BIOLOGY

Life's Beginning Detected By Electrical Means

Breathing Linked With Epilepsy; Protein as Liver Protection; Heart Disease Cause Discussed at Meeting

LIFE'S very beginning can now be detected electrically, it appears from research reported by Drs. J. Reboul, H. B. Friedgood and H. Davis, of Harvard Medical School, at the meeting of the Federation of American Societies for Experimental Biology.

When the egg cell, destined to become a new baby rabbit, bursts from its sac in the mother rabbit's ovary a characteristic electrical change occurs. The Harvard scientists detected this electrical change with a vacuum-tube potentiometer activating a moving-coil galvanometer. The research confirms earlier work reported by Prof. H. S. Burr and associates of Yale University.

While this work was confined to rabbits, the escape of the egg cell from the ovary is the first vital moment for other higher animals including man. Following this escape, called ovulation, the egg travels along a narrow tube until it meets and is fertilized by the male cell and a new life begins.

The scientists reporting did not mention practical applications of the work but if this electrical method of detecting the egg's escape from the ovary could be applied to human mothers, it might give the necessary information for making birth control by the rhythm method a success.

A new egg escapes from the ovary at fairly regular periods. These periods are not regular enough in most women to be depended on, but if the escape of each egg could be determined, the "safe period" might be accurately calculated.

What gives the signal for the egg's escape is not known exactly, but a hormone from the pituitary gland plays a part. The process has now been induced in rabbits, however, by electrically stimulating a definite area of the brain, Drs. H. O. Haterius and A. J. Derbyshire, Jr., of Ohio State University reported. The region is very localized and is situated in the part of the brain called the hypothalamus, to which the pituitary gland is attached. It is probably directly above and behind the optic chiasma, which is where the fibers of the optic nerve cross on the underside of the brain.

Ovulation occurs after stimulation of this particular region of the brain, but Drs. Haterius and Derbyshire stated that there is as yet no evidence that ovulation occurs because of the stimulation.

Control Epilepsy

Epileptic attacks might be prevented if the patient's breathing could be regulated to an even rate of inhaling and exhaling, it appears from research reported by Dr. Frederic A. Gibbs of Harvard Medical School.

This is because the stop and go system which regulates the breathing movements also affects the rate of brain cell activity, Dr. Gibbs explained. The brain cell activity generates rhythmical electrical waves, popularly called brain waves. A record of these brain waves is, except for the time scale, very much like the record of breathing movements. When breathing is slow, the brain waves are slowed, and the reverse.

Measures which correct disturbances of the breathing rate tend to correct and prevent the comparable disturbances in brain wave frequency which occur in epilepsy, Dr. Gibbs said. Conditions which cause sudden changes in breathing rate because of their effect on brain wave frequency bring on epileptic seizures.

Sugar Protects

Eat cheese sandwiches, meat and potatoes or some other form of carbohydrate and protein food with alcoholic drinks to protect against development of fatty livers, is the suggestion to heavy imbibers contained in a report by Drs. J. L. Bollman, Eunice Flock and F. C. Mann of the Mayo Foundation. Better still might be the eating of dextrose, the kind of sugar used in baby foods.

A diet rich in fat and with little carbohydrate and protein food makes the dog's liver excessively fat within four or five weeks, the Mayo scientists found. If the animals on the fatty diets are given, twice daily, enough alcohol to produce mild intoxication, their livers become fatty within a few days.

The same quantities of alcohol do not affect the animals if they are given adequate amounts of carbohydrate and protein food with the fatty diet.

When animals getting the fat and alcohol were given dextrose, less fat was deposited in their livers. The amount of dextrose needed was that required to maintain normal amounts of glycogen in the liver.

Angina Pectoris Cause

Cause of angina pectoris, severe and agonizing heart disorder, is laid to stomach spasms, in a new theory reported by Drs. D. E. Jackson, Russell N. Speckman and Helen L. Jackson of the University of Cincinnati Medical School.

"Angina pectoris is really due to acute, spasmodic, incoordinated contractions of the esophagus (gullet) or stomach or of both simultaneously," Dr. Jackson stated as the view of himself and associates.

As a result of these contractions, he

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explained, air or other stomach contents may be entrapped in the esophagus or the heart end of the stomach. Complete rupture of the organ, usually the lower end of the esophagus, has occurred in a considerable number of these cases. X-ray studies often make it possible to see these contractions, bulgings and other abnormal conditions in the esophagus. The location of these abnormalities has a direct bearing, Dr. Jackson said, on the distribution of the pain of which the patient complains.

Nitrites, standby medicines for patients with angina pectoris, relieve these patients by relaxing the smooth muscle of the esophagus or stomach. If the drug, which acts only locally, does not reach these muscle fibers in sufficient concentration, relief may not occur.

Angina pectoris has been one of the unsolved mysteries of medicine for nearly 170 years, Dr. Jackson pointed out. Some 80 different theories have been proposed to explain this painful and often fatal affliction. In presenting his and his associates' theory of the cause of angina, Dr. Jackson relegates the currently accepted theory to the field of demonology because "nothing but a demon can fulfill all the requirements" of this theory as to the cause of the condition.

Prostate Disease Remedy

One of the male sex hormones, testosterone, may be a valuable remedy for prostate gland disease, Dr. Harold P. Rusch, of the University of Wisconsin Medical School, suggested.

The hormone, Dr. Rusch's research showed, may undo some of the damage done in the disease. Recent research has shown that certain changes of the gland tissue are the result of a relative decrease of male hormone in relation to the amount of female hormone present in the male body.

Changing these proportions of male to female hormone by giving female hormone to mice caused changes in their prostate glands similar to those seen in man. In the experiments reported today Dr. Rusch was able to reverse some of the changes by giving male sex hormone to the animals.

Boil Germ Affects Heart

A new menace from a familiar germ, *Staphylococcus aureus,* which causes boils, appears in studies reported by Drs. H. E. Hoff, J. Dingle and L. H. Nahum of Yale University School of Medicine. (*Turn to Page 286*)

BOTANY

NATURE RAMBLINGS
by Frank Thone

Eagle or Dove?

HOW opposite are the scientific and common names of the columbine!

Many plants have practically the same names in the scientist's Latin and the layman's English. Violet is *Viola* to the botanist; the common name is directly derived from the Latin one. The same is true of Rose and *Rosa,* Lily and *Lilium,* Cherry and *Cerasus.*

Sometimes the common and scientific names are fairly close translations of each other, as Sunflower and *Helianthus,* Bloodroot and *Sanguinaria,* Cranesbill and *Geranium.* Or at least there will be an agreement of imagination, though the names have no close connection; thus Waterlily and *Nymphaea.*

But the two names of the columbine point in exactly opposite directions. For columbine, in any of the Romance languages, is immediately recognizable as a reference to a dove, whereas the botanical name, *Aquilegia,* comes from *Aquila,* the fierce eagle of the standards of Rome.

Why this paradox? It seems that the botanist and the man in the street (or rather, in the country lane) reached opposite fancies by looking at opposite ends of the flower. The layman looked at the top, and saw in its convoluted arrangement a nest of doves. The botanist looked at the five long spurs, and saw them as the claws of an eagle.

Imagination seems to have been just a trifle stretched in either case. The common name of columbine is certainly more poetic than ornithological: no dove ever built so neat a nest as is figured in the top of the columbine flower; furthermore, the standard number of nestlings for doves is two, not five.

And however good a botanist the donor of the eagle-name *Aquilegia* may have been, he certainly was no ornithologist, either. For the foot of an eagle has four clawed toes, not five; and who ever saw eagle's claws terminating in smooth round little globes full of honey-sweet nectar?

However, probably one should not be too captious. Imagination, whether of Carolus Linnaeus or of plain John Johnson, must be let have its way. Particularly when both furnish us with really beautiful-sounding names for a really beautiful flower.

The commonest American species of columbine has a second seeming paradox in its name. For its full title is *Aquilegia canadensis,* though by far the larger part of its habitat lies in the United States rather than in Canada. But that is only a relic of the days when France held all of North America between the Appalachians and the Rockies, as well as what is now Canada, and the name Canada was extended to cover practically the whole of the Mississippi basin.

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Like popcorn, a kind of popping rice has been produced.

New lightships on the coast of Britain are to be equipped with powerful lamps to send out beams visible at ten miles.

It would take nearly 20 tons of steel to equip a 150-acre grain and dairy farm with full equipment and implements of steel, according to one estimate.

● RADIO

May 4, 4:15 p. m., E.S.T.

NEW INDUSTRIES FOR OLD—Dr. E. R. Weidlein, Director of the Mellon Institute.

May 11, 4:15 p. m., E.S.T.

THE GRASSHOPPER PLAGUE—Dr. W. R. Walton of the U. S. Bureau of Entomology and Plant Quarantine.

In the Science Service series of radio discussions led by Watson Davis, Director, over the Columbia Broadcasting System.

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period. In this event, the remaining funds are to be used for fellowships for study of either streptococcus infections in man or of high blood pressure.

The foundation is named for Dr. J. M. T. Finney, eminent Baltimore surgeon, professor emeritus of surgery in the Johns Hopkins University Medical School, and chief consultant in surgery to the A. E. F., and for Dr. William H. Howell, professor emeritus of physiology in the Johns Hopkins University, former director of the Johns Hopkins School of Hygiene and Public Health, and vice president of the board of trustees of Science Service.

Dr. Finney, chairman of the board of directors, has not yet set the date for the board's first meeting and no definite plans beyond those outlined in Dr. Walker's will have been made. According to the will, however, the work of the foundation must be started within one year. First step will probably be to canvass leaders in cancer research all over the world to find which of them need additional men on their staffs to carry forward promising research already under way.

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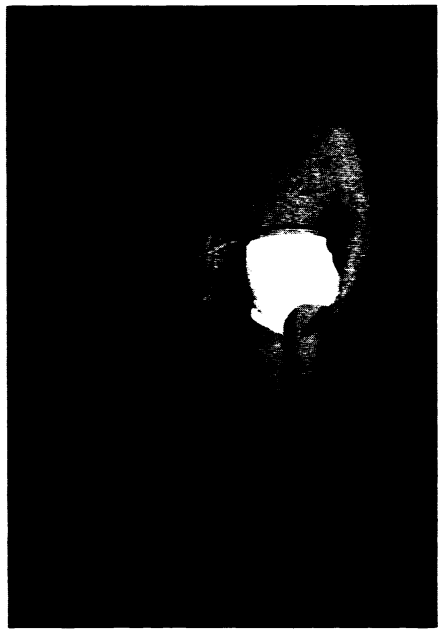
of the anthropologist—a spreading caliper, anthropometer, and an accurate tape line.

Children are harder to measure than adults, says Dr. Eleanor Hunt, associate anthropometrist in charge of body measurements for the project.

"Children are more flexible, and tend to stretch and wriggle," she finds. "But when they understand the purpose of what we are trying to do, they are usually cooperative. We explain to each child that we are measuring him, or her, in order to make clothing more comfortable to wear. And they understand they are helping to bring this about."

It takes about 20 minutes to measure a child, Dr. Hunt finds. But that does not mean 20 minutes of standing stiffly at attention, or in uncomfortable poses. The children move about a good deal during the measuring, and there is no strain or fatigue.



SO BIG!

For a long time, Miss O'Brien of the Bureau of Home Economics has been saying that American clothes should be made to fit real Americans. The Bureau receives thousands of letters from clothing manufacturers, pattern makers, people who sew clothes at home, and people who buy clothes. For years all these classes have been plaintively asking why sizes of real Americans are not available, so that clothes will fit better.

The clothing industry is still in the experimental stage, as Miss O'Brien sees it. After all, she explains, it is only about a century since clothes were first made in quantities, in the expectation that they would fit unknown individuals who might buy them.

Before that revolutionary idea was launched, clothes had always been either simple draperies or made-to-measure for a given individual, throughout world history. Now an attempt is to be made to bring order out of what is plainly called chaos, for young America, at least.

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Bruising a plant leaf or bending it will greatly increase the plant's respiration, experiments show.

"UNVEILING THE UNIVERSE: WHERE WE ARE—WHAT WE ARE," by Norton Wagner. A popular description of Sun, Moon, Earth (with its eleven motions and Theories of its Origin), Planets, Comets, Meteors, Eclipses, Stars, Novae, Nebulae, Atoms, Constellations, Star Charts, Zodiac Signs, Telescopes, Calendar, etc. Rainbow, Aurora Borealis, and Solar Spectrum in colors. With inspiring, highly instructive non-technical text, profusely illustrated with 550 Drawings, Portraits and up-to-date Photographs, all so graphically described that Amateurs, Students, Boy or Girl Scouts, and all Readers, may readily acquire a visual, comprehensive knowledge of the amazing celestial mystery-bodies that speed through the inky-black vacuum of intensely cold infinite space. *No home or library can be complete without this wonderful educative Picture-Book of the Sky.* A marvelous Gift-Book. Full cloth, only $1.00 plus 21c stamps. Free Circular. Order now before edition is exhausted.
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From Page 283

This common germ produces a poison which has lately been incriminated as the cause of food poisoning. Now the Yale scientists report that this poison, when injected in certain doses into the veins of rabbits, kills the animals in from one and one-half to 20 minutes. Death in these cases was due to poisoning of the heart muscle with resulting failure of its ability to contract and force blood into the body. The fatal doses were from one drop upward for every 2.2 pounds of body weight of the animal.

Ultraviolet Causes Cataract

The gradual hardening of the eye lens as people grow older with the development of farsightedness and even of cataract in old age is the result of the action on the lens of the small amount of ultraviolet light in daylight and artificial light. This theory and experiments supporting it were reported by Drs. W. E. Burge, G. C. Wickwire, H. W. Neild, and F. M. Hilpert of the University of Illinois.

This theory also accounts for the prevalence of cataracts in the tropics, since the sunlight there is relatively rich in ultraviolet radiation.

Chemical reactions in the eye lens under the influence of ultraviolet light produce hardening or calcification of the lens. As a result, it loses the crystal clearness necessary for vision, as in cataract of old age, and cannot be adjusted for seeing near objects. The latter condition is the farsightedness that makes many people over 40 years need glasses for reading.

Experiments with the lens material from pigs' eyes showed that short ultraviolet waves caused the lens material to become electro-negative. Weak solutions of calcium chloride abolish this electro-negativity and sodium phosphate restores it. Calcium and phosphate are both present in the eye lens, so the Illinois scientists assume that the ultraviolet light ionizes the lens material, particularly the phosphate, which then combines with the calcium to precipitate insoluble calcium phosphate. This produces calcification of the lens.

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In a ruined palace at Megiddo, Palestine, archaeologists have unearthed a hoard of Egyptian gold objects, apparently buried there in the fourteenth century B. C. when the region was under the Egyptian Empire, near the time of Israelite invasion.