

MEDICINE

Women Smaller Because Hormone Stunts Growth

► THE REASON women are smaller than men is that the female, or estrogenic, hormone has a growth-suppressing action.

Studies suggesting this were reported by Prof. W. S. Bullough of Sheffield University at the meeting of the British Association for the Advancement of Science in Belfast.

The female hormone exerts its growth-suppressing effect through its stimulation of the adrenal gland to produce hormones similar to cortisone. These hormones depress the rate of energy production and have a powerful action in checking replacement of skin cells and suppressing growth in general.

The male hormones do not seem to cause any extra production of cortisone-like hormones, so the growth of men and other male mammals is not suppressed.

Prof. Bullough's studies were made on skin in an effort to learn more about cancer. Anything that causes rapid cell replacement, he concludes, may help in producing tumors. Included may be factors such as over-eating, on the one hand, or hormones such as the estrogenic substances.

The appearance of cancer in mice may be entirely prevented by forced dieting, he reported, but it has not yet proved possible to eliminate it by hormones.

Prof. Bullough's studies were made under the auspices of the British Empire Cancer Campaign.

Science News Letter, September 27, 1952

ELECTRONICS

International Television May Foster World Peace

► INTERNATIONAL TELEVISION broadcasts may foster world peace by carrying bits of culture from nation to nation, helping people to understand people.

E. W. Engstrom, vice-president of the Radio Corporation of America, told a communications symposium of the Centennial of Engineering in Chicago that modern transportation and military advances have brought nations "uncomfortably close together" in a nearness that threatens destruction.

But television programs on an international level, he said, could spread friendship and understanding throughout the world and might act as an antidote to the threat of war.

Mr. Engstrom painted a rosy picture of television's possibilities. Commercially, it already has jumped to a \$3,000,000,000-a-year business. In five years, about 50,000,000 video sets will be in operation, he estimates.

Aside from its commercial applications, television is finding other uses. It has been used in business conferences when men participating in the meetings were scattered over many hundreds of miles. It has given

medical students close-up views of complex operations. Adapted to ultraviolet light, it has shown biologists things they could not see otherwise.

Its applications to education have only begun. Mr. Engstrom foresees a "pattern of adult education that surmounts evening classes and correspondence courses in convenience and effectiveness."

In addition to its practical applications, television has "cross-fertilized" other fields.

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BIOCHEMISTRY

Blood Plasma Extenders Needed to Save Lives

► CHEMISTS WERE called upon to develop plasma extenders to save the lives of victims of a major catastrophe by Dr. I. S. Ravdin, professor of surgery of the University of Pennsylvania Hospital, at the meeting of the American Chemical Society in Atlantic City.

Obtaining enough blood and plasma would be difficult as there is no absolutely safe method of sterilizing blood, he said. Both blood and plasma can transmit a virus that causes an acute inflammation of the liver, called homologous serum jaundice.

Because of the danger of a major disaster, such as atomic bombing, Dr. Ravdin told the chemists that there must be consideration of various plasma extenders, as the dextrans, PVP or polyvinyl pyrrolidone, and the gelatins which can be made in unlimited amounts and stored for unlimited time.

There is now a considerable likelihood that red blood cells can be stored for as long as nine months in the frozen state and still live as long as freshly-shed blood when injected into the veins, Dr. Ravdin explained, although this is not possible for whole blood.

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ENTOMOLOGY

More Potent Insecticide Safer for Humans, Pets

► AN ARSENIC insecticide more potent against many pests than chemicals now used has been synthesized and is undergoing field tests here and abroad, Dr. Roland M. Kary of the American Smelting and Refining Co., Barber, N. J., told the American Chemical Society meeting in Atlantic City.

Called Compound A-42, it is an organic arsenic substance, chemically, arsenomethane As-1,2 disulfide. It is expected to be less harmful to human beings and animals than the poisonous inorganic arsenicals used as insecticides.

A little of A-42 goes a long way in killing insects. Five parts in 10,000 kill termites. A tenth of one percent dose kills granary weevils, and one percent kills carpet beetles. For Japanese beetles, a five percent dust formula is used.

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IN SCIENCE

BIOCHEMISTRY

Chemical to Keep Blood Fresh Longer

► A CHEMICAL that promises to allow human whole blood to be preserved for longer periods than now possible was reported by Dr. Otto Schales of Tulane University at the meeting of the American Chemical Society in Atlantic City. The chemical, not yet clinically tested, is dimethylamino-isopropyl-phenothiazine.

It was developed on the theory that an enzyme action similar to digestion of food in the stomach works on the red blood cells, and so weakens them that they cannot withstand the stress of circulation in the body after 21 days storage. Cells treated with the phenothiazine compound were stored for seven weeks and were no more fragile than fresh red cells.

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PALEONTOLOGY

Find Fossil Bone of Largest Bird Known

► A FOSSIL bone of the largest bird known to fly has been found in Nevada, Dr. Hildegard Howard, chief curator of science at the Los Angeles County Museum, has reported.

A wrist bone, it belonged to a huge vulture that lived hundreds of thousands of years ago. The bird has been given the scientific name, *Tevatornis incredibilis*, to indicate its incredible size. Its wingspread is believed to have been 16 or 17 feet.

Usually a wrist bone is considered unimportant in figuring out what ancient birds were like by studying their fossils. The unusual size of this wrist bone, however, sets it apart from that of any other known bird, Dr. Howard states.

Furthermore, Dr. Howard says, the wrist bone clearly indicates that the bird from which it came was a flier. In the large running birds, such as the ostrich, the wing is reduced and none would have a wrist bone of such size.

The new super-size vulture is a cousin of the *Tevatornis merriami*, the vulture that previously held the record of being the largest bird of flight known to science.

The wrist bone specimen is part of an assemblage of Quaternary mammals and birds collected from Smith Creek Cave in White Pine County, Nev., under the sponsorship of the Carnegie Institution of Washington. The Quaternary period includes the Recent epoch in which we now live and the Pleistocene epoch, which began about a million years ago. The bone belongs to California Institute of Technology.

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CE FIELDS

CHEMISTRY

Progress Outmodes Past Pure Chemicals

► "CHEMICALLY PURE" chemicals of the past are now antiquated as the result of the growth of atomic chemistry, Dr. Paul C. Aebersold of the Oak Ridge National Laboratory, Tenn., told the American Chemical Society meeting in Atlantic City.

Impurities in such small amounts that they are not recognized by old-fashioned chemical tests can become strongly radioactive when exposed to the atomic pile. This unsuspected source of radioactivity can mislead the analyst who expects to identify a different kind of material by the rays given off.

Better separation methods to give more positive results and consume less time were urged by Dr. Aebersold, who pointed out that more students should be trained in methods of working with radioactive substances.

Refinements of measurement sufficient to spot an ounce of radioactive material in tons of ordinary material, or locate one microgram of it in an elephant, are in use today, according to Dr. Aebersold, who believes that physicists have about reached the limit of sensitivity in constructing measuring instruments.

He called upon chemists to devise cleaner separation methods and more sensitive tests. He urged use of radioactive isotopes of many different elements to trace breakdown products of amino acids, steroids and other chemicals of living matter.

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NUTRITION

Figuring Winter Vegetable Supply

► IF YOU want your family to be well fed this winter, you had better start now to do some long range planning. Prices of fresh fruits and vegetables are higher than usual at that time of year, so can or freeze whatever surplus you have from your own garden.

If you do not have a garden, you may be able to watch for good buys at your local market for canning or freezing. The housewife who is doing this for the first time may be at a loss to know how much food to can or freeze.

The amount of space she has to store the food will have to be considered, but apart from that she can figure by the amount of green vegetables needed for one person. Then multiply by the number in your family. Allow one-half the amount for children under six years.

For each adult allow 24 pints of green vegetables if canned, or 24 pounds if frozen, advises Miss Elizabeth E. Ellis, home economist of the University of New Hampshire. Include green snap beans, greens and broccoli among the available green vegetables.

Thirty-six pints of canned tomatoes will provide for a serving four times a week, Miss Ellis figures. Tomatoes may be canned in the form of juice, canned tomatoes or garden relish. Tomato juice may be frozen as well as canned, but whole tomatoes are not successfully frozen.

Twenty-five pints, or pounds, of other vegetables, such as carrots, beets, corn, peas, squash, lima beans or succotash, whether canned or frozen, will provide for a serving at least twice a week. If, in your winter pantry or a cool place, or in the freezer locker, you have stored 85 pints of vegetables in all for each adult in your family, it may help to offset a higher vegetable budget next winter.

Every housewife likes to supplement her vegetable budget with a few jars of crisp pickles, tasty relishes and spiced fruits. These products have little food value. Their chief function is that of an appetizer, the green or red color adding zest to the meal as well as attractiveness.

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BIOCHEMISTRY

Drunken Driving Test Checks 24 in 2 Hours

► MASS TESTING to detect drunken drivers is the promise of a 25-minute, two-step test reported by Dr. Irving Sunshine and Robert Nenad of Western Reserve University and the Cuyahoga County Coroner's Laboratory, Cleveland, at the meeting of the American Chemical Society in Atlantic City.

As many as 24 persons have been tested within two hours, the scientists reported. In checks for accuracy, it was shown that the method detects as little as two parts of alcohol in 10,000 parts of fluid, either blood or urine, being examined.

The test depends on alcohol turning a solution of potassium dichromate green. In the first step the fluid being tested is put in the outer part of a "Conway" cell. This is a small porcelain apparatus resembling a covered saucer. Two chambers, one within the other, make up the bottom of the cell. The potassium dichromate solution is put in the inner chamber. The whole thing is then heated for 20 minutes at close to boiling, 90 degrees Centigrade.

This evaporates any alcohol present, making it pass into the inner chamber, there to turn the dichromate solution green.

The second step consists of removing the green solution and determining the amount of alcohol absorbed by the dichromate. This can be done either by an electric-eye device or by comparing the green color to that of standard solutions of known alcoholic content.

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PHYSICS

Mesons Hold Key To Atomic Hearts

► THE KEY to understanding what forces hold the hearts or nuclei of atoms together, one of the basic problems in atomic physics, lies in the elementary particles known as pi-mesons.

These particles bear the same relation to nuclear forces as the photons, or light particles, bear to the electronic and magnetic forces acting between charged particles, Dr. Bruno Rossi, Massachusetts Institute of Technology professor of physics, suggests in the book, "High-Energy Particles." (See SNL, Sept. 13, p. 174.)

Protons, neutrons and electrons are the constituents of matter. Mesons are particles with masses intermediate between those of the electron and the proton. They are unstable and decay spontaneously in much the same way as radioactive atoms.

Even if we knew all about the elementary particles and the laws governing their behavior, we could not apply them to explain the living cell, Dr. Rossi declares.

"Common sense warns us that the properties of complex systems, for example, those that form a living cell, may well be more than the sum of the properties of their ultimate constituents," Dr. Rossi observes. "It is nevertheless true that, since all matter is an aggregate of protons, neutrons and electrons, an understanding of the properties of these elementary particles is a prerequisite to the understanding of the properties of matter."

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ZOOLOGY

Radio-Equipped Rats Used to Study Behavior

► THE BEHAVIOR of animals apparently varies with the frequency of impulses received and transmitted by the brain, experiments with "radio-equipped" rats by Dr. Joseph A. Gengerelli of the University of California at Los Angeles have shown.

Experimental rats and mice are equipped with tiny antennas that are connected to the animals' brains. Stimulation of the brain by remote control produced varying responses at different frequencies, he reported.

For example, at a low frequency, a rat's whiskers and face muscles vibrate. At a higher frequency, the rat rotates slowly to the left. The performance at each frequency was consistent.

Another interesting observation was that when the flow of current was reversed by rearrangement of receiving equipment, the behavior was reversed. That is to say, a mirror image of performance under the original set-up occurred.

To illustrate: An impulse of a certain frequency might cause the mouse to keel over to the left. When the current was reversed, he would keel over to the right.

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