didn't have fillings or other repair work according to 250 X-rays brought back by a University of Michigan scientific expedition to Egypt.

It is believed that the Egyptians of this period between 1580-1000 B.C. had dentists available and that they made restorations and bridges of some type, but there is no evidence of this in the 40 rulers X-rayed.

Rameses II, reputed to be the pharaoh who reigned when Moses was born, had an extreme case of destructive gum disease, with a marked loss of bone tissue around the sockets. His teeth appear to be badly worn, possibly as a result of a coarse diet, Dr. James E. Harris, professor of dentistry, reports.

Among the other rulers whose X-rays are being studied at the University of Michigan are Merenptah, who according to popular tradition, drove the Israelites out of Egypt; Sety I, a great warrior king who reestablished Egyptian dominion over Palestine, Libya, Syria, Phoenicia and other Middle East regions; Amenhotep I, one of the founders of the XVIIIth Dynasty; and Senekere II, who drove the Hyksos out of Egypt.

United Arab Republic cooperated in the project, which was financed by the National Institutes of Health and the University of Michigan.

Dual 'Pill' Mechanism

Birth control pills, which prevent conception by suppressing ovulation, may work by a dual rather than single mechanism, preliminary studies on 50 white rats show.

Tests with Enovid, one of several similar oral contraceptives, suggest the pills act directly on the ovaries by inhibiting an important enzyme system present in the ovaries and in male sperm cells. In what is thought to be the first report of this effect, scientists from Meharry Medical College, Nashville, last week presented tentative evidence that birth control pills block the action of the hyaluronidase enzyme in female rats, making them unable to ovulate. The hyaluronidase enzyme system effects the release of ripe eggs from the ovaries and the ability of sperm cells to penetrate the eggs. Corn oil and other substances used on control animals were found to have no influence on the enzyme system.

The experimental animals, divided into five groups of 10 each, were stud-

ied during a six-week period when they received tri-weekly injections of the drug or a control substance.

The growth of cysts noted in the rats receiving high concentrations of the contraceptive drug may be related to the fact that ovulation was suppressed and that larger than normal eggs developed in the ovaries. It is not possible to determine from this the incidence of cysts developing in women because the necessary tissue studies cannot be made.

The second, previously postulated, way oral contraceptives work is by acting on the pituitary gland which produces gonadotrophins or sex hormones that stimulate ovulation.

Drs. Henry Moses and Horace Frazier, and Burton Schwartz and Allen Burnstein reported their findings to the International Academy of Pathology meeting in Washington, D.C.

O₂: A Dangerous Drug

Oxygen can be lethal if it is misused. Because it is administered in hospitals so frequently, many physicians don't really think of it as a drug and tend to overlook the hazards inherent in its use, Dr. Philip C. Pratt says.

When oxygen is given therapeutically at increasingly high pressures over a period of even a few days, it can cause thickening of the lung's alveolar walls through which oxygen must pass on its way to the blood. When an overdose of oxygen results in this thickening, its door to the blood is closed and can, in some cases, cause death, Dr. Pratt believes. Experiments he and his associates conducted on rats show that this adverse effect of oxygen occurs primarily when the patient is subjected to continuous doses of gradually higher concentrations. Rats were exposed to atmospheres of 40 percent, 60 percent, then 80 percent oxygen for four days each and sacrificed at the end of the experiment. Lung damage resulting from the oxygen was found. Though oxygen damage to tissue was noted previously, Dr. Pratt believes this is the first experimental evidence confirming the fact oxygen itself is toxic. He and his colleagues began their investigations when they discovered they were able to identify, from lung tissue taken at autopsy, patients who had been given oxygen a few days before death.

In most cases, oxygen therapy should be discontinued when the level of oxygen saturation in the arteries has reached normal, Dr. Pratt says. It is not particularly difficult, though moderately expensive, to test routinely oxygen levels in the blood of patients receiving oxygen, he said in an interview; "All hospitals can do it."

Alveolar thickening, which appears

within two or three days after the start of oxygen therapy, can be reversed by cutting out the treatment. However, after a couple of weeks, it may be too late to undo the harm. There are situations, Dr. Pratt points out, in which continuous and steadily increasing oxygen therapy is essential to the patient's life and in such situations oxygen cannot be fairly blamed for death if it occurs.

Dr. Pratt and Drs. Harold S. Weiss and Richard B. Pilmer reported their studies to the American Association of Pathologists and Bacteriologists meeting in Washington, D.C. The research was carried out at Ohio State University.

Bone Growth Helped

Premature loss of teeth caused by defective bone may soon be prevented by the use of acrylic sponge, a foamy mixture that can promote bone growth.

Already successful in replacing the lost jawbone of monkeys, the new method will be tried in about a month in humans, Dr. Edward P. Henefer of the University of Pennsylvania School of Dental Medicine, Philadelphia, says. Preliminary surface tissue implantation of this "acrylate amide elastomer" in the human jaw shows promise for deeper implants, he told the 45th general meeting of the International Association for Dental Research in Washington, D.C., last week.

Dr. Henefer and his co-workers created tooth socket bone defects next to the teeth roots of 20 squirrel monkeys and then inserted acrylic sponge into the defective areas. The sponge prevented the collapse of overlying gum tissues and promoted bone growth within two months.

Dog Biscuits or Cake

Dog biscuits with large amounts of sugar cause little tooth decay when fed to rats—not nearly as much as that produced by cookies of the type commonly used for human consumption, a meeting of the International Association for Dental Research in Washington, D.C. was told.

Unlike the cookies, dog biscuits generally contain some source of added calcium phosphate, meat and crude molasses. Thus certain food combinations may be formulated that have relatively little decay-causing properties even though they contain substantial amounts of sugar, Dr. Robert M. Stephan of the National Institute of Dental Research, Bethesda, Md., explained.

The work adds to evidence of a relation between phosphates and tooth decay.

Brain Drain Refrain

The cure for the "brain drain" problem lies more with the nations that are complaining about it than the United States, the Senate was told by three witnesses last week.

The U.S. has recently been criticized by foreign nations, particularly the better developed ones, as a seducer of their best talent, a rich land hiring away their future development in the form of highly trained brains, and creating something called a "technology gap" in the process.

"If the domestic policies of a number of advanced nations demonstrated nearly the same high evaluation of their scientists and engineers that are evident in their protests over the brain drain, the outward flow would be markedly diminished," Dr. Donald F. Hornig, director of the Office of Science and Technology, testified.

Before the immigration subcommittee of the Senate Judiciary Committee, Dr. Hornig specifically exempted the underdeveloped nations from his accusation, suggesting that the United States aid them in developing conditions that would keep their highly trained people at home.

But the Europeans could solve the problem, he testified, by increasing their level of investment in higher education, paying higher salaries, giving more autonomy to junior workers, promoting them sooner and relaxing bureaucratic rigidity. Dr. Hornig was recently assigned by President Johnson to do a study for him of the gap and the drain.

Addressing the problem of foreign students who train in this country, ostensibly to work at home, and then elect to stay on, another witness declared, "The burden of persuasion should rest on the countries of origin rather than upon us." Richard A. Humphrey, director of the Commission on International Education of the American Council on Education, a group of 1,261 colleges and universities, added:

"The evidence is not yet very convincing that loser nations have exerted all possible efforts to regain their own talent.

"We ought, I think, to look hard for such evidence before accepting as just the criticism that we have exploited the talent of a specific nation."

David Dickinson Henry, director of the International Office at Harvard University, heads two programs that bring African and Latin American students to this country for training, "a form of technical assistance," and requires that they return home after completing school.

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