

yellowish colored gummy varnish which gave all characteristic tests for alkaloids. Attempts to crystallize this substance in the form of sulphate, picrate, hydrochloride and gold chloride from various solvents have thus far yielded negative results. The study of the alkaloid-like substance is to be continued.

ANTISEPTIC ACTION OF U. S. P. AND N. F. OINTMENTS.

BY GEORGE F. REDDISH AND H. WALES.*

Eighteen ointments are described in the United States Pharmacopœia, tenth edition, and nineteen in the National Formulary, fifth edition. Thirteen of the U. S. P. and fourteen of the N. F. ointments are used for conditions in which an antiseptic¹ action is apparently demanded. A search of the literature revealed that only a very few had ever been examined for inhibitory action on the growth of organisms. Consequently, these ointments were tested in the laboratories of the Food, Drug and Insecticide Administration to determine their antiseptic power.



Fig. 1.—Serum-agar plate containing *Staph. aureus* and streaked with six U. S. P. ointments. Antiseptic action is shown by Nos. 3 (*Unguentum Ammoniaci*), 4 (*Unguentum Hydrargyri Mite*), 5 (*Unguentum Hydrargyri Oxidi Flav.*) and 6 (*Unguentum Iodi*). Antiseptic action is not shown by Nos. 1 (*Unguentum Acidi Borici*) and 2 (*Unguentum Crysarobini*).

PROCEDURE.

Samples of ointments of known purity and strength were prepared, and their efficiency was determined by the method described by Reddish.³ In this test *Staph. aureus* is added to 1.5 per cent nutrient agar (p_H 7.2–7.4) containing 10 per cent of horse serum and also to plain nutrient agar without serum. After these have hardened in petri dishes the ointments, previously melted, are streaked on the surfaces of the agar with a glass rod and the plates are incubated at 37° C. for 24 hours. If the ointment is antiseptic a clear zone in which no colonies have grown surrounds the streaks. If the preparation has no antiseptic ingredients or if the active in-

redients cannot leave the base and permeate the agar medium, colonies of the test organism grow in close proximity to and even under the streaks of ointment (Fig. 1). Whether the bacteria in this clear zone are killed or their

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¹ The term "antiseptic," as used in this paper, means a substance which, when applied to microorganisms, renders them innocuous, either by actually killing them or by preventing their growth, according to the character of the preparation or the method of application.²

² Reddish, *JOUR. A. PH. A.*, 16 (1927), 501.

³ Reddish, *Ibid.*, 16 (1927), 652.

growth merely inhibited is not shown by this test. If such information is desired, however, simple transfer of small pieces of agar from the clear area to tubes of broth may be made. The method is used primarily as a test of bacteriostatic property. As ointments remain in contact with infective organisms for a long period of time when used in practice, they will be effective as antiseptic agents if they inhibit growth and will render the infective organisms innocuous.

The clear zone surrounding the streak of ointment, besides showing antiseptic properties, also measures to some degree the activity of the ointment. Zeigler's¹ study of the absorption and antiseptic properties of iodine ointments indicates that there is a definite correlation between the results obtained by such tests and the absorption through the skin. Iodine ointment (U. S. P.) gives a wide clear zone by the serum-agar plate test, and, as Zeigler has shown, the iodine from this ointment readily penetrates the skin. On the other hand, stainless iodine ointment (N. F.) does not give a clear zone of inhibition on serum-agar and under the conditions of the test the iodine is not absorbed by the skin.

RESULTS.

Only five of the twelve U. S. P. ointments tested (Table I) showed antiseptic properties. These were active in both plain and serum agar. The results obtained with **Unguentum Hydrargyri Mite** indicate that **Unguentum Hydrargyria Fortior** would also be antiseptic. Six of the fourteen N. F. ointments tested (Table II) were antiseptic in plain agar, while only four were active in the presence of serum. The result obtained with phenol ointment U. S. P. X, which did not show antiseptic properties by this test, was contrary to the usual belief.

TABLE I.

ANTISEPTIC ACTION OF U. S. P. OINTMENTS.¹

Ointment.	Width of zone of inhibition.	
	Serum agar, cm.	Plain agar, cm.
Ung. Acid. Bor.	none	none
Ung. Chrysarob.	none	none
Ung. Hydrarg. Ammon.	0.2	0.5
Ung. Hydrarg. Mite	0.4	0.7
Ung. Hydrarg. Oxid. Flav.	0.15	0.4
Ung. Iodi	0.5 ²	0.8
Ung. Iodof.	none	none
Ung. Phenol.	none	none
Ung. Pic. Pin.	0.15	0.3
Ung. Plumb. Ol.	none	none
Ung. Sulphur.	none	none
Ung. Zinc. Oxid.	none	none

¹ Media—10 per cent serum agar and plain agar. Test organism—*Staph. aureus*.

² In Fig. 1 this zone appears very much larger because the small scattered colonies which surround the clear zone do not show in the photograph.

TABLE II.

ANTISEPTIC ACTION OF N. F. OINTMENTS.¹

Ointment.	Width of zone of inhibition.	
	Serum agar, cm.	Plain agar, cm.
Ung. Bitum. Sulphon.	none	none
Ung. Calamin.	slight	0.2
Ung. Camph.	none	none
Ung. Hydrarg. Chlor. Mit.	slight	0.15
Ung. Hydrarg. Nit.	0.8	1.3
Ung. Hydrarg. Oxid. Rub.	0.15	0.4
Ung. Iod. Denig.	none	slight
Ung. Pic. Co.	none	none
Ung. Plumb. Iod.	none	none
Ung. Pot. Iod.	none	none
Ung. Resorcin. Co.	none	none
Ung. Sulphur. Alk.	none	slight
Ung. Sulphur. Co.	none	none
Ung. Zinci Stear.	none	none

¹ Media—10 per cent serum agar and plain agar.

Test organism—*Staph. aureus*.

¹ Zeigler, *Jour. A. Ph. A.*, 17 (1928), 648.

The influence of the base is demonstrated by the tests on zinc ointment U. S. P. and calamine ointment N. F. The calamine ointment, which contains about 17 per cent of zinc oxide in an ointment (chiefly lard) base, is antiseptic, while the zinc ointment, containing 20 per cent of zinc oxide in a paraffin-petrolatum base, shows no inhibitory action. These results show that, owing to the influence exerted by the base, it is impossible to predict the antiseptic value of a product from the antiseptic value of its constituents.

SUMMARY.

Only six of twelve U. S. P. X and four of fourteen N. F. V ointments were found to have antiseptic action under the conditions of the tests conducted on them. Furthermore, it was shown that the antiseptic action of such a preparation cannot be predicted from the action of its constituents.

A SIMPLE METHOD TO DETERMINE THE TOTAL VOLUME OF URINE VOIDED IN TWENTY-FOUR HOURS FROM A FRACTIONAL SPECIMEN.

BY HENRY J. GOECKEL.*

No doubt many clinical analysts are occasionally confronted with the same problem as the writer has been from time to time, namely, of receiving fractional parts of a twenty-four-hour specimen of urine to be analysed for the total quantity of some substance eliminated in the twenty-four-hour period, and the person submitting the same has failed either to carefully measure the total volume or has failed to note it down and has forgotten what the quantity was. It may be of interest to learn of the technic evolved and employed by the writer to determine the probable total volume.

When for dietary or other control it is important to know the total volume or the total quantity of sugar, urea, chlorides, etc., this enables you to save time, salvage the labor and to furnish the desired information with a fair degree of accuracy.

TECHNIC OF METHOD.

Several specimens of urine which by examination have been found to be practically normal are mixed together. The specific gravity and the urea content are again determined on this mixed specimen to be sure they are normal. The figures taken as normal are about 1.020 for the specific gravity and two per cent for the urea which figures hold for the section in which these tests are made by the writer under average temperature and humidity. When environmental conditions vary from this average the correct average volume, specific gravity and urea content is readily noted by observing these factors on the specimens received.

A measured volume of this mixed urine, namely, one hundred cubic centimeters is taken and compared colorimetrically with the urine of which the total volume is to be determined. They are compared in matched test-tubes or cylinders of equal diameter and equal thickness of the glass. Messlerizing tubes can be used for this purpose if at hand.

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