

## GENETICS-PHYSICS

**Size of Gene, Heredity Unit, Determined by X-Rays**

**T**HE SIZE of the gene, the unit of living substance that transmits an hereditary character, has been more accurately determined by Prof. Oswald Blackwood of the University of Pittsburgh, who reported the results of his researches before the meeting of the American Physical Society.

Prof. Blackwood's measurement of the gene was done indirectly, by means of a study of the amount of X-ray energy necessary to cause a permanent change, or mutation, by the bombardment of the genes in the germ-cells of a tiny insect, the fruit fly. Several years ago Prof. H. J. Muller of the University of Texas showed that these hereditary changes can be produced by this means, and since then other scientists have been carrying the study forward and refining the technique.

The new diameter of the gene, as now determined by Prof. Blackwood, is 80 Angstrom units; in more familiar measurement, 32 billionths of an inch.

Prof. Edgar Altenberg of Rice Institute, has recently shown that ultraviolet radiation is also capable of causing these hereditary changes, but it is much less efficient than X-rays. The "softest" ultraviolet rays that can produce mutations, Prof. Blackwood believes, are much larger than the genes, having wave-lengths between sixty and eighty times their diameter.

*Science News Letter, May 7, 1932*

## MEDICINE

**Drug Cure Unconfirmed By Health Service Study**

**P**RELIMINARY studies which the U. S. Public Health Service has made of the sodium rhodanate treatment for drug addiction, which Prof. Wilder D. Bancroft of Cornell University reported to the National Academy of Sciences as a "cure" for the condition, fail to confirm the claims of the Cornell University investigators, it has become known.

The U. S. Public Health Service has investigated the new treatment in about 20 cases at Fort Leavenworth station which it is maintaining for the study of drug addiction in cooperation with the Department of Justice.

"Our experience there is not quite in keeping with Dr. Bancroft's," said Dr.

W. L. Treadway, of the U. S. Public Health Service, who is directing the drug addiction studies.

Dr. Treadway explained that because of the many factors entering into the problem of drug addiction and its extreme complexity, he believed any new treatment, such as Dr. Bancroft's, must take into account the necessity for more accurate knowledge concerning the chemistry of the opium alkaloids; more reliable information as to their effect on the human body and the exact nature of addiction; together with a satisfactory evaluation of the many psychobiological factors involving addiction about which we talk glibly but have little accurate, concrete knowledge.

"So far as we know there is no treatment for drug addiction from the standpoint of a specific cure that will miraculously operate to rid the drug addicts of their addiction," he said.

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## BIOCHEMISTRY

**Hungarians Identify New Acid with Vitamin C**

**T**HE ANTI-SCURVY vitamin C is the newly-discovered hexuronic acid, it appears from experiments reported by Drs. J. L. Svirbely and A. Szent-Györgyi of the University Szeged, Hungary, to *Nature*. Experiments are now being carried on to determine this fact definitely.

In an earlier study guinea pigs remained free from scurvy for 56 days when the only scurvy-preventive they received was a minute amount of hexuronic acid. The experiments are being repeated with a larger number of animals and a more satisfactory basal diet in order to confirm or to disprove the first results.

Hexuronic acid was discovered and isolated in 1927 by Dr. Szent-Györgyi while working at the Biochemical Laboratory, Cambridge. This acid is found in pretty much the same vegetables and fruits as vitamin C and its chemical properties agree closely with those known for the vitamin. The acid is also found in rather high concentration in the cortex of the suprarenal glands.

Drs. C. G. King and W. A. Waugh of the University of Pittsburgh in the United States recently reported that they had found vitamin C crystallized from lemon juice to be hexuronic acid. Their report appeared in *Science* just two weeks before the Hungarian report was published.

*Science News Letter, May 7, 1932*

**IN SCIEN**

## PHYSICS

**Physicist Investigates Bursting Sodawater Bubble**

**W**HEN a glass of sodawater fizzes, each bubble of gas in bursting at the surface of the liquid throws out droplets the greatest range of which is  $5\frac{1}{2}$  inches.

This was determined by Dr. Otto Stuhlman, Jr., physicist of the University of North Carolina, in a study of the mechanics of effervescence reported to the American Physical Society.

In water the bubbles rising from the depths of a glass, for instance, at ordinary room temperature of 70 degrees Fahrenheit usually grow to a diameter of about a twentieth of an inch before they explode and eject many small drops of the water. Each burst is accompanied by the simultaneous ejection of as many as five drops.

*Science News Letter, May 7, 1932*

## MEDICINE-PHYSICS

**Curative Effect of X-Ray Dependent on Wavelength**

**N**EW TESTS that may have important applications in medicine's attack upon cancer by X-rays and radium have been presented by Dr. G. Failla of Memorial Hospital, New York City, to the American Physical Society.

X-rays from the large 700,000-volt tube recently installed at Memorial Hospital, X-rays from ordinary 200,000-volt tubes such as used in cancer treatment and gamma rays from radium do not have the same effects on human skin and other living tissue, investigators at the hospital have found.

Dr. Failla, reporting on behalf of different scientists engaged in the research, explained that the wavelength of the radiation plays an important part in the degree of effect produced, and that from a practical standpoint human patients and other living things do not react in the same way to the three qualities of radiation. These observations are expected to have direct application to the use of these radiations in the treatment of cancer.

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# CE FIELDS

## ASTRONOMY

### Reinmuth Object and New Comet Sighted During Week

**A**N OBJECT new to the heavens, the second within a week, was discovered at Heidelberg Observatory by Dr. Karl Reinmuth, astronomer, and observed also by his colleague, Dr. M. Muendler, the International Astronomical Bureau has been informed. The newly found Reinmuth object may be an asteroid or a comet. The Carrasco comet observed at Heidelberg on April 25 is definitely a comet. Both are twelfth magnitude and too faint to be seen without a telescope.

The Reinmuth object was located in the southeastern evening sky a little east of the bright star Spica in the constellation of Virgo. Its astronomical coordinates when observed April 27 were right ascension 13 hours 42 minutes 7.8 seconds and south declination 10 degrees 41 seconds and 52 minutes.

The Carrasco comet has been located not only by Heidelberg observatory, but also by the U. S. Naval Observatory and on the Harvard College Observatory photographs.

Dr. Muendler's observation showed the Carrasco comet to be twelfth magnitude with a right ascension of 12 hours, 8 minutes, 17 seconds and a declination north 23 degrees, 46 minutes, 13 seconds, on April 25 at 20 hours 43.3 minutes Greenwich civil time. It has a small daily motion in the heavens.

*Science News Letter, May 7, 1932*

## CARTOGRAPHY

### Air Mapping Made More Accurate by Mathematics

**A**RTILLERISTS in charge of long-range guns in war, and peacetime surveyors with impossibly rough terrain to map out, can profit alike by a new mathematical method for evaluating airplane photographs worked out by Prof. Earl Church of Syracuse University. Prof. Church described his new method at the meeting of the American Geophysical Union.

At present the most practical method

whereby an object in airplane photographs can be accurately located both in horizontal position and in altitude above sea level is by the use of complicated and highly expensive stereoscopic instruments of European manufacture, only a few of which are in this country. Prof. Church's method eliminates the use of such costly and difficult apparatus, and substitutes measurements with a simple instrument called a "comparator," in the initial steps of the problem. After that the whole operation is carried out mathematically. The formulae are somewhat laborious, but most of the work can be done with calculating machines.

It is necessary to have three known points accurately located in the first photograph. But after that, points located through reference to them can be used as initial points in the calculation of new locations.

*Science News Letter, May 7, 1932*

## PHYSIOLOGY

### Tests Show Coffee Only Brief Aid to Wakefulness

**T**HOSE who drink coffee in order to keep awake must drink a cup every hour or so, or the wakefulness they seek will wear off, according to results of experiments at Cornell University by Prof. A. L. Winsor and E. I. Strongin, under a grant of the Heckscher Foundation for the Advancement of Research.

Coffee is found to stimulate the production of digestive juices in one who drinks it occasionally. These effects are found to diminish as a tolerance to the drug caffeine which coffee contains is developed.

Prof. Winsor's research is said to prove what has long been suspected, namely, that the human body can create a tolerance to caffeine through continued use. It also tends to disprove the popular belief that coffee's effects last for six or seven hours, keeping a person awake "all night."

The experimenters measured the effects of caffeine on the human system by studying secretion of the salivary glands in the mouth, and by this method were able to check their results. They found that a period of about fifteen minutes occurs immediately upon drinking the beverage, during which the system remains passive. This is followed by the indirect effects, when secretions are increased 100 to 200 per cent.

*Science News Letter, May 7, 1932*

## MEDICINE

### Iron Salt Prolongs Life Of Tuberculous Animals

**A**NIMALS suffering from tuberculosis gain in weight and live longer when given injections of iron in the shape of ferric chloride, Dr. Valy Menkin of Harvard Medical School, reported to the meeting of the American Association of Pathologists and Bacteriologists. So far, his studies have only been carried on in animals and there has not yet been any application of the work to humans suffering from tuberculosis. Dr. Menkin had previously discovered that when this iron salt is injected into the veins of tuberculous animals, the iron accumulates in the tuberculous areas, and he wondered what effect this would have on the course of the disease.

He found that the iron injections retarded the development of the tuberculous changes and that while the animals died eventually of tuberculosis, they lived longer than tuberculous animals which did not receive the iron injections. Furthermore, there was less tuberculous involvement in the lungs of animals receiving the iron injections.

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## ARCHAEOLOGY

### Monte Alban Treasure Thought Unique Discovery

**L**ITTLE hope that the recent treasure tomb discovery at Monte Alban will be followed by a series of similar revelations of Mexican gold and jewels is held out by Mrs. Nuttall, American archaeologist resident at Mexico City.

The Monte Alban treasure is a fortunate discovery which may never be repeated, Mrs. Nuttall declares. There is much historical evidence that, in the days of Spanish Conquest in Mexico, the Spaniards forced and bribed Indians to open their ancestors' tombs. Systematic looting of Indian graves was the rule after the Spanish Conquest. The Spanish king granted concessions for the exploiting of native tombs in Mexico, and levied taxes on their yield.

An idea of the quantities of gold salvaged from Indian tombs is given by the chronicler Bernal Diaz in one incident. He told of a hurricane at Vera Cruz in the year 1529, in which 100,000 pesos of funeral gold were sunk.

Some of the churches built in Mexico by Spanish missionaries were financed by gold from the native tombs.

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