

THE INSPECTION OF CANNED FOODS EXPOSED FOR SALE.*

BY

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WE shall agree that our inspection of canned foods exposed for sale leaves much to be desired. It is extremely difficult to judge of the wholesomeness of such food by the methods at our disposal; and so it occurred to me that there might be some advantage from discussing this subject together.

The consumption of freshly-opened canned food very rarely gives rise to serious symptoms arising from germs and their products, if one bears in mind the enormous consumption of this material; and it looks as if trade practices almost suffice to protect the public from danger. These trade practices not only include the adoption of such methods of canning as will ensure the destruction and subsequent exclusion of organisms capable of originating decomposition, but also other measures with which you are doubtless familiar. The producer, for instance, generally allows for all blown tins picked out by the retailer from any consignment, and also for tins returned to the shop-keeper with contents which have proved to be unsound after the tin has been opened by a customer. Many invoices to the trade carry an undertaking to this effect, and the middleman is in some cases authorised to closely examine 10% of the consignment and the proportion of blown tins discovered is allowed for on the whole consignment.

If, moreover, we realise that not a small proportion of the cases in which the consumption of freshly-opened canned food has led to poisoning symptoms may be ascribed to tin poisoning, it does not seem that the public stand much in need of a greater protection than the present very imperfect methods afford, *so far as poisoning from food which has undergone changes of decomposition is concerned.*

When inspecting canned food, after we have dealt with blown tins and opened a small proportion of other tins and observed obvious decomposition in the offensive contents of an occasional unblown tin, we are left wondering whether in cases where there is no clear evidence of decomposition there may not be

some means of detecting such earlier changes as may lead to disturbance among susceptible persons. Impressed with the need for further guidance in this matter, I suggested to Miss Dove, M.B., who has been engaged now for some time in research work in my Department at University College, that it would be well to endeavour to further investigate this subject; and together we planned a scheme, embracing a large variety of tests, which claimed Miss Dove's close attention for many months. I am sorry to say that in this endeavour, as in so many instances of research work, much painstaking and skilled labour has borne but little fruit.

Our scheme was to select canned nitrogenous food which was particularly liable to decomposition; to pierce the tins of one-half of each batch of the foods we examined and so let in organisms which would start decomposition; to either re-solder or cover over such pierced tins; and then to re-open or uncover them and apply tests to their gradually decomposing contents, day by day controlling all these tests with similar tests applied to the contents of freshly-opened tins.

Miss Dove's experiments embraced only chemical and physical tests. We concluded that bacteriological tests were less available for practical sorting purposes; and we had in mind the fact that the bacteriological examination of these materials had already received a good deal of attention and had afforded no really helpful solution of our practical difficulties. The development of the spores of *B. Cadavaris* (a test suggested by Beveridge) takes about a fortnight; and *B. Gaertner* and *Botulinus* have rarely (if ever) been separated from such material, except after the cans had been opened and the material exposed to contamination.

Of course the experiments impressed the fact that the blowing of the tin is a very late sign of decomposition—we found that it might take many weeks, before it was apparent after an easily decomposable substance had commenced to decompose. Therefore the evidence of the blown tin is a positive sign of *advanced* decomposition, except in those rare cases when it may result from electrolytic action; and the experiments confirm the view that in a consignment containing blown tins there may be unblown tins the contents of which are unquestionably bad. Yet in our practical inspections it is only possible to open a small percentage of unblown tins; and assuming

*Opening remarks to Discussion at the Meeting of the Metropolitan Branch on April 23rd, 1915.

that as much as 10 per cent. of a part of a consignment is found to be obviously unfit, can we reasonably condemn the other 90 per cent.?

There would be no useful object served by detailing the large number of chemical tests which were applied to the gradually decomposing material with the object of detecting the earliest possible chemical signs of decomposition. It will suffice to say that tests were made, day by day, both for final and intermediary products of decomposition (including ammonia, sulphuretted hydrogen, carbonic acid, basic degradation products of proteins (ptomaines), phenoloid bodies, etc.). The results were variable and inconclusive, when one compared those from exposed material with those from the contents of the freshly-opened control tins. Certain tests advocated in text books (such as the rod dipped either in Nessler's reagent or in a mixture of hydrochloric acid, chloroform, and ether in order to detect ammonia) were found practically useless; and, in short, no chemical test was found of value as an indication of definite decomposition changes before the stage was reached when such changes were equally apparent in the changed physical characters of the material. We hoped to get earlier chemical evidence of change from the distillation of suitable solvent agents allowed to act upon the canned material, but without such definite results as would serve as a safe guide to practice.

Electro-conductivity tests for early decomposition changes have also proved of little practical value.

We found that a careful examination of the article (always aided by comparing the contents of an obviously sound tin with those of a suspected tin) will generally serve to detect the following physical signs of early decomposition changes, and that such changes are no better indicated by difficult and tedious chemical and physical tests:—

1. *Odour*.—This is more or less changed. The odour would generally be described as one of "staleness"; but, however it is defined, the observer is generally able to appreciate some change. It is well to place any questionable material in a clean, odourless bottle, filled up to the neck with a little strong solution of caustic potash, stoppered with a ground-glass stopper, and placed in the hot incubator for an hour. A control of obviously fresh material is similarly dealt with. At the end of the hour any faint difference in

odour generally becomes quite apparent. An offensive odour is generally a sign of very advanced decomposition.

2. *Firmness or Resistance to Pressure*.—Often a fairly early sign of decomposition is an appreciable loss of resistance when some of the article is pressed and broken up between the fingers and thumb. The article is slightly softer or more friable, and the contents of a tin are generally more easily turned out.
3. *Colour*.—A fading or change of natural colour is another useful sign of decomposition when it is associated with changes 1 and 2. When the colour changes it generally turns to a brownish tint. While the solid matter may show no such changes, any liquid matter present may do so, in which case the latter may show an increased opacity. The tin coating may also be slightly discoloured in places.

Therefore, in practice I would suggest that we should examine the whole of a consignment for blown tins, and that when blown tins are found we should open from 5 to 20 per cent. of a portion of it (say, two cases of 4 dozen). Whether we open 5, 10, or 20 per cent. of a portion of a consignment should depend upon—

- (a) The number of blown tins discovered.
- (b) The liability of the material to undergo decomposition. For this is very low with some articles, such as sweetened condensed milk; and high for others, such as certain canned fish (rock salmon, etc.), in which it is common to find 2 to 3 per cent. of blown tins. In canned meats it is unusual to find more than a fraction of 1 per cent. of blown tins.
- (c) The class of the material. Canned food in poor tins, and not carrying the name and address of the firm which puts it upon the market, calls for the most complete inspection.

When there are acid juices or oily liquids in the canned goods examined, it is desirable to collect a little of this liquid and to test it qualitatively and (if necessary) quantitatively for tin.

It is often advocated that every can should carry information as to the date of canning. I must confess that the suggestion makes but little appeal to me. Such articles as canned food are generally some months old before they are sold in shops, and I do not see that it matters if they are many months older. The "life" of properly prepared, canned food is governed by the life of the can. The contents remain practically sterile until ultimately air gains access; and I know of no respect in which sterile food twelve months old loses by comparison with sterile food three months old. The suggestion, if adopted, would tell against

the storage for sale at better market prices and would otherwise handicap the trade, and so probably lead to an increase in the cost of this material. I would rather see each can of preserved meat and fish carrying a warning notice that the contents should always be consumed on the day of opening; for this class of canned material appears to be peculiarly favourable to bacterial invasion, and therefore to the development of toxins; and probably in most of the recorded cases of "food-poisoning" from canned goods these harmful products are developed after and not before the cans are opened.

PROCEEDINGS OF THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED 1856. RECONSTRUCTED 1888.
INCORPORATED 1892.

ANNUAL GENERAL MEETING.

THE Annual General Meeting of the Society was held at the Society's Rooms, No. 1 Upper Montague Street, Russell Square, London, W.C., on Friday, October 15th, 1915, at 5 p.m. *Present*:—Dr. F. J. Allan (President Elect), Dr. A. Bostock Hill, T. Ridley Bailey, E. H. Snell, T. W. N. Barlow, W. H. Symons, Duncan Forbes, J. Tubb Thomas, C. Sanders, W. J. Howarth, W. A. Bond, G. F. McCleary, W. Stewart Stalker, Alice Stalker, A. T. Nankivell, Thomas Evans, A. E. Remmett Weaver, W. Benton, S. Nicol Galbraith, Oliver Field, P. W. Spaul, J. C. Jackson, G. E. Oates, Thomas Orr, Chas. Porter, John Brownlee, R. J. Ewart, P. Caldwell Smith, Wm. Butler, H. R. Kenwood, Agnes Estcourt Oswald, Armly Ashkenny, Frank Robinson, H. H. J. Hitchon, and G. H. Dupont

DR. A. BOSTOCK HILL, in taking the chair as Senior Vice-President present, expressed his great regret at the absence of the outgoing President, Lieut.-Colonel Herbert Jones, who had found it impossible to attend the meeting owing to his military duties. The pleasing duty of inducting Dr. Allan into the chair, therefore, devolved upon him (Dr. Bostock Hill) as the Senior Vice-President of the Society present on this occasion. He congratulated Dr. Allan on having been elected to the high office of President of the Society, and in his own name and in that of the Society expressed the wish that he, Dr. Allan, would enjoy as happy a year of office as had fallen to all his predecessors in the chair. He was confident that the honour and high reputation of the Society would be fully maintained under the Presidency of Dr. Allan and that his year of office would be as pleasant to him as it would be valuable to the Society. Dr. Bostock Hill then invested Dr. Allan with the

Presidential Badge and vacated the chair in his favour.

DR. F. J. ALLAN, in taking the chair as President of the Society, expressed his sincere thanks to Dr. Bostock Hill for the kindly manner in which he had inducted him into office, and also to the Society for the honour which had been bestowed upon him by the members. He also read a telegram from Lieut.-Colonel Herbert Jones, the late President, regretting that his military duties prevented him from officiating at the ceremony of induction.

Minutes.—The minutes of the last Annual Meeting, held on October 16th, 1914 (*PUBLIC HEALTH*, p. 46, Nov., 1914), were taken as read, approved and signed by the President as a correct record.

Correspondence.—The Hon. Secretary read letters regretting inability to attend, from Drs. J. W. Hembrough, H. C. Pattin, R. Ashleigh Glegg, H. Handford, H. L. Hamilton, Joseph Priestley, J. Tubb Thomas, Prof. Sims Woodhead.

The PRESIDENT reported the receipt of a letter from Dr. H. Beale Collins, regretting his inability to be present owing to the uncertainty as to the fate of his son who had been in action and was reported missing*.

Resolved unanimously: That the Hon. Secretary be asked to write a letter expressing the sympathy of the meeting with Dr. Beale Collins.

Annual Reports.—The following Annual Reports were received:—

(a) The Council (published in the October number of *PUBLIC HEALTH*.)

(b) Report of the Hon. Treasurer as follows:—

To the Council of the Society of Medical Officers of Health.

GENTLEMEN,

I regret to have to call attention to the fact that the Balance Sheet for Session 1914-15 shows an excess of expenditure over income to the extent of £43 13s. 9d., with the result that no further addition to the Reserve for Contingencies has been possible. An analysis of the Revenue Account for the past year will show, however, that every effort has been made to keep the expenditure within proper limits, and the deficit is entirely due to abnormal expenditure which does not properly belong to the Session under review. I refer more particularly to the item of £150 9s. 6d. for fares of Elected Representatives and the Hon. Secretaries of Branches which were incurred in Session 1913-14, but under the Articles of Association are voted by the Council in the following Session. The fares incurred for the past Session will not exceed £60, so that as a matter of fact the actual financial working of the Society during the past year would have resulted in a

* Members will be pleased to learn that since the date of the meeting Dr. Beale Collins has heard that his son is not dead, but is a prisoner of war in Bohemia, and that he has recovered from cholera and is being kindly treated by the Austrians.