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'FISH POISONING' AND ITS PREVENTION^{1/}

Fishery workers frequently suffer from various forms of skin or blood infections, commonly known as "fish poisoning," which sometimes result fatally. This journal has accordingly sought expert advice as to the nature, treatment and prevention of these troubles, and presents the following article from the George Williams Hooper Foundation, University of California, with which the author is associated.

By O. W. Lang

The term "fish poisoning" is applied in general to various infections sometimes suffered by fishery workers in the line of duty--arising from cuts by the teeth or fins of fish or by fishhooks or other implements, or from constant handling of raw fish, or fishing gear. Such infections are of so many different types that it is impossible to prescribe any one general form of treatment; but the exercise of some simple precautions will do much to prevent or overcome them.

Some time ago the writer and associates investigated certain forms of "fish poisoning" in canneries, and found that a number of plants had no such infections, while some had so much trouble that compensation insurance was refused. We found that where no infections occurred, simple precautionary measures were strictly enforced. We found also that one fishing fleet was employing such measures, and the number of cases reported during a season had greatly diminished.

FORMS OF POISONING

Among commercial fishermen and cannery workers the occurrence of various forms of skin infection has been frequently noted. Fells (1) has isolated a "pyogenic streptococcus" (pus-forming organism) associated with such infections. A physician associated with the fishing industry describes three forms: first, a skin inflammation or eczema, resulting from having the hands in contact with sauces used in packing fish. A similar form of skin infection has been encountered by workers during the lacquering of cans; second, infections resulting from cuts or punctures in handling fish, described as "erysipeloid"; third, "furunculosis" or boils on the forearm. Infections as a result of cuts from fish teeth, fishhooks and similar equipment have also been reported.

A skin infection among salmon fishermen and cannery workers has been described by March and Marshall (2). They note that the disease, after a short "incubation period," is characterized by pain, swelling and a dark red discolora-

^{1/} Taken from Pacific Fisherman, vol. 30, no. 7, June 1932, page 32.

Note: This leaflet supersedes Mem. S-329, issued by the former Bureau of Fisheries.

tion. There is general feeling of illness, often a slight headache, and a temperature between 99 and 100 deg. Swelling or pain, or both, may become quite marked so that a cut or prick on a finger may produce swelling of the whole hand and sometimes of the wrist. The period of disability is usually seven to ten days. The surface skin separates from the underlying tissues, the healed wound resembling an old water blister from a second degree burn. True pus is formed only from "secondary infection" or poisoning from some other source than the original cut. Similar "cocci" or poisoning organisms, of different type from the common pus-forming organisms, were found both in the affected parts and in the fish slime.

Proprietary applications of various types were used to combat the infection, all of which yielded the same amount of success. These local treatments tended to restrict further infection, but did not prevent the original infection from running its course.

MEASURES OF PREVENTION

In the light of the foregoing it is apparent that infections known as "fish poisoning" may be of various types. It is also quite evident that applications used to check these infections, once they have become apparent, are not very successful. Specific cures must be based entirely upon the type of infection. The solution rests, therefore, in adopting adequate sanitary and precautionary measures, not only in the cannery but also among the workers. The worker should be educated to the fact that such measures are adopted to protect his interest. Wherever such measures have been employed, infections have been reduced to a marked degree and in some cases seem to have been completely eliminated.

An Alaska salmon canning concern, for instance, supplies each boat with a solution of bichloride of mercury, tincture of iodine, vaseline, bandages and soap. The fishermen are required to wash their hands after hauling their nets, and wherever this is adhered to the number of infections has decreased. A solution of bichloride of mercury is always available. Another example is a California sardine cannery where no infection has occurred, in which the personnel were compelled to wash their hands and forearms at the completion of work, in the following preparation: 5 gallons warm water; 1 ounce "pinola" (pine oil preparation); and liquid soap. If the skin had become scratched or cut during work, the cut was treated with a mixture of iodine and glycerine.

The organism isolated from wounds by March and Marshall was subjected to various concentrations of sodium hypochlorite in the laboratory. It was found that a solution containing .045% available chlorine inhibited the growth of this organism after being in contact one minute.

While bichloride of mercury in adequate concentrations is a good germicide, its use by the inexperienced, especially in a food packing establishment, is not advocated.

PROCEDURE RECOMMENDED

At the completion of a day's work the workers should be required to wash their hands and forearms in a warm dilute solution of lysol or "liquor cresol comp., U.S.P." This should be used as a disinfectant for the hands only, and extreme care should be exercised in its use. An adequate supply of soap and paper towels should be available. After washing and as an extra precaution, the

hands should be treated with carbolated vaseline. Attention is also directed to the preparations previously mentioned, which have been employed with success in a certain sardine cannery. All abrasions, cuts or bruises, regardless of their magnitude, should be reported immediately after occurrence. These, if not too severe, should be treated with tincture of iodine. Where certain individuals suffer ill effects from iodine, an acetone-alcohol solution of mercurochrome may be substituted. Such a solution is prepared in the following proportions: Mercurochrome, 2%; Acetone, 10%; Alcohol, 35%; Distilled Water, 53%.

More recently, Marshall (3) has reported on the antiseptic properties of merthiolate (sodium salt of ethyl mercuri thiosalicylic acid; apparently the ortho compound). It is a white crystalline substance, containing 29% mercury, and mixes readily with soap. In solution it is practically colorless, but on the open market it is sold in the form of tincture (1:1000, 50% ethyl alcohol) or aqueous (1:1000 water); in either case it is colored with a harmless pink or green dye. For local application the tincture is advocated in preference to the aqueous solution.

FOR VESSELS AT SEA

Where fishing vessels are at sea for extended periods, either the master or some permanent member of the crew in authority should become familiar with at least certain fundamentals of first aid. Included in his first aid kit should be a supply of polyvalent anti-gas-gangrene serum, sterile needles and syringes. However, an accurate knowledge of the principles of serum treatment, as well as the technique of serum injections, should be had before any such treatment is attempted; since bad and even dangerous results may follow improper serum treatment.

It would be well, indeed, if the masters and some of the permanent members of the crews of our fishing fleets could obtain regular instruction in the prevention and treatment of such infections. Arrangements for such instruction might perhaps be made with public health officials or some responsible physicians at the various fishery centers. In some ways this might be considered as important as a knowledge of navigation, which many fishermen have found it necessary to acquire with the growing size and cruising range of the vessels.

The suggestions here offered indicate simple measures to be employed to control or prevent various forms of infection. When infection becomes apparent, however, a competent physician should be consulted as early as possible.

References: -- (1) Fellers, C. R.: Jour. Bacteriol., 1926, 12, p. 181, (2) March, H. N., and Marshall, M. S.: Proc. Soc. Exper. Biol. and Med., 1929, 27, p. 106. (3) Marshall, M. S.: Calif. and West. Med., 1931, 30, p. 1.

ADDITIONAL REFERENCE

SCHWARTZ, LOUIS, and TABERSHAW, IRVING R.

1945. Dermatitis in the Fish Industry. The Journal of Industrial Hygiene and Toxicology, vol. 27, no. 1, January. (Also obtainable from Fish and Wildlife Service, U.S. Department of the Interior, Chicago 54, Ill., as Fishery Leaflet 124).