Dr. G. M. Karns. These are approximately isotonic for mammalian and hence somewhat hypertonic for frog tissue.

It will be seen that the aqueous solutions are all superior in speed of penetration to the tinctures. This holds true even in comparing the 1.85% aqueous solutions with the U. S. P. Tincture containing 3.8 times as much iodine. When the U. S. P. Tincture is diluted with 95% alcohol to an equal iodine content, the tremendous rôle played by the solvent immediately becomes evident. The greater iodine content and the marked hypertonicity of the 5% aqueous solution are undoubtedly involved in its greater speed of penetration as compared with the other aqueous solutions.

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II. Effect of Iodine in Different Solvents on Permeability of Frog Skin to Ringer's Solution.*

M. S. BISKIND. (Introduced by W. F. Von Oettingen.)

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In the previous report,[1] a series of iodine solutions were compared with respect to their rate of penetration through frog skin. In this study an attempt was made to compare some of these solutions, and others, as to their relative effects on the ultrafiltration permeability of frog skin to Ringer's solution, with a view to obtaining some information as to the tanning properties of these solutions.

The method used is a modification of that described by Sollmann[2]: The skin was stripped off the hind limbs of large frogs, separated, tied off at the ankles, reinverted and tied onto the lower ends of filtration tubes, each consisting of a stoppered burette connected by means of a T-tube containing a Mariotte stopper, with a glass tube, one-half inch in diameter and of sufficient length that filtration could be carried out for several hours under a constant pressure of 31 cm. of water. The outside of the skin was exposed to the air.

The outside surface of the skin was treated by immersion in one of the various solutions for exactly 5 minutes after which it was

* Contribution from the Mellon Institute Fellowship for Research in the Pharmacology of Iodine.

[1] Biskind, M. S., this journal

[2] Sollmann, T., *J. Pharmacol. Exp. Therap.*, 1922, **21**, 200.

washed off with tap water. The tube was then filled with Ringer's solution, stoppered, and the amount passing through the skin for a 3-hour period determined. The latter interval was adopted as this is nearly the maximum time during which filtration proceeds at a nearly constant rate. Beyond this period there is usually an increase in rate, indicative, presumably, of a marked decrease in the viability of the cells. Shorter periods involve a considerable error in estimating the small quantities of fluid which pass the skin. Usually a treated and untreated leg from the same frog were run parallel at the same time, but inasmuch as the results with the treated skins were quite uniform, the controls are all grouped together in the tabulation.

The solutions used and the results are as follows:

	Solutions	Filtration cc. per 3 hours	No. Observations
1.	7.0% U.S.P. Tincture Iodine	1.5±0.1	8
2.	I_2 1.85%, NaI 2.20%, in water	2.1 0.026	7
	I_2 1.85%, NaI 2.05%, KI 0.089% CaI.$6H_2O$ 0.081%, in water	2.1 0.16	7
	I_2 5.0%, NaI 10.0%, in water	2.2 0.31	7
	I_2 I.85%, KI 2.42%, in water	2.2 0.34	6
3.	Normal (untreated)	11.25 0.55	70
	Mercurochrome 2% aqueous	11.5 1.43	7
4.	Ethyl alcohol 95%	18.2 1.12	8

The aqueous solutions all closely approach the 7% U. S. P. Tincture in reducing the permeability of these skins. There is no notable difference among the aqueous solutions in this respect, the apparent differences among them all approaching or falling within the probable error.

Two per cent aqueous mercurochrome did not affect the permeability of these skins (and in fact, barely stained them on 5 minutes' application); 95% alcohol markedly increased the permeability.

It was noted that the skins treated with the aqueous solutions were much more deeply stained than those immersed in the tincture, despite the differences in iodine contents. This confirms the findings of Karns, Cretcher and Beal,[3] with human skin.

[3] Karns, G. M., Cretcher, L. H., and Beal, G. D., *J. Pharm. Assn.*, 1932, **21**, 783.