

Section on Practical Pharmacy and Dispensing

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THE MOST DIFFICULT THINGS TO LEARN IN DISPENSING.

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The acts, the manipulations and the solving of the dispensing problems to which I refer, may be considered difficult to learn, because, comparatively, few learn to do them easily and well, and because actual experience in teaching, plainly and forcefully impresses the fact upon every careful observer. It must not be understood that I have in mind complex problems in higher physics, complicated chemical combinations, the differentiation of allied botanical species or the identification of peculiar plant cells. No, none of these are near so difficult to become familiar with and master as are the every day doings of the modern drug store; such things as the ultra scientific look upon as far beneath their notice.

It may be questioned whether or not all these very ordinary things are difficult to learn or are difficult to teach and there may be other questionings regarding them, for instance, whether their accomplishment is dependent upon natural fitness, adaptability or application; certain it is, that, no matter how secured, one must possess, at least, a moderate amount of *ability to justly estimate the relative value of pharmaceutical doings* before he can learn to meet the requirements just now under consideration; this is intended to mean that unless he regards these common place acts as essential to true success, he will not acquire sufficient knowledge regarding them to meet the actual demands of his vocation.

Touching the subject of special talents or particular fitness, much of interest may be gained from the experiences of teachers of pharmacy. From my own very limited opportunities, I unhesitatingly conclude that so called special talents or natural inclinations are no more or less than results of accidental environment and accidental training. Sensitiveness or, perhaps, vanity has lead me to closely observe students in this regard, and it is a most peculiar fact or, better, a most gratifying fact, that it is invariably the case that students do work in dispensing that is exactly consistent with the work they do in other laboratories and, further, their examinations in the theories of dispensing are almost without exception of the same value as their examinations in the theories of other branches of pharmacy. This is very interestingly shown, in that class of students with which every teacher is familiar: those who impress their instructors favorably and as making excellent progress, but who painfully disappoint when put to a real test. It is believed that these positive observations should finally become helpful, when we decide that a more intelligent segregation of students of all kinds will be the real beginning of better educational methods.

I admit that it may be well to let this discussion pass, for it matters not to us or to many more whether these dispensing accomplishments are difficult to learn or difficult to teach, the fact remains that many of them must be acquired without teaching; also, that few there are in pharmacy today, who have acquired that dexterity and facility in manipulation that to some of us seems an actual essential to worthy success.

It may also be wondered or questioned whether the want or appreciation of the difference, the very great difference between the doing and the *well* doing of things is an infirmity or something that follows a lack of standards. This applies more particularly and with remarkable directness to nearly all very common-place doings; for instance, to walking and talking. Why do so many of us talk badly or, why do we not walk better? These surely are usual and very generally performed acts. Probably, some of us have forgotten, because much of it happened very early in our lives, what great difficulty we experienced and how much pain we suffered in learning to balance ourselves that we might stand upright and move about. Word sounding and word arrangement was not easily acquired and has not yet been fully accomplished. Some of us have never stopped, probably, to ascertain whether our manner of speech is creditable, or not, and there are others who suppose that, to "get along," is all that is required of the walker. Undoubtedly, it is *very, very* difficult either to walk or talk and that is why so comparatively few are highly accomplished in these most becoming essentials. It is quite likely, however, that many are unfortunately unattractive walkers and talkers because there are no sufficiently well-fixed and generally published standards for walking and talking. There are, though, examples of excellence in these with which we may compare our own similar actions and there may be found examples worthy of close study and possible imitation. It is of the "walking" and "talking" in dispensing that I am writing; therefore, all this applies with direct and particular force, to the subject under consideration.

All the difficulties to which I have referred and shall refer, may be easily divided into two classes: those which require mental effort alone, and those which require carefully controlled physical force of greater or less amount, but always properly directed by a mind which has been trained to direct it.

I am uncertain as to the proper sequence of my classes of difficulties. If I knew which was first created, my mind or my body I could better arrange them; after all, these troubles of the dispenser are a confusion of mind and matter and the supremacy is yet, I believe, undetermined. In 1907, I must have thought the body "had the call" for I then presented a paper, at the New York meeting, under the caption, "The Hands and Eyes in Dispensing," (Proceedings, Volume 55, page 124), which is closely related to this discussion and I will be happy if any of my hearers or readers are sufficiently interested to read or re-read that effort, in connection with this later one.

It is decidedly "bromidic" as society folk say, to refer to the general difficulty of applying knowledge, but no matter how common-place this difficulty, it pertains, especially to dispensers, it is fundamental and remarkably prevalent. May not the teachers of the abstract sciences, attached to pharmacy, or the text books be somewhat to blame. The difficulty is not so great in connection with very special subjects, but it is pronounced when general or fundamental teachings are

involved. It may be that we give our dispensing students too much education and not enough training; actual dispensing exercises.

To apply and helpfully use knowledge, then, is difficult to learn. One may have run through the reaction of iron, repeatedly; may have made the solution of its chloride from the metal, oxidized it, diluted the solution with alcohol to make the tincture and then forget that it contains iron, that the iron is in the ferric state, that a chloride is present, that it is strongly alcoholic and decidedly acid. This is not the case with students, only, nor with the graduates of a particular school. Neither does it apply to any one or another class of knowledge, chemistry, physics, drug history, galenic pharmacy, all are very nearly alike in the neglect they suffer. There is a difference, however, in favor of physics and physical characteristics—the more commonplace are, oddly enough, most frequently overlooked. It is very hard for the average dispenser to learn to take advantage of the peculiar physical characteristics of medicinal substances. Many can glibly recite these characteristics, but few can evaluate their helpfulness, or the contrary. Often it is the very slight difference that must be remembered and utilized. The *physical* difference, for instance, between an alkaloid and the salt of an alkaloid; chemical differences, are, always, much more apparent. The physical differences of the three great classes of oils,—formidable stumbling block to the thoughtless, but a world of helpfulness to the thinker.

But these more subtle physical differences are not the only ones that are undervalued; the difference in dispensing between a lighter or a heavier substance, between a gummy and a friable drug, between a smooth, caking powder and one that rapidly separates into individual particles, between hard-grinding chemicals and those that are slippery and soft. So many, young and old, with whom I come in contact, still strive and struggle, yet fail to learn, when to properly use light magnesium oxide and when the heavy. Others will never really learn to know why milk sugar is better than powdered talcum for making a dilution of an active alkaloid, or why licorice root is a better absorbent than starch.

You and I may know the solubilities of many drugs, their specific gravity and their volatile or non-volatile tendencies, but how many of us have learned and know the *mechanical* possibilities of different drugs. I would be surprised if some are not quietly asking, "What does he mean by mechanical possibilities, in this connection?" I can assure you if the meaning is not quite clear, then you have not yet learned to advantageously use those possibilities. The dispenser must learn to use medicinal substances, some of them, as veritable tools, with which to do things, with other substances; they are just as much tools as are mill stones, files, planes and scissors; some of them are used for precisely the same purposes, in principle. A fair appreciation of the mechanical abilities of drugs, together with experience, good judgment, and even, a moderate sense of proportion and its value make almost the "IT" of dispensing.

Proportion in dispensing, I fear, is a term almost as new as "mechanical possibilities." It is, of course, a very general term, but want of consideration for it, is the cause of many, very many dispensing shortcomings. Nothing in dispensing technique seems more difficult to acquire than a sense of proportion. To so many, a particular manipulation is always the same, both in extent and force; it is made to fit all quantities and all characters of substances; it is subject to no

modification. Proportion applies to the quantities or to the measurements of things as they exist or as they may be made to exist. Whether a plan, a process, a force or a substance is used, in proper proportion or not, in dispensing, makes a world of difference. It is a law that controls many important dispensing manipulations and should be carefully studied, however much time it may require to master; it is knowledge that is not acquired so well by practice as by sound reasoning. Sense of proportion is entirely wanting when a dispenser throws a grain of strychnine sulphate in a mortar already containing a dram of quinine sulphate and proceeds to mix them. It is also lacking when he proceeds to make an ordinary solution of potassium bromide in the same manner he would make the usual solution of potassium chlorate. No matter what the relative bulk of the several ingredients may be, if they weigh the same, they are "coons" and all look alike to him. The preparation of an ounce of ointment to contain two percent of yellow mercuric oxide, would be prepared with the same regard for proportion, that he would prepare an equal quantity of an ointment to contain twenty percent of zinc oxide; morphine sulphate is dissolved in much the same manner as Epsom salt.

This law of proportion applies with particular force to the size and uniformity, essential and attractive uniformity, of pills, lozenges, tablets, suppositories and so forth; to the size of powder papers and their relation to powder boxes, and especially to containers. Oh! what dispensing sins are committed by using containers out of proportion to their specific purposes. In labelling, proportion must be very difficult to follow because it is so seldom shown; in the one item of spacing the writing on labels, its absence is more pronounced than any where else. I would feel that I had, by no means, lived in vain, if I could be assured that I had communicated to coming generations of pharmacists, to even a small degree, a better and more helpful appreciation of proportion in its relations to containers, labels and label writing. I am confident I would have added years to my life and much to my fortune, could I have always secured regard for proportion, in my employes.

True esthetics in pharmacy is a thing I have been harping upon for many years, not from a sentimental standpoint, but because I early learned that pharmacy and pharmacists were very "short" on the esthetic and because I had observed that those in other vocations who were "long" on it, were almost invariably successful and, if a personal reference can be excused, I will most positively affirm, with more than forty years of business life behind me, that this fortunate early realization has been my most profitable asset. But it is very difficult to acquire these true esthetic abilities and quite as difficult to apply them to all phases of dispensing. I confess to have made small progress, but the few forward steps I have taken have brought me to interest, to comfort, and I believe and hope, to the holding of much of the public's respect. This is written as the shadows lengthen and not with the slightest tincture of vanity, but simply as encouragement to those who may follow. Others may enjoy a contemplation of the truly beautiful much more intensely than do I, and I am heartily glad if they do, for I am sure they possess a thrilling pleasure that is beyond expression.

The *cause and effect* in dispensing is very difficult to learn. This will bring a smile, I am confident, to the lips of many very learned, so called pharmacists, who are not dispensers and who have had no actual experience with dispensers in

business. It is a person who has seen would-be dispensers, time after time and generation after generation, miscut pills, who realizes that the irregularity follows a want of appreciation of so general a principle as cause and effect. There are thousands and thousands of pharmacists today, with a normal temperature of 98.2° F., who cannot make a presentable cacao-butter suppository by hand, and there are just as many other pharmacists who are living with their blood at exactly the same temperature, who can and do make such suppositories very quickly and successfully. One class cannot be made to understand that the effect of holding the solidified fat between their fingers is to fuse it. Has any one, here, ever closely watched thirty-five or forty different persons fill gelatin capsules with sodium salicylate; the capsules out of the one original container, with identically the same salt, at the same time, in the same atmosphere, at an equal temperature, and notice the results? These results are always exactly consistent with the operator's appreciation of cause and effect.

A dispenser will scarcely presume to call himself accomplished who cannot fold any number of powders of exactly the same size and of a size that will properly fit a box with no other appliance than a spatula and without the aid of the box. Did you ever notice how many give their powders a "twist"; that is fold the ends on different planes? You may tell such dispensers over and over again how this effect is produced, but they will never correct the defect, until they learn themselves to connect the cause with the effect.

This more fundamental consideration of the difficulties of dispensing is nowhere so fruitful in results as in the generally thought, very simple matter of wrapping packages. The bad effects here, from certain very definite causes, are most pronounced. If there is one thing in the art of dispensing that can be reduced to an exact science, it is the wrapping of packages, with results that are not only esthetic, but such as make the very best advertisement. The proof that package wrapping is difficult to learn is strongly presented in the packages that go out of our stores. The cause of bad wrapping is generally too much paper and the absence of a few essential movements of the fingers; the effect is a waste of material and an unattractive, confidence-destroying package.

I trust this broader treatment of the subject, broader than I first intended, has added interest to quite prosaic matters. If to any one, it is not yet quite apparent, what, in my opinion, are some of the most difficult things to learn in dispensing, then to them, I would say: to make "round" pills round and "white" pills white, and the pills of the same lot of exactly equal size; to wrap powders tight, uniform and alike, to mold suppositories easily, without the possibility of mishap or to form them quickly by hand in cold weather or hot; to fill capsules *full*, dry or mass, with the medicament on the inside, only, and the outside clean and bright; to select appropriate containers and label them sensibly, fulfilling the real object of labeling, yet, withal, attractively and finally, to send out packages that look like they came from the hands of a pharmacist, who had been properly trained and not from a hardware store or grocery.

After all, I suppose, the most difficult thing to learn in dispensing is to learn, to really learn, how to dispense.