

TEACHING LABORATORY WITH THE BEGINNING PHARMACY COURSE.*

BY INA GRIFFITH.

It seems that there is some controversy as to whether laboratory should be taught with the beginning pharmacy course. This statement is upheld by the fact that the bulletins from forty-six Colleges of Pharmacy, which were consulted, indicated that laboratory is not being taught with the beginning course in pharmacy in 34.7% of these colleges.

In my opinion laboratory work is essential with the beginning course and I shall give my reasons for this opinion. The course, as conducted at the University of Oklahoma School of Pharmacy, consists of two hours of lecture and two hours of laboratory per week. The work is designed so that material dealing with laboratory experiments has been discussed at least within the week before the experiment is performed. The assignments for the first two laboratory periods are library work. The students are asked to read and write summaries of the prefaces to the United States Pharmacopoeia, the National Formulary, the New and Non-official Remedies, the United States Dispensatory and the National Standard Dispensatory. During this time in lecture we are discussing the history of pharmacy, the pharmaceutical Code of Ethics and the important publications.

A manual has been prepared which our students use as their laboratory guide. The first experiments they perform are in metrology. The students make measurements of length, volume and weight in both the metric and English systems and from their results arrive at the relationships of these two systems. The remainder of the semester includes experiments on specific gravity, melting-point determination, evaporation, distillation, sublimation, desiccation and exsiccation, comminution, solution, decantation, filtration, clarification and decoloration and separation of immiscible liquids.

In the specific gravity experiment the students determine the specific gravity of a liquid with the Westphal Balance, hydrometer and pycnometer, thus, checking their results and observing some of the sources of error of the apparatus. Both the Fahrenheit and Centigrade thermometers are used for the melting-point determinations showing the different range of the two scales.

The evaporation and sublimation experiments indicate to the students the different types of products that may be obtained, depending upon the control of the temperature. The students are required to separate as effectively as possible a mixture of alcohol and water by fractional distillation. They steam distil oil of turpentine and the aqueous-oleaginous distillate is kept in their desks for separation when the experiment of Separation of Immiscible Liquids is performed.

The properties of deliquescence and efflorescence are revealed by observing the weights of materials possessing these properties both before and after exposure to air. The solution of solids is studied with particular reference to the methods of hastening it and the change of temperature which takes place in some cases.

The students prepare Milk of Magnesia and wash the precipitate by decanta-

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tion. Finally, they decolorize a solution by allowing it to stand in contact with activated charcoal for a stated length of time.

Now, I feel that these and other experiments are valuable in the Beginning Pharmacy course because: *first*, they assist in the development of the student's technique. It is a well-known fact that students cannot develop technique by merely watching demonstrations. If the students are allowed to use their hands and correlate that use with their thinking they will acquire efficiency in handling more intricate apparatus that will be necessary in later courses. The students should be urged to use minimum quantities of materials which, of course, is an attribute to perfect technique.

Second, the purpose of this beginning laboratory course is to familiarize the students with processes and apparatus which they will use in later courses and finally at the prescription counter. We have found that this course serves as an introduction to the students and is a time-saver for them later when these processes and apparatus are employed. They must have an intimate acquaintanceship with laboratory technique and the way to gain that acquaintance is by actual employment and use of both processes and apparatus. My contention is borne out by this illustration from a leading pharmaceutical journal. It was said of a young man that "an acquaintance with the courtship of Dante and Beatrice will do him good but it will be neither so illuminating nor so satisfying as an affair of his own."

Third, the laboratory work helps to create and hold the interest of the students in pharmacy. The answers of the students themselves to a direct questionnaire provide testimony as to the effectiveness of the course in this capacity. By necessity most of the curricula do not include more than the beginning course in pharmacy in the first year's work. Many of the students become discouraged in spending their time on what they consider unnecessary work.

The experiences gained by students in this laboratory course and their experiments with processes and apparatus more clearly illustrate to them the direct application of these subjects of the curriculum to pharmacy, and give them an insight to some of the things they may expect later.

The reasons for teaching laboratory with a beginning pharmacy course may be summed up in the words of the German poet, Christopher Martin Wieland—"However learned or eloquent, Man knows nothing truly that he has not learned from experience."

NEWER IDEAS IN TEACHING A FIRST COURSE.*

BY E. V. LYNN.

All of you will agree undoubtedly that there is much opportunity for improving the results of teaching a first-year course in chemistry. In order to gage accurately these results, naturally we must base our opinion on how well the *average* student is able to grasp the principles we are endeavoring to teach. On this basis, the writer is willing to admit that he is entirely dissatisfied with his own experience

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