

# THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C. B. JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A. A. C. P., EDITOR OF THIS  
DEPARTMENT.

*Editor's Note:* Do colleges of pharmacy give sufficient work in pharmacology? I believe I agree with Dean Serles that they do not and that, with the extension of the course to four years, this should be corrected. However, the cost of a laboratory course in pharmacology to a large group of students may be expensive unless great care is taken to keep the expenses down. Demonstration by the instructor of the pharmacological reactions that "run into money" will be helpful, but a course that consists entirely of such demonstrations will not suffice. Dean Serles has presented a sane view of the problem and has given suggestions that will be helpful to any college contemplating such a course.—C. B. JORDAN, *Editor*.

## OUR FOUR YEARS' EXPERIENCE WITH THE TEACHING OF PHARMACOLOGY AT SOUTH DAKOTA STATE COLLEGE.

BY E. R. SERLES.\*

The advent of the four-year course as a minimum requirement for graduation from member colleges of this association has brought forth a divergence of opinion as to what subject material, new or old, should properly receive further development. The Syllabus published in the latter part of 1932 has projected an outline of the old and some new courses, which although not obligatory, will undoubtedly influence many of the schools and colleges in reshaping their curricula. Perhaps the most radical departure from the old order advocated by the Syllabus Committee was the dropping of the term *Materia Medica* and the inclusion of the term *Pharmacology* in lieu thereof.

Pharmacology is not a new science. It is not new to Pharmacy for our leading pharmaceutical houses have been employing a knowledge of its fundamental principles in drug standardization for many years.

The teaching of this science in colleges of pharmacy is, however, new. A survey of our college catalogs of a few years ago fails to show more than one or two schools engaged in the teaching of any phase of pharmacology except posology and toxicology and in most cases such courses were wholly didactic.

Realizing the value of laboratory demonstration in the teaching of chemistry, pharmacy and dispensing, we of the faculty of State College conceived the idea that the teaching of dosage and related functions of drugs could be more easily accomplished if we could but show the effects of a single drug or a group of drugs upon living organisms.

Perusal of medical college catalogs and laboratory outlines of courses in pharmacology offered in such schools, together with experience gained in the chemical war service clearly indicated that a course in pharmacology for pharmacy students was feasible and, what was more important, desirable.

Pharmacology was accordingly offered as an advanced elective to those students who had completed courses in physiology, pharmacognosy, *materia medica* and chemistry. The ease with which they adjusted themselves to the complicated laboratory procedure of taking a blood pressure, giving anesthetics, hypodermic and

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intravenous injections proved to us that here was a means of fixing the facts covering drug action and dosage long overlooked in our methods of teaching this important part of a pharmacist training.

Dr. M. R. Thompson in a paper before this group emphasized the adaptation of pharmacologic procedure to bioassays as being the phase of pharmacology which should receive our attention when trying to build a course for pharmacy students. This may be true, but it has been my experience, and particularly so as a member of the U. S. P. Bio-assay Committee, that this part of the work is highly specialized, and requires the best of apparatus, controlled conditions and a profound knowledge of the fundamentals of pharmacology, if more than just the technique of the experiment is to be demonstrated.

Again we must keep in mind that if we are to drop the subject hitherto known as *Materia Medica*, and put in its place Pharmacology, we must provide some means of conveying to the student a knowledge of that vast wealth of information concerning the origin, composition and properties of remedial agents. Such information, I believe, should be included in the courses of pharmacognosy, if the material is of a crude drug nature and in the courses of pharmacy if the substance be a chemical.

For the past four years we have been shaping our courses with this end in view: Pioneering in this field we have made mistakes, but most of them have been on the side of omission rather than commission.

*First*, we found our students lacking in a knowledge of physiology and comparative anatomy, especially of the smaller animals used in experimental work. *Second*, the ability to interpret physical phenomena, such as rate of injection, kinds of material injected and site of injection were problems for both the operator and student to master. *Third*, organization of laboratory experiments, so that the cost of operation is not too great is necessary for one must recognize that pharmacology properly taught is expensive. The source and care of laboratory animals is the chief factor in determining the cost of the course once the laboratory is equipped.

The course as it has been given has been chiefly for advanced students, where the numbers were few, consisting of two lectures per week and two three-hour laboratory periods. I should like to emphasize the fact that the laboratory periods should be at least three hours in length and could well be extended to a full half day for the more extensive animal experiments.

Our new course designed to include the students who are to receive a general training for the practice of retail pharmacy will consist of three lectures per week on the theory of drug action and a single laboratory period, chiefly demonstration.

In this connection I assume that you will be most interested in the laboratory procedures. For convenience we have divided these into two groups:

Chemical Experiments.	<i>Excretion of Drugs.</i>
Important reactions of: Methanamine	Phosphate, etc., in the urine
Formaldehyde	Iodine in the saliva
Alcohols	Physical chemistry of soaps and emulsions
Phenols	Action of indicators, U. S. P., etc.
Salicylates	Buffer value of phosphates

Antiseptics	Ether
Phenol co-efficient, etc.	Chloroform
Common uses	Chloral hydrate
Astringents	Magnesium sulphate
Effects on tissues	Effects of (rabbit)
Effects of acids and alkalies	Morphine
On protein	Chloroform
On mucous membrane	Chloral hydrate
Preparation of colloidal solution gels	Magnesium sulphate
Importance in drug action	Action of: (frog, guinea pig and cat)
<i>Physiological Experiments.</i>	Digitalis
Irritants and demulcents	Atropine
On skin and mucous membrane	Pilocarpine
Local anesthesia on a frog	Effect of drugs on circulation (dog or rabbit)
Local anesthesia on a man	Demonstration
Administration of anesthetics (rabbit)	Effects of drugs on G. I. tract (rabbit)
	Demonstration

This course will be given throughout the senior year and will be supported by the courses in Dispensing. The course as originally given will be continued for graduate study.

I am certain that the work which we have been giving during the past four years has enabled our students to have a better understanding of the whole field of therapeutics. It has impressed upon them the need for care in preparing sterile solutions for hypodermic injections, intravenous use of glucose, and an accurate physiological salt solution.

They know why a doctor prescribes an Eggleston dose of digitalis, because they have seen its action in an animal. They understand the normal functions of the human body better, and are, therefore, entitled to be considered by the physician as an indispensable aide in his service to the patient.

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### THE INTER-RELATION OF THE DEPARTMENTS OF PHARMACOGNOSY, PHARMACOLOGY AND CHEMISTRY.

*Editor's Note:* Education should not come in separate "packages" wrapped and labeled, chemistry, pharmacy, pharmacology, etc., because all of these subjects are inter-dependent and should dovetail with each other. This dovetailing cannot be successfully done without an effort on the part of the instructors. Professor Christensen points the way for such coöperative efforts.—C. B. JORDAN.

BY B. V. CHRISTENSEN.\*

Inasmuch as this paper is to be presented before a group of teachers of chemistry it is presumed that you will be interested in a few suggestions pertaining to the chemical training of students deemed desirable by teachers of pharmacognosy and pharmacology. The suggestions offered herewith relate more particularly to the nature rather than the scope of chemical knowledge which teachers of pharmacognosy and pharmacology consider essential as aids to a proper understanding and appreciation of these subjects by students. As a matter of fact, if you would

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