

tests for its neutrality and solubility, also methods of filling, sealing and sterilizing the ampuls.

What is the relation of lecture work to such laboratory classes?

In the practical pharmacy class, lectures are largely displaced by the student's own research. The instructor uses the time assigned to discuss the work in progress and to compare results so that the lecture period follows the laboratory period. On the other hand the lectures of the dispensing class deal in advance with the work of the day or of the week.

When the student of the latter class fully understands his subject and the principles he is about to apply, he then only requires sufficient repetition, under supervision, to become skilful in turning out his products with speed and dexterity. If pill making is to be taken up in the laboratory, the preceding lectures will not only include discussion of the characteristics of drugs commonly administered in this form but will also include the necessary information regarding excipients and preservatives. Pill coating will include instruction in gelatin coating with or without coloring, silver coating, and pearl coating, also shellac, salol, formalin and other enteric coatings. Pill making and coating is practiced until the student becomes proficient in recognizing types and in turning out creditable products.

A dispensing class at its best correlates the lecture work with the practical. A course which stresses memory work and in which the student follows set rules, depending largely on memory for his technique, does not produce the results for which our colleges of Pharmacy aim. If he has only assembled a mass of facts and rules our graduate falls far short of the ideal. If on the other hand he has acquired the ability to use his knowledge, has learned how to locate and to use additional data, how to reason through rather than to follow blindly or to lean upon his text-books; if he has developed the ability to coördinate head and hand he has had a training which should enable him to go far in the practice of his chosen profession.

MICHIGAN'S PHARMACEUTICAL ACHIEVEMENT.*

BY C. H. STOCKING.¹

"The following radio address by Professor C. H. Stocking, president of the American Association of Colleges of Pharmacy, will be of interest to all teachers of pharmacy. It gives a brief outline of pharmaceutical activity in the State of Michigan. I sincerely hope that Professor Stocking will, at a later time, write a complete history of this activity, and that the same will be done by leaders in other states of the Union. Such histories would be very valuable contributions to the Historical Section of the AMERICAN PHARMACEUTICAL ASSOCIATION."—C. B. JORDAN, *Editor*.

When James I of England in the 17th Century signed the corporate papers of the Apothecaries' Guild he said, "The business of the apothecary is a mystery: wherefore, I think it fitting that they should be a corporation of themselves." Pharmacists the world over may well look with pride and satisfaction to that early English monarch and his famous declaration. The impetus that was thus given to

* Radio address given over Station WJR, Saturday, January 28, 1933.

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the development of the profession by the organization of the Apothecaries' Guild was destined eventually to project its influence across the seas to the great North American Continent that was then being so rapidly developed. English and European influence upon the practice of pharmacy in America underwent a gradual evolutionary change, ever influenced by the discovery from time to time of new and powerful indigenous drugs, until the turning of the tide which marked the time for a new vision of things. Through a gradual ascendance in pharmaceutical affairs, America eventually became the market place of the world for drugs and medicines and the mecca for those who would satisfy the thirst for education and research.

The Nineteenth Century marks the rapid development of pharmacy along more highly scientific lines than any previous period. It is also the period during which the names of American pharmacists first began to appear in the scientific and educational literature of the profession. It is probably unnecessary to state that the earliest historical events having to do with the advancement of pharmacy in America center around places and persons in the old colonial section of the nation. As civilization pressed its way westward with the onward march of progress, pharmacy was carried into newly conquered territory. Thus did Michigan come to figure in the "business of the apothecary" which King James referred to as the "mystery," or being interpreted into modern language, the "art, craft or profession" of pharmacy.

The practice of retail pharmacy, for instance, was established very early in the history of the state and has grown in importance with the steady increase in population until the present time when we find approximately 5000 registered pharmacists and more than 2500 retail drug stores within the borders of our commonwealth. Had the history of retail pharmacy in Michigan not been written in words that spelled success, the incentive that gave birth to our large pharmaceutical manufacturing plants would not have sprung into being. As early as 1855 the founder of the firm of Frederick Stearns and Company came to the city of Detroit, on New Year's Day, from Buffalo, with little money, fair credit and high hopes and established himself in retail and manufacturing pharmacy at Number Eight Woodward Avenue. Mr. Stearns' first laboratory was in a room twelve feet square located in the rear of his retail establishment. From this modest beginning has grown an institution that distributes its products throughout the nation and to the ports of most foreign countries.

Another example of successful pioneering in pharmaceutical manufacturing in Michigan is to be found in the history of Parke, Davis and Company. This famous firm with its world-wide reputation had its beginning in a drug store at the corner of Gratiot and Woodward Avenues, in Detroit, in the year 1862. The financial struggles of the next few years, we are told, may be imagined but can scarcely be described. It was not until 1866 that something resembling a permanent organization was effected. That year the partnership of Duffield, Parke and Company was formed and the date, October 26, 1866, has since that time been looked upon as the real birth date of the business. To-day the manufacturing and research laboratories of Parke, Davis and Company occupy literally many acres of floor space in Detroit. In addition to this they have a biological farm of practically 1000 acres near the city of Rochester, Michigan and branch houses in strategic points in the larger cities distributed over the globe. Time permitting, I could trace the origin

and development of other important and well-known pharmaceutical houses in the Detroit metropolitan area, including such firms as Nelson, Baker and Company, the Frederick F. Ingram Company and the Arthur Colton Company, manufacturers of pill and tablet machinery for the markets of the world. Traveling westward to the city of Kalamazoo we find the Upjohn Company which was established in 1866, by the late Doctor W. E. Upjohn under the original title of The Upjohn Pill and Granule Company. During the nearly half-century of its existence the Upjohn Company has experienced a steady growth due very largely to the development in its research laboratories of a number of important and effective therapeutic agents. Other organizations of a similar character to those just mentioned might be named to show that Michigan has been a leader in the field of manufacturing pharmacy for more than three-quarters of a century. To be sure, some firms have come and gone. Others have grown in size and importance until their influence is world-wide in character. Michigan has been a magic word for many decades when the source of manufactured, medicinal products has been considered. This inland state, remote from the crude drug markets of the nation, has built within its borders vast temples of healing that through commercial skill and scientific research have written their names in indelible letters on the pages of medical history.

Leaving this brief description of the history of manufacturing pharmacy within our state, let us look for a few moments at the early beginning of pharmaceutical education. In this regard, it is a noteworthy fact that the first institution of higher learning in the United States to include instruction in pharmacy in its curriculum was the University of Michigan. Referring to the meeting of the Board of Regents which was held October 2, 1839, we find that the governing body of the University even in that formative period of the history of the institution was not unmindful of the need for instruction in pharmacy, for during the course of their proceedings on that date they adopted the following resolution: "*Resolved*, That the appointment of Professor of Geology and Mineralogy in the University be tendered to Dr. Douglass Houghton, of Detroit, and that he be also charged with subjects of Chemistry and Pharmacy, till the Regents take further order in relation thereto."

A few years later the records show that Silas Hamilton Douglas was appointed Professor of Chemistry, Pharmacy, Medical Jurisprudence, Geology and Mineralogy, from 1851 to 1855; and that his title was changed to Professor of Chemistry, Mineralogy, Pharmacy and Toxicology from 1855 to 1870.

It was not, however, until 1868 that the first courses in pharmacy were incorporated as a regular part of the University curriculum. In 1876 the College of Pharmacy was organized with Doctor Albert B. Prescott as its first Dean. Following along in chronological order in other universities may be mentioned the fact that instruction in pharmacy was first offered at the University of Wisconsin in 1883; at Purdue in 1884; at the Universities of Iowa and Kansas in 1885. All of the Colleges of Pharmacy at these universities have administrative officers possessing degrees from the University of Michigan. From coast to coast, Michigan men, graduates of the College of Pharmacy, are to be found in the teaching profession and in research and administrative positions in commercial as well as in governmental laboratories. The thorough training which the University offers, amply prepares its graduates in pharmacy for positions of trust and responsibility in many important fields of endeavor. From the educational standpoint we antedate all other

universities in establishing instruction in pharmacy. Due to the thoroughness of this instruction and to the fact that the minimum four-year curriculum has been in vogue here since the early nineties, it is well-known that more deans of colleges of pharmacy and more faculty members holding positions throughout the nation have received their education at the University of Michigan than at any other institution of learning. In pharmaceutical organization work, Michigan men by the score have been highly honored. Of the thirty-two presidents of the American Association of Colleges of Pharmacy five have been members of the faculty and six others have received degrees from this University. Michigan men in large numbers are listed in the annals of United States Pharmacopoeial and National Formulary revision work. If the "leaves of the trees are for the healing of the nation," Michigan men, Prescott, Stevens, Schlotterbeck, A. B. Lyons and others, have picked those leaves, have analyzed them for their medicinal virtues and have extracted their active principles for you and for me.

MODERN TRENDS IN EDUCATIONAL METHODS.*

BY A. B. LEMON.

More experiments and changes have been introduced in higher education in the last five years than in the previous twenty. The committee on educational methods of our National Conference on Pharmaceutical Research has been making a study of the major experiments in the field of higher education toward the end of selecting those the results of which might properly be used in pharmaceutical education. This paper is intended briefly to present some observations on a few of the educational problems receiving most wide-spread attention and showing most promising results. This may be considered a supplement to the less detailed report read before the conference last Saturday.

Experimentation has been very active in all four branches of education, *viz.*, care and direction of students, curriculum construction, teaching methods and administration. The National Society of College Teachers of Education has just published a wealth of material on changes and experiments in liberal arts education collected and organized by the American Association of University Women under the able direction of Kathryn McHale. This report gives, in addition to other valuable information, a summary of one hundred twenty-eight outstanding changes and experiments in higher education as selected by C. S. Boucher of the University of Chicago. From this elaborate list six topics have been chosen for discussion in this paper. These have been selected first because of the interest they should demand in pharmaceutical education and second on the basis of the number of colleges experimenting with them. The six selected are as follows:

- (1) Comprehensive examinations [115].
- (2) Admission of freshmen including tests [104].
- (3) Honors courses [100].
- (4) Personnel work including counseling of students [83].
- (5) Improvement in curricula [63].
- (6) Improvement in teaching methods [45].

* Section on Education and Legislation, A. P. H. A., Toronto meeting, 1932.