furnish lecture and demonstration material on this subject. The types of brushes which should be considered and which are listed in Charters' report are hair, tooth, bath, bottle, hand, camel's hair, nail, massage, complexion, eye brow and face brushes, given in order of their importances. Shaving brushes also should be discussed.

It has been the experience of every salesman that it is possible to sell a more expensive article, providing he can point out to the customer the quality of the more expensive one, showing why it would pay to purchase quality merchandise. In this way much bristle goods business which is now going to the variety store may be brought back to the retail druggist.

A study of foot preparations may also be included in this course, as they occupy an important place in the drug store. It is possible to sell related appliances provided something is known about this class of merchandise; for instance, how many druggists will suggest the use of a metatarsal arch support to a customer who is suffering from soft corns? Yet, about 90% of soft corns are caused by a weakened metatarsal arch. Such information makes it possible for druggists to increase their sales and thereby their profits.

In visiting a number of stores this summer, and speaking to the proprietors or managers of the stores, I found the greatest criticism of the graduate was that, although his theoretical training was good, his practical training was lacking. In the front of the store he was a liability rather than an asset.

By including courses of this nature, which would familiarize the graduate with the articles commonly sold in drug stores, this criticism would largely be overcome.

It would not be necessary to make this course required. If a student plans on entering the retail pharmacy field he will see the value of training in this line. If he intends to follow scientific lines he may find other courses more valuable to him.

A course of this nature may be made interesting by including the history of various items discussed. Sales talks, by various members of the class, with criticism, may also be used, although this must be limited, as time generally does not permit extended discussion. However, certain errors in salesmanship may be shown and the students become more critical of themselves and others.

THE PRESENTATION OF BASIC SCIENCES IN A SCHOOL OF PHARMACY.*

BY T. C. DANIELS.[1]

In November of 1933, an article appeared by Klemme (1) on "Why Organic Chemistry Should Be Taught in the School of Pharmacy," in which an appeal is made to stress the application of this subject to the professional needs of the student. The article presents one side of a fundamentally important question in Pharmacy education. Since my experience is somewhat at variance with the views expressed in this article, I should like to present for your consideration some reasons why Organic Chemistry and other basic sciences should not be presented with this so-called "pharmacy-slant."

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* Section on Education and Legislation, A. PH. A., Portland meeting, 1935.

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I believe pharmacy education has suffered more as the result of modification and attempted application of the basic sciences than from any other single educational factor. This method of presentation was a necessary evil when the two- and three-year curriculums were standard, but in a four-year curriculum it is not necessary nor justifiable. The fundamental method of approach as advocated by Harrod (2), Little (3), Jenkins (4), Fischelis (5), Rudd (6) and others decidedly represents the preferred method of instruction.

There have been many attempts to modify textbooks of Chemistry, Physics and Botany "to meet the needs of students of Pharmacy." These attempts for the most part have resulted in abbreviated, simplified texts partially or wholly inadequate for their intended mission. How many applied texts in chemistry or physics have you examined that you consider the equal of a sound text concerned only with the presentation of the fundamentals of the science? The pharmacist of the future, in order to properly discharge his duties, must be thoroughly trained in the fundamentals of physics, chemistry and the biological sciences, otherwise his professional service is limited largely to the status of a pseudo-technician having little understanding of his chosen work. It must be recognized that a broad and adequate foundation in the basic sciences is a prerequisite to their application which must follow. Indeed, pharmacy consists essentially in their application. "Watered courses" in these sciences are a menace to the proper growth and development of the profession.

We must all agree on the absurdity of expecting a student to apply a science without having first mastered its principles and gained a proper perspective of its significance.

There is a great deal of truth in the statement that "a little knowledge is a dangerous thing." Does the pharmacy student require less of the "fundamental principles and their application" than the chemical engineer? Does he require less of a knowledge of "reaction mechanism, atomic and molecular structure and the application of physico-chemical methods to the synthesis and analysis of chemical compounds" than the student majoring in chemistry? If that is your opinion, then you must also believe that it is unnecessary for the pharmacist to know anything of the syntheses and development of new drugs or of their physical and chemical properties. Without such training all information on substances of such complexity as drugs must necessarily be gained by rote. This is neither feasible nor desirable.

In order to arrange for a satisfactory transfer of credits from colleges of pharmacy, it is necessary that educators in other fields give full recognition to the courses in basic science. This recognition will largely depend on the contents and method of presentation and only where basic and fundamental instruction is rigorously employed can it be expected to meet with approval.

The proponent of the applied system of basic instruction will say, to be sure we must teach the principles of these sciences, but why not point out to the student, in passing, points that are of interest to his profession? I believe such teaching is psychologically unsound, because the pharmacy student is above all interested in those things which apply to pharmacy, and if principles are continually referred to the thing in which he is most interested it becomes for him a detached fact applicable to his interest, and not a principle which can be employed as such. Fur-

thermore, there is a tendency for the student to over-emphasize those things which apply directly to his profession and to consider all others of lesser importance. To clarify this point somewhat, assume a course is being offered in Analytical Chemistry for students of Pharmacy and in order to present an applied course official preparations are selected for the instruction. The student may master fully the material presented. He may be able to write chemical equations, and give explanations for the reactions involved, but unfortunately he is not grounded in the principles necessary to permit him to work independently. He is more than likely to be at a loss when placed on his own initiative. It is true he has learned many facts concerning analysis but nothing of principles which he is capable of applying to new problems. On the other hand, if he had mastered a sound course in the principles of analytical chemistry without reference to its application, his chances for working independently are much greater whether the work is, or is not, related to medicinals. In my own opinion, time spent in the application of a basic science is time not only lost in the development of the subject, but that it serves also to confuse the student because of the cross-objective fundamentals and their application.

In the examples of ether and chloroform mentioned by Professor Klemme, certainly no harm results in pointing out that ether is capable of peroxide formation and that chloroform is stabilized by the presence of a small amount of alcohol, etc. It is, however, to my way of thinking, a very serious mistake to discuss ether and chloroform of the United States Pharmacopœia in a basic course in organic chemistry. The teacher of a basic science must remember that he is teaching a subject; whether he is teaching a group of chemical engineers, pharmacists or chemistry majors is purely incidental and ideally should have no influence in the presentation of the subject. He is concerned with the teaching of basic principles only and the more successful he is in this instruction, the easier it will be to apply the subject in courses which must follow. In order to cover the principles of organic chemistry, and to attempt application at the same time as suggested by Professor Klemme, it would require a year course of at least ten units per semester, and even with such a course it is quite problematical if the student would finish with a useful perspective of the subject.

As to whether the basic science courses are presented in the colleges of pharmacy proper, or are presented in their respective academic departments, is a matter of no great concern and should depend entirely on the facilities and general organization of the school. It is of great importance, however, that wherever they be given, they shall be presented in a purely academic and fundamental manner.

I do not wish to be dogmatic on a subject having so many variable factors as teaching. It is commonly recognized that a great deal depends on the individual teacher, his training and experience, but I do want to call your attention to the danger of encouraging application of the basic sciences as a general educational policy. If teachers of such courses, with pharmacy training as a background, fail to recognize this danger, then teachers having no training in pharmacy should be preferred for the presentation of these subjects.

There is time available in a four-year curriculum in pharmacy to give good fundamental training in the basic sciences, with time remaining for their proper

application. Students receiving such training will be able to work with greater understanding and be better prepared for handling their professional problems.

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ENTANGLING ALLIANCES.*

BY W. F. RUDD.[1]

The price we pay for experience is disillusionment. The enthusiasm of youth sees the highways of life largely as parallel ways with few convergencies and fewer dangerous intersections: and so it goes all through early adolescence. Whether the issue be work or play or love or ambition, youth treats them all as individual problems.

Hardly are we out in the world, however, when the picture changes abruptly, and often completely. Decisions on any important issue are inextricably interwoven with decisions already made, and with others that we little dreamed would be so promptly forced upon us.

Trite observations, you will say, and they are. But upon just how well we learn to avoid unnecessary entangling alliances, or finding ourselves already in them, how well we are able to balance them against one another in the light of the principles involved or in the light of our experience, is at least one measure of our ability to make a place for ourselves in the world.

Just what all this has to do with the section on Education and Legislation is a natural inquiry. My only apology for this paper is that in my deliberate judgment few of life's activities present more of them and more dangerous entangling alliances than does the broad field of pharmacy.

One speaks with confidence only from one's own experience. It is therefore necessary to be somewhat detailed and personal in this brief paper. College of Pharmacy deans and their staff members have opportunity to see the currents and cross currents in pharmacy in a most intimate fashion. Nor are we permitted to live apart and watch these currents in an impersonal way. We are caught in them, whipped about, lose our moorings, are temporarily submerged and some of us lose out permanently. The more stalwart ones emerge battered and bewildered but usually, perhaps, better prepared for the next emergencies. There is no excuse for such figures of speech except that one naturally hesitates to approach the subject boldly and in detail. However, a few concrete examples of some of the more important cross currents which have materially affected pharmacy may be cited to indicate how involved it all is.

A common experience among our group is some sort of consulting connec-

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