

motility suggest paralysis of the parasympathetic autonomic nervous system, and is in line with the observation that vagus stimulation in dogs under amylal fails to lower blood pressure.⁹

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Skin Infection in Salmon Fishermen in Alaska.

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The occurrence of various types of skin infection among commercial fishermen has frequently been noted. Minute abrasions from the teeth or the spines of fish open the way frequently to infection. Fellers¹ has isolated a pyogenic streptococcus associated with fish and Klauder and his associates^{2, 3} have noted on the east coast a specific skin infection due to the bacillus of swine erysipelas.

While giving medical assistance to the commercial fishermen at Bristol Bay, a part of the Bering Sea, one of us (H.N.M.) noted a type of skin infection which was typical and had uniformly constant symptoms. Although the fishermen do not distinguish between this and other infections, the disease has apparently been known to them for some time.

The disease appears to have a short incubation period. Pain, swelling, and a dark red discoloration develop simultaneously. If, at this stage, the area is examined closely, a tiny break in the skin may be noted from which a drop or two of clear or slightly cloudy serum can be expressed. There is general malaise, often a slight headache, and a temperature between 99 and 100. Swelling, or pain, or both may become quite marked, so that a lesion starting on a finger produces edema of the whole hand and sometimes of the wrist. Epitrochlear and axillary lymph nodes are commonly enlarged or tender. Lymphangitis is rarely visible. The infection spreads locally between the epidermis and the dermis, separating the two layers to form a lesion resembling a collapsed blister, containing a few drops of turbid serum. Improvement usually begins in 2 or 3 days, but

⁹ Lieb, C., and Mulinos, M., *Proc. Soc. Exp. Biol. and Med.*, 1929, xxvi, 709.

¹ Fellers, C. R., *J. Bact.*, 1926, xii, 181.

² Klauder, J. V., *J. Am. Med. Assn.*, 1926, lxxxvi, 536.

³ Klauder, J. V., Righter, L. L., and Harkins, M. J., *Arch. Derm. and Syph.*, 1926, xiv, 662.

the blister may spread for 5 or 6 days, with more or less burning and pain, the pain frequently extending up the arm. The period of disability is usually 7 to 10 days. The epidermis separates from the underlying tissue (it was usually cut away), the healed wound resembling an old water blister from a second degree burn, from the size of a dime to the size of a dollar. True pus is formed only with secondary infection.

Smears were made on pieces of window glass when first reported, and on subsequent visits. A medium, prepared from frozen beef, and another prepared from raspberry gelatine, were prepared with the aid of faded litmus paper, and sterilized in a cannery retort. Cultures from lesions and from fish slime in these were brought to San Francisco for study.

Microscopic examination of the smears revealed in every case the presence of numbers of rather large Gram positive cocci, varying slightly but definitely in size and in their response to the stain, and occurring frequently in pairs, occasionally as short chains of 3 or 4 cells. They did not resemble streptococci, and did not seem typical for staphylococci. Every case showed these organisms in numbers, whereas only twice were other organisms noted, and these were not similar, nor were they present in any numbers.

Examination of the cultures revealed one tube in which the only viable organism was a coccus resembling exactly on morphological grounds the coccus observed in the directly prepared smears, including the tendency to arrangement in pairs, the slightly irregular staining, and the slight variation in size. No growth could be obtained from other cultures, with the exception of one made from the fish slime, from which several organisms were isolated, not certainly including the coccus above described.

This coccus grows luxuriantly on ordinary medium, presenting a slightly pigmented (a brownish yellow) opaque growth. Colonies are smooth, convex, round, several millimeters in diameter (24 hours). The optimum temperature appears to be 37°C. Broth cultures show an even turbidity in young cultures. Gelatin is very slightly liquefied, indol and H₂S are not produced, and neutral red and nitrate reduction tests were negative. Milk cultures show acid coagulation, and acid but no gas is produced in media containing dextrose, lactose, saccharose, maltose, or mannite.

Inoculation intraperitoneally into a guinea pig produced no reaction. Intradermal inoculations into a rabbit showed on the ear a progressive inflammation and some induration for several days, followed by absorption and healing. On the flank there appeared, fol-

lowing an inflammatory reaction, a hard swollen lump perhaps 5 mm. in height, and somewhat over a centimeter in diameter. A similar, but deeper, localized process resulted from a subcutaneous injection into a rabbit. The lesions appeared to reach a peak in 5 days, at which time incisions were made. These revealed encapsulated deep pockets of a caseous pus, from which pure cultures of the original organism could be secured. Thus far the disease has obviously not been reproduced, and the animal lesions might be explained by supposing the response to be due to an organism not necessarily connected with the human skin infection. However, the study reveals consistently the presence of the coccus described, and the presence of no confusing types. An attempt to reproduce the infection more accurately will be the subject for further investigation.

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On the Flavianates of Some Nucleinic Substances.

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Due to the lack of dependable methods for their identification, the isolation of nucleinic compounds from biological fluids is not an easy matter. Among the precipitants which might be useful in the isolation of these substances, flavianic acid (1-naphthol-2-4-dinitro-7-sulfonic acid) seemed to be promising. Kossel and Gross¹ found that flavianic acid forms crystalline compounds with organic bases. Among other substances these workers prepared guanine flavianate.

We have prepared the flavianates of cystosine, 5-methylcystosine, 2-amino-4-methyluracil, guanosine, adenosine and cytidine.

It has been found (with O. H. Emerson) that cytidine flavianate is a very useful substance in the isolation of cytidine from yeast nucleic acid. Flavianic acid is more satisfactory than picric acid for decomposing cytidine nitrate. Although cytidine flavianate does not seem to crystallize from an impure solution, it forms beautiful crystals when fairly pure and is a very convenient substance for recrystallizing as it has a very high temperature gradient of solubility. The flavianate is easily decomposed by dissolving it in 5% sulfuric acid at 60° and extracting the flavianic acid with butyl alcohol from

¹ Kossel, A., and Gross, R. E., *Z. physiol. Chem.*, 1924, cxxxv, 167.