

we should make our curricula conform to the established requirements for that degree. If we require an amount of work much in excess of 120-credit (semester) hours, examination of our curriculum, which is bound to come now that we are granting an academic degree, will raise a serious educational question. The answer will probably be either that our quality requirements are low or that the material of our curriculum does not warrant the credit or hours which we have assigned. By granting a purely professional degree we could avoid this inevitable analysis of our courses, but I most certainly would not recommend meeting the problem in that way.

In conclusion it seems to me that we need to carefully study our several courses, particularly Theory of Pharmacy and Pharmaceutical Technique, and adjust the time and credit evaluations on a sounder academic basis. Let me strongly emphasize here that I do not mean to minimize the necessity or value of these or any other Pharmaceutical courses outlined by the Syllabus. The issue which I raise is essentially a modernization of our traditional courses in the light of academic standards. In the hope of provoking discussion let me restate my stand; that the work included in the Syllabus outlines under Theory of Pharmacy and Pharmaceutical Technique is overemphasized and is receiving an unwarranted amount of time and credit (semester) hours; and, that the entire four-year course in Pharmacy can and should be brought in line with other baccalaureate degree courses in terms of clock hours and credit (semester) hours.

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## THEORY OF PHARMACY AND ACADEMIC STANDARDS.

A DISCUSSION OF A PAPER BY THIS TITLE PRESENTED BY W. PAUL BRIGGS.

BY HENRY M. BURLAGE.\*

In discussing Dean Briggs' paper I wish, first of all, to congratulate him on his efforts and to say that, on the whole, I agree with the content and intent of such discussion. There is no doubt in anyone's mind that the adoption of the minimum four-year course by the colleges of the Association has cast upon the educators in the Profession of Pharmacy new responsibilities. Now that such a course has been obtained after years of struggle and planning, these educators should not sit back with an air of complacency but should direct new efforts to modernizing, stabilizing and unifying a curriculum which was established to meet an unfortunate two- and three-year requirement and as a result has been haphazard in its structure. I am glad to note that Dean Briggs sets forth in part the responsibilities accompanying the new "mile-stone in pharmaceutical education."

In his discussion, the author has singled out those sections of the Pharmaceutical Syllabus, which in my own mind are of greatest importance in our pharmaceutical curriculum in building a theoretical and professional background. It probably would have been much better if the various subdivisions of Theory of Pharmacy, Technique and Operative Pharmacy had been outlined as separate

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courses to clarify a confusing situation, especially as to time allotment. This latter fact is evidenced in a study of the curricula and courses of the various member colleges. The greatest thought and consideration should be given to these Sections.

With regard to Sections B and C under Theory of Pharmacy (Syllabus, pages 113-117) there certainly is much in the outline that needs changing to avoid unnecessary duplication. These divisions should be developed still further to include work that is not given in basic courses of General Chemistry (Inorganic Pharmaceutical Chemistry) or Organic Chemistry (Organic Pharmaceutical Chemistry). The courses in chemistry, if basic, cannot certainly give the important aspects of the inorganic and organic medicaments and their requirements, standards, etc. Section B should include non-repetitious material about the official inorganic compounds, studying them from the angle of their periodic classification—not alphabetically as is usually done—accompanied by laboratory work performing the necessary U. S. P. tests and more especially preparing and studying the official preparations involving chemical reactions of these substances. Certainly such course content cannot be presented adequately in a course in General Chemistry of Pharmaceutical Chemistry of a basic character.

Section C should likewise be given after a basic course in Organic or Organic Pharmaceutical Chemistry stressing the official organic drugs and principles and finally, but of rapidly increasing importance, ethical New and Nonofficial Remedies of this character. One needs also only to step behind the prescription counter of the average pharmacy to learn immediately the growing importance and value of a knowledge of medicines of organic character, especially from the dispensing standpoint.

Section A appears as an example where, as the author says, "tradition has been used as a yardstick rather than progress in developing this course." There may be overemphasis and duplication in the teaching of "Heat, . . ." but there appears to be a need of a modernized course in technique (or whatever one wishes to call it), which although it might appear simple in its make-up but necessary in curricula in sections of the country, where many of the high schools are small—where one teacher gives instruction in more than one subject with the result that one cannot depend too greatly on the student's knowledge of the simplest processes and theories. Physics and Chemistry are, no doubt, much better presented in the large city high schools and Dean Briggs' statements in this regard would apply to those Pharmacy schools drawing students from the large and well-equipped high schools.

Dean Briggs' statement that every process and theory outlined under Pharmaceutical Technique and Section A of Theory of Pharmacy was actually employed in the chemistry and pharmacy laboratory does not apply to the situation in most schools. It is true that many of the processes should be and are studied or mentioned in General Chemistry. However, in most of the State institutions this subject is taught to the masses in large laboratory and lecture sections with the result that they know little or nothing about the practical applications of processes, the theories and the practices of the same. As a whole they appear as a poorly trained lot, who are only capable of using a laboratory manual of specific directions efficiently. If the processes mentioned are grasped by the students of pharmacy in

other courses as Chemistry and Physics, there certainly is no need of them in our curricula, but I fear that such a fortunate condition does not obtain if my observations in four institutions located in widely separated sections mean anything.

I cannot agree that the material in the Syllabus under Theory of Pharmacy, Technique and Operative Pharmacy can be covered in one course of 10 semester hours, but should be in 400-432 hours (18-19 semester hours) including Technique ( $48 + 64 = 112$ ), Galenical Pharmacy ( $64 + 96 = 160$ ), Pharmacy of Inorganic ( $32 + 48 = 80$ ) and Organic Materials ( $48 + 0 = 48$  or  $48 + 32 = 80$ ) providing the material in the last two subjects named is not given in Organic Pharmaceutical Chemistry of a non-basic character. This with at least 10 semester hours of Dispensing (totaling 28-29 hours) is equivalent to about 25% of the total hours required for a B.S. degree. For the same degree in Chemistry, basic courses equivalent to about 35 semester hours are required. There is no question that Part D of Theory of Pharmacy can be adequately placed in other sections.

The author indicates that the textbooks of Pharmacy are too voluminous because of conditions mentioned; it appears that there is a dire need of revising these costly texts into books of a more theoretical nature rather than copies (to a great part) of the U. S. P. and N. F. A comparison with the later editions of English texts show some interesting differences as to presentation of pharmaceutical theory and subject matter.

I agree with Dean Briggs that we are not justified in requiring more than the usual 120 semester hours for a B.S. degree, and in order to stay within these bounds it behooves us to examine our curricula and course contents very closely, in order to withstand and avoid critical examination.

One value of this paper to my mind is the fact that it presents an idea that worthy work might be done in this Conference by devoting a portion of each annual meeting to a very serious and critical examination of course content, distribution, etc., using the Syllabus as a possible starting point with an idea of developing the pharmacy courses so that they might be of the greatest value in developing the knowledge and pride of the student of pharmacy in his profession.

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## THEORY OF PHARMACY AND ACADEMIC STANDARDS.

A DISCUSSION OF A PAPER BY THIS TITLE PRESENTED BY W. PAUL BRIGGS.

BY H. A. LANGENHAN.\*

If you will define Pharmacy (Practical) as the application of the knowledge and training in Physics, Chemistry, Botany, Therapeutics, etc., *to the making of medicine*, you may readily realize that too much time is not given to this subject in any college.

The Syllabus outline is to help, in part, those who are not qualified to teach this subject, and those who do not understand what it is about, who naturally wonder what they should teach and why the subject is listed. Practical Pharmacy is not a special subject; it is a *specialized general subject*.

In order to teach in this broad field a foundation in all of the prerequisite

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