IN VIVO ANTIBACTERIAL ACTIVITY OF HEXENOLACTONE. Charles W. Johnson and J. W. Bartholomew, Department of Bacteriology, University of Southern California.

The antibacterial agent hexenolactone occurs naturally in whole oranges, baked whole meal bread, and ungerminated cereal. This compound was recently synthesized by Meddwar, Robinson, and Robinson (1943) and Kuhn and Jerchel (1943). Bartholomew and Hervey (1947) demonstrated the in vitro inhibitory effect of this compound at varying concentrations against a variety of pathogenic and nonpathogenic gram-positive and gram-negative bacteria. Particular effectiveness was noted in the case of *Salmonella enteritidis*.

The first experiment in this in vivo study was designed to determine the LD₅₀ of hexenolactone for 14- to 18-gram white mice. The chemical was diluted in physiological saline and administered by the intraperitoneal route. Death was used as an end point of toxicity. All observations were made at the end of a 96-hour period. The LD₅₀ of hexenolactone calculated according to the method of Reed and Muench (1937) was 5.26 mg per 14- to 18-gram mouse. A 1-mg dose of hexenolactone was selected as the therapeutic dose.

Experiments using varying dosages of *Salmonella enteritidis* and a single 1-mg injection of hexenolactone administered 30 minutes after injection of organisms by the intraperitoneal route showed protection ranging from 0 per cent, at the highest dosage of organisms, to 100 per cent, at the lowest dosage of organisms. Using a constant dosage of approximately 100,000 organisms, protection ranged from 30 to 60 per cent for the treated mice.

An unsuccessful attempt was made to increase the rate of survival, using *Salmonella enteritidis*, by administering 1 mg of hexenolactone 30 minutes after injection of the organisms and 1 mg 3 hours after the initial injection of the chemical. Preliminary observations indicate a possible decrease in the rate of survival with increased amounts of the chemical.

REPORT OF A RELATIVELY SEVERE AND PROTRACTED DIARRHEA PRESUMEDLY DUE TO *SALMONELLA PULLORUM* FROM THE INGESTION OF INCOMPLETELY COOKED EGGS. T. F. Judefand, Department of Pathology and Bacteriology, College of Medical Evangelists, Loma Linda, California.

Although *Salmonella pullorum* had formerly been considered nonpathogenic for man, a number of cases of human diarrhea from which this organism has been isolated have been reported. Attention has recently been drawn to this subject by the report of Mitchell et al. (J. Infectious Diseases, 79, 57-62, 1948), which gives data on a major food-poisoning outbreak characterized by a diarrhea averaging 2 to 3 days and involving 423 persons, 127 of whom required hospitalization. *Salmonella pullorum* was rather definitely incriminated in this outbreak, and the available evidence indicated that the source of the organism was incompletely cooked eggs in rice pudding.

A case is reported of a female, age 29, who developed a diarrhea 8 days after hospital entry for obstetrical care. This diarrhea lasted for about a month. Just before recovery there was an acute exacerbation associated with a temperature of 102.6 F that required a second hospitalization. *Salmonella pullorum* was isolated from the patient's stool at the onset of the diarrhea. The source of the infection appeared to be incompletely cooked eggs, which were served for breakfast each morning while the patient was hospitalized for obstetrical care.
Electronic Preservation of Boston Brown Bread. J. W. Bartholomew and R. G. Harris, Department of Bacteriology, University of Southern California.

One hundred 1-pound loaves of packaged Boston brown bread were each inoculated with 100,000 spores of a mixture of Penicillium and Aspergillus molds. Each loaf was then placed in a dielectric field produced by equipment engineered by the Electronic Chemical Engineering Company of Los Angeles. This equipment was designed to operate at 5,000 volts, 200 milliamperes, and at a frequency of approximately 26 megacycles. Each loaf was heated to a temperature of 150°F before removal from the field. This took about 3 minutes. None of the inoculated and heated loaves were moldy after 3 weeks of observation. All of the control loaves were moldy by the third day. Considerable trouble with "arching" and resultant burning of the bread was experienced. This could probably be eliminated by correct electrode design. The slowness of the process could be eliminated by the use of more powerful equipment.

Although Boston brown bread is not a conductor, it was decided to see what the effect would be if the bread were put in an induction coil. This resulted in much more rapid heating, and the "arching" and burning were easily prevented. Heating was only on the surface of the bread, but molding seldom is a problem in the interior. Of 100 loaves inoculated with mold and heated in the induction coil, none were moldy after 3 weeks of observation, whereas all of the controls were moldy within 3 days. This method was superior to dielectric heating.

Bread treated by the foregoing methods retained all its original moisture and flavor. The wrapper was not affected.

Chemotherapy of Tuberculosis in Intravenously Infected Chick Embryos. Abram B. Stavitsky and Henry F. Lee, California Institute of Technology, Pasadena 4, California.

A new technique for intravenous injection of chick embryos made possible the production of disseminated tuberculous lesions within the parenchymatous organs of the embryos. The bacteriostatic effects of compounds may be tested in a short period of time in the presence of intact tissues. Studies utilizing streptomycin and certain other chemotherapeutic substances served to demonstrate the validity of the method. Streptomycin prevented the development of histologic evidence of infection in embryos intravenously inoculated with human tubercle bacilli, but bacilli were recovered upon culturing the tissues.

The Theobald Smith Society
(New Jersey Branch)
New Brunswick, New Jersey, June 21, 1947


A new quaternary ammonium, which possesses strong antibacterial properties, is described. (1) Dilutions ranging between 1:24,000 and 1:788,000 exerted bacteriostatic and fungistatic activity, according to the organism tested. (2) The phenol coefficient when determined against Eberthella typhosa is 433, and when determined against Staphylococcus aureus 521. (3) Serum was found to depress activity. (4) Changes in the pH of PDDB solutions greatly influence the killing action against S. aureus. (5) A study of the sterilization of surgical instruments was made on scalpel blades contaminated with various organisms including anthrax spores, together with either pus or blood, according to a method described by Spaulding. Complete
sterilization of freshly contaminated blades was obtained with an aqueous solution of 1:1,000 PDDB in less than one-half minute, but 10 minutes were required, depending upon the organism tested, when the contaminants were allowed to dry on the blades before testing. (6) Skin disinfection was tested according to Gardner's technique. Complete sterilization of the test organism (S. aureus and Aerobacter aerogenes) was obtained in less than 5 minutes.

Potentiation of the Curative Action of Antimalarial Agents, with Special Reference to 8-Aminoquinolines and Naphthoquinones. Harry A. Walker, Division of Pharmacology, Squibb Institute for Medical Research, New Brunswick, New Jersey.

We have reported earlier in periodic malaria reports to the National Research Council that the 8-aminoquinolines, pamaquine and pentaquine, and a naphthoquinone identified as SN-12,230 individually possessed definite curative activity against Plasmodium cathemerium infections in the duck. The amount of drug necessary to demonstrate this action was found to be approximately equal to the maximum tolerated level. However, when pamaquine (or pentaquine) was incorporated into the diet together with SN-12,320, a significant potentiation of the curative action was observed. For example, all animals were cured (100 per cent curative effect) on a diet containing $\frac{1}{2}$ of the dose of pamaquine which produces a 100 per cent curative effect together with $\frac{1}{2}$ of the 100 per cent curative dose of SN-12,320. This constitutes a 4-fold potentiation.

As high as an 8-fold potentiation has been obtained with combinations of these 8-aminoquinolines and this naphthoquinone. Potentiation was also observed by combinations of pamaquine or pentaquine with two other naphthoquinones, identified as SN-13,936 and SN-5,949. As yet we have been unable to demonstrate any potentiation of the suppressive activity with combination of these drugs.