

considerable expensive and complicated apparatus and experimental animals, that they could not conceivably be adequately presented as part of a regular course; the subject would, in fact, constitute a very respectable course in itself and, if presented at all, were better done by a medical school. This practice is followed at present in some universities which have colleges both of medicine and pharmacy.

In the foregoing no mention has been made of the number of exercises that should be assigned a class. Suffice it to emphasize again the value of repeated practice of laboratory manipulations. This end can only be attained by assigning a considerable number of exercises. An excellent incidental feature of such a procedure is the opportunity which it presents to teach the art of laboratory management, a valuable attribute infrequently possessed by students.

In conclusion, it is not desired to leave the impression that the theoretical aspect of the work should be slighted; on the contrary, the student should be encouraged in every way to resort to the standard textbooks and journals. It is desired, however, to emphasize that a course of drug assaying should be primarily an intensive laboratory application of fundamental principles acquired during prerequisite courses and that such a course should be designed to provide a maximum of actual laboratory practice in the time available.

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HOW TO OVERCOME INDIFFERENCE CONCERNING STERILIZATION IN DISPENSING.*

BY A. W. LINTON.

It may seem like carrying coals to Newcastle to offer a paper dealing with sterilization in dispensing to the American Pharmaceutical Association. We may safely assume that the members of this body are well informed on the subject. With them it requires no argument to prove that all solutions intended for hypodermic and intravenous injection, solutions for application to the eyes and to inflamed and irritated membranes, as well as many dusting powders and ointments, should be dispensed in a sterile condition.

That the importance of sterilization in pharmacy has been well understood for years is evidenced by the splendid discussion of that subject in the fourth edition of the National Formulary, as well as by the briefer treatment in the Ninth Revision of the Pharmacopoeia. Recent editions of many textbooks on pharmacy and dispensing include chapters on sterilization as applied to pharmacy. During recent years numerous valuable articles on sterilization have appeared in the journals. There have appeared texts on bacteriology intended especially for the use of the pharmacy student, and these give excellent treatment of sterilization. It must be agreed then, that ample opportunity has been offered to those who would inform themselves as to the best methods to be followed in sterilizing medicinal preparations. It is true that even after a careful study of the authori-

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ties has been made, cases arise which are puzzling; as for example, which method is to be recommended when the solution to be sterilized contains an alkaloid easily decomposed by heat. Even in such cases, however, valuable assistance is obtainable if one only looks for it.

However, of what value is all of this available material on a vitally important subject if the pharmacist remains indifferent to the whole matter? It may be that the writer is taking too pessimistic an attitude, but he is much inclined to believe that in a majority of the stores in which prescriptions are compounded there is absolutely no provision made in the way of equipment for sterilization and little or no thought is ever given to the subject. At least this is true on the Pacific Coast. It is to be hoped that in this respect conditions are much better in the East.

How many pharmacists, east or west, are giving as much thought to the matter of dispensing in sterile condition those preparations which should be so dispensed as they are to the sanitary condition of their fountains? Heaven forbid that we should oppose the most careful attention to sanitation in the soda department, but in the name of Pasteur and Lister why not give some thought and study to proper methods of dispensing? Is it only in the far Northwest that many pharmacists are ignorant of or indifferent to the pharmacopoeial standards for sterile distilled water and physiological salt solution? Are there not many druggists, even near the educational centers of the East, who if they undertake to dispense a sterile solution are content to use distilled water purchased weeks or months before and stored with no special precautions. Is it possible that we may even be able to find a druggist who when asked whether he ever uses distilled water in dispensing, points with pride to a pint bottle containing what purports to be distilled water, but which contains a sediment calculated to arouse suspicion; said pint bottle and contents, if the truth were but known, having been included in the invoice taken when the store changed hands some years before?

These horrible examples are not greatly overdrawn. A pharmacist who enjoys considerable repute as a prescriptionist, in speaking to a new clerk in regard to dispensing a certain solution, referred to the distilled water in the stock bottle as "sterile water." The clerk asked: "That *is* sterile water, is it?" The reply was: "Well, I don't know, but I suppose it is. I bought it for distilled water." The water in question had been on hand for some time and the cork had been removed from the bottle many times. A pharmacist who makes on the manufacturing scale a solution to be used as a gonorrhoea injection, was much puzzled because in some lots an unsightly sediment appeared in the bottles. On examination, this sediment, which he called a precipitate, showed every appearance of a fine crop of molds. Inquiry developed that although the solution was non-alcoholic and contained practically nothing which might be supposed to serve the purpose of a preservative, no thought had been given to sterilization of bottles, corks or solution. And yet this pharmacist considered himself quite competent to recommend a remedy for a germ disease! A physician who specializes in the treatment of eye, ear, nose and throat, told the writer that an ointment which he prescribed for application to the conjunctiva of a patient, very soon after the first application caused an inflammation ten times more severe than the one which existed before the ointment was used.

To the writer it would seem that no pharmacist is a safe prescriptionist who is giving no thought to the subject of sterilization. He believes that a pharmacist, even though he has the certificate issued to him by a state board hanging in his store, has no moral right to hang out a sign reading, "Prescriptions Carefully Compounded," as long as he is wholly indifferent to sterilization. We will gladly allow for differences of opinion in regard to cases in which sterilization is necessary, and as to best methods to be employed, among those who have studied the subject, but cannot trust the man who is too ignorant, too careless or too lazy to give some thought to sterilization. If a surgeon, through carelessness in technique, allows his patient's wound to become infected, he is not a safe operator, no matter what degrees he may have or what skill he may possess. What shall be said in defense of the pharmacist who ignores those teachings of bacteriology which apply to his own calling?

We may divide into three classes those pharmacists who are negligent of sterilization. We mention first the old-time druggist, who took up his lifework many years ago when colleges of pharmacy were not so numerous as now, and when micro-organisms did not cause the human race as much concern as they do at present. Something might be said in excuse of this man's scanty knowledge of the need of sterilization, and yet would you condone the elderly physician who failed to sterilize his hypodermic needle? The old doctor did not learn the need of this in school, but he has not failed to keep pace in some measure with the advance of science. The pharmacist who registered back in 1881, or when his state first passed a pharmacy law, if he had read the journals would not have remained uninformed. And to the credit of these older men be it said that many among them have not failed to measure up to the demands made upon them by the advance of a third of a century.

We have also the men of a somewhat younger generation who did attend college, but before courses in bacteriology were commonly included in the pharmacy curriculum. Too many of these considered that when the pharmacy diploma and the state board certificate were framed and hanging over the prescription case, their education was a finished thing. Some of these, although during the last fifteen years they have learned much about how to collect bad accounts and how to train clerks to be good salesmen, have learned little or nothing which makes them better dispensers.

Saddest of all to consider, however, is the case of the recent graduate of a good college who has received adequate instruction in bacteriology and in the methods of sterilization, but who utterly fails to apply what he learned at college. Six months after graduation he is saying: "Old Pillroller has three good stores and fills lots of prescriptions, and never yet spent a dollar for sterilizing equipment. What old Prof. Dryasdust gave us about sterilization must have been hot air. What is good enough for Pillroller is good enough for me." Well, perhaps, old Dryasdust is, in part, to blame. The writer would be glad to think that he could instill into his students some of the fighting spirit manifested by a young lady who graduated a year ago from dental college. She was taken into the office of her father, a prominent dentist with a very large practice. The young lady soon found that in her father's office the matter of sterilization of instruments and solutions was not receiving proper attention. She was told by

her father and his assistants that their methods had proved to be all right and that she must forget a lot of the fool notions that no one thought of but college professors. But the young lady refused to be silenced by ridicule, and stirred up such a commotion that just to keep peace in the office her father allowed her to have a free hand in everything pertaining to sterilization.

What agencies may be employed to arouse the careless and indifferent ones to the importance of sterilization? We mention first the colleges. Most colleges of pharmacy now include a course in bacteriology in their curricula. This is exceedingly important, and such courses should be made as thorough as possible. Without at least an elementary knowledge of bacteriology the student cannot have an adequate conception of the reasons for sterilization and for the precautions observed in carrying it out. Without the knowledge of technique gained in the bacteriological laboratory he is likely in sterilizing a solution to be exceedingly careful about certain details and neglectful of the most essential. But the instruction received under the professor of bacteriology is not sufficient. In many schools the teacher of this subject, while eminent in his own science, does not have pharmacy training, and consequently does not make the application of sterilization and other phases of his subject that would be most useful to the pharmacy student. In the prescription courses the student should find the application of many things that he has learned in bacteriology to his chosen field of work. He should be given practice in sterilizing solutions and other classes of extemporaneous preparations by all available methods. In the lecture room and quiz class there should be ample discussion of the methods employed and the relative merits of the same. In the time usually allowed for prescription work in the two year course it is difficult to give adequate attention to the subject of sterilization. When the minimum length of a course in pharmacy has been extended to three years we may expect to see this condition corrected.

Almost as important as the work of the colleges must be that of the journals. They must be depended upon to educate those whose college days are past. Many articles on sterilization have been published, but the good work must continue. Very helpful would be articles illustrated by cuts of apparatus, especially if this be home built and not too complicated in construction. The editorial columns can be used to good advantage to remind the unprogressive pharmacist that the world is not standing still.

State associations can also play an important part in the campaign of education for more attention to sterilization. Officers of these associations and chairmen of committees on papers can endeavor to secure contributions dealing with the subject. These will be more interesting and will make a more lasting impression if they are accompanied by exhibitions of apparatus and demonstrations of methods.

While the colleges, the journals, and the associations, are endeavoring to educate the pharmacist to the importance of sterilization, the state boards should make it their business to test the knowledge of the applicant for registration on this subject. Surely it is not too early to require that the candidate for the privilege of conducting an establishment where medicines are dispensed shall be quite well informed in regard to the need for sterilization, and be prepared to carry out the various methods. Some state boards of pharmacy already examine candi-

dates on bacteriology. It may be questioned whether such an examination serves a useful purpose as long as the questions asked are such as can be answered by the study of a quiz manual. A candidate may be able to define bacteria and to classify them into groups, and still have no knowledge of bacteriology which will make him a more intelligent dispenser. Would it be unreasonable to ask the applicant for registration to actually perform in the laboratory the operations incident to dispensing a two percent solution of cocaine hydrochloride in sterile condition, or a solution of camphor in fixed oil suitable for hypodermic use?

Some may think that the writer is exaggerating the importance of this campaign for educating pharmacists in regard to sterilization. To such he would say that pharmacists as a class cannot hope to be generally recognized as professional men by other professions and by the public until they are willing to inform themselves upon, and to apply in their every day work, those sciences which have a direct bearing upon dispensing pharmacy. If we are content to remain indifferent to the ever changing demands made upon us by the progress of medical science, then we have no just cause to complain if the drug store continues to be a joke in the opinion of many.

In this campaign we may appeal not only to professional pride but to the commercial spirit. Many physicians are compelled to make sterile solutions in their own offices for which they would be only too glad to pay the pharmacist, if there was one in the neighborhood who was prepared to give proper attention to these. Most doctors who administer arsphenamine are willing to pay the pharmacist a dollar more than the cost of the ampoule for making the solution and furnishing the normal saline solution which is used with it. The dispensing of arsphenamine does not require elaborate equipment but does require care, and some knowledge of sterilization methods. The pharmacist who is willing to give proper study to the subject of sterilization will be rewarded, not only by the knowledge that he is performing a most important service for his community, but, in many cases at least, by a larger amount of business of a professional character than he had believed obtainable.

It is to be earnestly hoped that the colleges, the journals, the associations, and the boards of pharmacy will join in arousing pharmacists from the present all too common attitude of indifference in regard to sterilization in dispensing.

A SIMPLE SUPPOSITORY DEVICE.

BY CASWELL A. MAYO.*

I wish to bring to the attention of the Section a very simple little device, which is not new, having been patented in 1916, but which may be new to many of the members. So far as I am aware it has not been described in the Proceedings of the Association nor in the pharmaceutical press.

The device is extremely simple, consisting of a single mould holding 30 grains of cacao butter and a plunger or ejector.

* Read before the Section on Practical Pharmacy and Dispensing at the Washington Meeting of the American Pharmaceutical Association, May 7, 1920.