

ounces of metallic silver. This at current market prices was valued at \$852.13. Refining charges at ten per cent amounted to \$85.20. This left as revenue from the sale of the silver precipitate the sum of \$766.93. During the same period we used three hundred and fifty pounds of sulfurated potash. This at twenty-two cents per pound (in 100 lb. drums) cost \$77.00. As the amount of alkali needed was practically insignificant the latter figure represents the total cost of chemicals needed. Deducting this amount from the net amount of cash received, we had left \$689.93 as the return for our efforts. This amount we feel is decidedly worthwhile.

#### CONCLUSION.

The recovery of silver from exhausted fixing bath solutions by precipitation with sulfurated potash is a practical and profitable procedure, which any hospital pharmacist, who has even as little as five gallons of solution per week, to work with, should be interested in carrying out.

#### REFERENCES.

- (1) United States Pharmacopœia XI.
- (2) Treadwell & Hall, *Analytical Chemistry*, Vol. 1.
- (3) Crabtree & Ross, "The Recovery of Silver from Exhausted Fixing Baths," *American Annual of Photography*, 41, 159-178 (1926).

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### STOCK CONTROL IN THE HOSPITAL PHARMACY.\*

BY MARY E. BOWEN.<sup>1</sup>

One of the many problems with which hospital pharmacists have to deal is that of stock control. The number of items which must be available in the pharmacy at all times, though perhaps used only once in several months, runs into an amazingly large figure. The rise and fall in the demand for certain items which follows in the wake of the pharmaceutical detail men, makes this problem at times an exceedingly vexing one.

The general purchasing agent for an institution can tell from the records how many forceps, clips, yards of gauze and even how many bushels of potatoes will be needed for a given period of time and gauges his purchases accordingly. Our problem is not quite so simple.

However, the plan which we are now using aids a great deal in regulating purchases according to demand, and in keeping an adequate supply at all times to meet any ordinary circumstance. The two major points in this plan are a reserve or minimum stock, and a card file record of each purchase of each item stocked.

Each item when put in stock is given a minimum stock level which is noted on the container, or, in the case of individually packaged products such as biologicals, marked on the number of packages comprising this minimum. With most drugs and chemicals we use dispensing bottles for the routine work. These must be refilled when empty from the bulk containers and in this way the level of the bulk stock is watched more closely than it would be if each order was given out from this

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<sup>1</sup> Chief pharmacist, Hurley Hospital, Flint, Mich.

supply. In the instances where the total stock is too small to warrant a reserve supply, the minimum stock level is noted on the original container or on the shelf bottle to which the stock is transferred at the time of arrival. In all cases when the minimum level is reached, the card for that particular item is pulled from the active file and put into the section marked "Wants."

It is our custom to place orders with certain firms once a week. When the salesman comes it is only necessary to go through the cards in the want section of the file, pick out those for his company and place the complete order. Since the amounts previously ordered, together with the prices, are on the cards, the placing of the order becomes a simple matter. It also saves time, since it eliminates a hurried but often incomplete check of the stock with the salesman present. The odd items which are apt to make up single orders are cleared from the file by the end of each week and the orders placed with the proper firms.

Our card file system is made up of a three by five card for each item carried in stock. These cards, which are especially printed for this purpose, have eight columns with headings for the date, order number, firm, amount, unit of quantity, cost price, cost per Gm. or mil, and selling price (Fig. 1). The cards are titled with

H. T. CODEINE PHOSPHATE, 0.032 Gm.

Date.	Req.	Firm.	Quan.	Unit.	Cost.	U. G. M.	Sell.
6-1	12345	"A"	5	M	20.00	.02	

Fig. 1.—Stock purchase record.

the English official name of the drug whenever possible. All types of preparations such as ampules, capsules and so on are segregated, titled as such and filed accordingly.

The date, firm and amount ordered are entered on the card at the time the order is placed. The remaining information is filled in after the material has been received, checked and the invoice approved. After these final entries are made, the card is returned to the active file.

By means of this card system an instantly available record of all purchases of all items is always at one's fingertips. It is easy to think something has been ordered just recently, or that a larger unit quantity might be an economical buy, when actually neither of these conditions may be true. But, with a quick glance at the card all of this information is to be had. By noting the amounts ordered and the frequency with which they have been reordered, it is easy to ascertain whether a larger amount is advisable or whether it would be so slow in turn-over that the slight monetary advantage would be lost. The records of the prices as they vary from time to time serve as a check when prices are requested for future orders.

All of our standard drugs and chemicals are purchased on bid. The requests for prices go only to reputable firms, however, since it is penny-wise and pound-foolish to buy, just because the price is attractive, from someone in whose merchandise you have not the utmost confidence. The "price cutters" are generally those firms whose reputations for quality are none too good.

As a general rule new products are not stocked until the number of requests has shown that they will be used. Very often these new items are merely the same as

something already in stock under some other trade name. When this is the case, we notify the physician that we have A's product not B's in stock and secure his permission to use that. In this way we cut down the number of items carried and in so far as possible avoid duplications. We may, at a future date, change to B's product for our stock but we do not carry both at one time. Again the card is of assistance since it shows at a glance any differences in price, making it possible to buy to the greatest advantage.

The narcotic drugs form a separate and individual problem in that a perpetual inventory must be kept at all times.

A special loose leaf book with special forms is used to keep these narcotic records (Figs. 2 and 3). Each size of tablet, each kind of preparation has a section de-

H. T. CODEINE PHOSPHATE, 0.032 Gm.

Date.	To Whom Dispensed.	Amount.	Balance 1000.
6-15	4th floor	25	975

Fig. 2.—Daily record sheet.

H. T. CODEINE PHOSPHATE, 0.032 Gm.

Date.	Made Up.	Used.	Balance 000.
6-15	Received from "A"—Lot No. 23456		
	10 bottles, 500 each (5000)		5000
	Made up 40 bottles, 25's.	1000	4000

Fig. 3.—Narcotic stock record.

voted to its stock record. When a purchase is made, the amount purchased together with the manufacturer's name and the lot number is entered. If there has been a previous balance, the new amount is added to the old balance and the new balance posted. As each withdrawal is made, the date, amount used and the purpose for which it is used are all entered. The amount used is subtracted from the old balance and the new balance posted. Once a month the actual stock is checked to verify the book balance.

In the instances of the hypodermic tablets which are used on the floors, a slight variation of this system is used. When a purchase is made, the number of bottles, lot numbers, and so forth are recorded together with the new balance. Since our tablets are dispensed to the floors in bottles of twenty-five tablets, each time twenty or forty of these bottles are counted out this is noted as such and the total number subtracted from the old balance. At the same time this number is added to the previous balance on the daily record sheet. As these bottles are returned to the pharmacy empty, with a complete record of the disposition of the tablets on the floor, (Fig. 4) a new, full bottle is given to the floor and the number of tablets noted on the daily record sheet as having been dispensed to that floor and subtracted from the balance. The narcotic record sheets which are returned from the floors are then filed for inspection at any time by the Federal investigators. Dispensing the tablets in bottles of twenty-five does not mean that this is the total number of tablets

which can be had in stock on any one floor. In fact, most of the floors have at least two bottles of twenty-five tablets. This is better than giving them one bottle of fifty tablets since there is always a reserve supply; and the excuse that one floor had to borrow from another because they ran short of tablets no longer holds because at the first possible time after a bottle is emptied it is to be replaced with a full one. The total number of tablets in stock on the floors varies from time to

### HARRISON LAW DRUG SHEET

U. S. Reg. No. \_\_\_\_\_

NOTE: For every dose of Opium or Cocoa Leaves, in any form, Opium, Morphine, Codeine, Laudanum, Heroin, Cocaine, etc., a full line of this sheet must be filled out. Not at some future time, but immediately when the dose is given.

FAILURE TO DO IS PUNISHABLE UNDER THE LAW BY A FINE OR IMPRISONMENT OR BOTH.

H. T. CODEINE PHOSPHATE, 0.032 GM. (Gr.  $\frac{1}{2}$ ).

Date.		Name.	Location.	Doctor.	Drugs.	Amt.	Administered by.
Day.	Hour.						
6-15	1 P.M.	Smith, John	415-2	Jones	Codeine	Gr. $\frac{1}{2}$	Miss Brown

Total used 25; tablets received 25; signed nurse receiving; date 6-26-38.

Fig. 4.

time with the needs of any particular floor at any particular time. It may be that fifty tablets will hold the floor nicely over a twenty-four hour period, then emergencies may cause the need to rise to seventy-five tablets. These extra tablets to cover such an emergency need are simply given as temporary stock with the understanding that as soon as the immediate need for the increased number ceases the stock is to be reduced to the minimum. This is to avoid the piling up of stocks at any one time and keeps the number of narcotic tablets out at the minimum at all times.

If the number of tablets used by an institution is large enough to warrant having a private formula made up, the system in use by the University of Michigan Hospital in Ann Arbor is one which should be mentioned. In order to avoid all danger of mixing morphine, codeine and pantopon, which are the standard ones stocked on the floors, a system of colors is used. The labels on the bottles and the sheets on which the use of the tablets is recorded are printed in colors to correspond with the colors of the tablets. The codeine tablets are white, the sheets and labels white with blue lettering; the pantopon tablets are their natural grayish color, the sheets and labels being grayish blue to correspond; the morphine tablets are made up as a special formula colored a pale yet distinct yellow—again the sheets and labels are colored to match. With these three distinct colors, there is little if any chance that a morphine tablet may be mistakenly given for a codeine tablet, or that its use may be posted on the wrong sheet thereby upsetting the balance. This is a system which might well be used by any institution using enough of any one kind of tablet to have them made up in color. Drug manufacturers might make a note of this suggestion and offer one of their tablets in color for hospital use.

Both this system of narcotic records and of general stock control have been found to be most satisfactory and are sufficiently flexible to suit the situation in an institution of any size. In fact, neither of these systems was in use at Hurley Hospital two years ago. They were put into use as modifications of the systems in use by the University of Michigan Hospital, which is an institution having three times the number of beds as Hurley Hospital, and whose whole system of management is very different from that of Hurley Hospital. In the long run, the time it takes to keep these records is time saved, since it takes less time to check stock, write orders and see salesmen. It also means that many an embarrassing situation because of stock shortage is avoided.

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### ADVANCEMENT OF PHARMACEUTICAL EDUCATION.\*

BY FREDERICK J. WULLING.<sup>1</sup>

Through the many years I have devoted to the advancement of education I have learned that the source of the initiative of such activity is principally the educators themselves. They have had not only very little help from other sources, but were constantly confronted with opposition from many directions. Some of this opposition was formidable; some was deplorable, because it was based upon self-interest; and in still other cases it was to be considered, discussed, debated, and out of it often came helpful conviction and support. Every worthwhile forward step should be, and usually is, a collective one. The initiative usually comes from one or more individuals, who work upon the minds of many in executive and resourceful ways, and if they can convince the many, collective and binding action follows. The wisdom or the contrary, of the collective mind depends upon the preponderance or the lack of wisdom of the individual minds composing the composite mind. It is the well-rooted belief that a majority of individual minds, if they are agreed and unanimous upon the same subject matter, are wiser collectively than a minority and so the action of the majority prevails and becomes binding upon all. For an individual mind to sway or convince a majority is not, as a rule, an easy task, but that is the way nearly all forward steps are begun. To do this requires time, often very much time, even of many individual minds. It took about forty years to overcome the opposition to the Pure Food and Drug Law because of the self-interest of the minority. In education there is less self-interest than in the economic or industrial world and hence educational progress should be more rapid than it is. Why is that so? Because, it seems to me, not a sufficient number of educators put their minds upon the executive or administrative aspects of education. Every faculty member, not only the dean, should definitely train himself to become a very efficient administrator within the scope of his own work. Education, indeed every profession, needs a minimum of good business management in every division and as a whole. This minimum is constantly increasing; the alert and wide-awake are realizing this fact and are guided by it.

The pharmaceutical education of to-day is the product of the work of a comparatively few minds. The education of the future should be the result of the af-

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<sup>1</sup> Dean Emeritus, University of Minnesota.