

METHODS FOR THE EXTEMPORANEOUS PREPARATION OF SOLUTIONS OF MILD AND STRONG SILVER PROTEIN.*

BY MARVIN J. ANDREWS.

After receiving numerous queries concerning the method best suited to the preparation of Solutions of Mild and Strong Silver Protein it was decided to try various methods, and from the results of a representative group of students to determine the best method for the extemporaneous preparation of the solution. With this viewpoint in mind several methods were tried and results recorded.

Solutions of Mild Silver Protein were prepared by dissolving 46 grains of the crystal in enough distilled water to make 7 fluidrachms. This strength solution was taken as it is more difficult to prepare a concentrated solution than a weaker one, however, concentrations as high as 50% are not as frequently used as weaker solutions.

Solutions of Strong Silver Protein were prepared of two definite strengths. The first being of the same strength and quantity as for the Mild Silver Protein Solution to give a comparison of the two different solutions, and secondly by using 18 grains of the powder in enough distilled water to make 4 fluidounces, the strength and quantity most generally used.

Students were selected from the School of Pharmacy, University of Maryland, from the various classes, endeavoring in each case to select representative students, such as fast, slow, neat, careless, experienced and inexperienced. This selection was made in order to get results that would nearly correspond to the results, if possible to obtain them, from the retail pharmacists.

A stop-watch was used to record the time which was taken in each case, from the time the weighed powder or crystals were placed in the container until complete solution was effected. Time for weighing, pouring into the container and labeling were not recorded, as this time would remain constant for the individual in each case.

The Mild Silver Protein used was made by the Mallinckrodt Chemical Works, while the Strong Silver Protein was made by Merck & Co.

The following methods were used in preparing the solutions.

MILD SILVER PROTEIN.

1. The weighed crystals were placed in a glass mortar and about half the amount of distilled water slowly added, triturating rapidly without pressure on pestle until the greater part of the Mild Silver Protein was in solution, then the remainder of the distilled water added and contents triturated until all the salt was dissolved.

2. Solutions were made in two different ways by the bottle method. In one case the weighed salt was transferred to a dry bottle and the required amount of distilled water added, stoppered and shaken until the crystals were completely dissolved. The distilled water in this case must be added before shaking, as the solution has a tendency to foam. In the second case the distilled water was placed in the bottle and then the salt added, stoppered and shaken.

3. This method consisted of pouring the granules or powder into the distilled water contained in a graduate and stirring with a glass stirring rod until dissolved.

* Section on Practical Pharmacy and Dispensing, A. Ph. A., Baltimore meeting, 1930.

RESULTS.

Students No.	Method.	Time.	Method.	Time.	Method.	Time.
1	1	2' 10"	2	1' 25"	3	2' 15"
2	1	1' 35"	2	45"	3	1' 50"
3	1	1' 20"	2	40"	3	1' 45"
4	1	1' 30"	2	45"	3	1' 55"
5	1	2'	2	1'	3	2' 5"
6	1	2' 25"	2	1'	3	1' 50"
7	1	2' 35"	2	1' 10"	3	2' 10"
8	1	2' 6"	2	1' 45"	3	2' 20"
9	1	1' 22"	2	1' 18"	3	1' 35"
10	1	1' 16"	2	1' 7"	3	1' 30"
11	1	1' 25"	2	1' 45"	3	2' 24"
12	1	1' 26"	2	1' 56"	3	2' 6"

From the above results the best method for the extemporaneous preparation of Mild Silver Protein would be by method number two, that is by adding the water to the salt contained in the bottle or adding the salt to the water contained in the bottle. The fineness of the powder did not change the results to any appreciable extent.

STRONG SILVER PROTEIN.

The N. N. R. for 1929 states that "Solutions of Strong Silver Protein are best prepared by dusting the powder on the surface of cold water, and allowing it to dissolve without stirring or shaking. This requires about 10 minutes." After trying this method, using a 2- or 4-fluidounce graduate for containers, it was found that the time required for complete solution was from 20 to 40 minutes. As a result of this method the following methods were then tried.

● RESULTS.—46 GRAINS IN ENOUGH WATER TO MAKE 4 FLUIDOUNCES.

Students No.	Method.	Time.	Method.	Time.	Method.	Time.	Method.	Time.
1	1	45"	2	1' 3"	3	2' 40"	5	2' 35"
2	1	1' 30"	2	3' 8"	3	2' 25"	5	2' 45"
3	1	1' 22"	2	1' 30"	4	2' 50"	5	3'
4	1	1' 35"	2	2'	3	2' 5"	5	3' 5"
5	1	60"	2	2' 40"	3	2' 45"	5	2' 50"

RESULTS.—18 GRAINS IN ENOUGH WATER TO MAKE 4 FLUIDOUNCES.

Students No.	Method.	Time.	Method.	Time.	Method.	Time.	Method.	Time.
6	1	35"	2	50"	3	42"	5	1'
7	1	32"	2	1' 54"	3	34"	5	50"
8	1	25"	2	42"	4	37"	5	45"
9	1	1' 5"	2	1' 15"	3	35"	5	1' 13"
10	1	32"	2	43"	3	34"	5	45"
11	1	45"	2	1' 8"	4	1' 4"	5	1' 18"
12	1	40"	2	1' 15"	4	1' 36"	5	1' 25"
13	1	32"	2	1' 6"	4	2' 2"	5	1' 8"
14	1	42"	2	54"	3	55"	5	56"
15	1	57"	2	1' 5"	4	1' 55"	5	1' 22"

1. The weighed Strong Silver Protein was transferred to a dry glass mortar, a few drops of distilled water added and rubbed to a smooth paste, then the remainder of distilled water added, triturating rapidly until the powder dissolved.

2. Transfer the weighed Strong Silver Protein to a dry glass mortar, add a few drops of glycerin and rub to a smooth paste, then add water slowly while triturating until solution takes place. (NOTE: Due to the viscosity of the glycerin and strong silver protein, there was a tendency of the salt to stick to the sides of the mortar and on the bottom of the pestle, but this was not the case when distilled water was used alone.)

3. The weighed Strong Silver Protein was placed in a clean dry bottle and all the distilled water added at once, then the bottle was stoppered and shaken.

4. The salt was added to the water contained in the bottle and the contents shaken until all dissolved. There was a tendency in both cases, 3 and 4, for the salt to stick to the sides of the bottle, and a great deal of shaking was required.

5. The powder was dusted on top of distilled water contained in a graduate, then stirred with a glass stirring rod. There was a tendency in this case for the powder to form a ball, the outside of which was wet and the inside dry.

In conclusion from the results obtained in preparing both the concentrated and weaker solutions of Strong Silver Protein it appears that the quickest method is to make the solution in a glass mortar, using distilled water as the solvent. This method differs from the bottle method which appears to be the one best suited for the preparation of Solutions of Mild Silver Protein.

SCHOOL OF PHARMACY,
UNIVERSITY OF MARYLAND.

ABSTRACT OF DISCUSSION.

Wm. F. Reindollar asked relative to the percentage strength of the solutions. He thought there might be some difficulty with the strong solution, in ascertaining whether the salt was completely dissolved or not. The author stated that the percentage strengths of the solutions were approximately 1 and 20 per cent, and that complete solution in the case of the stronger solution was determined by passing a strong light through the solution.

Wm. Gray said that by using warm distilled water the solution can be more quickly obtained.

Louis Saalbach recalled that when the Strong Silver Protein solution was placed on the market under a trade name the manufacturer recommended using a few drops of glycerin in the water. He had no difficulty with the solution but pharmacists had different ideas relative to what a small amount of glycerin meant. He thought that a few drops of syrup would answer as well as the glycerin and may not be as irritating when the solution is used, as an injection. He agreed with the author on the method of preparing the Mild Silver Protein solution, but said the water should be placed in the bottle first. The author said that further questions might have been brought up relative to why he did not use argyrol and protargol. He said he had used argyrol and protargol also, but did not mention them in the paper as they were not official and only the official salts were discussed in this paper.

Relative to warm distilled water, the author said that it required a little time to heat the distilled water and the object of the paper was to determine a quick method for the preparation of the solution.

F. M. Holt asked whether it was permissible to add glycerin or syrup to these preparations.

J. Carlton Wolf said that after talking with a number of physicians in Baltimore he did not believe it advisable to use glycerin, especially if the solution was to be used in the eye, but other than that there seemed to be no objection.

Wm. Gray said that there were differences of opinion relative to the keeping qualities of the solution.

F. W. Nitardy referred to a solution of Mild Silver Protein which was about a year old, and was tested bacteriologically. There was a slight precipitate at the bottom of the bottle

but from examination it did not seem to be less effective. He thought that the solution of the Strong Silver Protein would not keep as well.

Adley B. Nichols said that he had been in touch with the manufacturers of argyrol and they had said that it is best to prepare a fresh solution. They did not give any definite time, but said that a solution three or four weeks old would not be as satisfactory as one freshly prepared. They cautioned against making a solution to be used from time to time and also against making a fresh solution and adding to it an old solution. From his own experience he said there is quite a difference in the effect on the eye of an old solution and a freshly prepared solution.

John R. Minehart confirmed the statement made by the former speaker in reference to the therapy. He said that certain dermatologists refused to use a protein solution of silver if it had been prepared more than five days, and he also stated that ill effects had come from using old solutions. He said he always instructed students to use a label saying this preparation should not be used after a certain date, namely, ten days after the date of preparing. He had found that some patients set aside bottles of solutions prepared on prescriptions and then after several months had used the same preparation with the result of causing irritation.

PERSONAL CONTACT RELATIONS WITH THE MEDICAL PROFESSION.

BY ANTON HOGSTAD, JR.

Pharmacy has much to offer to the profession of Medicine. Likewise the pharmacist can learn much from the physician, provided conditions are such as to warrant an atmosphere wherein the pharmacist assumes the rôle of an associate to the physician.

For the most part, American pharmacists have sadly ignored or overlooked one of the most interesting, instructive and essential phases of the daily conduct of their business. They have been content to remain within the four walls of the store, to merely greet the physician with a cheery "Good Morning" and then to calmly await whatever prescription patronage that the physician in question chooses to direct to this particular store.

Many are prone to feel and many likewise say that the physician does not care to coöperate with the pharmacist. This is not true. It is true, however, that physicians are not coöperating with the pharmacists in availing themselves of the special type of service that a pharmacist should render, but there are many reasons for this status of affairs.

One can hardly expect a physician to approach the pharmacist in an atmosphere that bespeaks only of a varied lot of side lines, including the luncheonette. Likewise, one can hardly expect a physician to seek the assistance of one who has seen fit to close his textbooks at commencement time, with the feeling that now college days as well as state board days are over, that there is no further need for study. Should not commencement time be looked upon in just what is implied in these words—commencement time rather than the close of the period? Further, one can hardly expect the physician to seek the advice and counsel of the pharmacist who fails to read medical journals as well as pharmaceutical journals. Does the average physician get the impression when he steps into a prescription room that it is a place of scientific achievement? Hardly! Where is the Library? Outside of the United States Pharmacopœia, National Formulary and a dispensatory, and in many cases old editions of these books, one notes the complete absence of a library. Yet the pharmacist claims to be a professional man.