DERMATOLOGICAL USE OF TITANIUM OXIDE.*

BY B. L. MEREDITH AND W. G. CHRISTIANSEN.

In a recent article by Metadier,[1] attention is again called to the therapeutic use of titanium compounds; Pick[2] in 1911 had conducted extensive experiments and had found them medicinally valuable. In Metadier's paper M. Delahaye is quoted as recommending the use of titanium oxide both as powder and as ointment in the treatment of skin diseases. Its action is said to be non-irritant, non-toxic, antiseptic, keratolytic, antipruriginous and keratoplastic.

It would seem, therefore, that titanium oxide in oitment form might well be expected to supplant zinc ointment. An investigation of this possibility has been made in these laboratories, using a sample of pure titanium oxide.

EXPERIMENTAL PART.

Prior to the use of the titanium oxide for the preparation of products to be tested for dermatological behavior, it was necessary to examine the purity of the oxide.

Purity of the Sample.—The usual $KHSO_4$ fusion failed repeatedly to dissolve the sample; and it was necessary to use hydrofluoric acid—the HF being subsequently expelled by evaporation with H_2SO_4. Qualitative tests were made for the heavy metals, which were found absent except for the slightest trace in the tin group. This was so faint that ultimate identification was scarcely possible and the sample was considered satisfactory for biological testing.

Test Preparations.—Two ointments were prepared containing 20% titanium oxide. The first (A) was made in the same manner as Zinc Ointment U. S. P. X, substituting titanium oxide for zinc oxide.

Ointment "A."	Gm.	*Ointment "B."*	Gm.
Paraffin	15	Paraffin	5
White Petrolatum	65	White Petrolatum	75
TiO_2	20	TiO_2	20

Due to the very bulky nature of the TiO_2 powder this preparation was considerably stiffer than the corresponding zinc ointment. A second (B) was prepared in which the paraffin was reduced:

DUSTING POWDER.

The original sample of TiO_2, being in the form of a very fine powder, was used as received.

BIOLOGICAL TESTS.

The two ointments and a sample of zinc oxide ointment were tested for their power to restrain the growth of bacteria using vaseline as a control; the method

* Scientific Section, A. PH. A., Portland meeting, 1928.

[1] *L'Union Pharm.*, 68 (1927), 129.

[2] J. Pick, *Med. Klin.*, 1270 (1911).

described by Dr. George F. Reddish, Bureau of Chemistry, Dept. of Agriculture was used. None of the three ointments exercised any restraining action different from that of the vaseline.

Scarified areas were treated by daily application of the titanium oxide and zinc oxide ointments and the titanium oxide dusting powder. In all cases the areas healed more rapidly than did control areas which were not treated. There was no observable difference between the ointments but all three of the latter were more effective than the powder.

None of these products caused any irritation when applied daily to the skin of normal rabbits for a period of fifteen days.

CONCLUSIONS.

There does not seem to be any significant difference between the action of zinc ointment and titanium oxide ointment under the conditions described above.

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THE PREPARATIONS OF PHENOLATED SOLUTION OF IODINE, N. F.*

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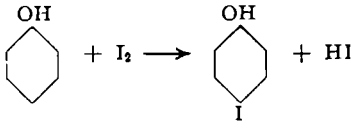
The National Formulary directs the mixture of glycerin, compound solution of iodine, liquefied phenol and water, used in the preparation of Boulton's Solution, to be set aside in the sunlight until decolorized. The standard treatises on pharmacy say little about the nature of the reaction which occurs during the exposure to light, and the National Formulary fails to mention the type of color glass in which the exposure should be made to accomplish most quickly the desired results. One of the texts on pharmacy (1) states that "Phenol being an unsaturated body, absorbs the iodine even as benzene does, and the iodine compound is colorless."

It occurred to the authors that a study of the influence of various radiations upon the rate of reaction and also a chemical study of the nature of the reaction which takes place would be desirable.

THE NATURE OF THE REACTION.

Samples of the solution prepared, omitting the liquefied phenol, did not lose their iodine color when heated to 50° C. for twenty-four hours, indicating the cause of decolorization to be the reaction between the phenol and iodine. The three mono iodo-phenols, ortho, meta and para, are recorded in the literature and, in general, are prepared by treating phenol with iodine in the presence of an oxidizing agent, such as nitric acid and iodic acid (2), these substances prevent the reversibility of the following reaction by decomposing the hydriodic acid.



* Section on Practical Pharmacy and Dispensing, A. PH. A., Portland meeting, 1928.