

# THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

ADDRESS OF THE PRESIDENT OF THE AMERICAN CONFERENCE  
OF PHARMACEUTICAL FACULTIES.

W. H. ZEIGLER.

I desire first of all to thank you again for having elected me to the highest office in the Conference. The duties, I assure you, have not been great and it has been a pleasure to have served you. The most trying duty I have had to perform was the writing of this address. I feel that I have been greatly benefited by the knowledge gained from a review of the proceedings of the Conference and that I am in a better position to serve you in the future.

I shall not attempt to review the past achievements of this organization for this has been well presented by other presidents. I have no recommendations to make. After a number of attempts, I have decided to offer as the subject for my Presidential Thesis:

"THE PHARMACY  
CURRICULUM AND  
TEACHING  
METHODS."

With the session of 1925-1926, we enter a new period in pharmaceutical education. No longer will a Conference school confer a degree after the completion of a two-year course. The object of the new three-year Conference course is to educate more thoroughly the future



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have letters in my file from deans of Conference schools who wrote as late as April, that they were still working on the schedule. The smaller schools were handicapped by the lack of instructors and laboratory space. Obviously, an instructor could not be in two places at the same time, even if he had the place. The Conference requirement of 2250 hours, figured on a basis of eight months of thirty weeks, means approximately five hours a day of five periods throughout the year. Most of the members felt that they should give more than the minimum. As a consequence, I am afraid we are going to have a crowded curriculum of technical and cultural courses, and I am wondering if the results will be satisfactory. The Conference should consider very carefully both the minimum and maximum number of hours required. It is undoubtedly a mistake to crowd the curriculum, for the student should have time for study and review. I believe the time has arrived when the Conference should standardize, as nearly as possible, the minimum Conference course. The syllabus committee has given us an outline of the courses in the past, and will, undoubtedly, in time give us an outline for the three-year course, but what I would like to have is a

pharmacist. How this is to be accomplished is the duty of this organization and I know of no subject more worthy of discussion than our third-year curriculum and teaching methods.

It is my opinion that we should devote more of our time to the study and improvement of our pharmacy curriculum. This was brought very forcibly to our attention during the past year, when a great many of us began to plan the three-year Conference course. I

definite percentage of hours assigned to each branch and let the Conference see that it is enforced.

#### UNIFORM CURRICULUM.

Pharmacy is one of the few professions that I know of which has no standardized curriculum and the only one which, at the completion of certain studies, so many different degrees are conferred. One of our deans writes me that "he would like to express the hope that the Conference will not endeavor to reduce the curricula of all the schools to uniformity, but that each school may continue to have the chance to develop in its own way along the lines which seem to promise most, in the particular locality where the school is situated." It is my opinion that we should have a somewhat uniform curriculum. This need not be identical in every respect but a well-balanced schedule which would in the end give us a finished product. The curricula of all medical colleges, holding membership in the Association of Medical Colleges, are more or less uniform. The course is well defined with percentages for each branch, and the graduate in medicine can practice his profession intelligently in any locality.

During the past year I mailed to the deans of our schools our new three-year curriculum with the assignment of hours. I asked for a candid opinion and I believe I received what I asked for. The opinion of some was that the course was entirely too technical, that English, zoölogy, social science, etc., should be added; others said we had too many short courses. It was the opinion of some that more pharmaceutical arithmetic and bacteriology should be given. On the other hand, others replied that "the course as outlined is broad and comprehensive. A student completing it satisfactorily to the Faculty should be discharged as well equipped to perform the services required from a pharmacist."

#### CULTURAL COURSES.

A question that we should discuss at this time is: Shall we add certain cultural courses to our three-year curriculum? It is my opinion that we cannot make our course too technical. It is our duty to educate our students along pharmaceutical lines. If zoölogy, social sciences, physical education and the languages are necessary to the study of pharmacy, then let us require these as pre-pharmacy studies. Let us teach the pharmacy subjects so as to bring out their intrinsic cultural value. I am convinced, after having taught two classes of high school graduates, that the educational requirements are not high enough. What are we going to do about it? If we add to our curriculum cultural courses, the pharmacy courses must be curtailed. I would like to have the Conference create a Committee, whose duty it will be to confer with the heads of high schools throughout the country in an endeavor to so grade the high school course that young men coming to us will have subjects that will prepare them to take up the study of pharmacy. Our students should have more English and mathematics; physics and biology should be required studies. We should encourage the scientific teachers of the high schools. We should persuade the authorities to introduce these courses into the high schools. There should be at least two scientific units in the high school course, selected from chemistry, physics, biology or botany. It seems, that as general biology would prepare the student for pharmaceutical botany and as physics is the science in the terms of which all other sciences are expressed, that these subjects are preferable. Chemistry is useful, but must be started again at the initial point in every pharmacy school. Botany would be, perhaps, too limited in its results; biology and physics would be of value to the student in whatever vocation he followed. If we cannot arrange to have the high schools add certain sciences to their curricula then we should require at least one year of pre-pharmacy work for entrance. In view of the fact that some of our high schools require only fifteen units for graduation, I would like to present for discussion the advisability of the Conference requiring sixteen

or eighteen high school units for entrance to any of our Conference courses—four of these to be English, two mathematics, one history, two Latin, and two science. The science to include physics and biology.

#### BUSINESS ECONOMICS.

I believe our curricula should be so arranged that the first year would be devoted principally to the laying of the foundation, and the last years to practical work. I, for one, feel that there is enough in the fundamental branches, pharmacy, chemistry, botany, pharmacognosy and pharmacology to occupy the student's time for three or even four years. I believe a course in business economics should be stressed in our minimum Conference course. This year our school employed a public accountant who organized, in my opinion, an ideal course in correct business practice. Special lectures were given by lawyers, bankers, wholesale druggists and others. The idea of this course is to equip the student to meet the ordinary problems which confront the druggist in organizing, financing, managing and developing a successful enterprise. Our minimum pharmacy course is intended to prepare the graduate to practice general pharmacy. Since pharmacy, as it is practiced to-day, is largely commercial, we should give the student a good working knowledge of the science of business. This branch should be given a place in both the second and third years. Commercial pharmacy, business economics, call it what you will, has come to stay. As Dr. Charters said last year in his address before this Conference: "The pharmacist should have a knowledge of two things—how to run a drug store, as well as how to perform his duties as a pharmacist." Business is recognized as a science. It truly is a profession.

First aid or minor surgery should also, undoubtedly, be given a place in our curriculum. The pharmacist is often called upon to render first aid until the physician arrives. He should know how to apply a bandage, control a hemorrhage and administer treatment until medical aid can be secured.

The question we should decide upon is: What is the minimum a man should know about pharmacy? There is no limit to the maximum. The commonwealth study will do much to solve this problem for us. I would like to submit, as a curriculum for our minimum course, the following subjects: Pharmacy, thirty-five per cent; chemistry, thirty-five per cent; pharmacology, eight per cent; botany, seven per cent; pharmacognosy, ten per cent; physiology, two per cent; bacteriology, two per cent; first aid, one per cent. This figures out seven hundred and eighty-seven hours in pharmacy; seven hundred and eighty-seven in chemistry; one hundred and eighty in pharmacology; one hundred and fifty-seven in botany; two hundred and twenty-five in pharmacognosy; forty-five in physiology; forty-five in bacteriology and twenty-five in first aid. Pharmacy and chemistry are taught in all three years; botany in the first year only; pharmacognosy in the second and third years; pharmacology, which includes bio-assay and toxicology, in the second and third years; physiology in the second year; bacteriology and first aid in the third year. It may be advisable to eliminate the specialties, such as bacteriology and bio-assay. I am not sure that manufacturing pharmacy should be featured in our third year. This, too, is a specialty and could be treated as such. We must see that our men are given more practical work in pharmacy. Some time ago, one of our leading pharmacists told me that he had employed not only our graduates, but graduates of other colleges, and had found them all deficient in practical pharmacy. He said: "For goodness' sake, give your men more practical pharmacy and eliminate some of the other branches that they never use."

The aim and object of our three-year pharmacy curriculum is to turn out the highest type of pharmacist. To accomplish this, we must require a broader preparation and a more evenly balanced curriculum. I admit progress has been made and that, as some one has said, "We should make haste slowly," but the fact remains that we are not satisfied with our educational requirements. We

are not altogether satisfied with our minimum Conference course. We have not done as well as we could do. The point I wish to emphasize is, that the time has not arrived when we can afford to rest upon our laurels. I am optimistic, however, for I feel that this Conference of pharmaceutical educators, feeling their responsibility, will, in the end, not only see that the foundation is sound, but that the structure of our future pharmacist is erected along lines that will hold. We have a duty to perform. We must see that the public is protected and that pharmacy is placed where it belongs among the professions.

Do not misunderstand me, I believe all of us have been conscientiously doing our best, in our own way, to obtain good results and make good pharmacists of our students. We must not be satisfied, we must push on.

#### TEACHING METHODS.

As a body of teachers, we have made wonderful progress along certain lines. The time has arrived, however, when we should endeavor to improve our methods of teaching. During our past Conference meetings, we have consumed too much valuable time in routine matters. This has been necessary, but it should be incidental and the reading and discussion of papers on teaching problems featured. I believe we should have a committee on papers. The duty of this committee would be to see that at least ten papers on subjects relating to the curriculum and teaching methods are presented at every Conference meeting and that these papers are fully discussed.

We have had papers presented before this Conference on the teaching of certain pharmacy subjects. As a rule they were received and allowed to take the *regular course*. Some of them were not even discussed. The papers presented by Prof. John C. Krantz at the last two meetings of the Conference, "The Correlation of General Chemistry with Pharmaceutical Chemistry" and "Shall we Teach Chemistry by the Project Method?" are worthy of attention. The project method undoubtedly has its merits. I use it to teach incompatibilities, the chemistry of plant constituents and certain reactions that occur between living animal tissue and drugs. The only criticism I have to offer of this plan, is that it is limited to certain subjects, and if the student is left alone to work out an exercise he often fails to get results and therefore becomes disheartened.

In the class room I believe a teacher should never lose an opportunity to illustrate practically the subject being presented. Nothing will impress the student and hold his attention so much as a demonstration.

Correlation is a topic to which we should give more thought. Each one of us has, to a large extent, been working independently to make our specialty as perfect as possible. We are all working to produce a finished product. We believe our methods are correct and as a matter of fact there has been very little coöperation among us. Each of us presents our subject to the student as a separate study and in consequence he has, in the end, to put them together, so he can properly use the information to practice his profession intelligently. The question is: Where can we correlate? Can we correlate throughout the pharmacy curriculum? It may not be possible to correlate all of the branches, but certainly the major studies could very easily be welded or fused together. Pharmacy is to a large extent chemistry and there is often a repetition of chemistry throughout the major courses. This could be avoided by having the teacher of pharmacy call in the chemist to present his side of the subject. When the pharmacologist reaches the subject of, let us say, the circulatory stimulants, he should call in the physiologist to present the physiology of the circulation. The botanist and the physiologist, the pharmacognosist and the chemist should each in joint meeting discuss points of special interest. We have had some correlation in our school but during the coming session I am going to have night conferences of our teachers and work out a systematic plan of coöperation in the correlation of our pharmacy branches. I believe, in order to bring about the best results in coördination, Faculty members

should visit each other during the teaching hours so they will be more familiar with the methods used by teachers in other departments in presenting their subjects.

It appears to me, since our minimum course is of three years, that we must devise some plan to review the work of the first two years. Often questions asked by the State Board of Examiners cover the first year's work at college. I believe our final examinations, at the end of the third year, should include all the work of the three years on all branches. If the student knows that when he comes up for graduation he will be examined on all his three years' work, he will soon learn to correlate and will review the work of the past regularly.

The following questions asked by our Professor of Physiology, on a final examination, may be of interest.

1. Of the branches you have had, which do you think most related to physiology?
2. What branches you will have, do you think most related to physiology?
3. What is the relation between physiology and botany, chemistry, practical pharmacy, pharmacology?
4. What part of chemistry do you use most in physiology?
5. What natural pharmaceuticals do you find in the body?
6. What position does physiology hold in general culture?

Questions of this character could be easily applied to other subjects. Chemistry is a good field for correlation. The teachers in pharmacy and chemistry should work together. The Professor of Pharmacy should call the Chemist in to review the chemistry of the drugs being discussed. To be sure the Professor of Pharmacy knows the chemistry also, but when it is presented by the Chemist, the effect is to hold the student's interest and make him realize that his pharmacy course is in the singular and not a series of courses in chemistry and pharmacy. Unnecessary repetition should be eliminated throughout our curriculum. There is no need for the physiologist to repeat the histology of the cell, when it is given in botany, further than to show that a cell is a biologic unit through all forms of life. There is no need for the pharmacologist to repeat the botanical origin of a drug when it is given in detail in the course on pharmacognosy. The bacteriologist and the botanist should correlate. As a matter of fact, all the branches taught in a pharmacy course could be correlated in some manner which would help us to graduate men who will know how to use the information gained. Carefully formulated questions will aid the teacher in determining if the student has a general knowledge of the subject. As an example, the following question is asked by the Professor of Pharmacology: Give an outline of the chemistry, pharmacy, botany, pharmacognosy and pharmacology of digitalis. It is very evident that a question formulated along this line, especially when the student knows in advance that he will be held for a general knowledge of a subject, cannot help but work to advantage. We must help the student to think for himself. As some one has said: "Such improvements as we have had introduced into our practice of teaching usually result in aiding the student to get along more easily without thinking, rather than making it more necessary or more pleasurable for him to do his own thinking. The cut and dried formula that most of us use will destroy the independence and initiative of the student."

Personally, I have discontinued the system of lecturing. I teach by assigning certain subjects from the text which I explain and upon which a quiz is held during the next period. Once a month I have a written quiz and at least once a month an individual oral quiz. During these oral quizzes, which are held in my office, I do not hesitate to ask questions on pharmacy, chemistry, botany and other subjects in the curriculum. A plan that I have worked very successfully in my course on pharmacology may be of interest. I refer to the system of calling upon a member of the class to act as quiz-master. The name of the student is drawn from an envelope and the card returned so that the same student may be drawn the second time or even the third time. The advantage in a quiz of this

kind is very evident. The student must be prepared to ask as well as answer questions. He never knows when his turn will come and, rather than stand before his classmates and display his ignorance, he keeps himself in readiness. I always remain in the class room to see that order is kept and that the answers are correct.

Another plan adopted by our school this year is one requiring first and second year men to present theses for advancement. A thesis is also required for graduation. The subject is provided by a committee of the faculty and given out not later than March. We believe this will give the student valuable experience in looking up references, practice in writing a paper, and aid in making him correlate for himself.

While on the subject of teaching methods, I would like to suggest that we discuss the advisability of requiring of all applicants for admission to membership in the Conference, that the faculty be composed of at least six full-time men and that four of these teachers must possess not only graduate degrees in Pharmacy but also have had practical experience in a drug store. I do not believe that we can specify other qualifications at this time, but I do feel that we should see to it that at least six of the faculty members devote their entire time to teaching.

In conclusion, may I hope that the thoughts expressed in this paper will be freely discussed for it is only by a frank, full discussion in this Conference that we will be able to solve some of our problems.

I therefore present for discussion the following topics which have been outlined in this paper.

#### SUBJECTS FOR DISCUSSION.

1. Shall we require a pre-pharmacy course for entrance or shall we require sixteen or eighteen high school units for entrance? Of what should the high school units consist?
2. Shall we have a standardized curriculum for our three-year course?
3. What should be the minimum and maximum number of hours?
4. Should certain cultural subjects be taught in the three-year course?
5. The subject of correlation.
6. The subject of quizzes and examinations.
7. The value of an essay for advancement and graduation.
8. The subject of faculty requirement for membership in the Conference.

#### AMERICAN COMPETITION AND FOREIGN MANUFACTURERS.

Jesse Rainsford Sprague, writing in *Scribner's* for September, has this to say regarding the American standard of living and its possible effect at a later day:

"We speak of the American standard of living as though it were something to which we have an inalienable right. The United States cannot continue to do things found by other nations to be extravagant. The plain facts are that we have so far been able to maintain a higher standard of living because we have inherited a vastly rich country with tremendous natural resources. We have been living on our capital. In the long run we will have to match personal ability with the harder living people of other countries.

"Professional optimists tell us that mass production which America has so amazingly developed will solve all our problems. But mass production is easy to imitate. Germany, for example, is rapidly copying our methods and with cheaper human labor to operate its machines can produce cheaper than we. Moreover mass production needs world markets. Our own population cannot buy fast enough to keep up with the product of our machines. But if we sell abroad then we must buy abroad. If we buy abroad, then our work-people and farmers must match their efforts against the poorer work-people and farmers of other countries. If we put up our tariffs, then mass production saturates our home markets and the factories must stop until the goods produced are used up."