

## Report on Subject of Dun Fish.

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Early in 1911 Captain Salling drew our attention to the difficulty which was experienced in the curing and preservation of dried and salted fish, as prepared in Newfoundland and Labrador. At his request we perused the existing literature on the subject, and forwarded to the Newfoundland Government a brief resume, including general advice regarding the cleaning and disinfecting of the curing places.

It appeared afterwards that the authorities were not quite satisfied that the disease which prevailed in North West Europe was exactly the same as the one they had to face in Eastern Canada and Newfoundland, and that therefore the treatment and disinfection recommended might not be applicable in this case. They accordingly requested us to extend our investigations to the exact determination of the cause of the disease in the Newfoundland fish curing industry, and to this end sent us early in 1912 a box of dun dried fish.

On arrival the enclosed photographs of the fish were taken, in order to exemplify what we considered to be the symptoms and visible effects of the dun, and our investigations were concentrated on classifying the organism which caused these particular symptoms.

Referring to the photographs, it will be observed that the fish is covered with spots. These spots are brown in colour, and are formed of a powdery material which can easily be brushed off. When the fish was allowed to stand in moist air, the brown spots increased in number and size.

### EXAMINATION OF THE DUN.

**Microscopical:** The brown material was found to consist of numerous clusters of cells, the single cells measuring about 2 to 4 micro-millimetres in diameter, and also parts of a mycelium. The obvious conclusion was that this was a mould, and the material was consequently spread on various nutrient media with the object of further studying it, and obtaining pure cultures.

**Physiological:** The mould was inoculated on various well known media, such as malt extract, fish decoction, and also sterile decoction of the dried fish itself. We found that the surface, and when the spore formation stage was reached developed brown colonies exactly similar to those observed on the fish itself. It was particularly noted that the mould thrived specially well on fish decoction from the dried and salted fish, and on closer examination of this phenomenon it was found that the presence of salt seemed to accelerate the growth, and it thrived well, even on gelatine and agar media containing 10 per cent of salt. The mould had a distinctly aerobic character, as it never grew downwards into the media, but showed the distinct surface

all implements likewise must be washed and disinfected every time they are finished with. All offal must be cleared away and disposed of as soon as possible, and not allowed to lie about.

For the disinfection of the curing places, etc., the best and cheapest method has been shown to be fumigation with sulphur, using about one ounce of sulphur per 35 cubic feet. In order that the fumigation may be effectual, it is necessary that the place disinfected be closed up practically air tight. If this cannot be done, the walls and ceilings, etc., must be washed with some disinfecting liquid, such as Formalin (a 7 p.c. solution of the commercial article) or Sulphurous Acid, (one part of concentrated acid to fifty parts of water). Other disinfectants recommended are Ammonium Bifluoride in 1/2 p.c. solution, or lime wash made by diluting ordinary Milk of Lime with ten parts of water. Such disinfection should take place periodically, say once a week. Implements, tables, etc., may be disinfected with Formalin, Ammonium Bifluoride or Sulphurous Acid solutions as above, and in this case also disinfection should be carried out at regular intervals, say every day.

Besides washing with disinfectants, all implements, tables, floors, tanks, decks, docks, etc., with which the fish is likely to come into contact should be frequently washed with fresh water (not stale harbor water) or better still, steamed down. This should be done at least once a day. A small stream of water under high pressure is stated to be more efficient than a larger stream at low pressure. The fish should be washed by spraying with clean pure water, and not merely throwing it into the water and taking it out again. It is of special importance that the butts should be thoroughly cleaned, and either steamed for twenty minutes or washed with some disinfectant every time they have been used.

The salt must be clean, having been preserved in clean packages and not exposed so as to allow it to become infected with the spores.

The treatment of the fish throughout should be conducted with the utmost care and cleanliness. Thus, it should not be allowed to lie about on decks or docks, etc., where the men are likely to walk about in their dirty boots, and the treading of the fish by foot in packing should not be allowed. In all cases it is advisable to use mechanical appliances in preference to manual labor if possible, always provided, of course, that such appliances are kept properly clean on the lines indicated above.

A further important point is, as already stated, the immediate removal of refuse from the neighborhood of the fish, for if left lying about it will undoubtedly become a breeding place for the undesirable organisms which will infect the fish.

It is recommended that the room in which the fish is treated should be light and airy, allowing for ample ventilation, and provision should be made for entirely closing the room for fumigation purposes. Cold storage of the fish after salting and dressing has also been shown to have

a beneficial effect, but as has been stated above, the really important points are cleanliness and quick and complete drying.

**Conclusion:** In Norway considerable success has been achieved in eliminating the disease by working on lines as indicated above. It is sufficient here to point out the main principle and methods for combating the disease, and to emphasize the necessity for steps being taken to secure reforms on these lines. The actual details must be left to the judgment of scientific experts on the spot.

It has often been stated by practical men that such precautions as we advocate cannot be carried out, owing to their being too troublesome and costly. In reply it may be said, firstly—that the cost and trouble of following out the simple and by no means exacting directions laid down would be more than repaid by the better quality of the fish, and consequently higher prices fetched by it. Secondly—that signs are by no means wanting that scientific methods are being adopted by some firms in Norway with great success, and it is certain that those who do not follow suit will eventually be fatally handicapped by the inferior quality of their product.

It is only reasonable to demand that food for human consumption should be treated according to modern ideas of hygienic and sanitary conditions, and there is no doubt that the fish curing industry will benefit thereby, as have all other food industries which have adopted the advantages offered by technical science.

### "To One Bath 60 Pounds."

Jumbo is very funny about his bath and in his native land takes great joy in splashing about in pools and rivers. Nature has been especially kind to him, inasmuch as she has endowed him with a shower bath, which he carries about with him.

But whether he takes the same pleasure in the bath that is given him when—for show purposes—he is in captivity is another matter. In any case, it must be a wearisome business, as it occupies a week.

Also it requires the services of three men, and costs £60! The first thing is to go over the elephant's huge body with the best possible soap—and as the amount of soap used is something like a hundred and fifty pounds, this is not a small item.

When he has been dried, the elephant is well sand-papered—which does not sound particularly enjoyable. The sand-papering being finished, Jumbo is rubbed all over with the very best Indian oil until his mouse-colored skin is supple and glistening. This is the most costly part of his toilet, as about thirty pounds' worth of oil has to be used.

### Fashions and Fads.

The train of an evening gown should be lined with its own material or with a plain silk of its own color.

Little vest "labe" showing under the closing of the coat are almost indispensable to the fashionable costume.

More and more the long-bodied French style is seen in children's frocks, both for school and better wear.

Macrame work is gaining in favour everywhere for all sorts of objects, from girdles and handbags to table covers.

Fashion is going to the opposite extreme of tight swathing, new coats and other wraps being positively voluminous.

Panama hats are sometimes trimmed with scarfs of raw silk stenciled in color. Pongee done in green has a good effect.

One of the prettiest necklaces is the velvet collar with its pendant or buckles. Short strings of very heavy beads are also liked.

Some of the new cotton crepes have a dash of silk mixed in with them to form a design, and this design is often as not in color.

In planning a blouse or gown, be sure always to have soft lines about the neck. The woman doesn't live who isn't improved by them.

Broad sashes of Roman striped ribbon are a pretty note of brightness in the simple dark dresses appropriately chosen for schoolgirls.

Coats to the new "sweater" dresses for spring are cut very full, hanging loose from the shoulder and springing into godets at the hem.

One of the most radical French dressmakers is showing gowns with draped skirts of black satin and bodices of peau de peche in bright colors.

Duveltyne is a great disappointment so far as durability is concerned, but it is forgiven for its wonderful texture. Wool velour has its virtues without its vices.

Chiffon taffeta lends itself peculiarly well to hip and bustle draperies—which may be one reason why we may expect to see a great deal of this taffeta for spring.

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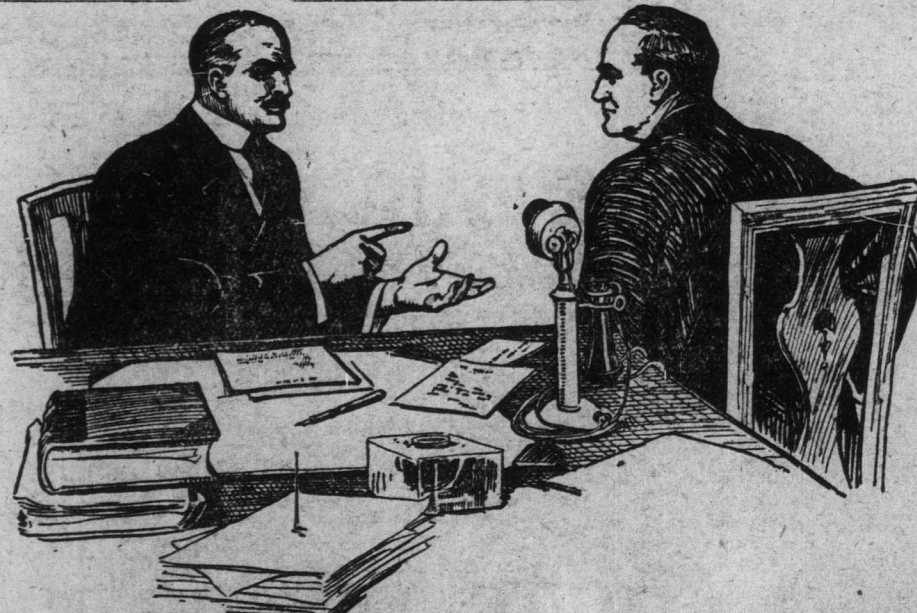
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