

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.

Science News Letter, June 16, 1951



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.

Gold salts, long used to treat rheumatic diseases, can kill L germs. Reasoning that this was why they helped some arthritic patients, Dr. Brown and associates next made test tube trials of penicillin and other antibiotic germ killers. Aureomycin, chloramphenicol and terramycin proved capable of killing the L germs, terramycin being most effective.

Meanwhile studies by the relatively new technique of electrophoresis had shown that the proteins in blood serum were changed in rheumatic diseases. In severe cases there is a relatively low amount of albumin. Cortisone treatment causes a rise in albumin in blood serum. Injections of albumin reduced joint pain and swelling within 15 minutes, the improvement lasting six to eight hours. Apparently the albumin had the same effect as cortisone in blocking the L germ-antibody reaction, Dr. Brown reasoned.

This led to giving albumin, to block the reaction, with an antibiotic, to kill the L germs. In the few cases treated this way, there was marked clearing of symptoms and improvement shown by blood tests.

But until the new treatment has been tried on 100 or more patients and results followed for two years, Dr. Brown does not feel any real judgment on it can be made.

Science News Letter, June 16, 1951

INVENTION

Processing Food With Natural Flavor Patented

➤ DEHYDRATED SOUPS and desserts, natural and imitation fruit flavorings, dried eggs and milk, soluble coffee, and other dehydrated products will keep their flavors locked in and stay in shape to use without airtight packaging through use of two new methods which have just won five patents for two scientists of Parke, Davis and Company, Detroit.

The methods involve mixing the food and beverage products with either polyvinyl alcohol or a cellulose derivative. They are now being tested by the manufacturers of various food products, but are not yet in general use.

Many extracts of natural and synthetic flavors lose some of their original flavor or odor or both when they are stored. In addition, they tend to become caked from the moisture in the atmosphere. The fatty substances in dried soups now have to be packed expensively and usually separate from the other ingredients.

If these two chemicals are mixed with the dehydrated foods and drinks, the patent descriptions claim, this deterioration and the expensive air-tight packaging which is needed to prevent it are done away with.

Patents 2,555,464 through 2,555,468 were issued to Herman H. Bogin and Rufus D. Feick and assigned by them to Parke, Davis and Company, Detroit, on the new methods.

Science News Letter, June 16, 1951

PSYCHIATRY

Panic Aid Posts Urged

Panic and fear victims after A-bomb attacks could be taken care of in special shelters. Panic may take heavy toll of lives.

➤ PSYCHIATRIC FIRST aid stations will be needed to take care of victims of panic and fear in case of A-bomb attacks, two groups of doctors have declared. Panic may take more lives than the actual A-bomb attacks, one group pointed out.

Three medical officers of the Army present a plan for prevention and control of panic in the UNITED STATES ARMED FORCES MEDICAL JOURNAL (April). In addition, a committee of the Group for the Advancement of Psychiatry has published a similar plan.

"It is possible," said Col. John M. Caldwell, Lieut. Col. Stephen W. Ranson and Lieut. Col. Jerome G. Sacks, "that loss of life may be greater by reason of panic than as a result of the disaster itself."

Both reports stress the need for complete information on the nature of the various panic-producing attacks which might occur. Just as important, it was said, was the manner in which this information is passed on to the general public. The committee of the Group for the Advancement of Psychiatry criticized the overly-dramatic predictions of impending doom which, it said, were disseminated by some columnists and commentators.

MEDICINE

Drug Fights Gangrene

➤ A LEG-SAVING drug is now available at drug stores on a doctor's prescription. This may mean the saving of large numbers of feet and legs threatened with amputation because of gangrene due to diabetes. Children may be saved from crippling due to chronic osteomyelitis.

The new drug is called Varidase by its manufacturers, the Lederle Laboratories Division of American Cyanamid Company. Doctors who have been using it in pre-release trials know it as streptokinase and streptodornase.

The two long words are names for enzyme chemicals produced by the dangerous streptococcus germs. These two chemicals have the power to liquefy clotted blood and thick pus. Once liquefied, such material can be easily removed from infected areas, giving a chance for anti-germ chemicals such as penicillin, aureomycin and others to act more effectively and also giving the body's natural healing powers a better chance.

"Early interruption of acute, severe anxiety reactions," on the part of individuals subjected to A-bomb and other attacks, was seen as the most effective approach. Both reports stressed the need for psychiatric first aid stations which would seek to return persons mentally affected by the attack to normal life.

"Group panic," it was pointed out, "involves unreasoning, uncritical, and unadaptive movement of groups toward escape from danger." To control this sort of action, it was suggested, road blocks should be set up on roads leading out of attacked cities. People moving away from the city in "unplanned and unauthorized manner" should be diverted and the proper information given to them.

Any evacuation movements which are necessary should be carefully controlled because, in such movements, panic is quite easily developed.

A community which already has sound mental health, good intergroup relationships, factual knowledge about the possibilities to be faced in an attack and a method of dealing with those possibilities, it was emphasized, would be most able to prevent or reduce panic.

Science News Letter, June 16, 1951

The action of these two streptococcus enzymes has been known for years. Laboratories all over the world have been trying to prepare the materials in large enough quantities to try them on patients.

Lederle Laboratories are the first to achieve this and it cost them "three years of sad experience and hundreds of thousands of dollars," Dr. David Bryce said.

Credit for solving the problem of finding a way to produce Varidase commercially goes to Frank Ablondi, working under Dr. J. H. Williams, director of research for Lederle.

Besides its leg-saving future, Varidase is said to show great promise as an aid in treatment of the deep-seated chest infections known as empyema.

The chemical is produced in a dried form. It is used either by injection into body cavities or is applied directly to infected areas, such as diabetic ulcers.

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