

Energy As Universe's Fifth Dimension

General Science

Royal Society of Canada Receives Research Reports

MONEY as an expression of the energy it will buy was suggested as a kind of fifth dimension of the universe by Prof. A. S. Eve of McGill University in his presidential address to the Royal Society of Canada at Montreal.

A new theory of the universe was briefly suggested by Dr. Eve when he explained that energy has an intimate relation with time and frequency or wave-length, now so familiar in radio. Just as Einstein explained gravitation on a geometrical basis, so Dr. Eve believes it may be possible to "consider energy more fully as an aspect of frequency, possibly arriving at a comprehensive wave theory of the universe."

"If I go to California," the McGill physicist explained to the leaders in Canadian science, "I must expend time to cover space; nor is my journey direct, but to the right or left, and up and down, added to the actual distance, so that we have three degrees or types of space linked to one of time, and Minkowski brilliantly showed us how inevitably these were united in the four-fold union of space-time.

"It has always seemed to me that even in this four dimensional union something is still lacking. In order to go to California I must have money, an important fifth degree of freedom. It is well known, however, that money is merely the opportunity to acquire what we think that we need, and on a journey money buys energy, so requisite for the traveler's life and movement, and no less essential to the army of workers who today assist him on his journey whether by direct or mechanical means. A bird can obtain its energy directly from food, and requires no money for sustenance, clothes or transportation. The fifth degree of freedom is, therefore, energy, and a large part of it we derive from breathing air, the only thing still free to all, without taxation or payment."

AQUARTZ crystal that measures pressures in an airplane engine with great accuracy and speed was exhibited to the Royal Society of Canada by H. G. I. Watson of McGill University. When the crystal is squeezed an electrical current is

generated within it and this current can be made to write the story of the pressure changes. Thus there is added another use to the practical applications of piezoelectric crystals which now regulate the frequency of radio stations, control accurate clocks and perform other scientific tasks.

IF you are a man the chances are that your ring finger is longer than your index finger. If you are a woman the chances are that your ring finger is shorter than your index finger. This is an interesting anatomical fact discovered by Dr. R. K. George of the University of Toronto and reported to the Royal Society of Canada. This state of affairs held for both right and left hands in most of 620 white adults that Dr. George studied.

THE mystery of feminine sex was lessened somewhat when Dr. J. B. Collip of McGill University, one of the group of Canadian scientists who gave insulin to the world, told the Royal Society of Canada details of his researches upon a hormone or powerful chemical substance that causes precocious maturity in young, immature and virgin animals.

Dr. Collip explained that the hormone is obtained from the placenta of animals, a portion of the reproductive system, and he gave credit to a Japanese scientist, Hirose, who nearly a decade ago found the first indication of the presence of this essential sex substance in the animal organism. Dr. B. P. Weisner of Edinburgh undertook the problem and his work formed the starting point of the McGill researches. Dr. Collip and his coworkers have progressed in their investigations so far that they have called the placental hormone by the name "Emmenin."

From the tests made on rats and mice, Dr. Collip discovered that the hormone is involved in the maintenance of pregnancy and he has been led to suggest that the placenta is a ductless gland of pregnancy, just as the pancreas is concerned in the disease of diabetes and the thyroid controls the rate of burning of food within the body.

Dr. Collip's new researches con-

sidered in connection with other researches on sex by Americans, Europeans and scientists of other nations demonstrate that the problem of sex is much more complex than previously realized. At least two and probably more than two hormones are involved in the complex functions that surround the sexual activity of the female. Dr. Collip's hormone is different from another feminine sex hormone recently crystallized by American and German investigators.

Emmenin has no effect on senile animals so that it offers no hope of rejuvenation. Neither does it have any effect on male animals which have hormones peculiar to their own sex.

In ten clinics in Canada and the United States, Dr. Collip's hormone preparation is now being tested experimentally upon human patients suffering from sexual disorders. It is hoped that some unhappy conditions will be corrected by the treatment. At the present time, however, the hormone is not available for general medical use.

RADIO is about to come to the aid of medicine by supplying a new tool for the treatment of disease. Out of the physics laboratory of the University of Toronto, Prof. J. C. McLennan brought to the Royal Society of Canada new information on the relation between the heat generated in the animal body and the frequency or wavelength of current that produces the heating.

Intense high frequency currents similar to those produced in short wave radio sets used to transmit messages to distant parts of the world have been known previously to produce a fever in animals and human beings or a warming of inorganic chemical solutions.

In fact, the dreaded disease paresis, formerly a hopeless sort of paralysis, has been treated successfully by the use of high frequency currents that by producing a fever in the blood kill the harmful spirochetes that produce the disease. The bad paresis germs are sometimes subdued by giving the patient a case of malaria. Malarial fever supplies the curative heat and after the spirochetes are (Turn to page 351)

Energy—Continued

overcome, quinine can be used to cure the malaria. Instead of using disease to fight disease in the way that was usual before the usefulness of high frequency heating currents was discovered, paresis patients are now raised to high temperature by complex apparatus that consists essentially of a shortwave radio sending set.

Prof. McLennan's new contribution to this treatment is his discovery, made jointly with A. C. Burton, that the heating is dependent upon the conductivity of the material through which the high frequency current is pulsating. Physicians have been reluctant hitherto to utilize the new treatment because they could not be sure just how the patients would heat up. Now through the use of Prof. McLennan's results obtained from tests upon chemical solutions similar to those contained in living things, physicians will be able to tell just what frequencies or wavelengths of current to use to produce a fever in any given part of the body. For Prof. McLennan finds that to heat a material of given conductivity to the greatest degree there is one best frequency or wavelength.

Science News-Letter, May 31, 1930

Staff of Science Service—Acting Director, Vernon Kellogg; Managing Editor, Watson Davis; Staff Writers, Frank Thone, James Stokley, Emily C. Davis, Jane Stafford, Marjorie Van de Water, J. W. Young; Librarian, Minna Gill; Sales and Advertising Manager, Hallie Jenkins.

Board of Trustees of Science Service—*Honorary President*, William E. Ritter, University of California. Representing the American Association for the Advancement of Science, J. McKeen Cattell, *President*, Editor, *Science*, Garrison, N. Y.; Burton E. Livingston, The Johns Hopkins University, Baltimore, Md.; Raymond Pearl, Director, Institute for Biological Research, The Johns Hopkins University, Baltimore, Md. Representing the National Academy of Sciences, John C. Merriam, *President*, Carnegie Institute of Washington; R. A. Millikan, Director, Norman Bridge Laboratory of Physics, California Institute of Technology, Pasadena, California; David White, Senior Geologist, U. S. Geological Survey. Representing National Research Council, Vernon Kellogg, *Vice-President and Chairman of Executive Committee*, Permanent Secretary, National Research Council, Washington, D. C.; C. G. Abbot, Secretary, Smithsonian Institution, Washington, D. C.; Harrison E. Howe, Editor of Industrial and Engineering Chemistry. Representing Journalistic Profession, John H. Finley, Associate Editor, New York Times; Mark Sullivan, Writer, Washington, D. C.; Marlen E. Pew, Editor of Editor and Publisher, New York City. Representing E. W. Scripps Estate, Harry L. Smith, *Treasurer*, Cincinnati, Ohio; Robert P. Scripps, Scripps-Howard Newspapers, West Chester, Ohio; Thomas L. Sidlo, Cleveland, Ohio.

TEN CACTI

Blooming size All different

POSTPAID FOR \$2.50

Table garden size \$2.00

JAMES ALLAN

Mountain Park

New Mexico

How to Run a Machine Shop—Continued

maintained exactly uniform. Each tool should be run at a little faster cutting speed than its predecessor, until that cutting speed has been found which will cause the tool to be completely ruined at the end of 20 minutes . . .

66. A change is then made in the thickness of the shaving, and another set of 20-minute runs is made, with a series of similar uniform tools, until the cutting speed corresponding to the new thickness of feed has been determined; and by continuing in this way all of the cutting speeds are found which correspond to the various changes of feed. In the meantime, every precaution must be taken to maintain uniform all the other elements or variables which affect the cutting speed, such as the depth of the cut and the quality of the metal being cut; and the rate of the cutting speed must be frequently tested during each 20-minute run to be sure that it is uniform.

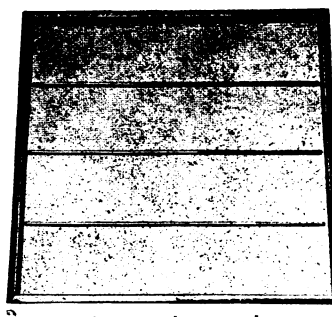
67. The cutting speeds corresponding to varying feeds are then plotted as points upon a curve, and a mathematical expression is found which

represents the law of the effect of feed upon cutting speed. We believe that this standard or method of procedure constitutes the very foundation of successful investigation in this art; and it is from this standpoint that we propose to criticize both our own experiments and those made by other investigators.

68. It was only after about 14 years' work that we found that the best measure for the value of a tool lay in the exact cutting speed at which it was completely ruined at the end of 20 minutes. In the meantime, we had made one set of experiments after another as we successively found the errors due to our earlier standards, and realized and remedied the defects in our apparatus and methods; and we have now arrived at the interesting though rather humiliating conclusion that with our present knowledge of methods and apparatus, it would be entirely practicable to obtain through four or five years of experimenting all of the information which we have spent 26 years in getting.

Science News-Letter, May 31, 1930

The Wistar Institute Slide Tray



SECTION THROUGH TWO TRAYS, SHOWING NESTING FEATURES

This tray will carry forty-eight 1-inch slides or thirty-two 1½-inch slides, or twenty-four 2-inch slides. Ample space for high mounts, well protected from accident or dust. Trays nest together. Width and breadth the same, so that they may be nested in either direction. All metal—no paint or varnish to affect slides.

Price, 85 cents each

Orders may be sent to

THE WISTAR INSTITUTE

THIRTY-SIXTH STREET AND WOODLAND AVE., PHILADELPHIA, PA.