Section on Practical Pharmacy and Dispensing

Papers Presented at the Sixtieth Annual Convention

PRACTICAL PHARMACY METHODS AND DEVICES.

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Before explaining the apparatus set up before you, I should like to make a few remarks in regard to manufacturing, so far as it concerns the retail druggist. For your information I will state that I am employed by the Scholtz Drug Co., which conducts a chain of retail stores in this city. We have a small laboratory devoted to manufacturing and analytical work, and I believe a few figures and notes from our records may prove of value or interest to you.

In opening, let me say that by making our own U. S. P. and N. F. preparations, which I believe druggists as a general rule do not do as much as they should, we can most effectively convince the doctor that we are pharmacists, gain and hold his confidence, and thereby aid our propaganda work in a manner that brings tangible results, results that you can count in dollars and cents.

Mr. Raubenheimer speaks a great truth in saying at the close of the paper just read: "To practice pharmacy is the pharmacist's birthright, which he must not sell, as it will end his existence."

We have given the pharmaceutical manufacturing houses too much work to do. We must do more ourselves, and you will be surprised to note the profit we can make by producing as many official and other preparations ourselves as is consistent with the conditions under which we work. I shall quote some comparative prices to illustrate my point, and for this purpose I have taken the list prices of two of the best known pharmaceutical manufacturing houses of the United States with such discounts as you can get when you are on the "jobbers' list," and can buy in quantity, in other words buy these preparations as near right as any retail establishment can possibly buy them, and compared them with the cost of these preparations to us, that is the cost of production arrived at in our laboratory.

To give you an opportunity to judge as to the correctness of what we consider cost of production, I shall give you a brief outline of how we handle our work and how we arrive at our cost figure.

Every time a preparation is made the formula is written on a card like Fig. 1.

From this the preparation is made. These cards are serially numbered and form a permanent record by being bound into monthly volumes. The cost prices of the various ingredients are filled in as the preparation is made and extended when finished. The information on this card is then transferred to a card index card like Fig. 2.

NOTE: HAVE FORMULA CHECKED BEFORE STARTING PREPARATION, CHECK OFF EACH ITEM AS USED AND FILL IN COST PRICES. MAKE ALL NECESSARY CALCULATIONS AND ALL NOTATIONS THAT MAY PROVE OF VALUE FOR FUTURE REFERENCE, ON BACK OF CARD.

THE SCHOLTZ DRUG CO., LABORATORY

Made by Powers Checked by Flint.

	FORMULA				COST	
✓	Calcium Hypophosphite	280		Grs.	.86 lb.	.54
✓	Potassium "	140		"	1.16 "	.37
✓	Sodium "	140		"	.82½ lb	.52
✓	Iron "	18		"	1.73 lb.	.07
✓	Manganese "	18		"	.84 ½ lb	.07
✓	Quinine alkaloid	8	80	"	.37 oz	.06
✓	Strychnine "		92	"	1.20 oz	.04
✓	Sodium Citrate	30		"	.45 lb.	.03
✓	Dil. Hypophos. Acid	120		c.c.	.94 pint	.12
✓	Sugar "Conf. A"	6200		Grs	6.00 cwt	.96
✓	Distilled Water qs.	8000		c.c.	.10 gal	.11
						2.89

Dissolve Fe & Mn. Hypophos. & Sod. citrate in 240 cc. of Dist. H2O by aid of gentle heat
Dissolve Ca, K & Na Hypophos. in 3600 cc. Dist. H2O to which 40 cc. Dil. Hypophos. Acid have been added
Dissolve Quinine & Strych in 240 cc. Dist. H2O with the aid of 80 cc. Dil. Hypophos. Acid.
mix the solutions and filter.
Percolate sugar with filtrate, adding H2O qs. 8000 cc.

Preparation: Syrup Hypophosphites Comp. U.S.P.
No. 6394 Control No. 11320 Date Nov. 13 - 1912

Fig. 1—Record Card.

THE SCHOLTZ DRUG CO. LABORATORY — PREPARATION RECORD

Syrup of Hypophosphites Compound U.S.P.

DATE	QUANTITY	RECORD NO.	TIME Hrs.	TIME Min.	COST Materials	COST Total	COST Per 1000 C.C. or Gms.	COST Per Gal. Lbs.	LIST gal.	Quantity Manufactured
11/13/12	8000 cc.	6394	2		2.89	4.28	.54	2.09	2.05	1909 32000 cc.
										1910 64000 "
										1911 64000 "
										1912 88000 "
										1913
										1914
										1915

Fig. 2—Index Card.

Each preparation regularly made at our laboratory has such an index card, giving the successive dates and quantities of the preparation made, cost, etc., all of which is very valuable information and in this form at your command at a moment's notice. As a further check on our products we keep a one-ounce sample of every preparation. This sample receives a control number which is also noted on the record card and the stock container of the preparation as well as every portion of it sent out to our stores. These samples are of value also to observe changes that may occur on keeping, etc.

In arriving at the cost of a preparation we add to the cost of materials used as shown by the record card, the cost of the time necessary to make the preparation (figured at 50 cents per hour), and a further 10 percent of the total of these two items which about covers what might be termed our overhead charges. The time allowance in all cases is liberal and based on actual observation of time required to do the work. With the above explanation I believe the message in the following figures will be clear to you:

	Our Cost.	Manufacturer's Price.	
		A	B
Elixir, Ammonium Valerate, N. F., gal	$2 25	$3 30*	$2 70
Elixir, Aromatic, U. S. P., per gal	1 20	2 34	2 06
Elixir, Bismuth, N. F., per gal	1 65	3 85*	3.00
Elixir, Buchu, N. F., per gal	2 50	....	5 00
Elixir, Buchu and Pot. Acetate, N. F., per gal	2 85	....	5 00
Elixir, Cinchona, N. F., per gal	1 45	2 75*	2 63
Elixir, Digestive Comp., N. F., per gal	2 20	2 47†	2 63
Elixir, Gentian, N. F., per gal	1 90	2 47	2 63
Elixir, Gentian, Glycerinated, N. F., per gal	2 20	3 85†	3 37
Elixir, Glycerophosphates, N. F., per gal	2 30	4 40‡	5 00*
Elixir, Iron, Quinine and Strych., N. F., per gal	2 10	3 30‡	2 81
Elixir, Iron, Quinine and Strych. Phos., U. S. P., per gal.	2 20	3 30*	3 00
Elixir, Potassium Bromide, N. F., per gal	2 10	3 03	2 63
Elixir, Strychnine Valerate, N. F., per gal	1 50	....	2 63
Elixr, Terpin Hydrate, N. F., per gal	2 60	3 99*	4 31
Elixir, Terpin Hydrate and Codeine, N. F., per gal	4 75	6 60*	7 50
Elixr, Terpin Hydrate and Heroine, N. F., per gal	3 60	6 27*	6 75
Liniment, Soap, U. S. P., per pint	37	....	56
Liniment, Turpentine, Acetic, N. F., per pint	35	....	49
Mixture, Glycyrrhiza Comp., U. S. P., per gal	1 05	....	2 25
Ointment, Boric Acid, U. S. P., per lb	30	....	52
Ointment, Iodine, U. S. P., per lb	70	....	1 13
Ointment, Nutgall, U. S. P., per lb	50	....	75
Ointment, Phenol, U. S. P., per lb	25	....	60
Ointment, Rose Water, U. S. P., per lb	60	....	94
Ointment, Zinc Oxide, U. S. P., per lb	30	51	54
Ointment, Resorcin Comp., N. F., per lb	60	....	90
Powder, Antiseptic, Sol., N. F., per lb	45	....	75
Powder, Dovers, U. S. P., per lb	1 70	....	3 00
Powder, Licorice Compound, U. S. P., per lb	18	....	30
Solution, Antiseptic, U. S. P., per gal	1 10	3 40†	2 63
Solution, Antiseptic, Alk., N. F., per gal	1 50	....	2 63
Solution, Arsenic and Merc. Iod., U. S. P., per pint	25	....	41
Solution, Iron and Ammon. Acet., U. S. P. ,per pint	12	....	56
Solution, Potassium Arsenite, U. S. P., per gal	50	....	1 60
Solution, Sodium Phosphate Comp., U. S. P., per gal.	2 20	3 40†	2 70
Solution, Strychnine Acetate, N. F., per pint	35	....	45
Spirit, Ammonia, Aromatic, U. S. P., per gal	2 60	....	3 90
Spirit, Ether Compound, U. S. P., per pint	1 25	....	1 69
Spirit, Nitrous Ether, U. S. P., per gal	3 50	....	5 00
Spirit, Peppermint, U. S. P., per pint	70	....	1 20

	Our Cost.	Manufacturer's Price. A	B
Syrup, Asarum Comp., N. F., per pint	28	....	56
Syrup, Citric Acid, U. S. P., per pint	12	....	32
Syrup, Ginger, U. S. P., per pint	18	....	29
Syrup, Hypophosphites Comp., U. S. P., per gal	2 05	3 02	2 63
Syrup, Iron Iodide, U. S. P., per lb	17	33	45
Syrup, Hydriodic Acid, U. S. P., per gal	1 80	3 21	3 00
Syrup, Rhubarb and Pot. Co., N. F., per gal	2 45	4 40	3 75
Syrup, Sarsaparilla Comp., U. S. P., per gal	2 00	2 48	3 00
Syrup, Squill, U. S. P., per gal	1 30	1 93	2 10
Syrup, Tolu, U. S. P., per gal	1 00	2 34	2 25
Syrup, White Pine Comp., N. F., per gal	1 75	2 04	2 40
Syrup, Wild Cherry, U. S. P., per gal	1 35	2 34	2 10
Syrup, Yerba Santa Aromatic, N. F., per gal	1 65	3 40	3 55
Tincture, Aconite, U. S. P., per pint	38	66	68
Tincture, Aloes, U. S. P., per pint	38	61	75
Tincture, Arnica, U. S. P., per pint	27	55	52
Tincture, Belladonna, U. S. P., per pint	29	55	68
Tincture, Benzoin, U. S. P., per pint	53	96	1 09
Tincture, Cantharides, U. S. P., per pint	52	1 31	1 01
Tincture, Capsicum, U. S. P., per pint	48	86	71
Tincture, Cardamon Comp., U. S. P., per pint	32	61	56
Tincture, Cinchona, U. S. P., per pint	40	88	86
Tincture, Cudbear, N. F., per pint	25	....	38
Tincture, Digitalis, U. S. P., per pint	33	55	71
Tincture, Gentian Comp., U. S. P., per pint	34	61	54
Tincture, Ginger, U. S. P., per pint	51	88	90
Tincture, Hyoscyamus, U. S. P., per pint	37	66	75
Tincture, Iodine, U. S. P., per pint	70	1 43	1 50
Tincture, Iron Chloride, U. S. P., per pint	30	69	60
Tincture, Iron Citrochloride, U. S. P., per pint	38	....	75
Tincture, Lavender Comp., U. S. P., per pint	40	74	71
Tincture, Myrrh, U. S. P., per pint	52	96	94
Tincture, Nux Vomica, U. S. P., per pint	38	66	68
Tincture, Opium, U. S. P., per pint	1 25	2 06	3 00
Tincture, Opium Camph., U. S. P., per pint	30	80	94
Tincture, Opium Deod., U. S. P., per pint	1 35	2 06	3 00
Tincture, Rhubarb, U. S. P., per pint	50	66	86
Tincture, Rhubarb Arom., U. S. P., per pint	53	69	75
Tincture, Strammonium, U. S. P., per pint	27	55	57
Tincture, Tolu, U. S. P. ,per pint	52	....	79
Tincture, Valerian, U. S. P., per pint	40	74	71
Tincture, Vanilla, U. S. P., per pint	88	1 38	1 35
Tincture, Viburnum Opulus Comp., U. S. P., per pint	57	....	75
Vinegar, Opium, U. S. P., per pint	95	....	2 03
Vinegar, Squill, U. S. P., per pint	11	....	36
Water, Bitter Almond, U. S. P., per gal	45	....	2 25
Water, Camphor, U. S. P., per gal	45	....	2 06
Water, Cinnamon, U. S. P., per gal	40	....	2 06
Water, Peppermint, U. S. P., per gal	50	....	2 06
Wine, Antimony, U. S. P., per pint	18	44	49
Wine, Colchicum Seed, U. S. P., per pint	27	55	68
Wine, Iron, U. S. P., per pint	25	....	53

I believe the list is comprehensive enough to prove that I did not pick on a few articles that we accidentally produce cheaper than the manufacturers can sell them.

*Same drug strength but not claimed to be official.
†A preparation of similar composition to the official.
‡A preparation similar to, but weaker in its active ingredients, than the official.
Where no price is given the preparation is not listed by the manufacturer.

In all our preparations, quality not low price is our aim. We buy the best materials and spare no labor or care in producing products that we can honestly say are at least equal if not superior to the best the market affords. It would be to our advantage to make these products even if they would cost us as much as we would have to pay for the ready made article.

I should like to call your attention to another line of work handled at our laboratory which saves much time for the salesman or clerk and also stimulates and creates business.

Every drug, chemical or preparation that has any appreciable sale is put up in bottles, cartons or package form in one or more sizes according to demand. We design our package with the idea in mind that they be convenient to the con-

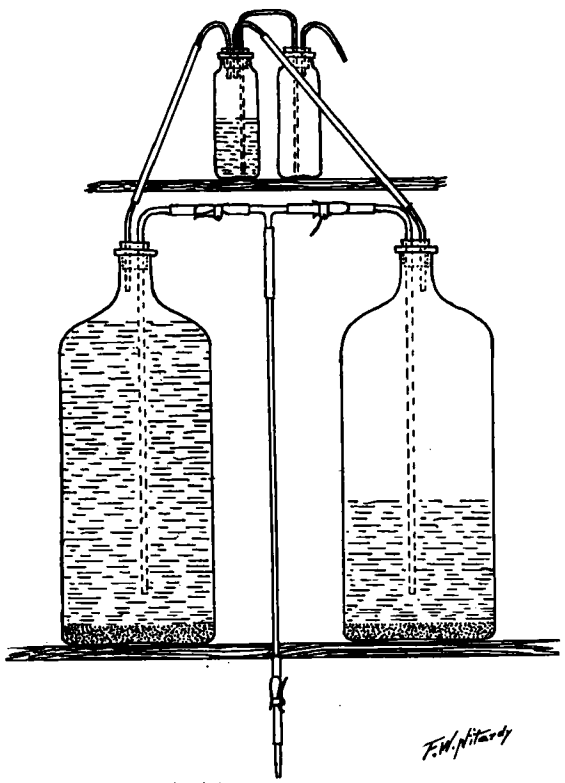

Fig. 3—Lime Water Apparatus.

sumer, preserving the unused portions, neat and attractive in appearance, but not expensive and above all bearing a label that gives such information to the consumer as he should have.

We use the term "U. S. P." or "N. F." whenever possible gradually educating the public that they mean something so far as quality is concerned.

Our records of the quantity of packages of certain articles sold during successive years show that suggesting to what use these staples can be put and giving proper directions for their use, is bringing very good results in increased business. We have more than doubled our sales on many of these articles in the last four years.

With your permission I will now explain this apparatus set up here. It is for lime water and quite simple even though it may look somewhat complicated at the first glance. We all know that lime water, no matter how carefully made, will deteriorate quickly, if exposed to air. For this reason the usual method of making lime water in one container, then decanting or filtering off the supernatant liquid into a stock bottle from which it is dispensed, is not satisfactory. It begins to deteriorate from that moment and when the last is dispensed it is little else than plain water with possibly a little chalk suspended in it.

This apparatus is intended to do away with filtering or decanting the lime water into a second container, to protect it from the action of air, and insure a continuous and plentiful supply, which will always be a strictly U. S. P. product, with a minimum expenditure of labor or trouble. The apparatus consists of two bottles of suitable size connected by means of a "T" tube with a double syphon having one outlet. The bottles are stoppered to prevent entry of air except

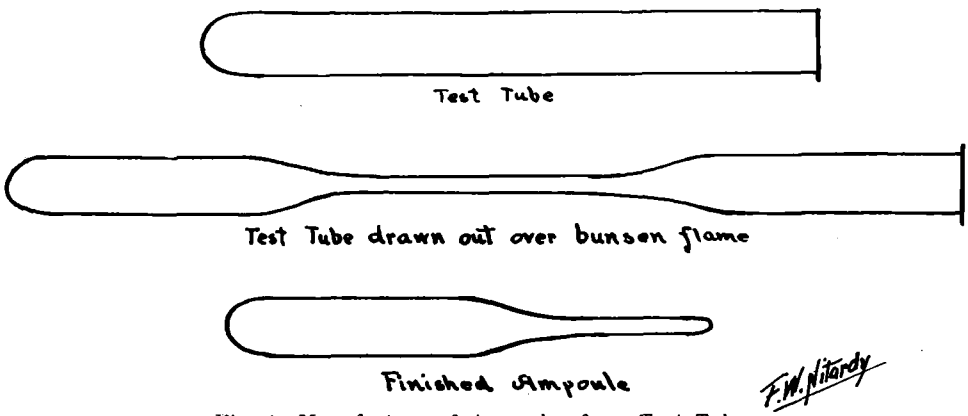

Fig. 4—Manufacture of Ampoules from Test Tubes.

through the inlet tubes bringing air from a third bottle, half filled with concentrated Potassium Hydroxide solution through which the air must bubble in entering this bottle, thereby removing the CO_2. The fourth bottle is an expansion bottle which prevents the spilling of the KOH solution in case of back pressure through change of temperature. Fig. 3.

To start the apparatus a quantity of the "Milk of Lime," hereafter described, is placed in each of the two syphon bottles. They are then filled with distilled water and allowed to settle till the supernatant liquid is clear. The syphon is then put in place, the air tubes connected, the syphon started and one of the syphon arms closed.

Lime water may now be withdrawn as needed from one bottle. When this gets nearly empty the other syphon arm is opened and the first closed, permitting the withdrawal of lime water from the second bottle, while the first is being refilled with distilled water, shaken, set back in place and allowed to settle, and so on alternately one and the other bottles are refilled without interruption of the syphon or ever being out of lime water.

The "Milk of Lime" referred to is a preparation consisting of lime slacked and washed by the U. S. P. process and bottled in semi-liquid form in well-sealed

bottles for future use. It is a great convenience and I should like to see such a product incorporated in either the U. S. P. or N. F. in the coming revision.

This display here consists of "home made" ampoules. In recent years, doctors are beginning to use sterile solutions for intravenous administrations, and the most satisfactory way of dispensing them is in a sealed glass vessel, commonly known as an ampoule. I suppose most druggists would consider it a little difficult to produce an ampoule extemporaneously, if they found they needed one, but it is quite easy. I make them out of test tubes. All you do is to clean a tube of suitable size and draw it out over a bunsen burner. After filling it is sealed and sterilized. The whole operation is quickly done and does not cost much. Fig. 4.

I also want to call your attention to a method of rapid filtration in use at our laboratory and originated by my assistant, Mr. Powers. Any liquid that will pass through paper rapidly will really filter quite slow because the paper lays close even to a ribbed funnel, not permitting the liquid to pass very rapidly. This is overcome by taking a large ribbed funnel and placing a small ribbed

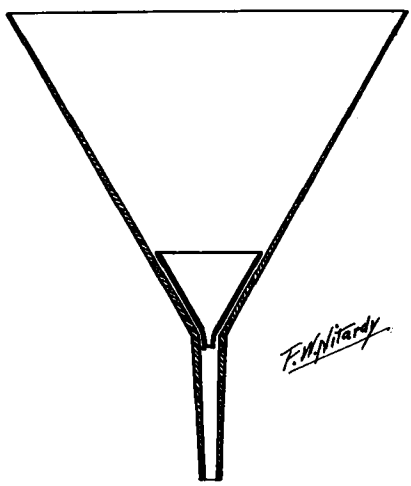

Fig. 5—Funnel for Rapid Filtration.

funnel, preferably one with the neck broken off, inside of it, thereby producing a space between the two funnels for the liquid to pass. By this method any liquid that does not clog the paper can be filtered in about one-fifth the usual time. Fig. 5.

Speaking of little tricks that save time and trouble, I want to mention our method of cleaning capsules that have been filled with a powder, such as aspirin, that has a tendency to adhere to the capsule. Shaking them in or rubbing them with a towel will not clean them. However, they are easily made bright and clean by placing them in a dish with a quantity of sodium bicarbonate, stirring and separating the sodium bicarbonate by means of a sieve, then finishing the capsules by shaking them in a towel.

One more suggestion and I shall close. Most of you have probably experienced some trouble with such preparations as Basham's Mixture, or Compound Syrup of Phosphates. I have a couple of samples of each here. This sample

of Basham's Mixture is about two months old and you notice it is in perfect condition. Here is another portion from the same batch. This is turbid, having precipitated a part of the ferric acetate in form of the insoluble basic acetate. The difference is due to the former having been kept in a refrigerator, while the latter has been kept at ordinary temperature, summer heat being sufficient to cause precipitation in this preparation.

In Comp. Syrup of Phosphates, N. F., a portion of the calcium salts will crystallize out unless kept in a cool place. Caramelization of the sugar also takes place gradually at ordinary temperature on account of the presence of considerable free acid, causing the beautiful red color to be displaced by a brownish color, which with the turbidity produced by the separation of calcium salts, makes the product very unsightly. Both can be prevented by keeping the preparation on ice. Here are two samples of this preparation from the same batch, one kept on ice and one at ordinary temperature. Note the difference! Not all druggists seem to realize the importance of keeping a preparation properly. Many a dollar, much annoyance and perchance your reputation as a pharmacist may be saved by properly protecting drugs and preparations from the influence of light, heat or air. No pharmacy should be without a refrigerator and other conveniences for proper storage of stock requiring such special care. For the proper preservation or storage of a preparation is every bit as important as its proper production in the first place.

DISCUSSION.

C. A. Mayo, of New York, led off in the discussion of Mr. Nitardy's paper, and said he had brought with him a few specimens of ampoules made from a new kind of glass. While one might be able to make them from test-tubes, it took some time to develop sufficient dexterity to do it advantageously, and ampoules could be bought quite cheaply. He had made some himself from test-tubes, and filled them with solutions of strychnine sulphate, but found there was a tendency to precipitate. This tendency was especially marked when solutions of alkaloidal salts were put up in ampoules made of very soft glass—as the ordinary lead glass. It had been found that ampoules of soft glass could not be used with any safety at all for alkaloidal solutions. There was some difficulty even with ampoules made from test tubes. But by using an especially hard glass, known as Jena No. 16, III. quite an advantage would be had. He had just received from a German manufacturer of ampoules on a large scale specimens made from a new glass which was even better and less subject to decomposition by alkaline solutions than the Jena glass, and he had brought them with him, thinking it might be interesting to the members to know that they could get these ampoules in a glass that was absolutely neutral.

He said that the Italians had probably done more with hypodermic medication than any other class of physicians. He thought the members would be surprised to find the variety of drugs the Italian physicians gave in ampoule form. Quinine, for instance; iron, quinine and strychnine—and particularly the iron salts were given hypodermically, and were dispensed in ampoules. In Greater New York there were 365 Italian pharmacists, and probably three times as many Italian physicians. Through them had been built up a large trade in ampoules, and an Italian there had gone into the manufacture and sale of ampoules, and had quite a large trade. Mr. Mayo said he had observed the method of a manufacturer in the East, who filled a good many ampoules with viscid liquors, and he said he had always found it necessary to fill them by means of a vacuum. He had been surprised to find that some of the French manufacturers used the rather tedious process of filling by means of a burette and hypodermic needle. By the vacuum method absolute sterility was

insured, whereas, if poured in through a funnel, it would be found that the capillary tube was so small that it would not run down. The way he himself accomplished it in that way was by alternately warming and cooling the ampoule.

Mr. Nitardy said that the doctor he had spoken of who ordered 500 ampoules at one time asked for a dry substance in them—sodium cacodylate. He simply poured the finely granular sodium cacodylate in the top of the test-tube, and a shake or two would bring it down into the bottom. In filling ampoules with liquid he used a piece of glass tubing that he had drawn out with a long point and graduated to the proper amount—a pipette. The long point was used to prevent the liquid from touching the sides of the neck of the ampoules. The reason the liquid should not touch the glass was that if it contained a substance which was destroyed by heat, it would char when the ampoule was sealed. His method of making ampoules was convenient for extemporaneous use when unexpected calls came, or the pharmacist was not prepared to fill such orders. If the doctor asked for a sterile solution in ampoule form, the druggist could make an ampoule on short notice, as it did not require great knack or experience. He had made the first one without any trouble. Mr. Nitardy said he knew that test-tube glass was not the best to use for a thing of that kind, and he did not mean to convey that idea, but simply to point out that it could be used in case of emergency.

Frederick T. Gordon, of Philadelphia, commenting on Mr. Mayo's remarks, suggested that, before filling the test tubes, it would be well to boil them in dilute hydrochloric acid and rinse them out with distilled water to remove the free alkali of the glass.

Mr. Mayo said he would not like this statement to go out without calling attention to the fact that European investigators had found that it was only a temporary advantage to clean them in this way, as precipitation would take place if allowed to stand long enough, as the alkali would find its way to the surface.

E. Fullerton Cook, of Philadelphia, said that Doctor Hutchins had recently suggested a device in connection with the sterilization of ampoules, the method being to sterilize the ampoule in water which was colored, and if any of the ampoules were not perfectly sealed the liquid would seep into the ampoule, and it was possible to detect that fact instantly upon taking them out of the liquid. He had also suggested the possibility of very efficient sterilization at comparatively low temperatures, because of the increased pressure brought about in the ampoule. This had not been absolutely demonstrated, but he had found that with comparatively low temperatures they were able to sterilize more successfully than would be expected at that temperature, and he accounted for it by the increased pressure in the ampoule when the liquid was heated.

Continuing, Mr. Cook said that one thing which had interested him greatly in the last few years, had been the subject of cost-accounting. Mr. Nitardy had mentioned this in connection with the prices he had given; for instance, he had taken the first cost of the material, and then the cost of labor and the loss in handling the preparation. Manufacturers who were carrying out cost-accounting and estimating the cost of material knew that there were a number of other items which must be considered. For instance, in order to put a preparation on the market, you must have a laboratory, and, unless you own the building, you must pay rent for it, as also insurance; and if salesmen were required to put the preparation on the market, that cost must go into the cost of the preparation. These "overhead" charges included every item of expense of the business, which must be considered as an item of cost of that particular preparation being priced. He agreed that the retail pharmacist could often manufacture an article more cheaply than the manufacturing houses, but nevertheless every item of cost should be considered. He had recently seen a pertinent statement bearing on this subject—an article intended to help the man who had to compete with the mail-order houses, and having nothing to do with the drug business. A man was represented as going into a hardware store and asking for a saw, and, being told that the price was seventy-five cents, produced his mail-order catalogue and said, "I can buy this for forty-five cents in Chicago." The merchant replied, "All right, I will sell it to you for forty-five cents." Then the prospective purchaser said, "Put it on my bill." But the merchant demurred to this, and said that it was only fair for him to pay cash for it, as he would have to do with the mail-order house. Then he should add to that twenty-five cents for express and

the two cents it would cost to order it. By this means, he demonstrated that the seventy-five-cent saw which the prospective buyer was going to get for fifty-five cents in Chicago would cost him in fact eighty-two cents cash instead. Not only so, but in this case the merchant claimed the right to keep the saw on his shelf for two days, as it would take the customer that long to get it from the mail-order house. Mr. Cook regarded this as a practical illustration of the working of the cost system.

Mr. Culley, speaking along the line of Mr. Cook's remarks, said he assumed that when Mr. Nitardy had named the sum of 50 cents an hour as the entire cost, that this was the price of his own salary, and did not include such overhead costs as the cost of containers, freight and delivery, and all items that went into the cost of the goods.

W. C. Anderson, of Brooklyn, said he did not think the comparison made here with reference to manufacturing houses and manufacturing retailers weakened the argument of Mr. Nitardy. The overhead expense that the manufacturer had for rent, insurance and the like was always paid by the retail druggist; he had to pay that whether he manufactured himself or bought from the large manufacturer. The time a clerk wastes in many stores could be used in manufacturing, and the 50 cents an hour added by Mr. Nitardy could, under these circumstances, be taken off the expense of these preparations. This saving would more than balance the cost of containers or anything of that kind.

Mr. Anderson, continuing, said he thought this address was a most interesting and instructive one. Time would not permit of going into the different items presented, such as lime-water and the keeping of the different preparations, but he felt that the Section was greatly indebted to the gentlemen who had presented this argument in favor of these little things that pharmacists so often forgot. Pharmacists often make a preparation properly, but never think of its keeping—never consider temperature, and other little matters that Mr. Nitardy had called attention to. The question was frequently asked why it was that the retail drug business did not pay better, and he thought it had been answered here today in a very clear and positive way. It was because the retail druggist was not saving money by manufacturing, instead of paying for the manufactured article. He not only lost in a commercial way —but he lost in experience. He also lost prestige, and lost his reputation to a great extent with the physicians. Mr. Anderson said he had nothing to say against the manufacturing houses, as they were doing a legitimate business; but the retail druggist himself was at fault in this matter, and he believed that every one of them should take to heart the facts and figures given here, because it was one of the things which would bring about the condition that all pharmacists were striving for, that of the true practice of pharmacy.

Cornelius Osseward, of Seattle, said it was refreshing to hear a paper of this kind. A few of those present might say that this would do well enough for a large store, but not for a small one; but he assured the members that it could be applied to the smallest pharmacy in the land. If, instead of standing over a show-case and reading a newspaper during business hours, the pharmacist would make his own preparations, he would find it a paying investment of time and effort. Personally, he did not think Mr. Nitardy should charge any time expense to these preparations, as it was wasted right along by the average pharmacist.

Mr. Nitardy, replying to the comments made upon his paper, said that Mr. Anderson and Mr. Osseward had already, in a way, answered the several questions asked, but he would like to state for information that the laboratory where he was engaged was run as part and parcel of the main store of the firm, and for that reason could not furnish good data as to the correct running expense, or "overhead" charge, as it was called. He paid no rent, taxes or insurance, as these went in with the expense of the main store, and he did not know what part to apportion to them. However, he had tried to allow for all of these in a way, though it was but a guess. He was satisfied that he had come very close to them, as he had watched the conditions closely. He thought the time he had allowed was liberal. The time necessary for cleaning of dishes and such things as that was also considered. They made some things in somewhat larger quantity than the ordinary store would make them, and in that way cut the cost down a little. But he was satisfied that the figures he had given would come very close to being the actual cost of production, everything considered, for the average druggist. If anything, it would fall below the figures quoted.

Mr. Cook, speaking again on this subject, said he had not intended to raise any question as to the value of the figures given, but simply wished to call the attention of the retail druggists to the fact that for absolute accuracy in cost of materials he must estimate the cost of items which were not spoken of here. Notwithstanding the fact that he would have his room anyhow, and would probably be hanging over the counter and reading the newspaper, if he was to get at the absolute cost of these things he must take into consideration the items which entered into that cost. In the case just cited, where the laboratory was part of the main store, and paid for out of the rent of the store, it was only proper that the laboratory should be divided off into square feet and pay its fair proportion of that charge. The same rule applied to labor and the like. It was at last only a matter of bookkeeping, to get accurate results. While the retail druggists of the country were not considering this question of actual cost, the large manufacturer was making it a big feature of his business, and had fixed his selling price on the actual cost of his products, and not the supposed cost.

Mr. Mayo, recurring to the subject of ampoules, said that the method of testing the sealing of ampoules by boiling in a colored solution did not originate with Doctor Hutchins. This method had been originated by von Boyesen, a German. Mr. Cook, he had supposed, had seen him use this method some three or four years ago at the Philadelphia College of Pharmacy. The method was described in the Proceedings of the American Pharmaceutical Association at the Los Angeles meeting.

THE ALCOHOL CONTENT OF THE BLOOD.

Schweisheimer carried out a series of experiments on total abstainers, moderate drinkers and drunkards. He found an extremely small percentage of alcohol in normal blood, .029 to .036 percent. Alcohol passes directly into the blood as such, and in the blood of a drunken man may reach as high as 2.26 percent. On taking a given amount, a higher percentage is found in the blood of a non-drinker than of a drinker. In the non-drinker the highest alcohol content is reached after one and a half to two hours; it remains at this level for a considerable time (five hours, as contrasted with two hours in drinkers) and falls slowly. In drinkers it rises and falls quickly, the entire time required for elimination being about half as long as in non-drinkers. The psychic signs of drunkenness run parallel with the concentration of the alcohol in the blood. The hypersensitiveness of epileptics to alcohol is probably due to the fact that they are unable to oxidize the alcohol and thus an abnormally high percentage of it passes into the blood. This determination of the alcohol content of the blood may be used clinically to differentiate between unconsciousness from alcohol and other causes, such as uremia, opium, trauma, etc. Tables and curves are given showing in detail the results of the experiments.—*Journ. A. M. A., Vol LX. p.* 704.