

# THE POSSIBLE DANGER OF ABSORPTION OF TOXIN OF B. BOTULINUS THROUGH FRESH WOUNDS AND FROM MUCOUS SURFACES

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**T**HERE have been recently investigated two outbreaks of botulism, in one of which, due to home canned asparagus, occurring in Salt Lake City, Utah, the housewife stated she merely placed some of the liquor of the canned vegetable on the tongue. Because of the resulting burning sensation the tongue and mouth were immediately washed with water and an alcoholic toilet water. Symptoms of botulism occurred in 36 hours and death in four days.

In the other outbreak at Hailey, Idaho, in which home canned corn was involved, the housewife stated that she crushed two or three grains between the teeth to test the quality but did not swallow any of the material. Symptoms of botulism occurred in 48 hours and death in eight days. Both foods were proved to contain a toxin of *B. botulinus*, type A.

There are on record many instances<sup>1</sup> in which it is stated the foods were only tasted, but in the above outbreaks we have the only reliable records of symptoms and death occurring from botulism by apparently rapid absorption rather than from the ingestion of the toxic food.

An effort was made to test on guinea pigs this interesting epidemiological possibility. There were fortunately available from the Ismay, Montana, and the Okanogan, Washington, outbreaks, home canned corn and string beans, respectively. Both foods had been proved to contain a toxin of *B. botulinus*, type A; m.l.d. for mice, 1/100,000 c.c.

The various methods of preparation of the experimental animals were as follows:

1. Shaved area, approximately one inch

square, on abdomen. Skin area was reddened and bleeding in places.

2. Shaved area, approximately one inch square, on abdomen. Three linear incisions made just through skin.

3. Shaved area, approximately one inch square, on abdomen. Small skin pocket made in center of area.

4. Hair on abdomen plucked out, area approximately one inch square.

5. Vaginal swabbings.

6. Uninjured and normal skin area, hair intact.

All animals were used in duplicate with both the corn and string beans except in experiments number 4, 5, and 6, when sets of six animals were inoculated. The material was vigorously applied except in experiments 3, 5, and 6 with sterile cotton swabs previously dipped and thoroughly moistened with the toxic foods. The injured skin areas were first washed with 95 per cent alcohol, allowed to dry before and after application of the toxic material. In each experiment, control animals in duplicate were inoculated subcutaneously with 2 c.c. botulinus anti-toxin, type A, testing 400 units per c.c. The control animals remained well.

Autopsies were made on three animals. Two were from experiment 4, and one from 5. The autopsy animals were etherized before death; bled from the heart and sodium citrate solution added. One c.c. of this citrated heart blood was inoculated intraperitoneally into mice in duplicate, to test the presence of toxin in the circulating blood, with negative results. Enrichment cultures in beef heart media were incubated and stained smears and agar shake cultures made from those

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gave positive results from the animals in experiment 4, for *B. botulinus*, type A, from the following organs: liver, kidney and mesenteric lymph nodes; spleen, brain, bone marrow and citrated heart blood were negative. Cultures from the animal in experiment 5 were negative for *B. botulinus* even from the uterus and its appendages.

#### RESULTS

Every animal died in experiments 1, 2, 3, 4, and 5, with typical symptoms of botulism, except those protected with antitoxin. All animals remained well in experiment 6.

#### CONCLUSION

The absorption of *B. botulinus* toxin does not occur on the unbroken skin. The absorption of botulinus toxin is probably not limited to any particular or specific portion of the gastro-intestinal tract, but may occur on or from any mucous surfaces, broken skin areas, or fresh wounds. Therefore extreme care should always be taken in handling suspected contaminated packs of food, though it is fully recognized and appreciated that from the epidemiology of the majority of the botulism outbreaks that have occurred, this is a remote possibility.



## DISEASES OF THE PRESSERS

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### I.

**P**RESSERS are not tailors. They are not needle workers. They have nothing to do with the sewing of garments. Their work is a branch of the garment industry. It consists in the pressing of ready garments with hot irons to put them in shape.

Pressing is a less skillful trade than tailoring. It does not require so long an apprenticeship. It can be learned in a comparatively short time. The pressing trade is filled by persons who usually have followed another trade. It is mostly recruited from the adult immigrant population, brought up in various other occupations, which it was, for some reason or other, impossible to follow in the new country. Pressing requires greater muscular effort than sewing at machines. Pressers are therefore selected from a more robust class.

There are very few women in the trade. Only in pressing of lighter garments,

such as silk waists and dresses, do women work as pressers.

Tailors sit at their work, pressers always stand. They lift heavy irons weighing from twelve to twenty pounds. In hand pressing, the worker lifts the hand iron and puts it down with considerable force upon the slightly moistened garment. In raising his right arm he bends towards the left side.

The irons are heated by electricity or illuminating gas. In olden times the irons were heated directly by coal burning within the hollowed iron. Later this was substituted by heating the irons by coal or gas in special ovens placed near the pressers. At present in the women's garment trade, there are but three methods of heating. The most modern one is by electricity. This is more frequently used in the dress and waist industry. It is claimed that for heavier cloth and garments electric heating is not appropriate. The usual methods of heating irons in the trade is by illuminating