

## THE PERMANENCE OF PEPSIN SOLUTIONS.\*

BY C. F. RAMSAY.

A series of tests made by the author of this paper indicate that pepsin solutions deteriorate and the rate of deterioration is progressive; they are fairly permanent for the first six months; that acidity is a factor is shown by a greater loss in activity in preparations containing the larger percentage of acid. The investigations will be continued.—EDITOR.

Considerable work has been done regarding the effect of different acids and salts upon the activity of pepsin. The retarding effect of certain substances on pepsin digestion was discussed by the writer in a paper published by the American Pharmaceutical Association in the year 1915. The writer finds no record of work determining the permanence of pepsin solutions. Since there are a number of liquid preparations of pepsin in common use, the National Formulary having no less than eleven, varying in their acidity as well as in other respects, it was thought advisable to determine the permanence of such solutions. Several N. F. Preparations of Pepsin which had stood from six months to two years were tested. These solutions had been made in strict accordance with the formulas of the National Formulary, third edition, and were found to be standard when first made, but upon standing most of them showed marked deterioration and some were inert. About this time the fourth edition of the National Formulary came out and the writer made up the various pepsin solutions strictly in accordance with directions given in this edition. They all tested standard when first made. After six months the following results were obtained:

Elixir of Pepsin	Inert	Acidity 0.23 percent HCl
Elixir of Pepsin, Bismuth and Strychnine	No loss	Neutral
Elixir of Pepsin and Bismuth	No loss	Neutral
Glycerite of Pepsin	12 percent loss	Acidity 0.3 percent HCl
Liquor Pepsin	Inert	Acidity 0.4 percent HCl
Elixir of Pepsin and Iron	25 percent loss	Acidity 0.2 percent HCl
Liquor Pepsin Antiseptic	40 percent loss	Acidity 0.23 percent HCl
Liquor Pepsin Aromatic	Inert	Acidity 0.4 percent HCl
Wine of Pepsin	25 percent loss	Acidity 0.02 percent HCl
Elixir of Pepsin and Rennin Compound	10 percent loss	Acidity 0.08 percent HCl

At the time of making up these N. F. IV preparations, it was suggested that the deterioration in the N. F. III preparations might be due to an excess of acidity. In order to determine this point a series of pepsin solutions were prepared with varying amounts of free acid. These preparations were tested when first made and again after standing six months. The following results were obtained:

Acidity 0.02% HCl	Lost 7% activity	Acidity 0.1% Tartaric	Lost 7% activity
Acidity 0.05% HCl	Lost 15% activity	Acidity 0.2% Tartaric	Lost 7% activity
Acidity 0.1 % HCl	Lost 15% activity	Acidity 0.3% Tartaric	Lost 15% activity
Acidity 0.15% HCl	Lost 20% activity	Acidity 0.4% Tartaric	Lost 15% activity
Acidity 0.2 % HCl	Lost 20% activity	Acidity 0.5% Tartaric	Lost 15% activity
Acidity 0.25% HCl	Lost 40% activity	Acidity 0.7% Tartaric	Lost 25% activity
Acidity 0.3 % HCl	Lost 60% activity	Acidity 1.0% Tartaric	Lost 25% activity

\* Read before Scientific Section, A. Ph. A., Indianapolis meeting, 1917.

Alcohol causes no retardation to pepsin unless the solution contains more than 30 percent.

Sulphurous acid causes no retardation to pepsin unless the solution contains more than 0.7 percent.

Glycerin shows no effect even when the solution contains as much as 50 percent.

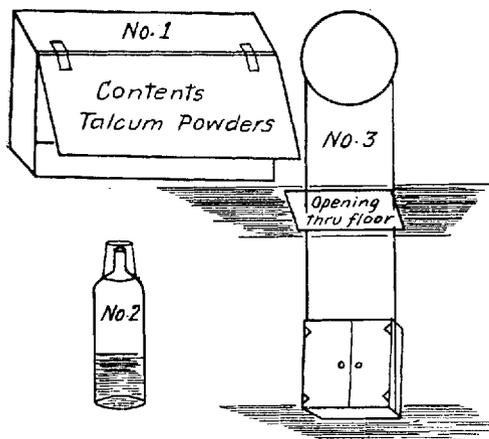
The above preparations will be tested again after standing one year. The results appear to indicate that acid causes a deterioration of pepsin in solution. This investigation will be carried further.

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### CONVENIENCES IN THE STOCK ROOM.\*

BY WILLIAM MITTELBACH.

The proper storing and protection of surplus stock is worth the thought of the druggist or merchant, and adds to the value of his resources. The surplus



stock put away in the cellar or other room should be protected from light and dust. For that purpose I have utilized the boxes obtained from my jobber at various times, by hinging the lid and placing the box so that the door keeps closed by gravitation (see illustration No. 1). In these boxes are stored patents, proprietaries, chemicals and other packages of like nature.

To protect stock bottles containing liquids, I use empty beef extract jars, or small glass tumblers placed over the top of the bottle, as is shown by illustration No. 2. For storing the official syrups, put up in small bottles, as is directed by the Pharmacopoeia, a dumb elevator constructed, as indicated in illustration No. 3, is a splendid and useful fixture. The syrups can all at times be kept in the cellar and can readily be elevated to the store floor when needed. The arrangement need not be large, and can be built in some convenient, out of the way corner of the prescription department.

Small quantities of fluid extracts remaining in pint bottles and not often used should be transferred to 4-oz. bottles. Some additional shelf room is gained by this, and you have the opportunity of seeing the condition of the extract.

\* Read before Section on Practical Pharmacy and Dispensing, A. Ph. A., Atlantic City meeting, 1916.