

by a solvent extraction method, but in every case was better than the normal recovery from cod livers. The lowest yields, 48.6 and 51.7% were obtained on the two smallest livers, Nos. 5 and 6; the other Nurse liver, however, weighed 36 lbs. and yielded 66% of oil. The largest liver, No. 2, gave a yield of 55.3%, and the highest yield, 70.8%, was obtained on No. 4, which weighed 43 lbs.

When these oils were tested colorimetrically for Vitamin A it was found that those from the Sawfish and Leopard species gave much higher values than any of the others, whereas the commercial samples from those two species had given the lowest values. When assayed biologically the specially prepared Sawfish and Leopard oils gave Vitamin A values of 2222 and 2700 U. S. P. X units, respectively, and the cod liver oil control showed 1566 U. S. P. X units. The two shark liver oils were therefore 50-80% stronger in Vitamin A than cod liver oil.

While two of the shark liver oils proved to be considerably more potent than cod liver oil with respect to Vitamin A, they were only one-tenth as strong in Vitamin D, each having about 14 Steenbock units as against 134 in the cod liver oil.

These carefully prepared oils were all free from any putrid or ammoniacal taste or odor, and had only a slight natural fishy taste. They all deposited stearine on standing at room temperature.

#### SUMMARY.

1. Commercial samples of liver oils from the Dusky, Leopard, Nurse, Sawfish and Sun sharks were tested colorimetrically for Vitamin A.
2. Oils were prepared from the fresh livers of Nurse, Sawfish, Sand and Leopard sharks and were tested colorimetrically for Vitamin A.
3. Oils from the fresh livers of Sawfish and Leopard sharks were assayed biologically for Vitamin A and D.

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### THE PROBLEMS\* OF THE TEACHERS AND STATE BOARD EXAMINERS.<sup>1</sup>

BY HARRY W. MANTZ.<sup>2</sup>

The Teachers of Practical Pharmacy and Dispensing will no doubt agree that the scope of their subject is gradually changing and becoming more complicated. Many causes might be cited, but two of the outstanding are: First, the limited amount of practical drug store experience possessed by the individual when he enters the Pharmacy School and when he appears before the State Board Examiners to prove that he is qualified to practice the profession of Pharmacy; *second*, the large number of new preparations put on the market and the lack of knowledge, concerning these preparations on the part of the physician, the pharmacist and the teacher of pharmacy.

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<sup>1</sup> Section on Practical Pharmacy and Dispensing, A. PH. A., Washington meeting, 1935.

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The State Boards are gradually decreasing the amount of practical experience necessary to meet their requirements. The result being that it is now necessary for the teachers to supply the training in the school which was heretofore obtained in the drug store. Our forefathers learned the profession by applying one of the basic laws of learning—"Learn by Doing;" no one will deny that this is the most efficient way of learning. Is it possible then for an instructor to supply this demand in the comparatively short time allotted?

The teacher of practical pharmacy and dispensing does not find it a burden to teach the processes and procedures for the manufacture of the U. S. P. and N. F. compounds and preparations. The pharmacist, however, is not only confronted with these, but with hundreds of others and combinations of them. This being the case it would seem necessary for the teacher to include instruction on these new preparations in order to accomplish that which is expected of him—to prepare the student to practice the profession of Pharmacy and meet the State Board requirements. The question then arises, if the new preparations are considered, at what point should the instruction end? It was pointed out in a paper presented at a meeting last year that nearly four million combinations are possible—to be obtained from one hundred drugs with four in a prescription. This proves that it is not possible for the teacher to give instruction on all the compounds and possible combinations, but only on the basic principles underlying the art of compounding and dispensing. This can best be accomplished by giving the student work which runs parallel to that carried on in the laboratories of the drug stores.

The examiners are also confronted with difficult problems and a good idea of these can be obtained by reading the proceedings of the joint meetings of members of the State Boards of Pharmacy and delegates of the American Association of Colleges of Pharmacy. Briefly, they are as follows: First, "How many and what type of preparations and prescriptions should be given in order to determine how much the applicant knows?" Second, "How many times should the applicant be allowed to make the preparations or compound the prescription?" Third, "What method should be used for grading the preparations and prescriptions?"

These questions have been discussed and no definite agreement has been reached, although the problems are of utmost importance. The teachers of *Materia Medica* have submitted a definite list of drugs, on which the examinations are to be based and, likewise, if the examiners and teachers of practical pharmacy were to cooperate, plans for uniform examinations could be made. It is realized that a definite list of preparations would hardly be possible; therefore, the suggestion for uniform examinations.

The aim of the examiner should be to find out what the applicant knows and not what he does not know. This is best accomplished by giving a comprehensive examination. Therefore, the more preparations and prescriptions given, the better it would be for both the examiner and the candidate. Four preparations or prescriptions are not sufficient to determine the qualifications of the individual; ten would seem a more satisfactory number. The type of preparations, the number of chances given to the individual to make the preparation, or compound the prescription and the method of grading are inter-related.

Most State Boards allow only one chance to make the preparation; providing this rule is followed. This suggestion is offered—that sixty per cent of the examina-

tion consist of U. S. P. and N. F. preparations with the directions for manufacturing given. It is only fair to give the applicant the same privileges which the pharmacist has in the drug store. If the directions are given and he has acquired the proper technique, he should be able to make a preparation the first time with perhaps the exception of emulsions. This would give the applicant a chance to make a grade of sixty per cent and the remaining forty per cent should consist of work on prescriptions, without directions given. In the writer's opinion, it is not fair to expect an odd prescription to be compounded correctly the first time, and in order to be fit for dispensing, it should be perfect to the degree which is possible. The prescriptions given in examinations often consist of odd combinations on which a certain amount of experimentation had to be done to ascertain the best method for compounding. This, no doubt, suggested the idea to the examiner that it would make a good State Board question. Why expect more from a man with a limited amount of experience than from the one who has had at least ten years? In many cases no basic principles are demonstrated in these combinations.

One point which the State Boards overlook, as far as the writer has been able to determine, is the applicant's ability to read original prescriptions. It would seem more important to be able to read a physician's handwriting and decipher a prescription, than to identify drugs. This could be made a part of the work on dispensing prescriptions in the examination. The remainder of the examination should consist of determining whether the candidate is qualified to handle a prescription from the time he receives it until it is ready to be handed to the customer. Every one present is acquainted with these proceedings without taking the time to enumerate them. If the candidate is not capable of making fifteen per cent on the remainder of this work, which will give him a passing grade, he is not qualified to receive a certificate of registration.

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## PROFIT—THE WAY OUT OF THE DEPRESSION.\*

FOR THE NATIONAL RECOVERY ADMINISTRATION.

BY W. BRUCE PHILIP.

To protect the consuming public the prices of drugs, medicines, toilet articles and drug sundries, must be at such a price level as to allow adequate pharmaceutical service.

A code of Fair Competition, for the retail drug trade, must be a guide, not for a few exception drug stores, but for at least ninety per cent of the 60,000 drug stores in the 48 states. This ninety per cent of the total number of drug stores serve at least ninety per cent of the geographical territory of the United States. This same ninety per cent of the drug stores serve at least seventy-five per cent of the country's population. If the Code of Fair Competition for the Retail Drug Trade will not bring recovery to the ninety per cent of the retail drug trade, the code then ceases to be a Code of Fair Competition for the Retail Drug Trade, and becomes a special code for a favored fraction of the retail drug trade.

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\* Section on Commercial Interests, A. P. H. A., Washington meeting, 1935.