of evidence of their usefulness, but on the complete ignorance of both by those who control their admission, however learned these men are in certain other directions.

I cannot close this communication in such a way as to leave it in the power of anyone to misrepresent or misunderstand my attitude toward pharmacodynamic investigators. I feel a great admiration and a great gratitude toward these devoted workers. Furthermore, I regard their work as constituting our chief hope for future benefits. At the same time, I condemn them for presuming upon their knowledge so far as to rule out the knowledge of others in matters regarding which they confess themselves ignorant. They have no right to demand that everything must stand still until they can find time and opportunity to attend to it in a better way. If this is done by the medical profession, patients are surely going to seek the poor man's physician, the proprietary medicine dispenser.

A NOTE ON THE STABILITY OF SOLUTION OF ARSENOUS AND MERCURIC IODIDE.*

BY WILMER H. SCHULZE.

Solution of Arsenous and Mercuric Iodide, or Donovan's Solution has evidently been looked upon as a fairly stable preparation which after standing a considerable length of time undergoes some change manifested by a change in color. Once this change has taken place the pharmacist is advised it should not be dispensed.

Textbooks and dispensatories refer to the change in color from colorless or pale yellow to reddish or red but fail to make any statement as to conditions which affect the rapidity of this change. In no case is mention made of the change in any of the constituents of this solution. One textbook states that when this color change takes place iodine has been liberated. Another authority states that when the solution becomes red it is supposed to contain free iodine.

Langenhan[1] states the cause of the change in color is not clearly understood, one writer claiming the colored solution did not give a positive test for free iodine with starch.

Rosen[2] reports that oxidation of arsenous arsenic takes place. At the end of one year and eleven months he found a loss of over half the arsenous iodide content although the total arsenic remained the same.

In a recent number of the JOURNAL[3] the writer showed that a rapid change takes place in the arsenous iodide content dependent on the method of preservation used. The change which takes place is an oxidation of arsenous to arsenic arsenic. This oxidation proceeds rapidly if the solution is exposed to ordinary daylight.

During the month of January 1925 the writer had occasion to analyze a sample of Donovan's Solution. The sample was in a well-filled amber container yet it showed only a little over 50% of the required amount of arsenous iodide. About a month later another analysis was made of this sample and it was found to contain

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* Section on Practical Pharmacy and Dispensing, A. PH. A., Philadelphia meeting, 1926.

[1] JOUR. A. PH. A., 508 (1925).

[2] Ibid., 6, 951 (1917).

[3] Ibid., 6, 464 (1926).

only 40% of the theoretical quantity of the arsenous salt. The solution was practically colorless. No additional observations were made until the following November; now the sample, which had been standing on the laboratory table, had changed to a light brown color and gave a positive test for free iodine with starch test solution.

A sample of Donovan's Solution was purchased from each of two pharmaceutical manufacturers. The solutions were in well-filled pint amber bottles and were practically colorless. They were placed in a dark cupboard when received. Analysis for the arsenous iodide content showed in the case of the sample purchased from Manufacturer A only 23.6% of the required amount of arsenous iodide whereas the other made by Manufacturer B contained 95.6%. Sample A was made March 27, 1925, Sample B, May 11, 1925. Manufacturer A could offer no explanation of this deterioration stating that analysis at the time of manufacture showed the full amount of arsenous iodide to be present. Additional investigation revealed the fact that this sample had been stored on a shelf where it was exposed to the light. Analysis of a control sample of this same lot, which had been kept in a dark cupboard, showed practically 100% of the arsenous iodide to be present.

A determination of the total arsenic present in Samples A and B gave the following results.

A Total arsenic 1.001% calculated as AsI_3.
B Total arsenic 1.053% calculated as AsI_3.

In December, one month after purchasing, Sample B was divided into two equal portions and these were transferred to pint amber containers. One was allowed to stand on the laboratory table in ordinary daylight while the other was kept in a dark cupboard.

In January and February the arsenous iodide content was again determined.

		January.	February.
A	Sample in cupboard	0.157% AsI_3	0.086% AsI_3
B	Sample in cupboard	0.897% AsI_3	0.846% AsI_3
B	Sample on table	0.766% AsI_3	0.400% AsI_3

Although there was a rapid change in the arsenous iodide content of the samples there was no change in color. In the case of the sample allowed to stand on the table, oxidation took place much more rapidly than the portion of the same sample kept in the dark cupboard.

The samples were not examined again until April. Sample A and that portion of Sample B which had been exposed to the light were light brown in color and gave a positive test for free iodine with starch test solution. At the present time that portion of Sample B which has been stored in the cupboard is practically colorless and analysis shows it to contain 0.353 per cent of arsenous iodide.

Conclusion.—The arsenous iodide content of Donovan's Solution undergoes a rapid change due to oxidation of trivalent arsenic to the pentavalent form. Light appears to accelerate this change very markedly.

The change in color of the solution to a light brown is due to liberation of iodine.

The liberation of iodine apparently does not take place until the arsenous compound has been completely oxidized.

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