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Serologic method for detecting infection in foods.By **J. BRONFENBRENNER** and **M. J. SCHLESINGER**.

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The isolation and identification of the infecting organism in contaminated foods is usually beset with difficulties and successful results are not the usual outcome. Negative findings often are due to the fact that it is impossible to examine the whole sample of the incriminated food bacteriologically. Since the pathogenic bacteria are usually few in number, and are not distributed throughout the food, it is more or less a matter of luck if one succeeds in isolating an organism which might justify the suspicions. If one attempts to increase the number of the specific bacteria by enrichment through incubation, he at the same time increases the number of saphrophytes, and thus adds to his difficulties. We find that the entire sample of suspected food can be advantageously analyzed for the presence of any suspected organism, or their split products (in addition to an attempt to isolate individual bacteria), by the following procedure.

The whole of the sample of food is chopped up and an extract made from it. This extract is concentrated so that all the specific bacterial protein is collected in a very small volume of liquid.¹ This concentrated solution is then tested against a set of specific immune sera. We have been able to detect by this method the presence of *B. botulinus* protein in 20 gram samples of artificially inoculated food, where the concentration of toxin was so small that it would have required giving at least 7 grams by mouth or 1.3 grams by injection into a mouse of 15-20 grams to obtain a positive result.

This method enables one to determine the presence of a suspected organism in contaminated food within 24 hours after receiving the specimen. It is, of course, necessary to have on hand a collection of specific sera of high titer.

¹ J. Bronfenbrenner and M. J. Schlesinger, *Jour. Med. Res.* (in press).

(This work is a part of the investigation of food poisoning, conducted under the direction of Dr. M. J. Rosenau, professor of preventive medicine and hygiene, Harvard Medical School. The investigations are done under the auspices of the Advisory Committee of the National Research Council on the Toxicity of Preserved Foods, and under a grant to Harvard University from the National Canners' Association.)

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On methods of isolation and identification of the members of the colon-typhoid group of bacteria. Further studies on C. R. indicator.

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Some time ago we described an indicator for the direct measurement of the hydrogen ion concentration in growing bacterial cultures.¹ This indicator consists of the mixture of China blue and rosolic acid, and covers the range of changes in the hydrogen ion concentration between $C_H = 1 \times 10^{-9}$ and $C_H = 5 \times 10^{-5}$. The choice of the dyes was made on the basis of their possessing suitable turning points coupled with the fact that their respective phases of highest color lie on the opposite sides of the point of neutrality. China blue is colorless at the concentration of hydrogen ions below 1×10^{-7} , and gives graded intensity of blue with the increase in the hydrogen ion concentration up to the point of about $C_H = 5 \times 10^{-5}$, when it reaches its maximum color. Rosolic acid, on the other hand, gives graded intensities of pink beginning with the hydrogen ion concentration close to 1×10^{-7} , and increasing gradually with the increase of the hydroxyl ions concentration reaching its maximum color at the $C_{OH} = 1 \times 10^{-5}$ (or $C_H = 1 \times 10^{-9}$). With the increase in concentration of hydrogen ions above 1×10^{-7} the rosolic acid has a pale yellow (straw) color, which is masked by the color of ordinary culture media.

¹ J. Bronfenbrenner, *Jour. Med. Res.*, XXXIX, 1, 25, 1918.