an iodine solution in Dioxan with petrolatum readily gives up its iodine to the aqueous secretion of a wound.

A one per cent ointment of iodine in petrolatum was tested bactericidally by the method of making a smear of the ointment on a plate inoculated with a culture of Staphylococcus aureus incubating for 48 hours and examining the area surrounding the ointment for evidence of the presence of bacterial colonies. The results were very striking in that the only location on the culture showing growth was in the outer edge of the dish.

The formula for preparing the ointment is as follows:

ANTISEPTIC IODINE OINTMENT.

Sol'n iodine in Dioxan 7%	14 cc.
Paraffin	10 Gm.
White petrolatum	76 Gm.
To make about	100 Gm.

The 7% solution of iodine in Dioxan is prepared by adding to 100 cc. of Dioxan in a flask 7.6 Gm. of powdered iodine, stoppering the flask and effecting solution by means of gentle heat using a water bath. Then ointment is prepared by fusing the paraffin and white petrolatum together in a casserole, cooling until the congealing point is almost reached and adding the Dioxan iodine solution at once and stirring until thoroughly incorporated.

Several different metals were studied concerning their adaptability for tubing for the satisfactory dispensing of the ointment but none were found which were not attacked by iodine in time. There remains but one way of dispensing the ointment which is in jars of the paraffin-lined lid type.

CONTRIBUTED BY THE IODINE SCHOLARSHIP OF THE PHILADELPHIA COLLEGE OF PHARMACY AND SCIENCE, UNDER THE DIRECTION OF THE IODINE FELLOWSHIP OF THE MELLON INSTITUTE.

FURTHER STUDIES IN FILTRATION.*

BY JOHN C. KRANTZ, JR., AND C. JELLEFF CARR.

INTRODUCTION.

In a previous communication (1) to THIS JOURNAL the authors studied the influence of various filter media on the hydrogen-ion concentration of aromatic elixir. Basic hydrated magnesium carbonate imparted an alkalinity to the elixir as shown by a p_H 9.2. Normal magnesium carbonate or magnesite was employed and found to be quite satisfactory as a filtering agent in the preparation of aromatic elixir, and it did not impart an alkalinity to the preparation.

With the establishing of definite turbidimetric measurements for pharmacopœial purposes and the application of the Baylis (2) turbidimeter for this work, the authors decided to investigate some of the theoretical ramifications of the problem.

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* Section on Practical Pharmacy and Dispensing, A. PH. A., Miami meeting, 1931.

THEORETICAL CONSIDERATIONS.

Oil particles suspended in water were found by various investigators (3) to have a diameter of 10^{-5} to 10^{-3} cm. The oil particles were found by microscopic measurement to be within this range. Oil particles suspended in water carry a negative charge, the origin of the charge is still open to question. Possibly the most tenable explanation is the preferential absorption of the hydroxyl ions of water. Thus the coagulation of the suspension is, partially at least, associated with the neutralization of these negative charges. Hardy's (4) work on the coagulation of suspensoids by means of electrolytes would suggest this condition to obtain. Thus when the charges on the suspended particles are neutralized by ions of opposite charge, the potential difference between the suspended particles and the dispersion medium becomes zero and the stability reaches a minimum. Powis (5), studying the influence of electrolytes upon the coagulation of suspensions. of cylinder oil in water found that the greater the valence of the positive ion of the electrolyte the greater was its capacity to coagulate the oil particles. He found the coagulating power of the four chlorides to follow the valency rule, namely, $ThCl_4$, $AlCl_3$, $BaCl_2$ and KCl.

Our investigations of the filtration of aromatic elixir with various filtering media led us to the conclusion, that with this and similar pharmaceutical products, clarification through a filtering medium consists of—*first*, coagulation by neutralization of the charge on the oil particle by an oppositely charged ion and *second*, the absorption of the coagulated particles by an insoluble filtration medium exhibiting an enormous surface.

EXPERIMENTAL.

Aromatic elixir was prepared using the same quantities of various filtering agents. The resulting elixir was examined in the modified Baylis Turbidimeter and their turbidities determined.

The results are recorded in Table I.

TABLE I.

Filtering medium 3 Gm. per 100 cc.	Number filtrations.	Turbidity p. p. m.
Sodium chloride	5	3
Fuller's earth No. 200	2	4
Magnesite No. 60	2	2
Magnesite No. 100	4	3
Ppt. magnesium carbonate	1	1
Magnesium oxide	1	1
Magnesium chloride	4	0.5
Talc No. 100	2	2
Alum	2	0.5

The results indicate that of the commonly used filtering media precipitated magnesium carbonate is the most efficient. The solubility of talc is relatively negligible, therefore its usefulness as a filtering agent depends almost entirely upon its absorption capacity. Magnesite dissolves to the extent of 10 mgm. per 100 cc. and for this reason serves primarily as a coagulant. Precipitated magnesium carbonate is soluble to the extent of 40 mgm. per 100 cc. and on account of its bulky nature exhibits a tremendous surface. Hence this medium possesses

the two-fold advantages of the capacities of coagulation and absorption. The filtering efficiency of talc was found to be augmented by the addition of small quantities of electrolytes such as sodium chloride. The objection to precipitated magnesium carbonate is the alkalinity which it imparts. For practical purposes of filtration we have found magnesite admirably suited.

SUMMARY.

Studies of various filtering media seem to indicate that the efficiency of a filtering medium for preparations of the nature of aromatic elixir depends upon its exhibiting the capacity of coagulating the oil particles by ionic neutralization and absorption by virtue of its surface properties.

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FIVE YEARS OF STUDY ABOVE THE HIGH SCHOOL SHOULD BE THE MINIMUM OF PHARMACEUTICAL EDUCATION.*

BY FREDERICK J. WULLING.

At the Rapid City, South Dakota, session of the Section on Education and Legislation, A. PH. A., 1931 meeting, I presented a paper on the "Completion of the Junior College the Next Prerequisite." (Published in the JOURNAL OF THE A. PH. A., April 1930, Vol. XIX, No. 4.) In the paper I advocated the "two-and-three" plan; that is, the completion of the Junior College course of two years of purely academic work and three years of technical pharmaceutical work following. Two years have now elapsed. The paper brought some comment, mostly adverse, although the proposal received some favorable support. One correspondent wrote: "Because I always read what you write I went through your paper. You should write and propose more frequently as I need more entertainment." The same critic commented even more caustically when the three-year and again when the four-year courses were proposed, but the minimum four-year course is now established as the five-year course will in the natural course of events become the accepted minimum course duly. Another friend wrote: "Your proposal to make the completion of the two-year academic Junior College course a prerequisite to technical study in pharmacy, is only another evidence that you should be put into the charge of a strong committee of restraint. Now that nearly all medicinal preparations are made and packaged on the large scale under conditions and checks that make mistakes impossible, your claim that the practice of pharmacy is a responsible one is simply preposterous. No education is necessary to simply buy and sell." Notice the reflection on both the pharmacist and the merchant. This critic's claims fall

* Section on Education and Legislation, Miami meeting, 1931.