

PHARMACOLOGY

Threatened Miscarriages Avoided by New Drug

► **FOUR OUT OF FIVE** women with a history of threatened or repeated miscarriages have had successful childbirths after taking a new safe synthetic substitute for the female hormone progesterone. This high rate was obtained at the Ohio State University clinic where it is now the preferred treatment for pregnant women threatened with miscarriage.

Announcement of 6 dehydro-retro-progesterone (trade name, Duphaston) was made to physicians after approval of the U.S. Food and Drug Administration, by Philips-Roxane, Inc., a pharmaceutical company in Columbus, Ohio. The drug is administered as a pill.

Seven years of laboratory tests in Holland and the United States, and clinical tests at the medical schools of the Ohio State University, Columbus, and University of St. Louis (Mo.) were needed before FDA approved the drug.

The fact that the drug does not interfere with ovulation makes it particularly valuable in treating women with reproductive disorders. It has no direct relation to any hormone except natural progesterone, and it does not suppress the body's ability to manufacture it.

No objectionable side effects have been seen in patients treated with Duphaston, whereas other agents, when prescribed to women over long periods of time, have sometimes shown masculinizing effects both on the mother and female offspring.

The development of the drug was made public at the meeting of the College of Obstetricians and Gynecologists in Chicago.

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TECHNOLOGY

World to Tap Oceans For Fresh Water Supply

► **THE DAY** when the oceans will be widely used to quench the thirst of an increasing world population is rapidly drawing near.

Scientific experts, in Washington for an all-day symposium on salt water conversion, were optimistic about the eventual widespread use of economically wringing fresh water from the briny oceans, although none would predict when this will occur.

The symposium was sponsored by the Office of Saline Water, a Government organization coordinating research in converting salt to fresh water.

The United States is presently using about 300 billion gallons of water a day. This figure is expected to double in 20 years. By 1975, nine trillion gallons of sea water will have to be processed annually to supplement the nation's fresh water requirements, Dr. Murrell L. Salutsky, research chemist at W. R. Grace & Co.'s Washington Research Center, predicted.

Various methods have been proposed for desalting the oceans, ranging from the use of atomic energy to the greatest energy

maker of them all, the sun. At present, all have one thing in common, the high cost of conversion.

The Office of Saline Water is in the midst of a large-scale research and development program to reduce the cost. Three demonstration plants, producing up to 1,000,000 gallons a day, have already been dedicated. Two others are scheduled to be built. Each is trying out a different desalting process.

The most promising methods thus far are freezing (whereby pure fresh water crystals are separated from brine) and thin membrane (which filters out the salt ions).

Research has whittled the price to one dollar a thousand gallons of fresh water. The average cost in U.S. cities is about 30 cents a thousand gallons.

A scientist at the symposium recommended that the minerals removed from the sea could be chemically processed into fertilizers and other industrial chemicals to significantly reduce the cost of extracting the fresh water.

More than 25,000,000 gallons of fresh water is now extracted each day in salt water conversion plants throughout the world.

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BIOLOGY

Simultaneous Sources Seen for Earliest Life

► **THE FIRST LIFE** on earth may have arisen from proteins and nucleic acids existing side by side.

Two conflicting schools of thought are that life originated from either one but not both. One school claims that proteins, long chains of chemical building-blocks known as amino acids, were the first pre-life to be formed. Geneticists generally favor that evolutionary development of nucleic acids came before protein. Nucleic acids are compounds made of rings of atoms, rather than a chain, and are involved in all forms of reproduction of living things now found on earth.

However, it is more likely that both proteins and nucleic acids arose in the evolutionary scheme at the same time, Dr. Melvin Calvin, Nobel Prize-winning biochemist from the University of California at Berkeley, believes.

He reported in *The Sciences*, publication of the New York Academy of Sciences in New York, that recent work by biochemists has shown that simple, long chains of amino acids, acting very much like proteins, could have developed under conditions on earth in its earlier stages.

It has been thought before that the ring compounds of nucleic acids required other living forms to produce them. But now several ring compounds, one of which is found in nucleic acids, have been made in the laboratory without involving any biochemical process. These could also have developed during early conditions on earth.

One of the major goals of the "new biology" of today will be to attempt to produce some form of living, reproducing "organism" from the raw chemicals and necessary environmental conditions.

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PHYSIOLOGY

Fatty Acids Associated With Emotional Stress

► **INCREASE** in the free fatty acids in the bloodstream has been associated for the first time with various types of emotional stress, such as depression, fear and anger, which were induced through hypnosis, the American Psychosomatic Society was told in Rochester, N. Y.

Earlier studies have shown that anxiety stimulates an increase in the free fatty acids (FFA), but this is the first time that a response in FFA has been seen in states of depression and anger, the investigators said.

The role of FFA in body metabolism has been the subject of considerable scientific interest in recent years. It is in the form of FFA that fat goes from the fat depots by way of the bloodstream to the organs of the body that burn it.

But efforts to study hormonal and other physiological changes that occur with depression and anger have been hampered by the almost insurmountable difficulties of inducing these emotions in realistic experimental settings. The hypnosis technique makes it possible to study emotion without complications that might distort findings.

The studies were conducted at the National Institute of Mental Health, Bethesda, Md., in a series of four sessions with 16 pre-trained volunteers, rated according to relative hypnotic susceptibility. Ten of them were highly susceptible and reported undergoing emotions accompanied by associated fantasies or memories.

Drs. Peter Mueller and Jacob Fishman, with Victor Loeffler, reported the findings.

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MEDICINE

Infants as Likely To Have Ulcers as Adults

► **AN INFANT** under one year of age is as likely to have an ulcer as an adult, the American Society of Abdominal Surgeons was told in Chicago.

Dr. Robert B. Tudor of the Quain and Ramstad Clinic, Bismarck, N. D., said there may be thousands of children who have undetected ulcers. He said studies indicate that the occurrence of ulcer has nothing to do with the ages of the patients.

Causes of peptic ulcer in children may be related to defect in total life adjustment. Recent evidence with respect to the age and sex of ulcer patients points to genetic determination, Dr. Tudor said.

Medical experts have advanced more than 30 theories to explain the relationship between acute illness and ulcers, which occur about the same in each decade of life, up to 70 and beyond.

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CE FIELDS

ASTRONOMY

Chromosphere Motions Traced to Low Levels

► DR. Z. SUEMOTO of the University of Michigan Observatory, Ann Arbor, Mich., reported to the American Astronomical Society meeting in Cambridge, Mass., that spectrograms of the 1958 solar eclipse showed spicule structures as far down as 1,500 kilometers.

Resemblance of these structures for all lines suggests that the chromosphere is composed of spicules with sheath-like structure down to this level.

Turbulence velocities at lower levels were measured on weak lines and were corrected for self-absorption. The velocity increases slowly from three kilometers per second at zero height to about ten kilometers per second at 1,000 km.

Velocities at higher levels were measured for apparently individual spicules on H and K lines of Ca II. Line widths for those spicules vary appreciably from spicule to spicule, suggesting that even among what seem to be individual spicules are included groups of spicules, Dr. Suemoto reported.

If the smallest observed velocity is interpreted as the actual velocities within an individual spicule, the turbulence velocity inside each spicule would come out to be about ten kilometers per second even at the height of several thousand kilometers.

Relative velocities between the spicules are relatively big, and if all velocities are included, the turbulence velocity increases upwards with the height.

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MEDICINE

Safer Cigarette Needed, Smokers Will Not Quit

► THE CHANCES of cigarette smokers giving up the habit are so slim that the search for a safer cigarette is the only practical goal, an American Cancer Society representative said.

Dr. E. Cuyler Hammond, who is currently directing the Society's six-year Cancer Prevention Study involving some 1,100,000 persons in the United States, told the National Press Club, Washington, D. C., that by applying the knowledge we have, we could overcome lung cancer.

Psychologists say that smoking goes back to the sucking habit of the infant, so whether or not the smoker enjoys his tobacco, he finds it hard to give up his pipe, cigar or cigarette.

Cigarettes have been linked to lung cancer in a number of studies, but research continues all over the world to ascertain the facts about this and other environmental causes.

Dr. Hammond, with four other cancer

research scientists, spoke in relation to the opening of the American Cancer Society's month-long campaign. Featured was the new "Man Against Cancer" exhibit, which will be moved to the Seattle World's Fair at the end of April.

Graphic explanations of the way cancer research is being carried on range from live laboratory mice in a germ-free chamber to a smoking machine for the collection of tar for research. There is a transparent model of a man used in testing X-ray voltages and their impact on tissue, and a six-foot model of a cell.

One of the hopeful research projects was explained by Dr. Chester M. Southam of Sloan-Kettering Institute, New York, who said that his work on immunology at the Ohio State Penitentiary, Columbus, Ohio, has encouraged him to continue this type of research.

"There is growing evidence," Dr. Southam said, "that there is a foreign antigen in some cancers. We at Sloan-Kettering, as well as many others, are studying tissue immunity."

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MEDICINE

X-Ray for Breast Cancer Advised in Many Cases

► SOME BREAST CANCERS have spread too far for surgery but will respond to high energy radiation, the American Radium Society meeting was told in New York.

Routine studies on armpit lymph nodes done at Francis Delafield Hospital, New York, on women referred for breast cancer have shown that in 50% of patients who appeared to be operable, the cancer had spread too far for surgical removal.

Dr. Ruth Guttmann, the hospital's director of radiotherapy and associate professor of radiology, Columbia University, said 68% of 111 women with widespread cancers of the breast were free of symptoms after three years. After five years, 50% had no signs of cancer. These results are slightly better than any previous study of treatment by the same method, she said.

Cancers of the nasopharynx, or upper part of the throat, also respond to treatment with a two-million electron volt radiation source, Dr. Hugh F. Hare of Los Angeles Tumor Institute and Lt. Cmdr. Quintous E. Crews Jr. of the U.S. Naval Hospital, Great Lakes, Ill., reported.

Their study showed a 33% survival rate for 24 cases followed for five years, which compares with a three percent survival rate on 30 patients treated at L. A. Tumor Institute by regular X-rays during the previous ten years.

Nasopharynx cancers account for one to two percent of all cancers and about 18% of the cancers of the head and neck. They are seldom found until they have begun to spread into the skull or glands of the neck. By this time surgery is less effective than radiation.

Side effects of high energy radiation were not serious enough to stop treatment in any of the cases reported.

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PSYCHOLOGY

Physician at Bedside Better Than Sedation

► A GOOD PHYSICIAN at a patient's bedside can have a more powerful effect on the patient's wildly beating heart than a sedative.

Medical studies have shown that the human heart can be taught to beat faster or slower by psychological means. Blood pressure can also be boosted or lowered in a similar way, Dr. W. Horsley Gantt of Johns Hopkins University School of Medicine and the Veterans Administration Hospital at Perry Point, Md., reported to the American Psychosomatic Society in Rochester, N. Y.

Heart rate and blood pressure can be conditioned as easily as the mouth can be made to water at the sound of the dinner bell or the sight and smell of a juicy beefsteak. The sound of a bell could be linked with the effect of a drug so that the bell alone can change the heart rate.

In fact, the cardiac-conditioned reflex forms very quickly. A single experience is often enough, and once formed the reflex is much more stable, sometimes lasting for years after other reflexes have disappeared. Although the cardiac-conditioned reflex is more difficult to observe than more conventional conditioned reflexes, it still provides a useful tool for studying the precise effect of drugs and psychological experiences on the heart and circulatory system.

Even a dog, it was found, can have its heart rate calmed just by having a person come into the room and stand beside the dog and perhaps pet it on the head or rub it behind the ears. The effect varies with the person and also with the particular dog. The blood pressure of a neurotic dog dropped from 140 to 70 when a person was present.

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MEDICINE

Eye and Nerve Disorders Related to Birth Weight

► LOW-WEIGHT, premature babies often have nerve and eye disorders later, a study has shown.

More than 1,000 premature babies weighing not more than four pounds at birth were followed up after a period of years, and 244, or 22.6%, had neurological or severe ophthalmic disorder.

Among them were 71 children with cerebral palsy, 29 who were mentally retarded to an uneducable degree, 102 with a history of one or more fits and 24 with other neurological disorders. Twenty were blind and 35 had severe visual defects. Nineteen were moderately or severely deaf.

All the children followed up in this study were originally investigated by the Medical Research Council after they survived to six months. Dr. Alison D. McDonald of Guy's Hospital, London, reports the later survey in the British Medical Journal, March 31, 1962.

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