

## PHYSIOLOGY

# Chemical Released by Nerve Carries Message to Muscle

**A** CHEMICAL released in certain nerves of the body every time a thought commands the nerve to move a muscle was described by Sir Henry Dale, director of Britain's National Institute for Medical Research. Sir Henry spoke at Indianapolis, Ind., at the dedication of Eli Lilly and Company's new research laboratories.

The message-carrying chemical is acetylcholine. Few people have ever heard of it. Yet it is the chemical that carries messages from some nerves to muscles. This performance was suggested by several researches in past years but the reality of the effect is only now being recognized. The theory contends that almost infinitesimal amounts of this chemical are released whenever there is a thought that commands a nerve to order a muscle to move.

Hundreds of times a second extremely small spurts of acetylcholine are produced in the body of an active person, each one bridging a gap from nerve to muscle.

It is hard to imagine the small amount of this chemical that is needed to act as chemical postman. Sir Henry computed that each outpouring spurt of acetylcholine consists of only three molecules. When he attempted to express its weight in grams, the scientific unit of weight that is one thirtieth of an ounce, he had to write twenty naughts to the right of a decimal point before a figure was reached.

If this chemical theory of how nerves control muscles really fits the facts, acetylcholine will be recognized as one of the most important substances in

the living body, with possible potential usefulness in medicine.

Dr. Reid Hunt, of Harvard, was the first to point out the importance of acetylcholine about 20 years ago. Sir Henry Dale is one of the experimenters exploring the chemical mechanism of nerve action. He finds some nerves act by giving off acetylcholine while others act by giving off adrenalin.

Sex, cancer, vitamins and virus diseases were linked together by Sir Henry.

Scientists have discovered that the sunshine vitamin D, coal tar products causing skin cancer, and both the male and female sex hormones have a type of chemical structure which shows them to be in the same chemical family.

In fact, Sir Henry explained, large doses of one of these substances will often act like one of the others, as when vitamin D is given in excess to female rats with the result that their sexual activity is quickened.

Even more startling is the discovery that the coal tar substances causing tumors in chickens seem to set up a cancer disease that becomes an infection.

Dr. Peyton Rous of New York's Rockefeller Institute of Medical Research first found that this kind of can-

cer could be transmitted by injections of the fluid filtered from cancerous materials. Now it is found that cancer caused by a coal tar substance injected into muscles can be carried from chicken to chicken by the same method. This surprising fact seems to indicate that an infectious disease is created by a chemical substance acting in some way upon the living body.

*Science News Letter, October 27, 1934*

## ASTRONOMY

## Soviet Scientists Make Large Telescope Lens

See Front Cover

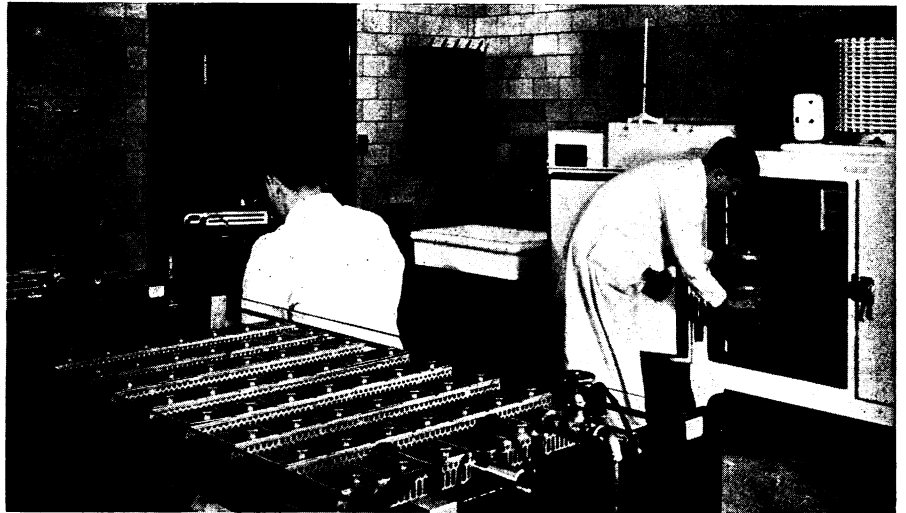
**S**CIENTISTS of Soviet Russia are entering the field of telescope lens construction. The cover illustration of SCIENCE NEWS LETTER this week shows a technician examining an 82 centimeter (nearly 33 inches) diameter lens.

Largest of the world's refractor telescopes is the 40-inch diameter lens instrument of Yerkes Observatory of the University of Chicago. The 33-inch lens of the Soviet scientists, therefore, is an understaking of the first magnitude.

Ultimate location of the lens will be in Pulkovo Observatory.

Prices asked by optical firms in Europe for the casting of the large piece of glass led scientists at the Optical Institute of Leningrad to undertake the job themselves.

*Science News Letter, October 27, 1934*



### A YEAR'S SUPPLY OF FROGS

*In the refrigerator in this sumptuous room of the new research laboratory building of Eli Lilly and Co., Indianapolis, recently dedicated, are hundreds of frogs kept in cold storage, at 4 degrees F. above freezing, until needed in testing digitalis. During the test each frog has his own individual cage (battery of cages in foreground) bathed in water of constant temperature. The strength of the digitalis is measured by its effect on the frog's heart.*

## VITALISM and MECHANISM A DISCUSSION

between

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Professor of Zoology, Tufts College

and

JAMES F. PORTER

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