absence of the stellate fibro-vascular bundles ("Star Spots") so common and characteristic in Chinese Rhubarb.

The plano-convex segments averaged from 8–10 cm. in length and 2–4 cm. in diameter. Most of the segments showed remnants of a dark brown spongy pith. In other respects the sections were similar to Chinese Rhubarb. The texture was not as solid and heavy, and the powder much more bulky and pink in color than that obtained from the Chinese variety.

It was observed that in experimental samples of fluidextract prepared from "Turkish" Rhubarb a considerable deposit of a yellowish crystalline nature settled to the bottom on standing. A portion of the crystalline residue from the fluidextract was identified as Rhaponticin by the solubility in alkalies and dilute alcohol. A solution of these crystals in dilute alcohol was shaken with ether and allowed to stand. Acicular crystals separated.

The U. S. P. test for Rhapontic Rhubarb was run on this lot alongside of a sample of authentic Rhapontic Rhubarb. No crystallization occurred while under observation for 72 hours.

Due to incomplete directions and the possibility of interpreting the U. S. P. Rhapontic test instructions in more than one way, the technic described in the German Pharmacopœia was followed with positive results. The crystalline precipitate from the "Turkish" Rhubarb was similar to that from true Rhapontic Rhubarb.

The German method of testing for Rhapontic Rhubarb was also applied to true Chinese Rhubarb with negative results.

We wish to point out the possibility of accepting a lot of Rhapontic Rhubarb for the official variety on the strength of negative results in the U. S. P. X test for Rhapontic Rhubarb. Modifications of this U. S. P. test are recommended and outlined in the foregoing paper.

Our experiments have conclusively proven that the so-called "Turkish" Rhubarb was none other than our old friend *Rhaponticum*.

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THE INFLUENCE OF LIGHT UPON THE HYDROGEN-ION CONCENTRATION OF CERTAIN GALENICAL PREPARATIONS.*

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

INTRODUCTION.

Working as a member of the committee on the actinic value of glass and of the committee on hydrogen-ion concentration of the American Drug Manufacturers' Association, one of the authors correlated certain data inter-related between the two committees which were thought to be of sufficient importance to warrant its publication in THIS JOURNAL. The pharmaceutical preparations selected were:

(1) Elixir Pepsin and Rennin Comp., N. F.
(2) Tincture of Digitalis, U. S. P.

* Scientific Section A. PH. A., Rapid City meeting, 1929.

(3) Fluidextract of Cascara, U. S. P.
(4) Elixir Glycerophosphates Comp., N. F.
(5) Elixir Iron, Quinine and Strychnine, N. F.

The samples studied in this investigation were composite samples prepared by five pharmaceutical manufacturing houses.

Traut and Valteich (1) made an exhaustive study of the factors influencing the stability of pepsin preparations. Among other interesting data recorded by these investigators, they determined the p_H of Elixir Pepsin and Rennin Comp., N. F. to be 3.67. In a further study of the stability of pepsin preparations, Valteich (2) observed that in those pepsin preparations which lost practically all of their activity upon standing the p_H of the product when prepared was close to the optimum p_H for peptic digestion. This suggested to this investigator that, "possibly the enzyme digests itself or its carrier and so loses its activity."

The influence of light of various wave-lengths on Tincture of Digitalis has been studied extensively although there are few references in the literature to hydrogen-ion concentration studies of this product. Macht and one of the authors (3) observed a deterioration of 20 to 30 per cent in the pharmacological activity of tincture of digitalis when exposed to ultraviolet radiation in quartz tubes. The activity was measured by the cat method and the phyto-pharmacological method described by Macht and Krantz (4) and (5). The deleterious influence of polarized light upon the tincture observed by Macht with Anderson (6) and with Krantz (7) has been the subject of some controversy in the recent literature; Bond and Gray (8) observed no difference between the action of polarized light and non-polarized upon the tincture when tested by the cat method. Rojahn (9) among other preparations exposed tincture of digitalis to ultraviolet radiation for 96 hours with a mercury vapor quartz lamp in quartz tubes. He observed 20 per cent loss in activity.

Tainter (10) showed the acidity of tincture of digitalis to be equivalent to a solution of hydrochloric acid $N/10{,}000$, p_H approximately 4.6. Joachimaglu and Bose (11) determined the p_H of the tincture to be 5.88 and showed that it became somewhat more acidic upon standing. Smith (12) showed the p_H of various tinctures of digitalis to be between 5.12 and 5.77. The first author (13) found the p_H of freshly prepared tincture of digitalis to be between 5.51 and 5.88 with a mean of 5.64.

The authors found no significant work recorded in the literature regarding the hydrogen-ion concentration of Elixir Glycerophosphates Comp. N. F.; Elixir Iron, Quinine and Strychnine, N. F., and Fluidextract of Cascara, U. S. P.

EXPERIMENTAL.

Samples of these five pharmaceutical preparations were stored in partially filled amber, blue and flint glass bottles in direct light (a portion of the day sunlight). Samples were irradiated also with an Alpine Sun Lamp in quartz tubes, one-half hour weekly over six weeks.

The hydrogen-ion concentration measurements were made with a hydrogen electrode Wilson type (14) in the case of Tincture of Digitalis, Fluidextract of Cascara, and Elixer of Pepsin and Rennin. The p_H measurements of Elixer Iron, Quinine and Strychnine, and Elixir of Glycerophosphates Comp. were made by means of the quin-hydrone electrode as described by Biilman (15).

TABLE I.—ELIXIR OF PEPSIN AND RENNIN.

p_H.	Flint glass.		Blue glass.		Amber glass.		Irradiated in quartz.	
When prepared	3.85		3.85		3.85		3.85	
42 days later	4.12	Turbid	4.05	Turbid	3.83	Normal	3.97	Ppt.
70 days later	4.12	Ppt.	4.04	Ppt.	3.80	Normal		

TABLE II.—TINCTURE OF DIGITALIS.

p_H.	Flint glass.	Blue glass.	Amber glass.	Irradiated in quartz.
When prepared	5.59	5.59	5.59	5.59
42 days later	5.09	5.18	5.20	5.19
70 days later	4.89	4.87	4.98	

TABLE III.—FLUIDEXTRACT OF CASCARA.

p_H.	Flint glass.	Blue glass.	Amber glass.	Irradiated in quartz.
When prepared	4.35	4.35	4.35	4.35
42 days later	4.00	4.10	4.00	4.09
70 days later	4.15	3.96	3.97	

TABLE IV.—ELIXIR GLYCEROPHOSPHATES COMP., N. F.

p_H.	Flint glass.	Blue glass.	Amber glass.	Irradiated in qurtz.
When prepared	5.61	5.61	5.61	5.61
42 days later	5.61	5.61	5.54	5.61
	Discolored	Discolored	Well-preserved	No discoloration
70 days later	5.33	5.34	5.33	
	Discolored	Discolored	Well-preserved	

TABLE V.—ELIXIR IRON, QUININE AND STRYCHNINE, N. F.

p_H.	Flint glass.	Blue glass.	Amber glass.	Irradiated in quartz.
When prepared	3.69	3.69	3.69	3.69
42 days later	7.00	6.32	3.78	Above 7.00
	Dark green	Dark green	Well-preserved	Dark green
70 days later	7.5	7.0	3.82	
	Ppt. amber color	Dark green	Well-preserved	

After 70 days the samples of Essence of Pepsin were assayed for their proteolytic activity by the Pharmacopœial method. The sample stored in amber glass compared favorably with the freshly prepared National Formulary product. Those stored in blue and flint glass showed a marked diminution in proteolytic activity.

After 70 days two samples of Tincture of Digitalis were assayed by the cat method; we are indebted to Dr. J. C. Munch of these laboratories for conducting assays on these by the official method.

TABLE VI.

Cat method.		Frog method.	
Flint glass	70 per cent	Flint glass	70 per cent
Blue glass	59 per cent	Amber glass	67 per cent
Amber glass	60 per cent		

Although there was not enough Tincture of Digitalis remaining in each sample to conduct a large number of assays, from the data obtained, there seems to be little variation among the samples when tested by the foregoing methods.

CONCLUSIONS.

1. Essence of Pepsin becomes less acidic when stored in blue or flint glass and decreases in proteolytic activity.

2. Tincture of Digitalis shows little variation in p_H whether stored in flint, blue or amber glass. The preparation tends to become more acidic upon standing.

3. Fluidextract of Cascara shows little variation in p_H whether stored in flint, blue or amber glass. The preparation tends to become slightly more acidic upon standing.

4. Elixir Glycerophosphates Comp., N. F. shows little variation in p_H whether stored in flint, blue or amber glass. It becomes discolored in flint or blue glass. The preparation tends to become slightly more acidic upon standing.

5. Elixir Iron, Quinine and Strychnine, N. F. becomes decidedly less acidic when stored in flint or blue glass which is accompanied by a marked deterioration of the elixir.

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THE THERAPEUTIC ACTIVITY OF NEOARSPHENAMINE.*

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Neoarsphenamine was first introduced by Ehrlich, the discoverer of its forerunner, arsphenamine. While arsphenamine was immediately recognized as an effective antisyphilitic there were certain objections to this preparation in practical use which were based on the necessity for dissolving it in a large volume of water and alkalinizing this solution before injecting it. This objection was overcome in neoarsphenamine by treating arsphenamine with sodium formaldehydesulphoxylate to obtain a product which was rapidly water soluble and which could be administered in much more concentrated solution without adjustment. This product, further, had the advantage of being less toxic than arsphenamine.

However, certain objections were also made to neoarsphenamine by some clinical workers treating syphilis; these being that neoarsphenamine was less efficacious therapeutically and more variable in its results than arsphenamine (1). This criticism was justified at least in part but it is proposed to present here the re-

* Scientific Section, A. PH. A., Rapid City meeting, 1929.