

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C. B. JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A. A. C. P., EDITOR OF THIS
DEPARTMENT.

The following papers, "Why Organic Chemistry Should Be Taught in the School of Pharmacy" by Dr. C. J. Klemme, and "What the Department of Pharmacy Expects of the Department of Chemistry" by Dean H. C. Newton, are worthy of careful perusal by all teachers of pharmacy and pharmaceutical chemistry. The arguments that Dr. Klemme sets forth for the teaching of organic chemistry by an individual prepared in pharmacy are, to my mind, irrefutable provided, of course, the individual is a well-trained organic chemist and a good teacher. That the department of pharmacy should expect cooperation, sympathy and understanding of the problems of pharmacy by the department of chemistry is to be expected by all, and Dean Newton has summed it up very well in his conclusion which is found at the end of his paper.—C. B. JORDAN.

WHY ORGANIC CHEMISTRY SHOULD BE TAUGHT IN THE SCHOOL OF PHARMACY.

BY C. J. KLEMME.

The subject of this paper has been limited to the question of teaching organic chemistry in the school of pharmacy because, although the same question might arise in connection with other branches of chemistry, organic chemistry seems to be more vitally linked with the substances composing our *materia media*.

The department in which organic chemistry is taught and the type of course given in the various schools of pharmacy depend upon several factors, among which we might consider, as the most important, the attitude of the school authorities and the physical structure of the school. However, the discussion in this paper will be limited to reasons for advocating the instruction of organic chemistry as an integral part of the work done by the school of pharmacy and not that of an extraneous department.

It is true that the fundamental principles of organic chemistry are the same in any course on that subject, but any teacher dealing with this course knows that certain phases may be stressed or slighted according to the needs of the student. It is obvious that the needs of students in pharmacy, chemical engineering, home economics and chemistry as a major differ to a considerable extent. The chemical engineer is interested only in fundamental principles and their applications and not specific details of any particular class or classes of chemicals, for he knows not what field of endeavor he will encounter upon graduation. The home economics student is interested primarily in food stuffs, textiles and perhaps dyes to a limited extent. The student majoring in chemistry requires a knowledge of reaction mechanism, atomic and molecular structure, and the application of physico-chemical methods to the synthesis and analysis of compounds. The pharmacy student must concern himself with not only the fundamental principles of organic chemistry in general but also the properties of specific classes of substances with which he will come in contact during his career.

It might be well to point out a few examples of phases in organic chemistry which, the author feels, the pharmacy student should be taught, and which are not given sufficient weight in what we might call a general course.

The U. S. P. directs that "ether to be used for anesthesia must be preserved only in small, well-closed containers, and is not to be used for this purpose, if the original container has been opened longer than twenty-four hours." No reason is given for this caution, but if an instructor in organic chemistry discusses the formation of peroxides along with possible effects of these substances, the reason for such strict caution is immediately explained.

The U. S. P. states that "chloroform contains not less than 99% and not more than 99.5% of CHCl_3 , the remainder consisting of alcohol." Why the presence of the alcohol? Why not some other substance? Is the alcohol an impurity or does it have a purpose? In the discussion of chloroform in the chemistry class, the instructor should explain the decomposition of chloroform into HCl and phosgene, and tell of the use of ethanol as a negative catalyst in this decomposition. The same explanation would apply to the use of methanol in formaldehyde to prevent polymerization. He should also tell why chloroform to be used for anesthesia is prepared from chloral and not by other methods.

In a general course in organic chemistry, the modern synthetic medicinals receive but scant attention. Due to the increasing use and value of these drugs, a pharmacy student should acquire a fairly comprehensive knowledge of their preparation and properties. The least that could be done in any course is to outline the method or methods by which some of these compounds are actually prepared instead of giving a purely theoretical method, which, when put into practice, affords a very small yield. A particular case along this line is that of phenylbarbital.

Of considerable interest to the student in pharmacy is the relationship between chemical structure and pharmacological action. We must admit that knowledge along this phase of the work is meager in the extreme and yet there are some very interesting points in this relationship which might well be brought to the attention of the student.

Alkaloids are passed over in a general course usually with an inadequate definition and a statement to the effect that they are rather heterogeneous and complicated. Yet to the pharmacist, these are tremendously important substances. Glycosides might be similarly cited. When the pharmacy student has not received adequate instruction in the glycosides, he finds himself at some loss in the study of materia medica where he discovers that so many drugs contain one or more glycosides as active principles.

There are other special classes of substances we might mention, such as the dyes and stains, volatile oils, waxes, etc., which do not receive the attention that should be given to them by a student of pharmacy when he takes a general course. The reason is natural and obvious. Many of these substances are not members of the great classical groups of organic compounds, but come under general headings of compounds containing two or more functional groups. The chemical engineer, the home economics student and the biology student are not seriously concerned with them, but to the pharmacist these substances constitute a group with which he should have more than a nodding acquaintance.

The author has been able to follow the progress of pharmacy students under both systems of teaching organic chemistry and it is his firm belief that wherever the physical set-up makes it possible in a university, organic chemistry should be

taught to the pharmacy student in the school of pharmacy and by an instructor who has graduated in pharmacy. Such an individual is in a position to know the exact needs of the student and can supply those needs to the furtherance and betterment of the student's education.

WHAT THE DEPARTMENT OF PHARMACY EXPECTS OF THE
DEPARTMENT OF CHEMISTRY.

BY HOWARD C. NEWTON.*

"Blessed is he who expects nothing
for he shall never be disappointed."

It must have been these words of Alexander Pope, written in 1727 in a letter to Gay, which inspired the answer of my friend, a teacher of Pharmacy, to my question, "What do you expect of the Chemistry Department?" He replied, pessimistically, "I expect nothing, so that anything I get will be better than I expected." However, this is not the unanimous answer to the question. Far from it. Another Pharmacy teacher replied, "I expect much of our Department of Chemistry and it always more than meets my expectations." Thus we find the two extremes and doubtless the true answer lies between them.

Realizing the difficulty in obtaining an accurate consensus of opinion on the subject of this paper, I decided to render my own opinion on it and, thereby, provide material for criticism and discussion in this Conference. In order that you may "read between the lines" more readily, I will state that my opinion is based on some twenty years of experience in Departments of Pharmacy, several of these years in an executive capacity, and on a recent study which I have made in the field of pharmaceutical curriculum construction. I am bringing to you who are teachers of Chemistry, therefore, the opinion of one who lives on the pharmaceutical side of the fence, if there is a fence between the two departments (which I doubt).

The expectations of the Pharmacy Department with respect to the Department of Chemistry, may be classified in two divisions—those which are more general and might apply properly between any two departments, and those which are specifically applicable to these particular departments of our discussion. I shall speak of the general expectations first.

The Department of Pharmacy, first of all, expects the Department of Chemistry to cooperate actively with it in doing everything possible for the present and future welfare of the student who is being educated and trained for the practice of some phase of Pharmacy. I purposely emphasize the welfare of the individual student—the individual Pharmacy student, because his interest should be the paramount interest of the two departments. His success in his chosen work is perhaps an approximate measure of the quality of the instruction he receives.

When a student enrolls in a college of Pharmacy, he does so, I believe, with the feeling that his curriculum is one that has been carefully constructed and coordinated for the purpose of preparing him for the practice of pharmacy. He has no reason to suspect that any department with which he comes in contact in his

* Creighton University, Omaha, Nebr., 1933.