SOAP AS A DISINFECTANT AND ANTISEPTIC

By L. W. BOSART

Although considerable matter has been published from time to time showing that soap, besides being the universal cleansing medium, is a valuable disinfectant and antiseptic, this fact does not seem to be generally understood. It was thought to be worth while, therefore, to call attention to the results of some of the work which has been done in this connection.

Robert Koch[1] was the first to investigate this subject and to ascribe to soap a germicidal action. He was followed by Behring[2], Jolles[3], Serafini[4], Rodet[5], Rasp[6], Reichenbach[7], Lamar[8] and Nichols[9], all of whom found soap to be definitely germicidal.

John E. Walker[10] of the Army and Navy General Hospital at Hot Springs, Arkansas, has carried out some very thorough work on soaps made from the individual fatty acids which occur in ordinary soap. His work shows soap to be a very powerful germicide, much stronger, on the whole, than carbolic acid.

H. G. Elledge,[11] who worked in connection with the Laundryowners' National Association at Mellon Institute, says that he has demonstrated that soap, even in water at 40°C. in concentration equal to that employed in washing woolens, has a bactericidal efficiency of 98 per cent for all the common pathogenes.

Again Elledge and McBride[12], in reporting the results of their investigations of the effect of washing on the sterility of clothes, say that the washing with soap produces a bactericidal efficiency comparable to that obtained by pasteurization. In their tests the washing was done at 40°C. so that the bactericidal action was not due to high temperature but to the soap solution itself whose strength was considerably less than one per cent. A laboratory model of the usual type of commercial washing machine was used.

Dr. Pilod[13] conducted investigations on the ordinary cake of soap. He found that soap was not only sterile itself but did not offer a favorable medium for the development of bacterial cultures. Pilod used soap which lay in the operating room or had been kept in the laboratory without special precautions. He says that soaps are originally sterile both on account of their chemical composition and their method of manufacture.

A little consideration of the method ordinarily employed in soap making will show that this must necessarily be the case. Fats themselves, if reasonably pure, that is, free from moisture and organic impurities, do not furnish a medium on which micro-organisms can propagate. (Animal fats especially are made completely sterile in the process of rendering.)

This is also the case with strong caustic solutions which are combined with fats to make soap. The latter are strongly germicidal even when cold. It will be seen, therefore, that the materials of which soap is made must be comparatively low in micro-organisms when they enter the kettle to be boiled. If, in addition to this, it is considered that the soap is heated to a high temperature and ordinarily kept hot over a period of several days, it must necessarily be sterile as it comes from the kettle.

Pilod summarizes his work as follows:

"Sodium soaps are originally sterile both because of their chemical composition and because of their mode of production. While this sterility is easily maintained in the inside of the cake, its outer surface is always exposed to soil. If in spite of this it remains aseptic, this is for the reason that soap prevents the development of germs, which quickly die in contact with it, with the exception, however, of the spores which can keep for a long time on the surface of the soap but without undergoing further developments. In spite of this limitation, it is unnecessary, according to our view, to sterilize soaps by heating them before use, but it is sufficient to rinse off well the outer surface of the soap in order to carry away mechanically any spores which may have settled there. This simple expedient will suffice to restore to the soap its original sterility."

With regard to the use of soap for treating wounds, we would call attention to a paper published by Dixon and Bates[14] in the *Lancet* in 1917. These surgeons treated wounds with a 2½ per cent solution of common yellow soap and dressed the wounds with sterile gauze soaked in this solution. They state that the wounds healed up quickly and the dressing caused much less pain than ordinary dressing. Haycraft[15] also used soap solutions with great success during the World War. Superficial wounds were completely excised and the soap solutions were rubbed into the surface; they were then stitched up. He found that deep wounds with compound fractures healed better with the use of soap solution than with ordinary antiseptics. For four months previous to the time of writing he had been using soap solution in all cases where it was possible.

It is not desired to urge, at this time, the use of soap as a general antiseptic, nor to claim that it is a specific against all manner of pathogenic germs. The subject is one, however, which is worthy the consideration of physicians and those interested in first aid treatment, for soap and water are materials that are always close at hand and can be had in almost any emergency.

The treatment of wounds with soap and water is so natural and simple that it should come into more general use, if thorough trial proves it to be as satisfactory as the experience of the English surgeons would indicate.

From the foregoing, the conclusions may be drawn that soap is, from

the very nature of the material used in its manufacture and the process by which it is made, a sterile substance; aside from this, it is a powerful disinfectant; it is a sanitary and efficient medium for the cleansing of soiled and infected clothes; it appears to be a very satisfactory material in the treatment of wounds to clean them and keep them in a sterile condition.

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[1]Mitt. a.d. Kaiserl. Gesundheitsamt, 1881, *1*, 271.
[2]Zeitschr. f. Hg. u. Infektionskrankh, 1890, *9*, 414.
[3]Zeitschr. f. Hg. u. Infektionskrankh, 1893, *15*, 460.
[4]Zeitschr. f. Hg. u. Infektionskrankh, 1898, *19*, 130.
[5]Arch. f. Hyg., 1898, *33*, 369.
[6]Rev. d'Hygiene, 1905, S. 301
[7]Zeitschr. f. Hyg. u. Infektionskrankh, 1908, *58*, 45.
[8]Jour. Exp. Med., 1911, *13*, 380.
[9]Jour. Lab. & Clin. Med., 1920, *5*, 502.
[10]Journal of Infectious Diseases, 1924, *35*, 557-566.
[11]Scientific American Supplement, 1917, *84*, 30.
[12]American Journal of Public Health, Volume 8 (1918), 494.
[13]La Presse Med., 1912, No. 16.
[14]Treatment of Wounds by a Solution of Soap in the Casualty Clearing Station, by Captains R. G. Dixon and H. T. Bates. Casualty Clearing Station, B. E. F. France.—The Lancet, 1917, Part II, p. 789.
[15]On the Treatment of Gunshot Wounds with a Solution of Soap and Water and Primary Suture, by Capt. J. B. Haycraft, Surgical Specialist. Casualty Clearing Station.—Brit. Med. Journal, 1918, Part I, pp. 80-82.

OIL FROM SEED CURES LEPROSY

The definite eradication of leprosy as the result of the discovery of a tree, the properties of which are said to cure the disease, is predicted in the report of the British Empire Leprosy Relief Association for last year, which was published on January 18. A passage in the Leprosy Society's report reads as follows:

"Leprosy was formerly regarded as incurable, but recent researches have led to the discovery of methods of treatment which, if given at a sufficiently early stage, will cause the disappearance of all signs of the disease. It is now certain that leprosy can be eradicated from any country where adequate arrangements are made for the proper treatment of all persons contracting the disease."

The report says that D. E. E. Muir, of the Calcutta School of Tropical Medicine, discovered that pure oil from the ripe seeds of the Southern Hydnocarpus wrightiana was as efficacious as ethyl esters, which are now used and which cost at least ten times as much. This tree is said to thrive in all tropical countries.

The report states that the largest number of recoveries from leprosy effected in the British possessions have been obtained by Americans.