

should be suspended on this remedy until more definite statements can be made as to its action."

My thanks to Mr. Paul Carl for his valuable assistance in this work is hereby acknowledged.

UNIVERSITY OF KANSAS.

COMPARISON OF THE SENSITIVENESS OF THE FEHLING, THE NYLANDER AND THE PHENYL-HYDRAZINE TESTS FOR THE DETECTION OF DEXTROSE IN URINE.

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Preparation of the Dextrose.—The highest purity dextrose prepared by Merck & Co. was used in these experiments.

Owing to the presence of moisture in the dextrose, which would affect the weight of the dextrose when used for the purpose of making percentage solutions, the dextrose was dried to constant weight under a pressure of 125 mm., over calcium chloride, in a vacuum desiccator placed in a thermostat at a constant temperature of 37.5° C. The absorption of water during weighings was prevented by having the dextrose in a glass stoppered weighing bottle.

Date.	Weight.
October 5	26.0951 gms.
October 12	26.0894 "
October 19	26.0868 "
October 20	26.0865 "
October 26	26.0865 "
October 27	26.0866 "
November 2.....	26.0865 "
November 3.....	26.0865 "

This table shows that, under the conditions of our experiments, constant weight was reached at the end of fifteen days' drying. Although drying was continued during another fifteen days, there was no further loss in weight.

Preparation of the Dextrose Solutions.—The dextrose solutions were prepared as needed by dissolving weighed quantities of our dried dextrose in the proper quantities of distilled water.

Nylander's Reagent used in these experiments was made as follows:

Bismuth Subnitrate.....	2 gm.
Sodium Hydroxide.....	8 gm.
Rochelle Salt.....	4 gm.
Distilled Water to make.....	100 cc.

Two kinds of Fehling's Solutions were used in these experiments, as follows:

1. (a) *Copper Solution:*

Cupric Sulphate.....	34.639 gm.
Distilled Water to make.....	500.000 cc.

(b) *Alkaline Solution:*

Sodium Hydroxide.....	175 gm.
Rochelle Salt.....	60 gm.
Distilled Water to make.....	500 cc.

Of these solutions equal parts were taken and mixed fresh each day that the experiments were carried on.

2. A dilute Fehling's Solution, as suggested by Prof. Judson Daland, consisting of one part of Fehling's Solution No. 1 and two parts of water.

Methods Employed in Conducting the Tests.—In conducting these comparison tests, the following procedure was adopted: Fresh aqueous solutions of dextrose of known strengths were first prepared. All of these solutions were subjected to each of the four tests under comparison until we reached that dilution of dextrose at which each test failed to respond. The technique adopted was the same as if urine had been employed.

Nylander's Test.—Five cubic centimeters of the dextrose solution are boiled in a test tube. Five drops of the reagent are then added and the boiling continued for three minutes. The appearance of a dark color indicates the presence of dextrose.

Fehling's Test.—(Conducted in same manner for solutions 1 and 2): Ten cubic centimeters of the reagent are boiled at least two minutes in a test tube, and then carefully examined to see that no deposit has formed, thus showing that the reagent is not contaminated by a reducing substance. Fifteen drops of the dextrose solution are then added and the mixture slowly brought to a boil, when the appearance of a red or yellow precipitate indicates the presence of dextrose in the solution.

After several preliminary tests it was found that if more than fifteen drops of urine, containing dextrose, are added to the reagent a dirty green, non-characteristic appearance is produced. Consequently the above amount was chosen for these tests to correspond to the maximum quantity of urine that can be employed in the Fehling tests.

Phenyl-hydrazine Test.—Half fill a beaker of convenient size with water and then set it on a tripod and heat to boiling. Half fill a six inch test tube with the dextrose solution; make the solution slightly acid with acetic acid; and then set the test tube with its contents in the water in the beaker. While waiting for the water to boil, prepare the phenyl-hydrazine reagent (fresh for each experiment, as it does not keep well). Weigh out, roughly, one gram phenyl-hydrazine hydrochloride and two grams sodium acetate; mix the salts; dissolve them in ten cubic centimeters of distilled water; acidulate the solution by the use of about five drops of strong acetic acid; and, finally, filter to clarify. After the water in the beaker has boiled for about five minutes, observe the contents of the test tube and filter if necessary. Measure into a test tube about ten cubic centimeters of the clarified solution under examination and add five cubic centimeters of the prepared, clear, filtered reagent. Mix well and then place in the boiling water in the beaker and continue to boil for one hour. Remove the test tube and allow to cool thoroughly, when, if dextrose be present, a yellow crystalline precipitate will appear.

This precipitate under the microscope appears as yellow, needle-shaped crystals often arranged in rosettes, fans or sheaves.

Results of the Experiments.—The results of the experiments are shown in the accompanying table:

TABLE SHOWING THE SENSITIVENESS OF THE FOUR TESTS.

Percentage Strength of Dextrose Solutions	Fehling's Test (No. 1—ordinary)	Fehling's Test (No. 2—dilute)
0.5	Positive	Positive
0.25	Positive	Positive
0.125	Positive	Positive
0.0625	Positive, after standing 5 minutes	Positive
0.03125	Positive, " " " "	Positive, after standing 5 minutes
0.015625	Positive, " " " "	Positive, " " " "
0.01	Positive, " " " "	Positive, " " " "
0.009	Positive, " " 10 "	Positive, " " " "
0.008	Positive, " " " "	Positive, " " " "
0.007	Positive, " " " "	Positive, " " 10 "
0.006	Positive, " " " "	Positive, " " " "
0.005	Positive, " " " "	Positive, " " " "
0.004	Positive, " " 15 "	Positive, " " 15 "
0.003	Positive, " " " "	Positive, " " " "
0.002	Positive, " " " "	Positive, " " 30 "
0.001	Positive, " " • 20 "	Positive, " " " "
Percentage Strength of Dextrose Solutions	Phenyl-hydrazine Test	Nylander's Test
0.5	Positive before cooling	Chocolate Coloration
0.25	Positive " "	Dark Amber "
0.125	Positive " "	Dark Amber "
0.0625	Positive after " "	Light Amber "
0.03125	Positive " "	Light Amber "
0.015625	Positive " "	Negative
0.01	Positive " "	
0.009	Positive " "	
0.008	Positive " "	
0.007	Positive " standing $\frac{1}{2}$ hour	
0.006	Positive " $\frac{3}{4}$ "	
0.005	Positive " " 1 "	
0.004	*Negative " " 1 "	
0.003	*Negative " " 1 "	
0.002	*Negative " " 1 "	
0.001	*Negative " " 1 "	

*A deposit formed; but microscope showed no characteristic crystals.

Conclusions.—From the above experiments we concluded:

1. That Nylander's test is of no value for proportions of dextrose under 0.5 per cent.
2. That the ordinary strength of Fehling's solution is the most sensitive of the four tests we have examined and that even with a dilution of 0.001 per cent. it still yields positive results after standing twenty minutes.
3. That the dilute Fehling's solution shows a high sensitiveness and is in this respect slightly superior to the phenyl-hydrazine test.
4. That the phenyl-hydrazine test shows a high sensitiveness and that its limit of sensibility is about 0.005 per cent. after standing one hour.

Practical Application.—With regard to sensibility, the Fehling test and the phenyl-hydrazine test are both so satisfactory that they leave nothing to be desired.

for clinical purposes. The Fehling test is superior to the phenyl-hydrazine test in ease of execution. The phenyl-hydrazine test is superior to the Fehling test in the non-fallacious character of its findings. We advocate the habitual use of the Fehling test to disclose the freedom of urine from dextrose. If, however, any urine be encountered which reacts positively with the Fehling test, said urine should then be subjected to the phenyl-hydrazine test to make certain that the positive reaction obtained by the Fehling test was caused by dextrose and not by one or more of the many substances which may be present in urine and react toward Fehling's test like dextrose.

In conclusion I desire to express my appreciation of the excellent services rendered during the conduct of the work by my assistant, Dr. C. J. Stamm.

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ALWAYS BLAME THE BOARD.

Boards of pharmacy are made up of human beings pretty much like the ordinary citizen. As individuals, they are liable to make mistakes and even in council, with the exercise of the best of care and judgment, errors are certain to occasionally occur. The interesting question, however, comes when it must be decided who shall be the judge of right and wrong acts and who shall set up the standard by which the board of pharmacy is to be measured. Our editorial experience, which dates back almost as far as the average board of pharmacy, and the experience of other pharmaceutical journals shows that pharmacists are always ready to judge of the acts of a board of pharmacy and are quick to give their decisions, particularly when, in their own minds, it calls for criticism. We have seen boards of pharmacy blamed for the scarcity of drug clerks, for the high price of salaries, for the number of drug stores for sale, for the close proximity of drug stores, for cut rate prices, for the low wages paid clerks, for the number of clerks out of employment, for the annual or bi-annual re-registration fee, for the necessity of attending a college of pharmacy, for interchanging certificates with other boards, for not adopting reciprocity in registration, for paying the secretary of the board a salary, for letting women in pharmacy through, when men making the same average would not have been passed, for having it in for women in pharmacy and denying them registration on the required percentage in examinations and for a long list of other things that need not be mentioned here. Our experience with boards of pharmacy convinces us that as individuals and in their official capacity the board members are anxious to do the very best they can for the welfare of pharmacy in the state concerned.

We are not calling attention to the criticism of boards of pharmacy with a view of having the practice discontinued. If anything, it should be encouraged. It acts as a safety valve for disgruntled pharmacists and does not harm the board. The board member who cannot stand criticism is unqualified for a position as a state officer. The board which escapes criticism must be inactive and the law under which it exists a dead letter.—*Meyer Brothers Druggist.*