

The adulteration of butter / [Allan Barns Graham].

Contributors

Barns-Graham, Allan, Jr.
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THE ADULTERATION OF BUTTER

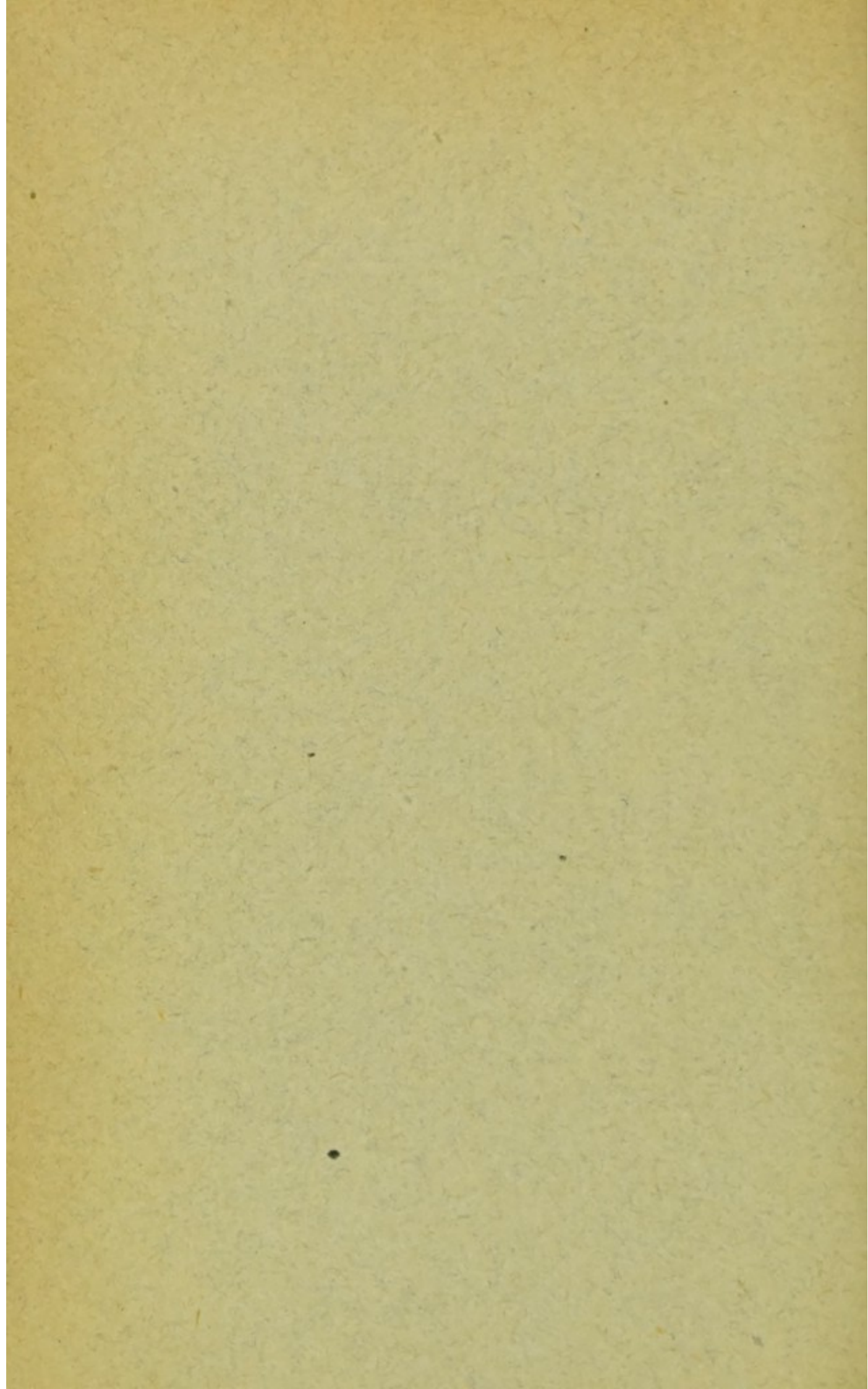
THE OBJECT OF THIS PAMPHLET IS TO TRY AND PROVE
TO SIR EDWARD STRACHEY, BART.,
AND HIS COMMITTEE, THAT
PUBLIC HEALTH

Demands

- (1) An end to the "Milk-Blended-Butter-Trade"
- (2) The upholding of the Sixteen per cent. Water-Limit ; and
- (3) The Total Prohibition of Boracic Acid in Butter

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Publishers to the University of Glasgow

1906



With Mr. Allan Barns Graham's
Compliments

June 1906

Craigallian
Milngavie, N.B.



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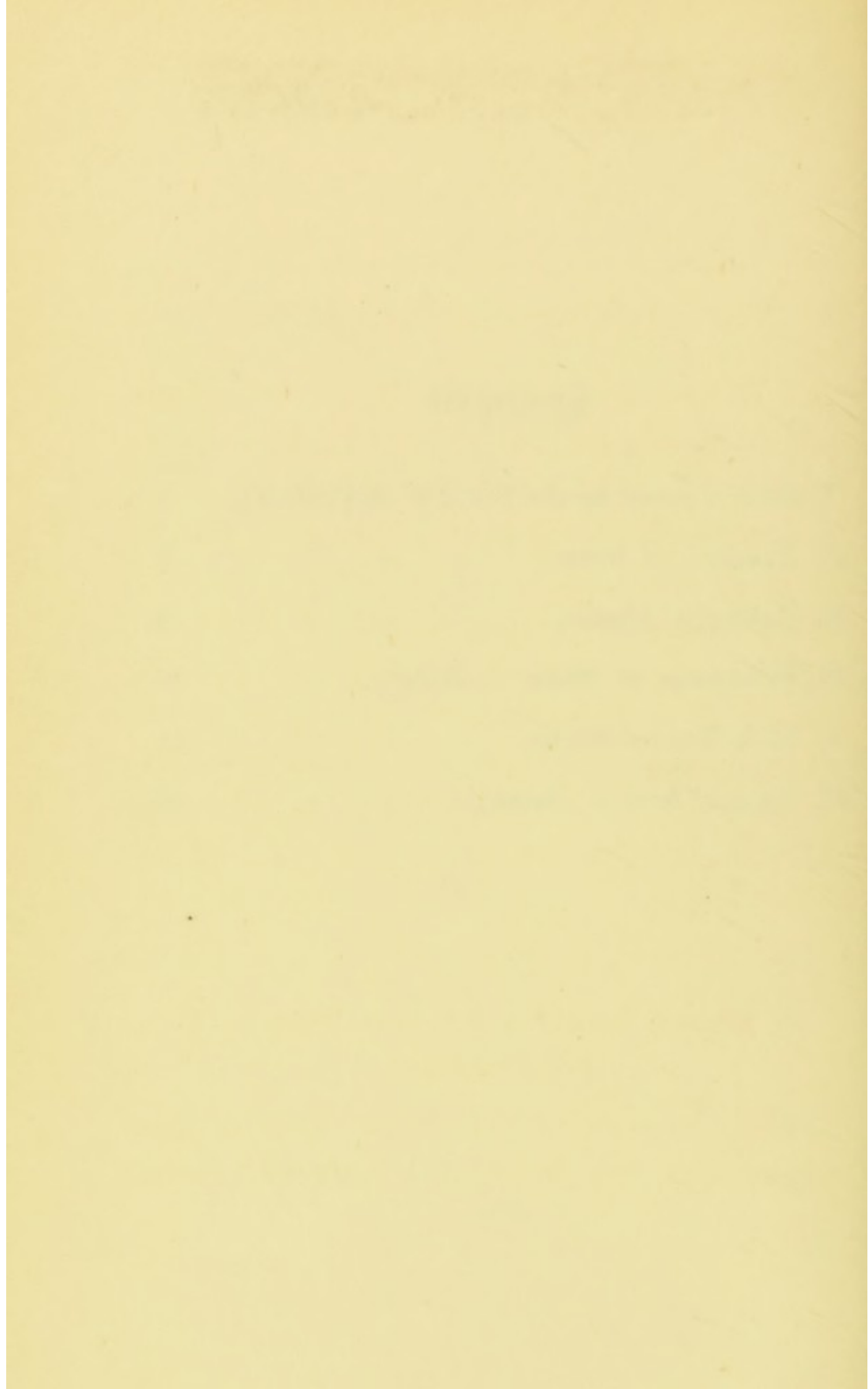
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The Adulteration of Butter

OUR Daily and Agricultural Papers have from time to time published evidence given before the Select Committee of the House of Commons which is at present considering the Butter Trade of this country.

My object in writing this is to do what I can to assist this Committee, and also to remind all interested of the warning so often given by our Municipal and County Health Officers of the serious danger in allowing children to be fed on a drugged and impure Food Supply.

I. Strict Control by the Board of Agriculture.

The Scottish Agricultural Organisation Society, Ltd., has drawn up a National Scheme

in favour of Co-operative Dairying. A large Committee has also been appointed to look after this Scheme, and once things are properly organised I believe there is a great future ahead of Dairying in this country.

I understand that Sir Thomas H. Elliott, in his evidence before the above-mentioned Committee, advocated the Registration, Inspection, and control of Butter Factories, etc.

All Farms (Dairy Farms) Co-operative Milk Depôts, Creameries, Dairies, Butter Factories, Cheese Factories, and Margarine Factories should be registered, etc., and Practical Rules and Regulations strictly enforced.

The interest of Public Health and Co-operative Dairying go hand in hand, and all should realise this.

II. Blending of Butter.

I am not against the "working-together" or "blending" of butter, **provided** in doing so no Margarine or other butter-substitute is added thereto.

III. Colouring Matter.

I wish it "*were*" possible to do without "Annatto," but I fear, unless a law is passed forbidding its use, that the "*imagination*" of the public will insist on butter having this uniformity of colour.

There are some people who imagine that the colour of butter is entirely a matter of breed. A Jersey cow fed on grass will undoubtedly yield butter of a much richer colour than will an Ayrshire or Shorthorn cow fed in the same way, but this same Jersey in the winter months, when hand-fed, will often give butter of a much lighter colour—it will sometimes be of the appearance of lard. Were our Dairy Farmers therefore to give up using Annatto the public would absolutely refuse to buy their butter.

This public taste or demand is quite absurd, for the white and colourless butter may be much superior to the coloured article.

IV. Percentage of Water in Butter.

The late Dr. Aitken (Chemist to the Highland and Agricultural Society of Scotland) analysed samples of Salt and Fresh Butter for me in 1902.

The Salt gave an analysis of 11 % water and the Fresh 13.5 %–13.8 % water. (That is both were under 14 %.)

“*I consider this 16 % water-limit absolutely fair.*” There should be no exceptions made. What applies to Australia should equally apply to Ireland and elsewhere.

It is also in the interest of “*Public Health*” to have this 16 % water-limit.

Public Health Officers should see to it that any butter “*heavily charged*” with water should undergo a thorough Bacteriological Examination.

Water is, unfortunately, not always pure or free from disease germs.

V. Milk-Blended-Butter.

I cannot write too strongly against this Trade. *It should be absolutely prohibited.* It has in it (1) a serious danger to Public Health, and (2) it is also certain to undo the good work of our Agricultural Colleges, not only in this Country but also in our Colonies.

“Milk-blended-butter” might be defined as “*Improperly made butter.*” Improperly made butter *is* and always will be a serious danger to Public Health. “Milk-blended-butter” cannot keep for any length of time, hence the temptation—or I should perhaps say “hence the necessity”—to overcome this difficulty by the use of Boracic Acid and other drugs.

To prove the seriousness of this matter, let me give one or two extracts from a very able work which everyone interested in this question should carefully study.

I refer to “*The Principles of Modern Dairy Practice by Grottenfelt.*”—trans. by Woll.

(1) See page 242.—“Some writers argue that the keeping quality of the butter is due entirely to the salt which it contains. This assertion is not justified however. While it is well known that salt has strong preserving properties, it does not generally check the growth of the pathogenic (disease-producing) bacteria. The only one of these organisms which, according to Foster's experiments, was influenced by salt was the cholera bacillus. The typhoid bacillus was not at all incommoded by common salt, and tubercle bacilli only after having been exposed to the action of salt for a long time. As regards the non-pathogenic bacteria found in milk, I have ascertained that they are generally but slightly influenced by salt that may be present in the substratum. If the conditions are otherwise favourable for these organisms, even a high salt content in the nutritive solution will not check their development. In the experiments mentioned I grew lactic-acid bacteria, among other mediums, in sterilized brine which had previously been a preserving fluid for butter. They developed vigorously in it, and fully

retained their ability to produce lactic fermentation, although they went through a long series of inoculations from one sample tube with sterilized brine to another. If, on the other hand, salt was added to this brine so that the solution became saturated, the lactic-acid bacteria developed only slowly and feebly, and after having been grown in 3 to 4 such solutions, they died out entirely. As regards the influence of salt on other bacteria found in milk, I have only ascertained that certain putrefactive bacteria are very sensitive to the action of salt, while, *e.g.*, the butyric-acid bacillus, *i.e.*, the form of the same with which I have experimented, is only slightly disturbed by a high salt content in the substratum. Salt therefore influences as a rule only slightly the growth of bacteria. It may be noted in this connection that the preserving influence of salt, *e.g.*, in butter-making is largely due to the fact that it indirectly counteracts the development of bacteria. It leads to unite the small drops of butter-milk in the butter to larger, which may be easily expelled in working. Unfavourable conditions are thereby

created for bacteria, the moisture necessary for their development being removed for the larger portion of the butter; and the salt content where some fluid remains becoming so concentrated that the bacteria are checked in their development."

(2) See pages 244, 245 and 246.—“**Bacteria in Butter.** When packed, a larger or smaller number of bacteria is always found in butter. The number will differ according to the treatment which the milk received and according to the kind of butter produced. In a sample of sweet-cream butter examined bacteriologically I found a comparatively small number of bacteria an hour after it was worked, and the different samples of ‘Paris butter’ (see p. 205) analyzed contained still fewer such organisms—viz., from 120 to 300 per c.c. As would be expected, a far larger number have been found in fresh sour-cream butter—viz., not less than 2000-55,000 per c.c. During the first days a perceptible increase in the number of bacteria was noticed in all samples of butter, especially in the outer layer. In the centre of the tub a comparatively small increase took place

during the first hours, but it soon stopped, at least if the butter had been well worked. The lively bacterial increase in the surface layer spread very slowly towards the centre.

“Lafar (Munich) found an immense number of bacteria in sour-cream butter examined by him, which presumably had not received the best treatment. In most samples ten to twenty million bacteria per gram ($\frac{1}{28}$ of an ounce) were found, and he adds that it is not stretching matters to assert that more living organisms are often consumed with an ordinary good-sized Sandwich than there are inhabitants in Europe.

“The outer layers of fresh sour-cream butter will be found to contain a large number of the bacteria that took part in the ripening. But these do not generally appear to thrive long in butter, unless it is soft and contains a good deal of butter-milk. Samples of butter of different origin have shown great difference in this respect. If a sample is dry and hard, the lactic-acid bacteria and even some putrefactive bacteria will soon disappear, so that butter after four or five days will present an

entirely different picture to the bacteriologist than before. In place of the staff-like bacilli found, other wholly different forms seem to appear, such as several kinds of '*sarcina*' and small '*micrococci*.'

“These forms multiply rapidly, and, according to what I have been able to find out, do not in general exert any bad influence on the quality of the butter—at least when alone. The staff-bacteria have not disappeared entirely, but are in a great minority.

“If, on the other hand, a sample of butter is soft and contains large quantities of buttermilk, the bacilli will retain their superiority all the time; the lactic-acid bacteria appearing first, and later on others, giving rise to more or less harmful fermentations. The importance of these conditions for the keeping quality of the butter is evident without any further elucidation.”

Having seen over the Dookie and the Richmond Agricultural Colleges in Australia, I feel sorry when thinking of the damage this “Milk-blended-butter trade” may do to the good work done at these colleges.

At these colleges every student when learning to make butter is taught to get rid of the butter-milk adhering to the butter grains. Now the object of this is to produce an article which *will* keep.

Therefore every drop of butter-milk left adhering to these butter grains naturally lessens this keeping quality.

In case the seriousness of this matter is lost sight of, let me remind my readers **that milk and separated skim milk is a perfect food for pathogenic and other bacilli**, and it therefore follows that the leaving of butter-milk in butter, or the adding of milk or solidified skim milk to butter, is not only manufacturing an article which can not keep for any length of time (**unless it be drugged**), but it is also placing on the market an article which might easily prove a serious danger to public health.

I need hardly say more on this point, for anyone will see at a glance how intolerable is this trade, how serious it might prove to young and delicate children, and how damaging to the splendid work which is being done by our Agricultural Colleges.

VI. Boracic Acid in Butter.

I have kept this matter to the last, and if I may say so, it is the most important of all. This use of Boracic Acid is an abominable practice.

It is the worst form of adulteration. To think of this country professing so much, believing so much, and doing so much, yet allowing a practice to continue which not only **must** retard the growth of children, but also may be one of the causes why so many children are not so robust as their parents would like them to be, surely we have cause to feel ashamed.

Let us hope that Sir Edward Strachey and his Committee will have the courage to demand an end to this.

I have heard it said that our medical authorities are divided on this question, and that some doctors state that boracic acid is **as harmless as salt**. There may be men who

talk like this, but they are certainly not the leaders of this noble profession.

I know that in writing thus I make an attack on practically every butter factory in Australia, but according to the evidence given by Mr. Lovell to the 1901 Departmental Committee on Preservatives in Food (see page viii.), and from Dr. Thorpe's Butter Analyses of 1902, and from what I myself saw in Australia, I cannot write otherwise.

This state of things **must** be put a stop to, and **can be** without detriment to the Colonies.

Both Australia and New Zealand have great Dairying possibilities, and their butter production might easily double or treble itself.

Our Colonial Butter Makers need not fear to tackle this question of Boracic Acid. I do not think it is a really difficult problem.

The following extracts will, I think, prove how Boracic Acid **is** a danger to Public Health:

(1) See "Dairy Bacteriology," by Dr. Ed. von Freudenreich, translated by Ainsworth Davis, page 89:

“**Boracic Acid.** According to A. Mayer this acid makes milk keep very well. The experiments of Lazarus show, on the contrary, that it has little power against germs, and that milk to which it is added curdles as soon as ordinary milk. *Against disease germs especially it proved quite powerless.*”

This last sentence should be carefully noted, for it proves that Boracic Acid does not check the growth of the disease germs which may be present in “Milk-Blended-Butter.”

(2) See “Principles of Modern Dairy Produce,” by Grotenfelt, page 249:

“**Preservation of Butter.** Butter being an expensive and very delicate article of food, it has of course been the object of adulteration and admixtures of preservatives.” See page 250: “An admixture of such antiseptics must, however, as previously shown (p. 145), be considered an adulteration, especially if it takes place without the knowledge of the buyer. The salting of the butter is an entirely different matter; the fact of its being used is not disclosed for the public, and each buyer may easily satisfy himself concerning its pre-

sence. The great majority of people, moreover, demand salt in their butter. [The same applies to the use of butter colour during the greater portion of the year.—W.]”

In a letter dated 1st September, 1903, received from the late Dr. Carstairs—forty years Health Officer of Geelong, Victoria, Australia—he wrote the following :

“I thought that the use of Boracic Acid in milk or its products was illegal, if not, the sooner it is made so the better.”

I have cuttings which I took from the Australian papers in 1898 *re* this matter of Boracic Acid, and I think the following two are worth giving :

See *The Argus*, dated 2/3/98. **Adulterating Milk—Dr. Gresswell’s Opinion :**

“The prosecution of a milk vendor, reported in *The Argus* yesterday for selling milk which contained added water and mineral matter, probably boracic acid, raises the question of the use of preservatives in milk. In his evidence Mr. Dunn, the analyst, said the use of boracic acid as a milk preservative was extremely dangerous to infants and invalids,

because, though present in only small quantities, its frequent use multiplied the doses till they reached a serious total.

“ Dr. Gresswell, Chairman of the Board of Public Health, concurs with Mr. Dunn, and adds that the use of boracic acid in milk should be prohibited absolutely by law, because milk forms the staple food of all infants who are not breast fed. European countries have already adopted this prohibition, and the necessity for their lead being followed is shown clearly when it is remembered that boracic acid merely suspends putrefaction ; it does not destroy deleterious micro-organisms. Where filth is present in milk, boracic or salicylic acid does not remove its ill effects ; it merely holds them in check, and they are free to do their mischief as soon, for instance, as dilution by water occurs. Then, when the acids are excreted by the kidneys, the active micro-organisms of the filth remain to do their dreaded work. Thus the dirty dairyman, who is a curse to civilisation, and the clean, who is a blessing, are placed on the same level, since boracic acid makes the milk of both

equally acceptable to the layman. With wines the same danger is run, particularly in the case of the man who drinks much, because the practice of putting salicylic acid in wine is, according to Dr. Gresswell, appallingly common."

According to Dr. Thorpe's 1902 Butter Analyses, the Danish, Canadian, and sixty-two per cent. of the Dutch butter-makers can supply us with pure and unadulterated butter. Why, therefore, should we allow other butter-makers to use boracic acid or any other drug?

The Victorian Government has, I understand, passed their Milk and Dairy Supervision Bill. The editor of *The Australian Farm and Home*, in his May and August, 1905, numbers, states most emphatically that it is a small number of farmers in Victoria who, by their carelessness and filthiness, have made this legislation a necessity.

It is this same carelessness and want of cleanliness referred to by Dr. Gresswell which has forced the Australian Butter Factories to use Boracic Acid (or Preservitas).

The following Resolution was published in

the *British Medical Journal*, 3rd November, 1900, page 1341 :

“That, in the opinion of the State Medicine Section of the British Medical Association, the addition of preservatives to milk, butter, and similar products, beer and wine, should be prohibited, and their addition to other foods regulated by Statute.”

I understand that our Medical Authorities are still of the same opinion.



