

Substituting the values found in the laboratory experiment, in which five bags, each containing 400 cc. of milk of magnesia, were washed 12.5 hours:

$$\frac{191.4 \text{ sq. in.} \times 12.5 \text{ hours}}{0.529 \text{ gal.}} = 4522 \text{ sq. in.-hours per gal. of milk}$$

Applying this data to plant scale equipment, a series of five canvas bags three feet in diameter by four feet high, having a total capacity of 1060 gallons of milk and a total effective area of 32,290 square inches would require 148 hours for complete washing, thus delivering 172 gallons of finished milk per 24 hours. Six such operating units would deliver approximately 1000 gallons.

These calculations are of course correct only in proportion to the extent to which the fundamental factors can be maintained unchanged in passing from a small laboratory scale to the plant scale. That this cannot be done is best illustrated by the fact that in the system we have visualized for plant practice, each outer vessel must contain 1590 gallons of wash water. Therefore it must be eight feet in diameter, if the bottom of the bag is to be one foot from the bottom of this kettle. Since the cloth bag containing the milk of magnesia is only three feet in diameter the annular space between the containers will be two and one-half feet. This is hardly comparable to the one-inch annular space in the laboratory equipment. The abandonment of agitation in the external wash water in the laboratory experiment was based on the rapid diffusion of the sodium sulphate and the small annular space, *viz.*, one inch, so that the concentration gradient could still be considered negligible. This would hardly hold good in the plant-size equipment now visualized and therefore one would need to assume agitation on both sides of the canvas once more in order to use these calculated dimensions.

SUMMARY.

A mathematical analysis has been presented for the case of washing a material in suspension by means of water separated from it by a permeable membrane. The effect of adsorption as well as simple diffusion has been considered, and an equation derived from Fick's Diffusion Law and Freundlich's adsorption isotherm.

A practical evaluation of this method of washing as applied to milk of magnesia has been carried out.

PHYSICIAN AND PHARMACIST.*

BY RALPH W. CLARK.¹

The past quarter of a century has witnessed rapid changes in the character of the retail drug business. However, the drug store is and always has been an essential and responsible factor in caring for public health. To what extent this position will be preserved depends, I believe, somewhat upon what we as pharmacists do in our position in a triangle involving physician—yes, dentist and nurse, and pharmacist and the public.

* Section on Practical Pharmacy and Dispensing, A. P. H. A., Portland meeting, 1935.

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Medicine and pharmacy are sister sciences which have traveled hand in hand down the centuries from early times, since self-preservation has been instinctive in the human race. Dentistry and nursing are newer members of the public health professions but they occupy important positions.

The modern drug store is an institution containing a conglomerate assortment of merchandise. The proprietors of these stores vary in type as much as the stores they operate. It appears, then, that the approach to the physician, dentist and nurse is an individual problem. Much has been written about the subject assigned to me, but most of it is not of the kind which discusses the pharmacist himself. The problem, as I see it, is to convert more and more pharmacists to high professional standards which will naturally lead to better inter-professional relationship.

A pharmacist is influenced by several things: namely, college training, the literature he reads and the pharmaceutical associations to which he belongs, as well as the environment in which he works. The first three will be discussed briefly before anything is said about the individual responsibility of the pharmacist.

The present educational requirements make it necessary for the young pharmacist to have a college education before he may be licensed to practice pharmacy. It is desirable for each college of pharmacy to have as a member of its faculty at least one man who is particularly interested in inter-professional relationship, as students need information in this field which also furnishes a good point of contact between the college and those engaged in the practice of pharmacy.

The next generation of pharmacists will be of higher professional standing because of the advance in educational requirements. These men should be taught methods of contact with members of the related health professions as well as a profound interest in public health. They should above all things be imbued with a higher sense of their own professionalism. With a background of the usual things taught in the pharmacy school, they should be better able to carry on the type of contact which pharmaceutical manufacturers have found very valuable.

Many pharmacists do very little reading in either trade or professional magazines. These publications carry much useful information and pharmacists should be more familiar with them. Perhaps more emphasis on contemporary literature in colleges of pharmacy would get our future pharmacists into better reading habits. The pharmaceutical press has been and should continue to be of value in educational programs. From time to time campaigns have been inaugurated against irregular prescription pricing and other practices involved in inter-professional relationship.

National pharmaceutical associations are helpful in keeping a unity of purpose throughout the states and in supplying valuable material for use in this work. State pharmaceutical associations play an important part in the progress which may be made. In Wisconsin much more interest is being shown in inter-professional relationship meetings throughout the State during the year and in conventions of the Wisconsin Pharmaceutical Association, the report of the chairman of the committee on inter-professional relationship and the talk in a similar vein by O. U. Sisson stimulated more discussion than usual, in fact, more than most other parts of the program, showing that pharmacists are becoming conscious of the value of this work. Here the state association is doing its part by holding the

meetings referred to and by continual publicity in the *Wisconsin Druggist*, official publication of the Association. This practice is more or less common to other states.

The unfortunate thing about inter-professional relationship activities in a state association is that the officers will spend about ten cents per store in the state on a project like this and feel that they have done well by it while they will spend many times this amount on other activities. On the other hand, every man showing an interest in this field of endeavor is of great value to his association and it is encouraging to note that the number is gradually increasing.

The public and the members of the public health professions will not believe that "the druggist is more than a merchant," nor that he is a professional man if certain individual pharmacists do not uphold the standards involved. People are generalizers. If a pharmacist is careless in compounding one prescription, they are inclined to say that all pharmacists are careless in compounding all prescriptions. What we need is less unfavorable publicity showing a lack of interest in public health; less development of the liquor and restaurant portions of drug stores and more cleaning up and merchandising of the prescription department. Pharmacists who have not neglected this part of their stores have been and will continue to be better off than those who run a business too much like a department store.

Pharmacists must watch out for the public's interests and the interests of the members of the public health professions, as well as their own. They may call upon a physician or dentist to ask what service they may be to him. By keeping up-to-date on new remedies, and, unless I am mistaken, in many cases, getting better acquainted with the current revision of the U. S. P. and N. F. as well as other books and magazines, the pharmacist calls on a physician or dentist well-prepared to carry on a friendly, intelligent conversation, and inspire in him an interest which may be of mutual benefit. The physician may be surprised to know how misleading some of his orders are and that he should not price them to the patient as he knows little about the cost, overhead and turnover in the prescription department. He may be made to see that a trial balance drawn between counter-prescribing on the one hand and office-dispensing on the other would show no advantage to either profession, not to mention the effect upon the patient whom both professions should serve to the best of their ability.

The physician may be willing to prescribe more U. S. P. and N. F. preparations when he is told what they contain and the reduced cost of the medicine to his patient. He will be surprised to learn that certain proprietary products, especially those with short, easily remembered names, widely prescribed by physicians a few years ago are now advertised directly to the public. He may be made to understand that real compounding is an art and that pharmacists are better qualified than he to do this work. He may be shown that individual prescriptions are often better than bottle to bottle proprietary preparations which may be used by every physician in town. He may become a good friend, a better physician and a better prescriber.

Coöperation with dentists, a new field, should be undertaken with caution. There are several drugs of proven usefulness in the U. S. P. and N. F. as well as many other items with which the pharmacist should acquaint the dentist. Den-

tists will welcome such efforts if the pharmacist uses intelligent reasons, drawn from the ideals of both professions, to recommend his services and they may become prescribers instead of dispensers.

It is necessary for pharmacists to show an interest in public health; to favor public health legislation; to be interested in civic affairs. In this way favorable publicity may be had which will help in the contact with the public and the public health professions. It is necessary for pharmacists to emphasize service and quality, not price, in their contact with the public health professions. Substitution should, by all means, be avoided but the pharmacist should make use of his skill and training in promoting U. S. P. and N. F. products. He should be sure to point out that more than materials go into a prescription and the cost to the patient will, therefore, not be in direct ratio to the cost of the ingredients. Pharmacists should make more use of their professional training and should consider their skill, accuracy, responsibility, time and overhead in the selling price of a prescription. The public and the public health professions can be made to understand these things only if the pharmacist is professional and acts as a professional man should.

If every pharmacist were an asset to his profession the accumulation of favorable publicity would be far-reaching. If professionalism were stressed somewhat more, the public would be willing to pay for more than the materials which go into a prescription and to accept the pharmacist as more than a merchant. If more pharmacists were willing to put their own houses in order first, then good inter-professional relationship would fast become a fact instead of an ambition stimulated by the decrease in the number of prescriptions being filled. Such individual activity would help inter-professional relationship and raise public opinion of pharmacists. It would be far better than sitting back as a witness to the modern spectacle of having a supposedly intelligent American audience receive its instruction in medication over the radio, the dispensing done by highly trained script readers or black-faced comedians, or rocked into a false sense of healthful security by sweet music advertising nostrums "for sale in every drug store."

HONORING AGE AND SERVICE.*

BY JOHN E. KRAMER.¹

A custom established in 1928, a mere seven years ago, would not seem to have gained very great historical importance in such a short space of time. But when the inauguration of the custom entailed an event that had happened fifty years before—history was definitely involved.

In the early Spring of 1928 the officers in charge of the pending Alumni Reunion of the Philadelphia College of Pharmacy and Science endeavored to induce as many graduates as they could to return to the College for the annual meeting of the Alumni Association and the various class reunions. Special stress was placed on the members of those classes who had graduated five, ten, fifteen and other intervals of five years before.

* Section on Historical Pharmacy, A. Ph. A., Portland meeting, 1935.

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