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THE TEACHING OF BOTANY IN PHARMACY COLLEGES IN RELATION TO PHARMACOGNOSY.*

BY WILBER J. TEETERS.¹

The most successful teaching of any science is to have a definite objective. In other words, definitely land the student somewhere and, if possible, create an interest and love for the subject.

The question has been raised as to whether the beginning course in botany as taught in our colleges really and truly prepares the student for the study of pharmacognosy which applies botany in a specialized way. In our colleges of pharmacy, connected with Universities, the pharmacy student is, as a rule, given the General Botany taken by Liberal Arts students, which is the general fundamental beginners' course.

Pharmacy students are not enthusiastic about this course, and the teacher of Pharmacognosy usually finds that he must give instruction in many things that should have been mastered in botany.

There must be a reason for this dislike of a most fascinating subject and also lack of knowledge of the specific information he should have gained as far as botany is concerned for the successful study of pharmacognosy.

The real object of this discussion is to find out the reason for this dislike, if it exists, and if the information in botany does not link up with pharmacognosy, and if possible suggest a remedy.

We do not think that this statement will be challenged—that our professional students in all subjects are interested in proportion to the use or application he can make of the information in his particular field. Our professional students are commercialized, at least to the extent that they want to see the connection between what they are getting and the use they are to make of it in practice. To put it plainly the students are asking the question, How is this information going to bring them dollars in their practice? As a rule, they are not interested in science for pure science's sake. This statement does not apply to botany alone but to other fundamental subjects as well. In elementary chemistry for instance, as taught to professional students, the teacher who spends too much time on technical theory and does not back up his points with illustrations that have an application to the profession the student is preparing for, will probably not hold the interest of his students and they will fail to get out of it what they should and, probably, as a result, dislike the subject. The chemistry must have an application to their particular field to make the right impression. If this is true of chemistry, a subject they know is the foundation of pharmacy, how much

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more is it likely to be true of botany, a subject that they consider, in a way, only a side issue.

The trouble with the teaching of botany is that students think they are not getting information they can use. They learn about protoplasm, cells, plant hairs and breathing pores, but are deficient in information about roots, leaves and flowers as applied to medicinal plants. We do not mean at all that the botany teacher, in order to make his course attractive, should instruct in medicinal plant constituents, history, dosage or use, but that he make his course attractive and interesting by emphasizing the points of botany that must be used in the study of pharmacognosy and that, in so far as possible, the teacher use medicinal plants to illustrate his points. This, coupled with field excursions or the use of drug gardens, should make botany more interesting, popular and instructive.

The solution of the successful teaching of botany is not for the teacher to emphasize the things he is particularly interested in himself which may be slime moulds and not of much practical value to a student of pharmacy, but to use medicinal plants for all illustrations. Make practical use of medicinal drug gardens and field excursions to connect the work with living things.

The next point is important. The teacher of botany should know and appreciate the application of botany to the specialized subject of pharmacognosy just as the successful teacher of chemistry applies even beginning chemistry to medicine, dentistry, engineering or pharmacy.

If this is done the teacher of pharmacognosy can devote his time to drug history, constituents and uses and the student will feel that the whole thing is practical, interesting and fascinating, and that no subject in the curriculum is of more direct value to him in the practice of his profession.

HIGHER STANDARDS JUSTIFIED.*

BY FREDERICK J. WULLING.¹

In April 1926, the Board of Regents of the University of Minnesota definitely placed pharmacy at Minnesota upon a minimum four-year degree basis. This is one of the goals I have been working for during the past thirty-four years. It was part of a definite program which includes many more forward steps for the future and which I have already disclosed in a measure. The advancement of the minimum or lowest course in pharmacy to four years, thus placing pharmacy in Minnesota upon an unquestioned collegiate basis, was a long fight, with myself here in Minnesota the initiator and the only supporter until about a dozen years ago when the faculty approved and seven years ago when the Minnesota State Pharmaceutical Association, almost unanimously, endorsed the step and requested the University Regents to enact it. As far as I know, no pharmacist elsewhere advocated or worked for the same end,² but a number of educators long ago approved and hoped we in Minnesota would succeed and thus make it easier for their respective colleges to reach similar standards. There were many, however, who

* Read before Section on Education and Legislation, A. Ph. A., Philadelphia meeting, 1927.

¹ University of Minnesota.

² The College of Pharmacy of the University of Ohio, which went on a minimum four-year basis in the fall of 1925, did so at the suggestion of the President of the University, I understand.

actively opposed the step, as they opposed the advance from the two-year to the three-year obligatory course, and in their opposition they thought it necessary to criticize me personally. That their criticism was not justified is proved by the fact that now all of the recognized colleges are or soon will be on the three-year minimum basis. I have heretofore taken very little notice of this personal criticism, taking it as part of the give-and-take of life, but some recent criticism is of such a nature that I thought I should write this article, not in defense, but in explanation and for the information it contains in the hope that my critical friends will discover at least a sincerity of purpose based upon a conviction that such work as I have been doing has been necessary and constructive as evidenced by periodical approval or enactment by individuals, institutions and associations, of the steps and principles advocated.

For over forty years now I have advocated and, in every case where I had the power to do so consistently, forced higher pharmaceutical standards. Forty years ago medicine and pharmacy were on a par as far as entrance requirements to colleges of medicine and pharmacy were concerned. In other words: there were no entrance requirements at all in the light of the requirements of to-day. Despite that fact there were many competent practitioners in both fields of service. In those earlier days many of the more capable ones had gotten their training in European countries where educational standards were higher. In those days the apprenticeship system, though on the wane, still turned out better pharmacists than some of the colleges did because much of the preceptor-training, especially in practical lines, was still very good and thorough. The chief difference between preceptor-training and college-teaching in the matter of the quality of student output, lay in the fact that *the preceptors carefully selected their apprentices* while the colleges discriminated not at all and accepted all who could pay the tuition fees irrespective of the preparation, quality or adaptability to the profession of the applicants. This was true also of medicine in a large measure, but the courses in medicine were longer and more difficult and those who completed them were on the whole more adequately trained scholastically and technically than were those who completed courses in pharmacy. Both colleges of medicine and pharmacy began raising their entrance and graduation requirements, but the colleges of pharmacy instead of keeping step with the colleges of medicine, allowed the latter to outstrip them greatly. Thus pharmaceutical educational requirements went relatively backwards (but from this shortcoming, pharmacy is now gradually recovering).

This was the situation after I had gotten well into the study of medicine and pharmacy in my youth. Long before that I had dedicated myself to the service of my fellows and now I decided this service should be in the field of pharmacy rather than in medicine, because pharmacy as the major medical specialty needed, more than medicine did, such ideals as I had set for myself and such work as I thought I could do. It seemed to me then that pharmacy needed a no less developed type of mind than other professions already possessed, because in the aspects alone of responsibility to the patient and of the possibility of disastrous results to life of incompetence, pharmacy seemed only second, among all professions, to medicine. It was my conviction also that if pharmacy had recruited its ranks with men of the same degrees of self-esteem, professional pride and

aggressiveness that characterized physicians as a group, it would have ranked more equally with medicine. *The fundamental difference between pharmacy and other professions lay not so much in the responsibility and scope or nature of practice, as in the mental and scholastic calibre of the practitioners.* The remedy seemed therefore simple enough for pharmacy: the raising of the educational and social standards to a point of adequacy. This I decided early in life to help to do. I realized I could not help as much at the prescription desk as I could in the educational field and so I chose the latter as the arena of my work and planned a program on which I have been working now for thirty-five years, unperturbed by criticism, greatly encouraged by the good-will of a few similarly-minded and happy in the knowledge of a modest achievement in the field of my endeavor.

It is needless to refer to more than one of many recent criticisms and I speak of this one only because it is of general interest:

"Higher standards increase the cost of education and hence decrease the number of entrants and correspondingly increase the cost of medicines to the sick." It is not true that higher standards decrease the number of applicants for admission. Experience has proven that the contrary is the case. It is true that higher standards increase cost of education and therefore of medicines. Higher standards in all walks of life entail higher cost, but the world has decided that standards and not cost shall come first. The world is developing by advancing standards. The production of the wherewithal to meet the higher cost is inherent in and concomitant with the development. The standards we are always concerned with are minimum standards. The differences in the minds of men relate to what the minimum shall be from time to time. The minimum standards of one profession or of one industry or of one government have definite relations to all other professions, industries, governments, as the case may be, and are determined largely by these relations. What the standards are or ought to be depends also in a large measure upon the minds which interpret the relations and their importance. If the high and increasing standards of other professions are justified, as I believe they are, pharmacy because of its scope and of the responsibility involved in its practice, is entitled to and requires equal standards. To demand or to be satisfied with low standards is to acknowledge inferiority. In the future pharmacy will refuse more vigorously than in the past to do this and will assert itself more aggressively. It will do so through higher and more discriminating minds which higher standards will attract to the calling and a calling which is distinctly a profession, as brought out recently in Dr. Charters' report of the Commonwealth Study of Pharmacy from the Functional Standpoint.¹ This report will aid greatly in bringing a much higher level of applicants into pharmacy. The more rapid rehabilitation and development of pharmacy will depend upon the right kind of recruits admitted upon the basis of adequate educational standards.

Although my mind has always been open and has often been changed by helpful suggestions or criticisms or by the opinions or judgments of others, it is unchanged in the matter of my early convictions and decisions relating to pharmaceutical standards.

¹ See also Mr. Johnson's presidential address, 1926 Meeting of the Minnesota State Pharmaceutical Association and my address to the 1926 Meeting of the Wisconsin Pharmaceutical Association.