

TECHNOLOGY

Clock Varies Less Than One Ten-thousandth of a Second

➤ A CLOCK so accurate that if it continues at the present rate it will gain or lose only one second in 30 years has just been put into operation at the Bell Telephone Laboratories, Murray Hill, N. J. It is expected to vary less than one ten-thousandth of a second per day.

This master timekeeper controls radio broadcast network switching clocks and "time-of-day" service in New York City. The new apparatus is used by the telephone companies to regulate equipment for the coaxial cable and radio relay television and telephone networks, as well as overseas, ship-to-shore and mobile radio-telephone service.

The clock's split-second precision lies in four extremely stable quartz crystals which vibrate constantly at a frequency of 100,000 cycles per second. The vibrations of these crystals control the frequency of a special electronic current with a precision of one part in a billion.

The new equipment is housed in air-conditioned rooms where the temperature never varies more than two degrees.

The new clock will provide a third, independent reference for time measurement throughout the United States. Extremely accurate measurements already are made by the U. S. Naval Observatory and the National Bureau of Standards, using quartz crystal clocks similar in general to the Bell clock. All such timepieces are checked with astronomical observations.

Science News Letter, June 16, 1951

MEDICINE

Heart Sound Meter May Measure Stress Effects

➤ DOCTORS in the future may have a better guide to the heart's ability to withstand stress, thanks to a heart sound meter reported at the meeting of the American Heart Association in Atlantic City, N. J.

This special electronic apparatus was tested by Drs. John H. Foulger and Paul E. Smith, Jr., of the Haskell Laboratory of Industrial Toxicology at Wilmington, Del.

The heart sound meter, they reported, analyzes low frequency heart vibrations, allows estimation of the heart's output of blood, stroke volume and the volume of the dilated heart.

The ratio of the stroke volume to the volume of the dilated heart may, they stated, have value as a measure of the heart's ability to withstand stress.

The completeness of the emptying of the heart's ventricles, which pump blood to the lungs and the rest of the body, seems to be related to the "abruptness" of the contraction of the ventricles, they found.

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UNSEEN AGENTS—Bacteriologist Lucille B. Robinson (left) and Dr. Ruth H. Wichelhausen examine tubes containing *L* organisms. These are grown in broth at an even temperature so that laboratory tests can determine the ability of various substances to kill the organisms, possibly leading to a remedy for rheumatic diseases.

MEDICINE

Rheumatic Disease Hope

Terramycin and albumin may be remedies for rheumatic disease. Basis for treatment is new-old theory that disease is germ caused.

➤ TERRAMYCIN, one of the anti-germ chemicals from an earth microorganism, and albumin from normal human blood hold promise of becoming remedies for rheumatic diseases, if studies reported to the American Rheumatism Association meeting in Atlantic City, N. J., are borne out by further research.

This new team of potential anti-rheumatic remedies was developed by Drs. Thomas McPherson Brown, Ruth H. Wichelhausen and William R. Merchant of George Washington University School of Medicine and Mt. Alto Veterans Administration Hospital, Washington, D. C., and Mrs. Lucille B. Robinson, research bacteriologist at Mt. Alto Hospital.

Some 150 or more patients have been getting either the new terramycin-albumin treatment or some variation of it tried in the course of developing the new treatment combination. Dr. Brown stressed, however, that it is too soon to talk about the treatment itself and that he and his associates are chiefly concerned at present with the basis for the treatment.

This basis is a new-old theory of a germ-cause of rheumatic diseases, from the heart-crippling rheumatic fever of childhood to the arthritis that painfully cripples grandpa's joints. The trouble maker, according to this theory, is a strain of germs called *L* organisms.

These organisms are said to be small enough to move in and out of a single cell. The body seems to respond to this by producing antibodies to fight the organisms. The reaction between the antibodies and the *L* germs result, through a hypersensitivity of the body, in the pain, swelling, fever, stiffness and crippling of the rheumatic diseases.

Cortisone, Dr. Brown believes, relieves these symptoms by blocking the antibody-germ reaction. When cortisone is stopped, the reaction and its symptoms return.

It was as a test of the theory of the *L* germ sensitivity cause of rheumatic diseases that terramycin, other antibiotic drugs and blood serum albumin were used as treatments.