existence. It is hoped that the next year will find us equipped with social rooms where we may meet informally and discuss topics of pharmaceutical interest, and in which we may be favored with weekly lectures by members of the faculty from other departments of the University.

We believe that the mind of the student, if directed rightly in regard to his profession, will retain and practice that which we instill. It is the ideal of the Local Branch to continue in its efforts for the advancement of pharmacy as a profession until every pharmacist in the state of North Carolina is a member, and until every member practices his profession in accordance with the principles contained in the Code of Ethics of The American Pharmaceutical Association.

## EXAMINATIONS AND THE FUNDAMENTALS.*

BY J. W. STURMER.

A few years ago a set of examination questions used by Thomas Edison to pick promising candidates for his employ was given to the press. Forthwith it became the subject of a lively discussion in which professional educators, journalists, humorists, musical comedy artists, and the members of the Whitlers' Club from Rosin Center, took lively part. What, indeed, more vulnerable to criticism than a set of examination questions? The callowest freshman does not hesitate to find fault with the questions of the most venerable professor;—and Edison soon found himself assailed from every quarter.

To silence his numerous critics, he finally said that the sole purpose of his examination was to pick the candidate with a good memory. But memory, as everybody knows, cannot function until there is something to remember. And college men proved that a large portion of the questions covered ground outside the purlieu of a conventional college education. It appeared that the same could be said about school and high school, all of which is interesting, for it proves that Edison had inadvertently tested for something besides memory. He had picked the candidates with the inclination and the ability to gather knowledge from many sources—men of alertness, with wide-spread interests—in short, the "live ones," and of good memory.

A pharmacy board examination is devised to serve an entirely different purpose, namely the exclusion from registration of those candidates who may not reasonably be expected to function as safe and competent practitioners of pharmacy. Edison's test as it was conducted, would set the bars too high. His test as he viewed it—a mere memory test—would be inadequate, for a pharmacist must not only have knowledge, but must also know how to use it. He must know facts—yes, and likewise principles. Of the latter he must have clear understanding so that he may apply them, for in practice there arises an infinite variety of problems—too many to be memorized, and which can be solved only by the application of what, for want of a better word, we call theory.

Let us, however, not belittle the value of memory, or of memorized knowledge. When we say we know, we mean that our memory holds in store the facts, con-

* Read before Joint Session of the National Association of Boards of Pharmacy and American Conference of Pharmaceutical Faculties, Buffalo meeting, 1924.

cepts, near-facts, or fancies, which bear upon the case. When we reason, we depend largely upon our memory-store to supply us with material with which to carry out this mental process.

Now in every profession or vocation, certain facts and certain generalizations or principles are used frequently; others but seldom. Those which are often used, and particularly, if they help us to correlate other facts and to understand them, constitute the fundamentals. A candidate who is not familiar with the nomenclature of science, cannot read its literature understandingly. If he does not know the significance of chemical formulas, is not familiar with the basis of the chemical classification of compounds, does not know the make-up of an acid, a salt, an ester, an ether, etc., he cannot study his pharmacopœia with profit. In other words, what the candidate must know in order that he may have a reasonable chance of finding and understanding what he does not know, but must look up in the literature, is fundamental knowledge. Without this, obviously, there can be no growth, no development. In analytical chemistry, for example, a knowledge of volumetric solution, and of factors, is fundamental. The detailed procedure of determining phosphorus is not. And with a knowledge of basal volumetric principles, a specific process may be looked up when needed. * * * * Hence the necessity of distinguishing between the fundamental and the incidental.

In a test of the type of Edison's covering the fundamentals is not so important. In pharmacy board examinations it is essential. And anyone familiar with the character of recent state examinations knows that our boards are quite generally cognizant of this fact. But it is also essential that the candidate be able to put into practice his knowledge of these fundamentals, and in order that he may do this, he must have studied with understanding, and not learned by rote. Memorized definitions, and generalizations of science are not real knowledge; at best they are only potential knowledge, just as a black walnut in a boy's pocket isn't edible and assimilable—isn't food—until he has contrived to crack it. Occasionally one meets, in grading papers, the most astonishing malapropisms, showing that the candidate had no idea of the meaning of the phrases he had learned,—reminding one of the little tot, who, joining in our national hymn, America, sang lustily, "I love thy roxorills, thy woosy pimpled bills." But even though a definition, or a generalization, be given letter-perfect, we cannot be sure of its meaning or purpose having been understood. For this reason it is far better to frame the question so that its answer *will involve the application* of textbook knowledge. Better a simple problem involving the use of specific gravity, than to ask "What is specific gravity?" Better some practical question on processes involving the use of a catalytic agent than to ask for a definition of this type of substances,—better, for the answer, will constitute assimilated, and hence usable knowledge. The other type of answer may, or may not.

Nor can one be sure that the candidate has done some reasoning of his own if he answers a question beginning with "why," for answers to 'whys' are not always studied as the authors intended that they should be, but are sometimes learned verbatim as a simple memory feat, in which case we have another parallel of the boy with the black walnuts, but with the distinction that the boy does experience a strong biologic urge to look for a rock, while our candidate may or may not have such intentions.

Briefly, then, the fundamentals in pharmacy are the basal facts and principles of the sciences upon which pharmacy is based. They comprise what a pharmacist must know and clearly understand in order that he may use his text and reference books—in order that he may grow in knowledge and efficiency—in order that he may deal satisfactorily and successfully with the tasks and problems which arise in everyday practice. It is the theory—if you will—of which he should have clear understanding in order that he may be really and truly *practical.*

It is, therefore, what the examiner should embody in his set of questions, for it is such knowledge, rather than familiarity with curious and isolated facts, that determines whether the candidate may reasonably be depended upon as a safe and competent pharmacist.

To be sure, it is no easy task to frame such determinative tests. They cannot be culled from textbooks. They require original work, and work of a high order. But they make for the results which are desired. The labor involved is therefore a distinct public service of a high order.

---

## THE COMMONWEALTH STUDY OF PHARMACEUTICAL EDUCATION.

### BULLETIN No. 2.

This is the second of a series of twelve monthly statements to be issued by the staff conducting this study, to acquaint the profession with the progress of the study.

From its inception the Commonwealth Study of pharmaceutical education has enjoyed the unqualified endorsement of all the leading organizations interested in pharmacy. This hearty endorsement has been supplemented by active coöperation of the American Conference of Pharmaceutical Faculties, The American Pharmaceutical Association, The National Association of Retail Druggists, The National Association of Boards of Pharmacy, The United States Department of Health, the faculties of both Medical and Pharmacy Schools, and many individuals who will be given full credit for their support when the final report is published.

A committee was early selected to act in an advisory capacity to Director W. W. Charters and his technical staff. On this committee are men eminently qualified for the work by training and inclination. The committee includes men whose interests cover the entire field of pharmacy. The personnel of the committee is as follows:

*Chairman,* Dean J. A. Koch, Pittsburgh College of Pharmacy; H. C. Christensen, *Secretary* of the National Association Boards of Pharmacy; Dean C. A. Dye, School of Pharmacy, Ohio State Univ.; Dean C. W. Johnson, College of Pharmacy, University of Washington; Dean R. A. Lyman, College of Pharmacy, University of Nebraska; Dean W. F. Rudd, School of Pharmacy, Medical College of Virginia; Dean H. H. Rusby, New York College of Pharmacy; J. H. Webster, *Ex-President* of the National Association of Retail Druggists; Dean W. H. Zeigler, *President* of American Conference of Pharmaceutical Faculties.

The Advisory Committee has met twice for three-day sessions in Buffalo, New York.

As rapidly as parts of the study are completed they are submitted to sub-committees of experts for criticism and advice. Dean Rusby is chairman of the sub-committee of Botany and Pharmacognosy. Dean Dye is chairman of the sub-committee on Practical Pharmacy, Dean Rudd is chairman of the sub-committee on Chemistry and Dean Lyman is chairman of the sub-committee on Physiology and Pharmacology.

Obviously the practice of Pharmacy may be divided into three major sub-divisions as:

1. Filling of prescriptions.
2. Answering queries relating to pharmacy.
3. Conducting the commercial side of the business.

The first two duties only are being considered in this study. Subsequent bulletins will explain how the knowledge, skill and ideals necessary to perform these duties is being compiled.