

COMMITTEE REPORTS

MINUTES OF THE JOINT MEETING OF THE AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES WITH THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY, CHICAGO, ILLINOIS, AUGUST 13, 1918.

The joint meeting of the American Conference of Pharmaceutical Faculties and the National Association of Boards of Pharmacy was called to order at 2.40 o'clock P.M., Tuesday, August 13, 1918, by President W. P. Porterfield, of the National Association of Boards of Pharmacy.

The first report was that of the Joint Committee on Examination Questions, which was submitted by the Chairman, Prof. C. B. Jordan; it follows:

REPORT OF THE COMMITTEE ON EXAMINATION QUESTIONS.

For a number of years the work of this committee has been in charge of Dr. Henry Kraemer and he perfected a good organization and would have accomplished a great deal if he had continued in the work. Unfortunately, he felt that as President he could not give the work of the Committee his attention and, therefore, turned it over to us, and we have endeavored to carry out his ideas.

The Committee was organized into six sub-sections, as follows: 1. Pharmacy and Dispensing; 2. Commercial and Legal Pharmacy; 3. Physics and Chemistry; 4. Botany and Pharmacognosy; 5. Physiology and Pharmacology; 6. Bacteriology and Immunology.

Each sub-section elected its own sub-chairman as follows: 1. Pharmacy and Dispensing, E. A. Ruddiman. 2. Commercial and Legal Pharmacy, C. O. Lee. 3. Physics and Chemistry, C. B. Jordan. 4. Botany and Pharmacognosy, E. L. Newcomb. 5. Physiology and Pharmacology, Dr. Bernard Fantus. 6. Bacteriology and Immunology, E. N. Gathercoal.

Each sub-chairman received the following statement regarding the scope of the work to be covered:

"Questions are the best index of what is being taught in the Colleges of Pharmacy. We are interested in a study of what might be called fundamentals, leaving it to the teachers, individually, to develop their courses as they may deem proper. There are other subjects that could be handled, as, the discussion of the value of lecture, laboratory work, methods of teaching, methods of examination, rating of questions and anything else which would add to the efficiency of the teacher."

The members of each sub-section have been studying the problems involved in their special branch of the work. The report of this Committee consists of the reports of the several sub-committees, together with criticisms of questions that were submitted to the General Committee before it was divided into sections. Dr. W. C. Anderson will criticize the questions on Pharmacy; Dr. C. A. Dye those on Botany, Materia Medica, Pharmacognosy and Bacteriology, and I will criticize those on Chemistry.

(Signed)

C. B. JORDAN.

Prof. C. A. Dye presented his criticisms as follows:

On going over the various groups of questions one cannot fail to notice a marked difference in the degree of detail with which the lists are covered. Some are evidently based on the general idea of thoroughly covering the subject in a very practical manner, leaving out the non-essentials. Others evidently followed the Syllabus very closely, going into all the minute details of the subject. It therefore seems to me that we should decide whether or not the questions should be based on the Syllabus in its entirety or simply a thorough practical covering of the subject. The Syllabus, as I understand it, attempts to cover a given subject in a thorough manner, giving, as it were, a synopsis upon which the lectures may be based, the degree to which this shall be followed depending upon the judgment of the instructor and the time allotted.

This in itself is all well and good, but I should like to know how many schools are able to go into any given subject as exhaustively as the Syllabus would indicate in the time allotted each subject. Then when we take into consideration the fact that many schools only put in three days a week on the work, I fail to see how they can hope to discuss the details very thoroughly. At best they can hardly hope that the students will do more than learn a lot of defini-

tions which will be forgotten as soon as they leave school or in many cases by the time they are out of the classroom. For this reason I fail to see any practical use in burdening the list with a lot of questions dealing with theoretical details and having little practical value. We all know that the time we have is entirely too short to even master the essentials.

There appears to be an overlapping of some of the lists, especially the botany and materia medica, the botany and pharmacognosy and the pharmacognosy and materia medica. This, however, is to be expected in those schools where these subjects are more or less closely associated. Neither of these features is serious, however, and can easily be remedied when the questions are gone over for the final assignment.

Another point that occurs to me is that there is a large number of questions devoted to little used and non-essential drugs. This appears to be due to the desire to develop questions, cover everything, and give the impression that all such are thoroughly discussed. If these are discussed, the study and discussion must be very superficial and elementary, since the time assigned to such subjects is not sufficient to permit of a very thorough discussion. And here again the thought comes, is this necessary, or could we not better occupy our time with things more fundamental? I know this idea does not find favor with some of the members, and we may differ very materially in our ideas as to what drugs should be considered as essential, but the fact remains that many of them find little use and others purely local use.

Again it would seem that entirely too much ground is covered by the questions in botany. So much detail is of course quite necessary if botany is to be made a major subject, but as it is, and the way things are going, it seems hardly necessary. Many of the questions must simply be covered by "set definitions," and as such are meaningless to the candidate and only serve to burden him with a lot of non-essentials. No wonder the schools are criticized by the Boards for turning out men ignorant of the simplest essentials in pharmacy, chemistry and other branches when we take their time in trying to fill them with a lot of stock definitions. It surely is time that we awaken to a realization of the fact that the tree of pharmaceutical instruction has a great many branches that need sharp pruning if it is to continue producing fine fruit.

It also seems unfortunate that so little time and so few questions are devoted to physiology. It is of course possible that the list I received was not representative. But even so, the questions that appeared apparently were not formulated with the idea of creating much thought or enthusiasm on the part of the student as to the real value and application of physiology to everyday life or its value in explaining the action of drugs. Indeed, one of the subjects that is of vital interest and concern to us all, and without a knowledge of which we cannot explain the action of many agents, is dismissed with little or no ceremony. If we are to judge from the questions, it is a great deal more important to know whether the calyx is "cad-u-cous" or "deciduous" than to know the normal body temperature or heart rate and how these are affected.

While I may have some very decided views on certain groups or individual questions, and the importance apparently attached to one group as compared with another, I believe as a whole they are well worth while. The idea is a good one in that it will tend to bring about uniformity, and will undoubtedly have a tendency to raise the standard of the Boards, and with these raised the schools must follow with higher standards and better teaching facilities. The first set of questions will no doubt be severely criticized, and most of us will probably think we could have prepared a better one; nevertheless, out of all this effort must eventually come something well worth while.

Dr. W. C. Anderson presented the following:

REPORT OF THE SECTION ON PHARMACY AND DISPENSING.

Prepared by Edsel A. Ruddiman, Chairman.

As temporary Chairman the writer sent out letters asking for nominations for permanent Chairman; the vote resulted in the election of the writer.

Letters making some suggestions and asking for others were sent to each member of the Committee. As a result, a list of six topics for discussion was made out, which list with a summary of the discussions is given below:

Subject 1.—"To what extent should students be required to memorize formulas and methods of making U. S. P. and N. F. preparations? What is to be gained by memorizing them? What information should the student have about each preparation made in the laboratory?"

The summary of the discussions represents the opinion of the majority of those who took part, though there was naturally some disagreement.

It is the general opinion that the student should remember type processes; that he should remember the presence in a formula of such agents as are likely to cause incompatibility when preparations are mixed; that he should remember the percents or amounts of potent ingredients, but that he should not be required to learn the complete formula with the idea of making up preparations from memory, in fact he should be discouraged from doing so; that he should know the chemical reactions, if any; and particular stress should be placed on the reasons for the different steps in the methods of making.

In regard to preparations made in the laboratory, the student should know the official name and synonyms, the official definition, the ingredients and the percent of the active ones, the reasons for each step, the reactions if any, the best way of preserving and any change that may take place on long storing, and the dose. In other words, he should know everything that is to be known. It is also suggested that he should know the cost of the home-made product compared with the purchased one.

Subject 2.—"How may we get greater uniformity in questions asked?"

Several members of the Committee suggest that the instructors send to the Chairman the questions which are actually asked in examinations, that these be classified and a copy of all questions returned to each member of the Committee for study and comment. It is also suggested that the Chairman send out a list of certain classes of preparations and ask that each member of the Committee write out questions on these preparations, that these questions be published, and then other classes be taken up, going through the U. S. P. and N. F.

With perhaps the exception of one set of questions, all those sent to the Chairman were evidently questions which had actually been used in examinations.

It was the intention of the Chairman, when he sent out the requests for examinations, to get questions on both pharmacy and dispensing. Most of the members responding sent questions on pharmacy, but only a few questions which would come directly under the head of dispensing. In this first effort to classify the questions, the Chairman decided to incorporate only those which have a direct bearing on the U. S. P. and N. F. preparations, and chiefly those preparations for which a formula is given, leaving out, for the present at least, the questions which bear on assay processes, doses, uses, physical properties of chemicals and drugs, incompatibilities, and prescriptions. In grouping these questions the wording was slightly changed in a few minor cases, but so far as possible the original wording of the examiner is given.

Subject 3.—"Should we in our daily work strive to encourage the student to prepare himself so that he may be able to manufacture a limited number of proprietaries of his own? If so, what lines do you suggest?"

The members of the Committee are practically unanimous in advising that the student should be capable of making a limited number of proprietaries and that these remedies should be limited to toilet articles, cough preparations, corn remedies, cleansers and polishes, flavoring extracts, veterinary remedies and dips, and preparations of a similar nature. A few members advise the making of any or all kinds of proprietaries, and one objects to the making of any proprietaries.

Subject 4.—"Please give a list of those U. S. P. and N. F. preparations which each student is generally required to make in the laboratory."

The number of preparations made in the schools varies greatly. The only way to remedy this is to get a greater uniformity in the length of the course given. The U. S. P. and N. F. preparations selected for making in the laboratory also shows variation, there not being any one preparation that is made by all of the schools reporting.

Subject 5.—"a. What is the best method you have found for teaching students how to compound prescriptions? This included incompatibilities. b. Approximately how many prescriptions is each student expected to fill? c. In case of incompatibility, is the student taught how to determine experimentally what the trouble is—what the precipitate is if one is formed? d. Is an examination given on reading poorly written prescriptions?"

It is difficult to summarize the discussion on this subject.

Subject 6.—A discussion of the underlying principles which should govern Boards of Pharmacy in framing questions.

The majority of those discussing this subject are of the opinion that the Boards of Pharmacy should so word the questions that the answers may be comparatively short and yet will require some reasoning on the part of the applicant for registration; that questions asking for the whys and wherefores are particularly good; that it is not advisable to use questions which can be answered by Yes or No; that it is not advisable to word questions in a way that will admit of long or rambling discussion; and that the questions should cover a wide range. In the discussions varying phases are brought out, and members of Boards of Pharmacy may find some valuable suggestions.

Dr. E. L. Newcomb presented the following report of progress for the Section on Botany and Pharmacognosy:

TOPICS AND SUGGESTIONS PROPOSED BY THE SECTION ON BOTANY AND PHARMACOGNOSY.

General.

I. Discuss the need for comprehensive botanical and pharmacognostical training on the part of pharmacists in order that they may keep abreast of the rapid advances which are being made in organic, physical, and plant chemistry; pharmacology; clinical medicine, and other closely allied sciences.

II. Does not a logical and sequent consideration of pharmaceutical botany and pharmacognosy dictate that the plants most simple in form, structure and function should be taken up for study first? Is this scientific and logical system of study being generally adopted?

III. To what extent should the subject of Ecology be discussed with students in pharmacy? Should they be given any field work in this subject?

IV. How can the medicinal Plant Garden be made of greatest value in connection with the teaching of pharmaceutical botany and pharmacognosy? Give an outline of the use which may be made of the garden during the spring and fall. Discuss the value of the greenhouse as an adjunct to the teaching of these courses. Formulate five type questions relative to instruction given in the garden or greenhouse.

V. Give an outline of what you consider to be essential instruction on the compound microscope, its care and use. Why is it of fundamental importance that the student should become familiar with this instrument and early use the ocular micrometer in the study of plants? Should the use of microscopical accessories, such as the polariscope, warm stage, special eye pieces, microspectroscope, binocular, etc., be explained before work in which they are involved is introduced? Is the time not at hand when all students should be required to purchase a compound microscope as a part of their laboratory equipment?

Pharmaceutical Botany.

VI. *Thallophytes*.—Schizophyceae, Schizomycetes, Chlorophyceae, Phaeophyceae, Rhodophyceae, Diatoms, Lichens, Phycomycetes, Ascomycetes, Basidiomycetes, Fungi Imperfecti.

(1) How much didactic and laboratory time should be devoted to the study of this group? (2) Outline what you consider to be a satisfactory course on this group, and state what illustrative and demonstrative material to use. (3) Formulate a set of questions which will illustrate what you consider to be the most essential parts of the subject. (4) Discuss the different values which a thorough understanding of this group of plants has for the pharmacist.

VII. *Archegoniates*.—Hepaticae, Musci, Filicales, Equisetales, Lycopodiales.

Discuss this group as indicated by the outline given under Thallophytes.

VIII. *Spermophytes*.—Gymnosperms, Angiosperms.

(1) Outline what you consider to be a satisfactory method for teaching the life history of this group. What illustrative material is used in connection with laboratory work? (2) Formulate a set of questions which will illustrate what you consider to be the most essential parts of the subject. (3) Discuss the scientific and practical value which the purely botanical study of the life histories of this group has for the pharmacist. (4) At what time should the following subjects be discussed with the pharmaceutical student: evolution, paleontology, environment, natural selection, mutation, Mendel's law, etc.?

The Study of Cell Contents.

IX. Should this instruction be given during the first year and does it logically follow the courses on plant groups?

X. How much time should be devoted to the study of protoplasmic cell contents—what material do you find well adapted for the laboratory work and what is the value to the pharmacist of a knowledge of this subject?

XI. Outline what you consider to be a sufficient amount of work on the starches and inulin. Name the starches and inulin-containing material to be used and formulate five questions on the same.

XII. Outline the instruction which you consider adequate and formulate questions on each of the following substances: sugars, alkaloids, glucosides, plant coloring principles, calcium oxalate, plant proteins. Enumerate the material used for the laboratory work.

XIII. Outline work and enumerate material to be used for study of: silica; tannin; fixed oils; fats and waxes; mucilages; gums; volatile oils and resins; latex, and ferments.

XIV. Discuss the fundamental importance to the pharmacist of a knowledge of the subjects mentioned in XI, XII, XIII.

The Study of Plant Cells.

XV. Discuss the work which you think should be given on the origin and composition of the cell wall. Present a list of the illustrative material to be used. Formulate five (5) questions on the work.

XVI. Outline the instruction which you give on parenchyma and mechanical cells. Enumerate the illustrative material used for laboratory work. Formulate ten questions on this subject.

XVII. Outline the instruction which you give on conducting and protecting cells. Enumerate material used and formulate ten questions on the same.

XVIII. Discuss the fundamental importance to the pharmacist of a thorough knowledge of the nature of plant cells and by example illustrate this importance.

Outer Morphology and Inner Structure.

XIX. (1) Is the study of the structure of plants along with outer morphology the best plan? (2) Enumerate the illustrative material which you have used for giving laboratory instruction on the outer morphology of the following: root, stem, leaf, flower, fruit, and seed. (3) Enumerate illustrated material most suitable for the study of the inner structure of the above named plant parts. (4) Formulate a set of ten questions on outer morphology and ten on the inner structure of plant parts.

Plant Classification and Physiology.

XX. (1) How much work should be done on plant identification and classification? (2) What is your plan of procedure with this work? (3) Discuss the value to the retail pharmacist of ability to identify plant specimens. (4) Formulate a set of ten questions on this subject.

XXI. Outline what you consider to be the proper amount of didactic and laboratory work on—root pressure, photosynthesis, transpiration, geotropism, heliotropism, factors influencing growth, organic and inorganic soil constituents, etc. Prepare ten questions on this subject.

PHARMACOGNOSY.

XXII. *Drug Identification.*—(1) What method of instruction have you found most valuable in teaching the student how to identify crude vegetable drugs? (2) How many vegetable drugs in addition to those included in the U. S. P. and N. F. should the student be expected to know by sight? (3) Do you give each student a sample of every U. S. P. and N. F. drug? (4) Should the following concerning each drug be taken up in connection with the work on identification when the student has the drug specimen in hand: Latin title, English title, synonyms, name of plant yielding the drug, family to which the plant belongs, etymology, part of the plant represented by the drug, habitat and general character of the plant, commercial source of the drug and constituents? (5) What kind of an examination do you conduct to determine the students' ability to identify drugs and give the facts enumerated in (4)?

XXIII. *Extended Pharmacognostic Study*—(1) Would it be advisable for all colleges to devote the time for this extended study to the same drugs; if so, should this committee enumerate a list of the drugs to be taken up in this more comprehensive way? (2) Enumerate the drugs

which you feel should be studied in great detail. (3) What suggestions can you offer for improvement in the following outline for the comprehensive study of a vegetable drug: (a) Official title of drug—U. S. P. definition—synonyms—etymology. (b) Latin and English names of the plant—synonyms—etymology. (c) Systematic botanical position of the plant. (d) Systematic morphological description of the plant, including drawings from living plants from the garden or greenhouse of parts used for the preparation of the drug. (e) Occurrence and propagation of the plant—culture of the plant—effect of cultivation—production of the drug—collection and preparation (the greenhouse, garden and drug drying laboratory used extensively for this work.) (f) Commercial channels through which drug is marketed—commercial varieties—methods of packing. (g) Description of the commercial drug including, when possible, a comparison with the material from the garden—morphological description—anatomical description—powder description—odor and taste—application of micro-chemical tests, pyro-analytical methods, microscopical accessories, etc., where applicable. (h) Detection of admixture and adulteration—pharmacognostic valuation. (i) Similar or parallel drugs. (j) History (if time permits). (k) Examination of important powdered drugs from previous lessons as unknowns. (l) Review, consisting of a set of home study questions. (4) Would it be advisable for Boards of Pharmacy to adopt a uniform list of the more important drugs upon which questions and microscopical work involving study as outlined above might be asked? (5) Formulate ten questions suitable for use following the intensive study of what you consider to be five important drugs.

XXIV. *Advanced Pharmacognosy*.—(1) Discuss the teaching of this subject—outline what you believe should be included in the course. (2) Discuss the value of this work to the retail pharmacist. (3) Formulate ten questions on advanced pharmacognosy.

XXV. *Field Work*.—(1) Outline the method which you use for instructing students while on field trips. (2) Discuss the value which such trips have for the practising pharmacist. (3) Formulate ten questions on field trip work. (4) How many field trips do you consider advisable? (5) Should herbarium work be a part of this course?

XXVI. *Equipment for Pharmacognosy*.—(1) Discuss the equipment you consider necessary for the proper teaching of pharmacognosy and pharmaceutical botany.

In response to a request of Professor Henry Kraemer, Dr. Newcomb also gave a synopsis of a paper which he had prepared on the subject of *Digitalis*.

REPORT OF THE SECTION ON PHYSIOLOGY AND PHARMACOLOGY (INCLUDING BIO-ASSAY) OF COMMITTEE ON QUESTIONS AND EXAMINATIONS OF THE AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES.

By Dr. Bernard Fantus.

This report has been prepared after correspondence with the various members of the committee, a canvass of the custom prevailing in the schools of pharmacy of the United States, and consultation with many teachers regarding ideal courses to be aimed at. Twenty-two schools responded to the Questionnaire sent out.

All these schools, with one exception (the University of Wisconsin), teach physiology, though two schools teach physiology only in the four-year course. The remaining nineteen schools give an average of 35 hours in lectures, and 15 hours in recitations. Laboratory work in physiology is given by only five institutions, the hours devoted to it ranging from 32 in three schools to 108 hours at the University of Nebraska. Only one school mentions demonstrations. We may conclude that practically all the schools recognize the desirability of teaching physiology, at least in the form of didactic work.

It is impossible to analyze satisfactorily the replies regarding the teaching of pharmacodynamics. This term, which covers the study of the action of drugs, was purposely selected in this inquiry to differentiate this study from that of pharmacology, which might include anything pertaining to drugs. Eight schools among the twenty-two give no work in pharmacodynamics. Most of the others reported that from 48 to 60 hours are devoted to this study. However, it is evident from the reports that, in most cases, the instruction is given as part of the course on materia medica, which, as we all know, merely means the enumeration of the therapeutic uses of the drug. Four schools give laboratory work in pharmacodynamics, with the time devoted to it ranging from 18 to 108 hours. One school in addition speaks of 15 hours' demonstration. Real instruction in pharmacodynamics is, therefore, given in only very few of the schools of pharmacy in this country.

Work in bio-assay is carried on in six of the schools that have responded. In the two-year course, from 12 to 15 hours of laboratory work or demonstrations are allotted it in three of these schools. Three schools give more extensive laboratory courses, ranging from 45 to 108 hours, in the three- and four-year courses. Mere lectures are evidently considered undesirable in the teaching of bio-assay.

DISCUSSION.

From the returns of this inquiry it is evident that the greatest possible divergence of custom in the teaching of the branches of instruction investigated by this committee prevails among the various schools of pharmacy: from none given at the University of Wisconsin to 252 hours each in physiology and pharmacodynamics at the University of Nebraska. Similarly does opinion vary regarding the ideal courses for schools of pharmacy in these branches. Thus, while Professor Kremers, of the University of Wisconsin, says: "We have no right to take the time necessary for satisfactory courses, in each of these branches, from the studies now given in our two-year course," Professor Sayre believes that, "to meet the demands of future pharmacists, an ideal course will certainly approximate, if not actually equal, the courses now given in these subjects in our best medical schools. So far as bio-assay is concerned," he says, "we should give far more attention to this than medical schools do."

The only manner in which these conflicting opinions of the experts consulted can be reconciled is by assuming that they look upon the aims of pharmaceutical education from diametrically opposite standpoints. Obviously, those who believe that no instruction in these branches should be offered have in mind the present-day druggist, whose work is chiefly commercial, and hardly at all scientific. Those, on the other hand, who advocate thorough and complete courses in these branches, have in mind the higher professional training of pharmacists, which seems to be the general trend of the majority of the schools.

It may well be questioned what this trend towards higher pharmaceutical education is leading us to, for upon the desirability or the undesirability of this depends in a large measure the final disposition that will and ought to be made of the branches under discussion. An unbiased observer, noting the kind of work that practically all the graduates of pharmacy are called upon to do in the drug store, cannot but deplore the fact that the present-day training does not really fit them for their life's work. Courses in bookkeeping and business methods, and the studies of the numerous sundries and other articles besides drugs that constitute the chief bulk of the business are hardly touched upon in the schools. On the other hand, drug assay, detection of adulterations, the making of complicated galenicals, the preparation of chemicals, etc., upon which most of the time of the student in present-day schools of pharmacy is spent, are practically useless to ordinary druggists. It must also be admitted that the strictly professional pharmacist, he who limits his practise exclusively to prescription work, belongs to an almost extinct species and this for a good reason, namely, that his chances for making a livelihood in the struggle for existence are admittedly rather poor. It would seem, therefore, that the above-mentioned trend toward higher pharmaceutical education is a mistake, unless it contemplates and distinctly recognizes the great change that has taken place in medical practise. We may as well admit that doctors are writing fewer and simpler prescriptions, and that this tendency is bound to become increasingly manifest as the older doctors leave the field of practise to the products of modern medical schools. This means that professional pharmacy is on the down-grade, unless the pharmacist is willing to equip himself to serve as a complete laboratory-man in medicine, that is, unless he is prepared to combine diagnostic-laboratory technic with the therapeutic-laboratory methods he now practises in the compounding of prescriptions.

Inasmuch as the modern trend of medical practise is in the direction of requiring more of diagnostic than of therapeutic laboratory work, the field of practise for a pharmacist equipped to do all this work is great and bound to become increasingly greater. That this is so may, for example, be gathered from the following quotation from E. P. Joslin's "Diabetic Manual," (Lea and Febiger, 1918): "Examination of the urine should cost the patient little. Formerly, I deprecated the routine examinations made in drug stores, but now I welcome them. The druggist is a trained chemist. He is constantly doing quantitative work, and it is far easier and cheaper for him to examine a urine than for a doctor. Druggists will undoubtedly undertake such work with satisfaction. It will be an agreeable relief from the many activities in a drug

store which have nothing to do with the profession of a pharmacologist." And, it might be added, it would also be an agreeable relief to the doctor.

While it may be admitted that there are at present practically no individuals who do such work, it must also be pointed out that such individuals are not available. The medical laboratory work is at the present time done by medical practitioners, many of whom, when they first undertook this work, were not as well equipped for it as would be the average graduate of a good school of pharmacy. For pharmacists to become recognized as competent in this field of work, and to obtain and merit the confidence of the medical profession, short courses in urinalysis, etc., would not suffice; but a training would have to be required no less extensive than that which fits for medical practise, though it ought to be, to a certain extent, of a different type. With a preliminary and a theoretic training exactly like that of the physician, which would include two years of university work in chemistry, physics, biology and language, and the first two years of a medical course, excepting anatomy, a pharmacist who aims to become a medical laboratory man ought to have the opportunity of devoting the other two years of study entirely to perfecting himself in laboratory technic in its various branches, including microscopic and chemical diagnosis, bacteriologic manipulations and pathologic and immunologic technic, in addition to a thorough understanding of pharmaceutical principles and practise. Such a man would, of course, get as thorough a training in physiology and in pharmacodynamics as the medical student, and a much more extensive training than he in pharmacy, materia medica, and bio-assay. The drug merchant, on the other hand, needs little or none of this training. For him, very brief courses, at most, in these subjects are all that are justifiable.

It is therefore the opinion of this committee that, before it can arrive at a serious recommendation regarding the teaching of the branches under discussion, it is necessary that it be instructed what the aim of pharmaceutic education is; for, while the present-day druggist needs but a minimum of instruction in these branches, the pharmacist of the future would require elaborate courses. It is, however, evident to the committee, that even the present-day druggist should have a certain amount of intelligence in regard to the teachings of modern pharmacodynamics. To merely mention the uses of drugs in connection with the study of materia medica, as is done at the present time, leads the student to the erroneous opinion that drugs in general have specific actions and uses. The fact that drugs are merely natural resources, capable of harming or helping according to the manner in which they are used, cannot be appreciated by anyone who does not have at least a smattering of pharmacodynamics. Hence, a brief course on elementary pharmacodynamics should be introduced into all schools of pharmacy. Such course might possibly be combined with that of physiology, where conditions are favorable for such a merger. A brief study of bio-assay might be included in the course on pharmacodynamics, preferably in the form of demonstrations.

L. E. SAYRE: I have believed for many years that we should have training along this line of pharmacology and have tried to introduce that work in the University of Kansas. We know from practical experience that in many cases it has resulted in not only a success professionally, but financially. A young man came to me some years ago and said: "I am tired of the soda water, cigars and lunch counter business. I will go out of the drug business rather than go into that kind of business." I said to him, "Cut loose; equip a good laboratory, and go into this work as a business."

This young man located in a city of about 250,000 inhabitants; two years afterwards I visited him and was surprised to find him located on one of the business corners of the town; he had a very large store, beautifully equipped; no soda fountain or cigar counter. He had a large laboratory and was making a wonderful success.

THE REPORT OF THE SECTION ON COMMERCIAL AND LEGAL PHARMACY.

By Prof. C. O. Lee.

The work of the sub-section was organized as follows:

1. Each member of the committee was asked: (a) to discuss seven general topics bearing upon the teaching of Commercial and Legal Pharmacy; (b) to discuss any other topics pertaining to Commercial and Legal Pharmacy not incorporated in the topics suggested.
2. Each member was asked: (a) to submit 24 copies of twenty questions representative of the work covered in Commercial Pharmacy in his school; (b) to submit 24 copies of ten questions representative of the work covered in Legal Pharmacy in his school.

The chairman received no reply of any kind from eight of the twenty-four members of this sub-section. Of those replying, four sent only letters, eleven replied by discussing the seven general topics suggested. Of these five submitted the questions on Commercial Pharmacy, but only four submitted 24 copies of their questions. Of these also four submitted questions on Legal Pharmacy, but only two furnished 24 copies of their questions. One furnished an unselected lot of questions, that had been used in examinations.

The seven general topics, as previously suggested, will be submitted together with a summary of the discussion on each.

1. (a) Should our committee recommend how much time should be given to the study of Commercial Pharmacy? (b) How much time shall we recommend to be given to this course?

To (a) above, seven favored a recommendation from this committee; two favored the time recommended in the *Syllabus*; one was doubtful, and one was opposed to such a recommendation.

To (b) above one recommended 30 hours; one 60 hours; one 120 hours; one 150 hours to 200 hours; one 480 hours; one 75 hours; two that no time should be given to this course; three doubtful as to the number of hours that should be given to this subject.

2. What subjects should be taught in a course in Commercial Pharmacy? How much time should be given to the teaching of such course?

To this, two suggested following the *Syllabus*; one suggested that only commercial arithmetic be offered; one made no reply; one suggested 30 hours to store management, 10 hours to legal pharmacy, 30 hours to commercial arithmetic, and 50 hours to various phases of salesmanship, total of 120 hours; one suggested 6 hours to economics, 6 hours to accounting, and 6 hours to business law, 3 hours to business organization, and 2 hours each to marketing and advertising; one suggested 3 hours per week for one semester for each of the following subjects: accounting, salesmanship, advertising, principles of economics, commercial geography, principles of psychology and principles of sociology and 2 hours per week for one semester on each, commercial law and office organization; five were doubtful.

3. Should the teaching of Commercial and Legal Pharmacy be anything more than theoretical? Should there be laboratory or practice work; if so, how much time should be given to each?

In reply, three would make the course wholly theoretical; four would make the course theoretical with some practical work, where possible; two were doubtful; two said *no*.

4. In order to fit out students to better understand society and the individual, should a course in Applied Psychology be a part of the course in Commercial Pharmacy?

To this five were favorable in various respects; one entirely opposed; five undecided.

5. Should Commercial Pharmacy be taught by a man engaged in business, or is a man of recent business experience sufficiently qualified to teach the subject, provided his educational qualifications are satisfactory? To this one was indifferent; ten preferred to have this subject taught by a man of business experience and a theoretical knowledge of the subject.

6. Should the State Boards of Pharmacy, in examining candidates for registration, ask questions upon the subjects of (a) Commercial Pharmacy, (b) Legal Pharmacy?

To this five were in favor of the Board asking questions on Commercial Pharmacy; six were opposed. As to Legal Pharmacy, seven favored the Board asking questions in examinations and three were opposed.

7. Should instruction in Legal Pharmacy be given by a man trained in law, or by a pharmacist, or by men from both professions in coöperation?

To this one did not reply; four favored lawyers only; six favored some form of coöperative work.

8. Copies of the questions as submitted on Commercial Pharmacy attached.

9. Copies of the questions as submitted on Legal Pharmacy attached.

SUMMARY.

In reviewing the results of the work of this Section, the chairman regrets that only about one-half the members responded to the efforts of the committee. Those responding confined their discussions largely to the topics as suggested in the letter from the chairman.

The time suggested for the course in Commercial Pharmacy ranges from no time at all

to 40 percent of the time of the pharmacy course. The subjects suggested range from commercial arithmetic to courses in accounting and economics, and most generally including a study of salesmanship, advertising and store management. It is largely agreed that such subjects should be taught theoretically with laboratory or practice work where the latter could be offered to advantage. Some emphasized the necessity of real practical work. As to applied psychology, many favored some phases of it, others were not clear as to the importance of the subject. It seemed to be a general opinion that men of experience and education should teach the subjects of Commercial and Legal Pharmacy.

As to Boards of Pharmacy asking questions on Commercial Pharmacy, more opposed the idea than favored it, but that the Board should ask questions of legal concern was generally favored.

It was the original plan of the chairman to submit copies of all questions received to each member of the committee, but so few submitted questions, and fewer submitted the required number of copies, that the plan was abandoned, and the copies submitted are attached to this report for general consideration.

CONCLUSIONS.

The limited amount of work that this committee has done reveals a very great lack of uniformity in presenting the subjects of Commercial and Legal Pharmacy in our schools, especially Commercial Pharmacy. There is a very great difference of opinion as to the number of hours that should be given to these subjects, as well as to the subject matter and the manner of presenting it.

If these courses are to be a part of our college curricula there is great need for their standardization. Some have suggested that the courses as outlined in the *Syllabus* are comprehensive enough. This may all be true but the *Syllabus* does not seem to serve as a guide to the teaching of these courses, where taught, and some schools have no Commercial Pharmacy courses.

A majority of the questions on Legal Pharmacy are comprehensive and present the subject fairly well, but the questions on Commercial Pharmacy are largely arithmetical. This may all be well and good, but the arithmetic or the system of bookkeeping is a small part in the making of an efficient pharmacist as compared with the more comprehensive fundamental principles that underlie good business methods, good salesmanship, good citizenship, and good professional service.

A clerk needs to know how to price goods and figure profits, but he needs more to know that good business is more than profits, in dollars and cents. He needs to know that a good salesman not only receives the customer's money but his confidence as well, and that he, a clerk, is a citizen, and as a professional man is expected to render honest expert service. We fail to teach our students that they are a certain part of a great complex society in which each individual has a definite moral, social and professional task to perform.

Your sub-section reports progress but does not feel that it can at this time make any recommendations. It is hoped that the work of this sub-section will be continued.

Dean Frederick J. Wulling then read a paper entitled *More Consistent Pharmaceutical Standards*, which was published in the September, 1918, number of the *JOURNAL OF THE A. PH. A.*, pp. 795-799.

H. L. MEREDITH: I want to resent the statement that "the pharmacists are not fit to help this Government in this war."

DEAN WULLING: We all dissent from that. I did not make that statement.

H. L. MEREDITH: I understood that it was a quoted statement, but when I see boys taken into the army who are dead from their shoulders up, and commissioned lieutenants and captains, and whose duties are to look after the condition of tires on automobiles—when I see vehicular surgeons brought into the army as captains for the purpose of looking after the mules and horses which are built by Henry Ford—I resent the suggestion that our men are not intelligent enough to be called into consultation.

Down home we had a boy, the extent of whose knowledge and experience was to wash cars, who is a lieutenant in the army today. We have another man who was working in a shoe house and he is a captain; yet they say that pharmacists are not intelligent enough to help prosecute this war. I resent that.

The people of the United States are not opposed to pharmacists participating in this war. Tell the fathers and mothers of the boys who are enlisted what kind of service they are getting in the Army today and they will rise up as one man. In at least one camp a bartender has charge of the dispensary. Should the parents of the boys investigate they will want to know why, and the first answer is, that the pharmacist isn't patriotic enough. I know a man who is in a machine gun crew in France because he would not serve in Camp Meade under a bartender who knew nothing about pharmacy. It is time for us to speak out and assert ourselves. I don't believe in going only to the Surgeon-General, we should go to the public as our President does.

Dean Wulling says the Boards should establish the prerequisite requirements. The National Association of Boards of Pharmacy can hardly do that until the faculties standardize their own colleges. If the colleges don't do that, and the National Association of Boards of Pharmacy does establish a prerequisite requirement, the only alternative is for the National Association of Boards of Pharmacy to establish a standard for colleges of pharmacy which they will recognize. I think the colleges should cooperate in this work.

CHARLES W. HOLZHAUER: There is one statement in Dr. Wulling's paper which I should like to be informed about. I was under the impression that the ethical stores were on the decrease for the simple reason that a man can't make a living, in the East, anyway, by confining his business to the filling of prescriptions and laboratory work. I would like to be corrected, if I am wrong.

PROFESSOR KOCH: They have been on the increase in Pittsburgh.

H. C. CHRISTENSEN: Ethical stores are on the increase. I have travelled in nearly every State in the past year, and particularly in the Northwest, on which Dr. Wulling's statement is based.

L. E. SAYRE: I would like to ask Dean Wulling upon what basis the statement is made that the intelligence of the druggists, as the representatives at Washington see it, is insufficient to be of any service.

F. J. WULLING: I am sorry Doctor Sayre asked that question because everybody has answered it for himself. We do not need anyone to make a statement like that at all. Just take the action, and the action, or rather the lack of action, is sufficient, isn't it? We haven't been recognized, have we?

L. E. SAYRE: No, and what excuse is there for that?

DEAN WULLING: I would like to know myself. In matters relating to the Government we all have to be very careful what we say and do. You can all draw your own conclusions. I cannot quote any particular person, because no person has made that statement to me. I have had correspondence with heads of departments in Washington, and some of it has been very satisfactory indeed; in the beginning, it was not satisfactory at all. Now, it has been brought about that the War Department has established a military status for students of pharmacy, although they must be members of a collegiate institute.

L. E. SAYRE: Can you answer the question why it is there is a difference between the pharmacists in the Navy and the pharmacists in the Army?

F. J. WULLING: That is one of the riddles that I am not able to solve. It is considered that the marine is above the soldier. That is the reason given me a few years ago. Why, I don't know. There are a lot of things we know about but we should not talk about. I am perfectly willing to defend the Washington officials in large measures. I really haven't anything further to say except that I hope something constructive will come out of this discussion. If you gentlemen can agree with me in only part of what I said, possibly you can crystallize that into some action. It won't do simply to keep on talking; we have got to do something. We are all dressed up with nowhere to go; we have got to fix a time and get there; fix a time for the realization of some of these things and wake up to them.

L. E. SAYRE: Shall we go to the public rather than to Washington?

F. J. WULLING: I wouldn't want to embarrass the Government at this time; I have a grievance against the Government because they have not enacted a bill creating a pharmaceutical corps, but it doesn't mar my loyalty to my country. I wouldn't want to embarrass the Government at this time; if it wouldn't embarrass the Government I would be perfectly willing to take the case to the people. I think it might be a good plan to ask the Government if they would resent our going to the public.

WILLIAM C. ANDERSON: I do not feel that in going to the public on this question we would be embarrassing the Government, but rather helping the Government. I believe the Government ought to know; I believe the people in authority in Washington ought to know what the conditions are in our Army.

As to the pharmacists being denied positions in the Army because of lack of intelligence, I have very little regard for that assertion. I am sure that is not the reason why the pharmacists have not been given a position in the Army. One of the first reasons is that we have in Washington, and have had for years, an influence always working against pharmacists. That influence must be overcome before pharmacy can secure its rightful place.

I had the fortune to come to this meeting from Indianapolis with a soldier whom I heard speak at the Chamber of Commerce luncheon in Indianapolis the day before. I was impressed with his speech; he was a captain in the medical department of the Belgian army. I introduced myself and one of the questions we took up was this matter of pharmacists in the army. He was really horrified when I told him what the position was. He said: "Do you mean to tell me the American army has no pharmacists?" I said, "That is the actual fact." He said, "Who handles the medicines?" I said, "Why, men who have been horseshoers, bookkeepers and chauffeurs, etc., have positions higher than the pharmacists. We have pharmacists in the trenches and in the ranks, and we have in that same regiment men who formerly had been horseshoers and chauffeurs, who are handling the medicine." He said, "I can't understand it." He said, "In our armies, the pharmacists occupy a very important position, in Belgium, in France, and in England; we could not get along without them, and I can't see how the American army can get along without them; every ambulance has at least one pharmacist, and some of them two. If we want medicine we write for it, the same as if we were at home; if we wanted a five percent solution of phenol, we would write for it and the pharmacist compounds it. The pharmacist keeps the records." He stated that he was on his way back to France; that he was going to Washington and get his passports and he was to have an interview with General Gorgas and that he would speak of this matter very positively to General Gorgas, expressing his opinion with reference to it.

There were three gentlemen sitting near us and overheard the conversation, and they became interested; they began asking questions and, the situation being explained to them, one of them having a son and the other a brother and another a relative over in France, they said, "Why don't you bring this to us? Why don't we, who have our boys over in France, know of this condition and know that our boys are not getting the medical treatment they should have?"

One other reason why we have been denied this position, in my opinion, is that the distribution of medicine in the Army does not require the services of a pharmacist. Such distribution is wrong. It is not the treatment the boy would get at home. Physicians do not depend upon pills and tablets alone. The Medical Department of the Army seems to believe that the pills and tablets can be handed by the chauffeur to the patient as well as by the graduated pharmacists. Such a distribution is a relic of old-time. This Belgian officer expressed himself in that way when I told him they used pills and tablets; he said, "That is old-time; we don't treat that way today."

H. M. WHELPLEY: I want to say a few words, merely to give you the point of view of the Army, very briefly. I recently had a long talk on this subject with an army officer of extended experience in the army. From that conversation, I gathered two points that must be made before we get pharmaceutical service. First of all, we must convince the Army that pharmacists are needed. He claimed that they are not; next, we must show them that pharmacists are sufficiently educated to be deserving of a commission. He pointed out to his satisfaction that at the present time they are not.

These are the two points that were the burden of his talk of fully an hour. First of all, that they are getting along all right, and, second, that pharmacists should not complain about their non-recognition because they are not sufficiently educated to be deserving of commissions.

HENRY KRAEMER: When Dr. Anderson was talking to the captain of the Belgian Army, he was discussing one type of pharmacists and the captain was thinking of another. The pharmacists of France and the apothecary of Germany and the chemist of England are professional pharmacists and these are the men who are allied with the medical department. I heartily approve of Doctor Anderson's suggestion. But really, let us just think of the seriousness of the situa-

tion. I don't think we should be too hard on the American Medical Association. It was with Eberle I spent some time a year ago on this matter with Doctor Simmons. When I said to him that we had a sufficient number of professional pharmacists in this country, and that we were urging his support because these men could command the attention and interest of our boys at the front, the American Medical Association was willing to pick up this movement, but we have not, pardon me, I think, done all we could.

H. L. MEREDITH: I would like to ask Professor Kraemer whether a pharmacist he has turned out and on whose certificate he has put his name has less intelligence than the ordinary blacksmith or bartender.

WILLIS G. GREGORY: I wish to take this opportunity to express my appreciation of the value of these joint meetings of college men and board men. Perhaps I am somewhat better able to appreciate their value, because of the fact that I am a member of a State Board of Pharmacy and I am also a teacher in a college of pharmacy.

Now, we are enjoying our annual pastime of "passing the buck." Every year we come together and the Conference of Faculties with a great deal of seriousness and unlimited dignity unanimously resolves that it is time the Boards of Pharmacy should do something, and the Boards of Pharmacy with equal seriousness and surpassing dignity decide that it is time the Colleges of Pharmacy should do something. After we have passed these resolutions and transmitted them to each other, we adjourn, and next year we do the same thing over again.

Now, I have a notion, from having listened to this annual performance for a number of years, that conditions would be materially improved and progress would be made if we could be a little franker with each other and define some of our statements. We have, on the one hand, a group of college men that are constantly preaching higher standards and bemoaning and bewailing the fact that we haven't the proper standard, whereas the fact is we have standards in the American Conference of Pharmaceutical Faculties that are reasonably satisfactory at the present time to a large majority of the Conference. That is the reason they do not put up any higher ones because they are satisfied with things as they are, for the time being. I doubt not that the same condition exists in the Boards of Pharmacy. You have standards with which you are satisfied for the time being; if you were not satisfied you would create new ones. Why don't we get together on these standards and see how far apart we are? I don't think we are so very far apart. Our friend over here said the Boards of Pharmacy couldn't do anything until the colleges classified themselves or standardized themselves, and if they didn't do it, the boards would do it for us. Thank you, gentlemen. We are obliged to you for your good intentions, but so far as I understand the situation, the colleges of pharmacy have standardized themselves and are maintaining at the present time a standard which is reasonably satisfactory to the American Conference of Pharmaceutical Faculties, or else we would change it. Perhaps I don't know what the board men are talking about when they talk about standardizing the colleges of pharmacy. I presume I do not, and I want you to tell me what you mean, after I get through.

As I understand it, we have standardized colleges of pharmacy and that standard is satisfactory to us; if it is not satisfactory to the boards, I wish they would tell us wherein it is unsatisfactory; we would like to study that problem and we want all the light on it we can get. We are trying to get forward, but we can't go faster unless we are educated, and it is up to you gentlemen to put us.

In the first place, as I understand it, the Conference of Pharmaceutical Faculties has established this standard: First, that in order to matriculate a student, that student must be 17 years of age. That is a beginning standard. Second, that that student must have had two years of high school. That is another step in this standard. Next, that that student—perhaps I should have said this one first—must be of good moral character; we have to certify to that in our school. Fourth, this student must attend at least two years' instruction in this college of pharmacy. Fifth, that these years must include at least twenty-five weeks of instruction. That is the minimum; many give thirty or thirty-five and possibly thirty-eight in some cases. But there is the minimum per year, and each year must include a minimum of six hundred hours.

You know, this up and down business, this attitude in colleges of pharmacy interests me. I heard during the meetings of our Conference some talk about the "upper colleges" and the "lower colleges" and I wondered what it was that determined the attitude. As near as I can make it out it is in inverse proportion to the number of their students. If they have a few stu-

dents they are higher colleges of pharmacy and if they have a whole lot of students, they are a lower school of pharmacy. I am not sure that that definition is correct, but that is the impression I have gathered from listening to the discussion in our Conference.

We must have this two-year minimum amount of instruction and there must be a vacation period between them so the student will have a chance to digest what he gets one year and not be affected by mental dyspepsia when he gets ready for his second course. I suppose I have forgotten part of our standards because I didn't think to write them down.

If that is not the standard that the Boards think about and talk about and want, I wish they would tell us what standard they do want. I think that is quite a respectable standard, when you consider that only a few years ago we didn't have any at all.

I think the benefit to be derived from meetings of this kind is in being frank with one another. I think the colleges should tell the boards what they believe and want, and I think the boards should be equally frank in telling the colleges what they want. We are all trying to accomplish the same end and all of us want to serve the community not only in war times but in times of peace. Let us all boost, and we can do it.

The report of Chairman E. N. Gathercoal of the Section on Bacteriology and Immunology was read by title and passed for publication. It follows:

REPORT OF THE SECTION ON BACTERIOLOGY AND IMMUNOLOGY.

The Section on Bacteriology and Immunology of the Committee on Questions and Answers was organized in the fall of 1917 by the election of a chairman by ballot. The chairman and members have exchanged four series of letters in connection with the work of the committee.

The Section begs to submit its report under four headings, as follows:

First: Bacteriology, or better, perhaps, microbiology, is an essential in pharmaceutical education and should be a required part of the curriculum of pharmaceutical colleges, at least in the three-year and four-year courses.

Second: Adequate facilities for laboratory instruction should be provided and adequate time allotted for the proper teaching of the subject. From six to ten percent of the total curriculum hours should be assigned to bacteriology.

Third: Bacteriology as taught in colleges of pharmacy should not closely follow the subject as now taught in colleges of medicine. This science in pharmaceutical courses should embrace not only a study of pathogenic bacteria and their activities but also special work in sterilization, valuation of disinfectants, preparation of culture media and stains, diagnostic tests, sanitation work and a thorough knowledge of sera and vaccines as well as studies in Immunology, Zymology, Parasitology, etc.

Fourth: A summary of the information gathered by the members of the committee regarding the amount of time devoted to bacteriology in pharmaceutical courses and a list of questions indicating the scope of the work in colleges of pharmacy is also submitted.

COMMENT.

There has arisen within a few years a tendency to introduce "fads" among the subjects taught in pharmaceutical schools just as such a tendency has spread in our public schools and all other educational institutions. Ofttimes the fad becomes an established part of the curriculum and frequently develops into a very valuable part. Bacteriology in a pharmaceutical course is still frequently regarded as a fad and in the opinion of the conservatives its introduction into pharmaceutical curricula should be tabooed.

Bacteriology, however, has arrived at a well-established position in all educational courses having to do with medicine, sanitation and public health. The pharmacist is especially concerned in acquiring a knowledge of this science. Without question, the study of bacteriology should be included in what we now term the longer pharmaceutical courses, and these so-called longer courses should very soon become the predominant ones in pharmaceutical education. The one question that confronts us then is this: Shall the subject of bacteriology and immunology be included in the two-year or shorter pharmacy course and how much time shall be accorded to it?

Dr. Albert Schneider, of the California College of Pharmacy, says that the essential preparatory studies, namely, Physics, Biology and Human Physiology, should be presented in the first year of the two-year course and a lecture and recitation course of not less than 30 hours' class room work and six to ten laboratory periods should be given in the second year.

Dr. H. H. Waite, of the University of Nebraska College of Pharmacy, states that not less than 128 hours should be allotted to Bacteriology in the second year of the two-year course.

Dr. Francis Wenniger, of the University of Notre Dame, believes that at least 90 hours should be given to the teaching of Bacteriology in the shorter pharmacy courses and that the subject should not be omitted from any pharmaceutical course leading to a degree.

It is the general opinion of the committee members that the teaching of bacteriology by means of lectures and recitations only, without laboratory exercises, is not satisfactory, but some of the members, notably Dr. Gayfill Ellison, of the University of Oklahoma School of Pharmacy, hold that General Bacteriology should be presented to students of pharmacy even if laboratory work cannot be given.

As to the nature of the work presented in the bacteriological course in pharmacy, the Committee is practically unanimous on the point that such work should be founded on general bacteriology and that the scope of the work should be broad; much more so perhaps than the usual medical course in bacteriology.

The following is based on a résumé of the replies of the committee members regarding an ideal course in bacteriology. Two-year Pharmaceutical Course, one-half semester (eight weeks) of second year: Lectures and Recitations, 24 hours—General Bacteriology, Immunology and Serology, Pathogenic Bacteria, Hygiene and Sanitation. Laboratory, 48 hours—Sterilization and Disinfection Methods, Preparation and Preservation of Culture Media, Isolation of pure Cultures, Microscopic Study of Bacteria, Yeasts and Molds.

Three-year Pharmaceutical Course, one semester (sixteen weeks) of third year: Lectures and Recitations, 48 hours—General Bacteriology (more amplified than in the shorter course). Immunology and Serology, including illustrated lectures on the production of antitoxins and vaccines, Bacteria in Disease, Bacteria in the Arts—food preservation, butter and cheese production, soil bacteria, sewage disposal, water purification, etc. Laboratory, 96 hours—Sterilization and Disinfection Methods, Preparation and Preservation of Culture Media, Isolation of Pure Cultures, Cultivation and Study of Pathogenic Bacteria, Milk and Water Counts, Isolation of Sewage Bacteria, Valuation of Disinfectants, Preparation of Sterile Ampuls.

Four-year Pharmaceutical Course (after Dr. Schneider): First Year—Preparatory—The essential preparatory studies, Human Physiology, Physics and General Biology. Second Year—General Bacteriology—Lectures and Recitations, 30 hours; Study Preparation, 60 hours. Third Year—Laboratory Bacteriology—Laboratory, 120 hours. In addition to the usual laboratory course in general bacteriology, careful training in the exact technique of the preparation of the standard culture media and more important stains should be included. Fourth Year—Special Training.

At the University of Illinois School of Pharmacy we aim to teach the students especially all forms of sterilization and disinfection, apparatus being provided in the laboratory for such work. Likewise, the preparation of culture media receives much attention and every student is required to clean and sterilize all the glassware he uses and to prepare and preserve all the culture media he needs. Each student is required to isolate and, if possible, to identify and name at least one bacterial species. Such materials as hay, meat, feces, milk, water, sewage, air, pus, etc., are assigned for this purpose. Much attention is given also to the bacterial count of milk, water and food-stuffs and to the isolation of sewage bacteria. The valuation of disinfectants receives attention as also the sterilization of pharmaceutical solutions and the preparation of sterile ampuls. The students do not spend so much time on the pathogenic bacteria as do medical students, though they do make cultures and mounts of about 15 pathogenic bacteria. We have never done anything with animal inoculation, though in a complete course that certainly should be included. The recitations are based on assigned lessons in the text-book and thus the history and theory of the science are brought out. Especial attention is given to immunology and to the commercial preparation of antitoxins and vaccines.

Professor Jordan presented the report of the Section on Physics and Chemistry.

REPORT OF THE SECTION ON PHYSICS AND CHEMISTRY.

The work of this Section was organized as follows: 1st. Each member of the Committee was requested to prepare a set of 20 questions that he considered practical for State Board Examinations and that would also indicate, in a measure, the scope of the work that the members

were doing. 2nd. They were asked to submit any subjects that they considered of sufficient importance to merit discussion. 3rd. Complete sets of questions were later distributed and the members asked to criticize them. 4th. Subjects for discussion were submitted and opinions called for.

In general, the members of the Sub-Committee responded well to the requests for opinions, discussions, and questions, the only disappointing feature being that very few offered any criticisms of questions submitted. It is also to be regretted that a number of colleges of pharmacy had no representative on the Sub-Committee. The membership of the Committee was secured by Dr. Henry Kraemer and, as I understand, consisted of all those teachers of chemistry and physics in Conference colleges who volunteered to assist in the work.

The following subjects were discussed and the conclusions drawn by consensus of opinion:

Teaching of Physics.—The opinion was universal that Physics should be required of graduates in pharmacy. A majority of the Sub-committee considered that a year of High School Physics should be required for entrance to colleges of pharmacy, and this would satisfy the need for instruction in this branch. All agreed that if Physics was not required for entrance, a lecture and laboratory course should be given. If the curriculum does not permit this, as a last resort, physical facts should be taught in the Chemistry course, although this is not recommended as sufficient for the pharmacy graduate.

The following resolutions were presented and voted upon:

1st. *Resolved*, That Physics should be dropped from the Pharmacy curriculum, and that all necessary physical facts be taught in the Chemistry course. 7 No, 4 Yes.

2nd. *Resolved*, That the Pharmacy curriculum should require at least one-half year of Physics consisting of both lecture and laboratory work. 6 No, 5 Yes.

3d. *Resolved*, That the Pharmacy curriculum should require at least one year of Physics consisting of both lecture and laboratory work. 6 No, 5 Yes.

Many of the answers to these resolutions were modified by statements that are too lengthy for record here.

As a result of this study the Committee would recommend *That if Physics be not required for entrance to the College of Pharmacy, at least one-half year of Physics, consisting of both lecture and laboratory work, be required of all graduates in pharmacy.*

Another question that the Committee considered was the amount of time that should be devoted to theoretical chemistry in the General Chemistry Course. The Committee as a whole agreed that not enough theoretical discussion was given. The following resolution was presented: *Resolved*, That not less than one-half of the lecture time in General Chemistry should be devoted to theoretical discussion. Yes 8, left to instructor 3.

Your Committee recommends *That the National Pharmaceutical Syllabus require that more time be devoted to theoretical chemistry and that not less than one-half of the lecture time in General Chemistry be given to it.*

The subject of useless synonyms was discussed, and all agreed that too much time and effort are spent in memorizing synonyms, and that the number should be reduced to the minimum.

This resolution was submitted for consideration: *Resolved*, *That the American Conference of Pharmaceutical Faculties should recommend to the National Association of Boards of Pharmacy, and to the drug and chemical manufacturers and importers, that only official synonyms be used in examination questions and on containers of drugs and chemicals.*

This resolution was heartily endorsed and therefore your Committee recommends it for your consideration.

When the lists of questions were received, it was found that many of the teachers were asking for information that is usually considered unnecessary to remember, or can easily be found in reference books when needed, and has no value in the thorough understanding of the subject under discussion. In order to bring this to the attention of the members of the Committee, the following questions were submitted and the following answers received:

1st. Should students be expected to remember atomic weights? A hearty *NO!* in response, except a few that they will naturally remember by repetition.

2nd. Should students be expected to remember assay processes of the U. S. P.? Response—*NO!*

3rd. Should dose and therapeutic action of chemicals be taught in the Chemistry Courses? Response—“*NO!*” in most cases. Some thought it should be left to the instructor’s judgment.

4th. Is it important that students remember the number of assays of any particular type process? Response—"NO."

These questions and responses indicate that the teachers of physics and chemistry do not consider that it is necessary or valuable for students to remember data that, although necessary for the solution of problems, is of no value in understanding the processes involved, and can easily be obtained when wanted from any good reference book. Unfortunately, State Board Examiners do not always look at it in this light, but often place great weight on the ability to remember data. The Chairman of the Sub-Committee is of the opinion that this Conference should make a recommendation to the National Association of Boards of Pharmacy regarding this question, but the Sub-Committee has not as yet had time to consider the question in that connection, and is therefore not ready to offer a recommendation.

Many other subjects were discussed by the Sub-Committee, of which the following are representative:

1. Is opposition to chemical and physiological assaying by the average retail pharmacist who claims he never uses it and that it is for the most part impracticable, and belongs only to experts, justifiable? If so, why spend time teaching these things?

2. Is it really a "waste" of time for pharmaceutical students to take up courses outside the regular fixed curriculum, in order to be more polished and have a better understanding of others, and other sciences and arts, besides that of the circle of pharmacy?

3. Would not a year or two in Physics under good physicists pave the way for a better foundation to understand the physical phenomena met with in pharmacy?

4. Would not a year or two in mathematics, as higher algebra, trigonometry and calculus, help the pharmacy students in dealing with all mathematical calculations involved in the science of pharmacy?

5. Would not more time devoted to organic chemistry, physical chemistry, colloidal chemistry, and chemistry of synthetic drugs, aid more in establishing the pharmacist in his rightful place as an expert in his science and art of preparing, preserving, compounding and dispensing medicines?

6. Should the fundamentals of chemistry and physics be taught differently for pharmacy students?

7. Should a course in Food Analysis be included in the pharmacy curriculum, and how much time should be devoted to it?

8. Should a course in Physical Chemistry be included in the pharmacy curriculum? If so, should it be elective or required?

9. To what extent should Urinalysis and Toxicology be taught?

10. Should we not attempt to bring into the Course in Pharmacy laboratory work in chemistry that will tend to develop a desire on the part of the students for research problems?

11. I believe that the student derives the greatest amount of knowledge of his general chemistry by a great amount of time spent in qualitative analysis. Therefore, should not the student be given unknown mixtures of several bases and acids and allowed to work out his own salvation, giving him only sufficient instruction that he may not waste time or become discouraged?

Your Sub-Committee can only report progress on these subjects as time prevented the full discussion of them.

Miss Zada Cooper presented a report of the Committee to Investigate Short Term, Correspondence, Summer, and other Similar Courses in Pharmacy. This was published in the October, 1918, number of the JOURNAL OF THE A. PH. A., pp. 894-898.

WILLIAM MANSFIELD: Miss Cooper has shown us that there are a number of States in which there are schools which have no right to exist, and they are primarily in existence because the boards of pharmacy and the legislatures of those States have no pharmaceutical standards.

JACOB DINER: The paper of Miss Cooper deserves a great deal of discussion. On the one hand, we are talking about a four-year high school and a four-year pharmacy course, and, on the other hand, we have the six-weeks "fly-by-night" correspondence course. What are we going to do about it? Discussions are not going to solve this problem at all. It is up to the members of the boards of these States, where they have no prerequisite requirements, to insist that prerequisite requirements be introduced. In New York there was an avalanche of opposition

aroused when prerequisite was mentioned; today we have two years' high school and two years' college and we expect to have more soon.

HENRY P. HYNSON: I move, Mr. President, that this paper be referred to the two secretaries of the associations here assembled with the request and the authority that they have a large number of copies of this paper published. In my opinion the subject is presented in such an attractive way that it will be the most influential tract that could be circulated in the several States. I think the States could reimburse the faculties for this expense.

H. H. RUSBY: In seconding that motion, Mr. Chairman, I want to endorse what you yourself said a moment ago. I think it is not wholly up to the boards of pharmacy; I think if the boards of pharmacy do not have assistance from the schools of pharmacy in securing the necessary legislation, they are going to have a very hard time. I feel that the schools which have been insisting and clamoring so loudly for hasty work in elevating the standards of schools have been grossly negligent of their duties. Most of them have done nothing whatever, and some of them have said they did not care a thing about whether they got prerequisite laws in their States or not. Universities have a great deal of influence in their States; they are acquainted with legislative matters; they have attorneys and they could do an immense amount of work in securing prerequisite legislation. Why don't they do it? I, this morning, was going to offer in the Conference of Faculties a resolution directing the Executive Committee to ascertain what steps, if any, had been taken by the universities represented in the Conference looking to prerequisite legislation, and what success had attended their efforts, and to report at the next meeting. The secretary thought it might be misconstrued and be regarded as something aggressive and unfriendly, so I withheld it. It was not so intended.

While the boards of pharmacy must do their part, it is up to the schools of pharmacy to assist in securing this legislation, and if they don't do it, it is not likely to be secured at an early date.

R. A. LYMAN: I want to say a word with reference to the matter Dr. Rusby has just brought out. When we were in San Francisco, the Boards of Pharmacy passed a resolution recommending that we take steps to go to a four-year high school requirement in the year 1920. After that I felt perfectly at home with the Boards of Pharmacy, and I feel safer when I get up to discuss a problem which is concerned with the raising requirements in pharmacy when I am in the presence of board members than when I am in the Conference of Pharmaceutical Faculties. For three years the State universities have tried their very best to bring these requirements up to four-year high school requirements. They have done it in almost every State in the middle, northern, and western States, and have rejected the students who did not have such preliminary education. We have tried to get the Conference schools to come to the four-year high school requirements. Last year, in my presidential address, I put it up to the Conference. It had been put up to them by two presidents before me. It was put up by one president and reformed by the second one; in 1917 they begged these schools to put the adoption off until 1918. In 1918 they asked to put it off a little longer; we needed five years, so we put it to 1923, with an understanding among us all that in 1923 there would be no backsliding.

In the universities of my particular section, we are taking up the matter of prerequisite law; there is a committee, of which I am a member at the present time, working upon a prerequisite law for the State of Nebraska. I don't know whether it is a good thing for me to stand here and say so, or not; sometimes it is a good thing not to speak of activities, because opposition may be developed. I have always maintained, since I have been in the Conference, that it was the duty of the colleges to take the advanced standing. The colleges existed in America many, many years before the state boards were thought of, and the colleges have molded public opinion and made the organization of state boards possible. I have never been willing to say that I thought that the advancement should come from the boards, but I do say that the advancement has got to come from cooperation between the Conference and the Boards. I can assure you that in all the States where there are universities clamoring for a higher requirement, their faculties are not asleep in the legislative department of their States, and the time is not far distant when in every State in the Union, where there is a progressive university requiring the highest of ideals, you will find a prerequisite law.

W. F. RUDD: We have a prerequisite law in Virginia which was passed in February of this last year. I am sure that it is due entirely to the fact that the president of our board was

present in Indianapolis last year and got some fire in him which he carried down to Richmond and he sat there on his job. He lives three hundred miles away, but he went down to Richmond and stayed there all the time that was necessary during the session of the legislature, and he put over the prerequisite legislation in February of that year with not a negative vote in the Senate, and a large majority in the House. Now, if we, as Faculty people, and as Board people, can see this thing aright, we are certainly all going in the same direction. If we can carry home with us something of the spirit that Mr. John E. Jackson got from the meeting last year, then we will have prerequisite legislation coming up over and over again.

CHARLES FALKENHAINER: There has been something said here about universities not doing anything along the line of securing prerequisite legislation. To aid our efforts in that work, Dr. E. L. Newcomb came down to an Iowa legislative meeting, a year ago last winter, and addressed our association. His presentation virtually resulted in our getting a prerequisite law. There was contest, but the members were aroused and exerted their efforts until the fight was won. It requires persistent coöperative work.

H. M. WHELPLEY: I desire to amend the motion before the house to refer this matter to the secretaries of the two associations, by substituting that it be referred to the Editor of the Journal of the American Pharmaceutical Association with the request that the report by Miss Cooper be printed and that a supply of reprints be made of it for distribution to interested persons.

Prof. H. P. Hynson accepted the amendment, which was seconded by Dr. H. H. Rusby, put to a vote, and carried.

Professor C. A. Dye read the following report by title, which was accepted for publication:

REPORT OF THE COMMITTEE OF THE AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES ON
RELATIONS OF THE COLLEGES WITH THE BOARDS.

Those of us who were so fortunate as to be present at the joint session of the Colleges and the Boards last year, and heard the discussion which took place, will no doubt recall that a great many splendid suggestions were made relating to the establishment of closer relations between the two bodies. The ground was most thoroughly covered and there is little left, that is new, for your Committee to discuss or recommend. At most, therefore, we can but hope to emphasize more strongly some of the features suggested last year and perhaps present a few new questions for discussion.

Throughout the discussion there was uniformity of expression of the great desirability of the Schools and the Boards coming closer together and the wish for a closer coöperation in their work. We believe that with an earnest fostering of this spirit the grade and quality of the licentiates will be materially improved. This is certainly a condition greatly to be desired, if not actually demanded, at the present time, and one which we are sure all are trusting will be speedily brought about.

If, however, this view of coöperative work is to result in greatest influence and permanency there must be developed along with it a greater spirit of recognition of the value of the friendly criticism that may be offered by members of both organizations. Little can be accomplished if both sides come so far and then entrench themselves behind what they are pleased to call their line of personal privilege. Both are surely falling short of their duty to the students and the Commonwealth represented if personal ambitions are permitted to enter into the question of how far the best interests of pharmacy will coöperate. Personal ambition and personal privilege are both well worth while, in their proper places, and should be jealously guarded, but when they are permitted to influence every move and lead into political intrigues we are forgetting our duty as teachers and officers of the State we represent.

We believe that, as a rule, the Faculties are more willing to coöperate than are the Boards. The latter, if we may judge from various reports, are more or less inclined to stand on what they are pleased to call their prerogatives as State officials and resent any suggestions from impractical college professors. There was a time when the college professor might be looked upon as an impractical visionary, as devoid of real modern up-to-date, practical ideas as is possible to imagine, but that day has passed. That this is true we feel is more than evidenced by the way the Government is calling them into service. On the other hand, we unfortunately find a number of teachers who are unwilling to listen to suggestions and friendly criticisms from the Boards; they seem

to feel that they are omniscient and therefore can make no mistakes. That they should be so short-sighted and stand in the path of their own progress and the best interests of their students seems impossible.

Indeed we should think they would welcome such friendly criticism, for the members of the Boards are in position to judge better of the work we are doing as teachers than any other class of men.

It is to be regretted that we find such members in either organization for they surely stand in the way of any genuine and lasting progress. On the other hand, it is to enable these two groups to see their mistakes and profit by them that these joint conferences are held. That they are productive of good results is evidenced by the increasing number of Boards and schools that are seeking to identify themselves with the two organizations. This fact in itself is not enough; there must be something more behind the act of joining than the simple badge of membership. There should be an active participation, by representatives of both organizations, in not only their own meetings, but also the joint conferences. Colleges and boards that fail to maintain an active membership by representations should not be permitted to enjoy the rights and privileges, as well as the dignity and standing, that the membership carries with it.

As one member of the Committee states, "I should be glad to see more intimate connections between college faculties and the boards of pharmacy than exist on paper and by the annual meeting of representatives of both groups." In other words, the conference idea should not stop with our annual meetings, but should be carried back to our various states, there to be renewed. In this connection the member of the committee previously quoted says: "I would recommend that at meetings of the boards, representatives of the college faculties be occasionally invited to attend." The Chairman of your Committee believes even more enthusiastically in these joint conferences of the boards and the schools, and the benefits to be derived therefrom, and would therefore make the recommendation stronger, namely, that the boards should request that representatives from the various schools should meet with them at least once a year for a joint conference and discussion of the various problems of education and registration. Some may wonder what problems we might have either in common or individually wherein we could be of any service to each other in solving or, for that matter, any reason why we should wish to get any closer together. To suggest one or more such problems worthy of discussion, we might mention the question as to what extent we are using the *Syllabus* as a basis for our teaching and the Board examinations. It is of course to be assumed that we have some common basis, but even though we may, this must be used with care. With the *Syllabus* care and judgment must be exercised, even where it is used in a coöperative way, for if not, we will find some of the schools attempting to follow the outlines of the *Syllabus* to the letter and trying to cover all the details of a subject in a limited time. As a result their work is likely to be superficial and the students lack sufficient training in the fundamentals. On the other hand, as teachers, we may attempt to cover what we consider the fundamentals, and the Boards in their examinations assume that the subject has been completely covered. In either event the result is generally the same, failure for the student and embarrassment for the teacher. Such a condition could not arise if there were a closer relationship and coöperative spirit between the boards and colleges of the various states. At present the *Syllabus* is the only authoritative guide, which we have, that may be used by both the teachers and the boards as a definite basis for our work. It is a creation of representatives from both organizations constituting this joint conference, yet we wonder to what extent and by how many schools and boards it is followed. Surely we must have some basis and common ground for, and limitations to our work as teachers and examiners, if our work is to be efficient and the examinations are to be fair and consistent.

(To be concluded in next number.)
