

produce an abundance of lather in all kinds of water, and when used as a shampoo, leave the hair light and fluffy. They contain no free caustic alkali, as an excess of fat over the amount of caustic alkali is used, and potassium carbonate is used to complete the saponification of the balance of the fat.

Do not expose liquid soaps to the cold as it causes precipitation of stearates. These will generally redissolve if the liquid is allowed to stand in a warm place.

NOTES ON THE DECOMPOSITION OF NEO-SALVARSAN.

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That Neo-Salvarsan is capable of producing toxic symptoms if used while in a decomposed state is a fact that must be more seriously borne in mind by those who have occasion to use it but once in a while.

By reason of its peculiar loose combination, it tends to deteriorate at the slightest provocation, eventually changing, within a few hours, from that of a comparatively harmless medicament, to that of a very poisonous and dangerous compound.

This is particularly true in those instances where the product is made into solution some hours in advance of its use.

This is a practice, however, that is being rapidly disregarded and one that Ehrlich himself greatly deplors, for it is generally known that Neo-Salvarsan is more readily altered by exposure than Salvarsan. Ehrlich's precautions along these lines are emphatic and must be zealously heeded in order to avoid serious troubles. With the more improved appliances of administration now at our command, solutions barely become a half hour old before they are used. They should be used at once, however, after preparation.

It has been observed nevertheless, that toxic symptoms have developed in many cases notwithstanding the most careful technic. In this connection no one has as yet advanced a satisfactory explanation of the causes leading up to these conditions. Judging from what has been gleaned from this brief study, it would seem, that the body fluids, and the tissues and organs that convey them, would in a large measure be responsible for these symptoms by reason of the alteration of this compound after introduction into the body.

After once Neo-Salvarsan has been released from its sealed enclosures it begins to suffer a change. This change begins at once, but proceeds slowly as crystal by crystal becomes involved, by reason of atmospheric contact. So delicate is this decomposition at first, that it is imperceptible to the unaided eye.

This remains unnoticed until an advanced stage is reached, when suddenly it manifests itself by a darkening of the substance.

It was observed that high temperatures with a moist atmosphere, caused decomposition more readily than low temperatures with drier surroundings. Hence, to keep Neo-Salvarsan it must be in a dry state and free from atmospheric influences, just as we find it on sale in the open market.

In order to demonstrate the ease with which this product changes, the follow-

ing experiments were conducted under conditions that would obtain in a well-regulated laboratory or dispensing pharmacy.

A five percent solution was made, using ammonia free water, recently distilled. Four cc. of this fresh solution was placed in a tube and immediately corked. Another four cc. was placed in a similar tube but was not corked. The experiments were instituted at 3 p. m., December 3, 1912. The results obtained were as follows:

Closed Tube.—December 4, 1912, 12 noon (21 hours after preparation), a slight decomposition at the surface of the solution. The color is a light brown. The color occupies mostly the surface of the solution. No sediment. Slight suspended precipitate.

Open Tube.—December 4, 1912, 12 noon (21 hours after preparation), a decided decomposition at the surface of the solution. The color is a dark brown. About one-third of the volume of solution appears to be so colored. No apparent sediment but considerable flocculent particles in suspension.

Observations of December 6, 1912, three days after preparation, time 3 p. m.:

Closed tube reveals a deep brown colored solution, the color spreading throughout the solution. A slight sediment is observed.

Open tube shows a dark, brownish-black solution. The color is decidedly diffused throughout the solution, with a heavy sediment.

From this we are to infer that within 24 hours solutions of Neo-Salvarsan become absolutely unfit for use. As yet, no suitable chemical means has been found by which this decomposition can be retarded or detected in its early stages. In the case of the crystals the author has found that the microscope offers the best means by which this change can be detected far in advance of eye or reagent. The unaided eye detects the change after a danger point has been reached, while chemical reagents are of no avail. By virtue of the microscope, each crystal can be seen to gradually change in color, from that of its original yellow to that of a light brown and later on a dark brown, when under exposure. One of the injunctions given by the producers of Neo-Salvarsan is that it must not be used if it shows any signs of discoloration, and if once exposed be used up at once or before discoloration. Unused amounts should be rejected.

Fresh Neo-Salvarsan under the microscope presents a picture of oddly shaped, greenish-yellow crystals, in variable sizes, narrow and long and of a tubular appearance, resembling in some respects, small, narrow, and short, waxy or fibrinous renal casts. In nature they are waxy like, and glossy, and tend to transform into yellowish oil-like globules if kept for any length of time in a warm place and free from the air. This was quite noticeable with those mounted in water free cedar oil, under cover glasses on glass slides. In this manner I have kept crystals for several months without suffering much alteration other than a coloration of those near the edge of the cover glass where air was most likely to enter. The coloration which ensued in such an event was slow in forming and of a light brown color. In the case of decomposed crystals—plain or in solution—the microscope revealed the same to be of a deep, dark yellow to brown color, the depth of color depending largely upon the extent of the decomposition, the age of the preparation and the length of time exposed to external influences.

The dark colored sediment produced by prolonged oxidation of Neo-Salvarsan

in solution, is of a brownish-black color and granular. While under the microscope it appears to be lighter in color, and has the appearance of amorphous powder, that is, it is devoid of definite crystallization, other than that as observed later on. These formations are not all alike, since some are found to be more granular or flaky than others.

Decomposed solutions of Neo-Salvarsan all have a scum on the surface of the fluid which reveals a metallic lustre. The sediments as found in the above experiments when placed on a slide and studied by the microscope, in a dried condition, showed the presence of numerous well formed octahedral crystals of As_2O_3 which responded to all of the tests for arsenic. The sediment itself if heated in a closed tube gave the characteristic arsenic ring formation at the cool portion of the tube, with the formation of the typical crystals. These in turn were made to respond to other tests for arsenic.

The conclusion reached in the foregoing study is that Neo-Salvarsan begins to suffer a change immediately after it becomes exposed to the action of the atmosphere.

That the change is a gradual one of oxidation.

That toxic symptoms may develop as a result of this obscure decomposition—when used—long before any change can be detected by the unaided eye.

That the toxic element produced in consequence of this decomposition is mainly arsenic trioxid.

That the degree of toxicity depends entirely upon the amount of free arsenic trioxide present.

AN ANCIENT PATENT MEDICINE AD.

The patent medicine craze had a firm hold on its victims way back in Queen Anne's time. In the current *Atlantic* the following advertisement is reprinted from Addison's Spectator: "A Treatise of the Hypochondriack and Hysterick Passions vulgarly called the *HYPŌ* in Men and *VAPOURS* in Women" was advertised, as well as many nostrums of which the following is a typical notice:

The Vapour in women infallibly Cured in an Instant, so as never to return again, by an admirable Chymical Secret, a few drops of which takes off a Fit in a Moment, dispels Sadness, clears the Head, takes away all Swimming, Giddiness, Dimness of Sight, Flushings in the Face, &c., to a Miracle, and most certainly prevents the Vapours returning again; for by Rooting out the very Cause it perfectly Cures as Hundreds have experienced: It . . . causes Liveliness and settled Health. Is sold only at Mrs. Osborn's Toy-shop, at the Rose and Crown under St. Dustan's Church in Fleet-street, at 2s. 6d. the Bottle, with directions.—*The Atlantic*.