Trichlorethylene on Nerve Conductivity.—To determine the capacity of trichlorethylene to block nerve conductivity, an area of the sciatic nerve of a dog anesthetized with ether was exposed and subjected to faradization and the respiratory and blood-pressure responses were noted. A sling of trichlorethylene was placed around the nerve for several minutes and the nerve stimulated peripheral to the sling. These experiments are also shown in Table II.

SUMMARY.

Trichlorethylene may be used by inhalation to produce anesthesia in the rat. The anesthesia in the rat and rabbit is accompanied by marked stimulation of the skeletal musculature. Repeated anesthetizing did not markedly influence the growth or important viscera of the rat. The compound was incapable of producing anesthesia when administered rectally. During inhalation anesthesia in the rabbit, a mild hyperglycemia results. Trichlorethylene applied to the sciatic nerve, was incapable of blocking the blood pressure and respiratory responses of faradization.

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A SIMPLIFIED ASSAY FOR THE OFFICIAL IODINE-IODIDE SOLUTIONS.*[1]

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Solutions of iodine, containing potassium iodide, have been employed as therapeutic agents since the recognition of the germicidal properties of the former substance. Two of the most important of these products are the tincture and the compound solution of iodine. The former is an alcoholic liquid containing 7 Gm. of iodine and 5 Gm. of potassium iodide in 100 cc.; the latter is an aqueous fluid having 5 Gm. and 10 Gm., respectively, of iodine and potassium iodide in each 100 cc. These two galenicals have enjoyed recognition in the last five Pharmacopœias, and have both been accepted by the Committee on Scope of the forthcoming Standard. Furthermore an Antiseptic Solution of Iodine (1), having a concentration of 2.0 Gm. of iodine and 2.4 Gm. of potassium iodide, respectively, in 100 cc. is being considered for admission.

The U. S. P. provides assays for the iodine and potassium iodide content of both of these agents. The respective assays are similar in each case and are herein briefly described:

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[1] Contribution of Bureau of Chemistry, State of Maryland Department of Health.

[2] The author wishes to express his appreciation to Dr. William M. Thornton, Professor of Analytical Chemistry of the Johns Hopkins University, for helpful suggestions offered during the course of this work.

Potassium Iodide—A measured quantity of the solution is evaporated to dryness on a water-bath, small successive portions of distilled water are added from time to time until the iodine has been completely volatilized, the dried residue is weighed and qualitative tests for the potassium and iodide ions are made.

Iodine is determined volumetrically upon a measured aliquot by titration with 0.1*N* sodium thiosulphate solution.

These assays embody several undesirable features:

(*a*) The determinations require two 5-cc. portions. Tincture of Iodine is marketed to-day largely in small individual bottles which frequently contain less than 10 cc. This condition requires the purchase and mixing of two samples.

(*b*) The assay for potassium iodide is in fact a total solids determination. Provided that sufficient potassium iodide be added to respond to the qualitative tests, a much cheaper salt might be substituted for the balance, and escape detection.

(*c*) The determination of potassium iodide, particularly in the case of the compound solution is time consuming, four hours are required for some samples.

(*d*) Sodium thiosulphate solution, unless carefully prepared and preserved will deteriorate and require frequent standardization.

The recognition of these defects has lead to the proposals of numerous other procedures for the determination of one or both of the ingredients. Among those suggested have been the determination of iodine colorimetrically (2) and by converting to iodide with zinc and precipitating with silver nitrate (3); the determination of potassium iodide argentimetrically (4), or by difference after determining free and total iodine (6, 7). Other assays (8, 9, 10) employ modifications of the iodine cyanide method of Rudolf Lang (11). The following procedure, devised in this laboratory is believed to be simpler than any of the foregoing and to be free from the objections raised against the official methods:

Five cc. of the solution is measured into an iodine flask and the free halogen is titrated with 0.1*N* alkaline potassium arsenite solution using starch indicator. Fifty cc. of concentrated hydrochloric acid and 5 cc. of chloroform are then added, the mixture is well cooled and then titrated with *M*/20 potassium iodate solution until the chloroform layer is colorless. The iodine may be calculated from the number of cc. of 0.1*N* potassium arsenite required; the potassium iodide from the difference, in cc., between the amounts of potassium iodate and potassium arsenite solutions used. The reactions may be represented by the following equations:

$$As_2O_3 + 2I_2 + 5H_2O \longrightarrow 2H_2AsO_4 + 4HI$$
$$KIO_3 + 2KI + 6HCl \longrightarrow 3KCl + 3ICl + 3H_2O$$

EXPERIMENTAL.

The volumetric reagents were prepared from C.P. chemicals. The arsenite and thiosulphate solutions were standardized with Baker's reagent iodine, the iodate solution with Bureau of Standards arsenic trioxide. The 0.1*N* potassium arsenite solution was made to contain a definite excess of potassium bicarbonate as recommended by Gooch (12) to neutralize the hydriodic acid formed.

A comparative study of this and the U. S. P. assays was made upon three galenicals, Tincture of Iodine U. S. P. X, Antiseptic Solution of Iodine, U. S. P. XI (proposed), and Compound Solution of Iodine U. S. P. X. The first and last were obtained by mixing the residues of a number of previously assayed samples, known to approximate the proper concentrations, the second was carefully prepared from U. S. P. chemicals. The results of this investigation are tabulated:

Sample.	Iodine. U. S. P.	Iodine. Volumetric.	Potassium Iodide. U. S. P.	Potassium Iodide. Volumetric.
Tincture of Iodine X	7.42	7.42	5.38	5.48
	7.42	7.45	5.36	5.44
	7.43	7.44	5.42	5.36
	7.43	7.43	5.42	5.38
Tincture Iodine XI	1.98	2.00	2.40	2.42
	2.00	2.00	2.42	2.45
	1.99	2.00	2.43	2.42
	2.00	2.00	2.44	2.43
Lugol's Solution	4.70	4.70	10.16	10.15
	4.67	4.72	10.12	10.10
	4.70	4.69	10.14	10.12
	4.70	4.68	10.18	10.11

DISCUSSION.

Owing to the high concentration of potassium iodide in Lugol's Solution the amount taken for assay was 4 cc., in addition the volume of concentrated hydrochloric acid was increased to 75 cc. for this product and for the U. S. P. X tincture. Slight modifications of the quantity taken for assay, in order to maintain proper concentrations will make this method applicable to Churchill's Tincture of Iodine or any similar preparation. The results of this assay compare favorably with those obtained by the U. S. P. method and the following advantages are claimed for it: (*a*) It permits the estimation of the two constituents upon one portion, thus conserving the sample, (*b*) it employs, for the estimation of iodine, a solution that is not only quite stable, but one that may be prepared directly from arsenic trioxide—a primary standard, (*c*) it substitutes a volumetric for a gravimetric estimation in the potassium iodide determination, hence is less time consuming, (*d*) in the latter portion of the assay it employs a reagent that is specific for the iodide ion.

SUMMARY.

A new assay has been devised for Iodine-Iodide Solutions.

The results obtained by this method are in good agreement with those secured by the United States Pharmacopœia.

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