stitute, Bethesda, Md., announced to the American Chemical Society in Milwaukee that by the use of the electron microscope they had seen for the first time a single nucleic acid molecule.

This kind of macromolecule is found in large quantities in the hearts of living matter, particularly in the chromosomes and genes of all cells that carry on the biological stream of life.

These nucleic acid molecules are also the major constituents of viruses. The desoxyribose nucleic acid extracted from such bacteria as the pneumococci, staphylococci and colon bacillus has the extraordinary property of transforming one type of bacteria into another type. This transformation, known as mutation, takes place only when the nucleic acid molecule is present as a giant molecule.

The single molecule was found to be approximately one ten-millionth of an inch in diameter and approximately three 100-thousandths of an inch long.

Science News Letter, April 12, 1952

INVENTION

Half Life Measurement Made More Accurately

➤ MEASURING THE half life of radioactive materials when the half life is as short as one-thousandth of a second can be accurately done with a new method which received a patent recently.

Clyde E. Wiegand, Oakland, Calif., is the inventor and he has assigned his patent, number 2,590,057, to the Atomic Energy Commission.

Previous methods, such as impressing the radioactive pulse of the material on an oscilloscope, were inefficient for the short-lived materials, the inventor says. The present method feeds the pulses from a radioactive detector through a discriminator and a height-varying circuit to a multichannel differential pulse discriminator.

Science News Letter, April 12, 1952

PSYCHOLOGY

Frustration Is Killing

➤ FRUSTRATION can be killing.

Many a person, frustrated in a situation where he cannot release his pent-up feelings, has probably felt that this might be true. Now a scientist has shown that it is true, at least for mice. And the mouse studies, he believes, may provide a clue to some human breakdowns when there has been a cumulative effect of emotional inactivity, or frustration, on the patient's endurance.

The scientist is Dr. Peter Rabe of Jackson Memorial Laboratory, Bar Harbor, Me. The mice were frustrated by physical restraint. The greater the restraint, the greater was the frustration.

The mice were the kind that have convulsive seizures when exposed to the ringing of a bell. In Dr. Rabe's experiments, some of these mice were allowed to run freely in a large washtub while another group was penned in a small wire cage in the tub.

Ordinarily these mice begin to run when the bell starts to ring. Those in the wire cage did not have room to run. The animals free to run in the washtub showed only a 25% death rate. The animals unable to run because of confinement in the small cage showed an 85% death rate.

Dr. Rabe believes the prevention of the discharge of energy, inability to "work it off" when emotionally aroused by the ringing bell, made the difference because it caused a more violent frustration.

Dr. Rabe's findings with mice corroborate those of Dr. David Levy, New York child psychiatrist, that physical restraint and consequent frustration lead to abnormal behavior.

Dr. Rabe does not agree with the definition of frustration which says that frustration occurs when a desired object cannot be obtained. This, he says, is only a description of a situation which may lead to frustration. A better definition, in his opinion, is that frustration is a state of interruption or blockage in the organism's natural tendency toward tension adjustment, or toward keeping a balance between stimuli from the environment and reaction to the stimuli.

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SCIENCE NEWS LETTER

VOL. 61 APRIL 12, 1952 No. 15

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc. 1719 N St., N. W., Washington 6, D. C., NOrth 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., $5.50; 2 yrs. $10.00; 3 yrs., $14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., PEnnsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STAte 2-4822.

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