

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

ERNEST LITTLE—CHAIRMAN OF EXECUTIVE COMMITTEE, A. A. C. P., EDITOR OF THE
DEPARTMENT.

The paper presented below is both an important and timely one and should be carefully read by the readers of this section. It aroused considerable discussion when read before the Conference of Teachers of Chemistry at Dallas, Texas, last August.

Doctor Klemme has been appointed chairman of the A. A. C. P. Committee on Pharmacy Predictive and Achievement Tests and has already demonstrated great enthusiasm for this work. By consent of the Executive Committee, his committee has recently been enlarged and will, in all probability, present several important recommendations to us at the New York meeting next August. It is important that we should be in a position to give their recommendations intelligent consideration and arrive at a decision based upon an adequate appreciation and analysis of the important factors involved.—ERNEST LITTLE.

THE APPLICATION OF OBJECTIVE EXAMINATIONS IN ELEMENTARY ORGANIC CHEMISTRY.

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In submitting this paper on the application of objective examinations the authors wish to call to your attention and emphatically stress the fact that the setting up of objectives for any given course and the application of objective examinations in those courses is a logical outgrowth of and an adjunct to the work of the Special Committee on the Scope of Survey. The real goal of this work is not to study objectives and objective examinations so much as it is to determine whether or not schools of pharmacy are at present teaching the subjects which will best fit the student for a life's undertaking in the field of pharmacy. In the final analysis we are endeavoring to measure the achievements of students during their four years in college and to correlate these achievements with the requirements of the profession. Furthermore, the National Association of Boards of Pharmacy realized the necessity of making a survey of pharmacy schools in order that the state examining boards might know which schools were worthy of recognition. Also pharmacy is essentially the same, whether it be in Maine, California, Washington, Kansas or Florida, and it is to be hoped that all recognized colleges of pharmacy will in the future teach essentially the same subjects in order to meet more or less standardized requirements. Therefore, as we proceed with a discussion of objective examinations, let us not lose sight of our major objective.

These aims can be accomplished only if definite objectives for each course taught are set up. Since these objectives outline what the student is expected to accomplish, they are in reality the key to the entire situation. *First*, they should be based upon the requirements of the profession. In other words, a definite list of objectives based on these requirements will give the teacher a guide in any particular course so that the necessary phases will be taught and unnecessary or superfluous material, which may in many cases be time-consuming, will be omitted. *Second*, they serve admirably as the basis for examination of student achievement.

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Therefore, we come logically to the necessity of testing our objectives by examination.

This paper deals with the application of objective examinations in Organic Chemistry as taught at the Purdue University School of Pharmacy, and the questions are based on the outline of objectives as listed in a paper by one of us (KO and submitted at the last meeting of this body). While the actual work on these objective examinations looms large in our minds, we must not lose sight of the fact that these examinations are designed primarily to study the list of objectives in this course with the view of submitting that list of objectives as a standard basis in teaching Organic Chemistry in American Colleges of Pharmacy.

While there is a maze of factual knowledge to be learned in Organic Chemistry, we have endeavored to shape the objective examinations in such a way as to depart to a large extent from excessive and irrelevant factual knowledge and to cultivate as much as possible the reasoning power of the student. A better general knowledge of the underlying principles of Organic Chemistry may thus, by eliminating the "crammed" and short-lived facts and instilling into the mind of the student the tendency to reason on the general principles, be brought within the grasp of the student. The types of questions which have been used in the objective examinations during the past academic year have been somewhat restricted in number. We have used primarily the True-False, Completion, Multiple Choice and Match-List types. In addition to these, the subject itself offers questions such as the completion and balancing of organic reactions and reactions involved in elementary syntheses. In formulating any of these questions one must be careful above all to see that each and every question is valid without exception. In the case of True-False statements, for example, each statement must be either completely correct or entirely wrong. The Match-List form must be such that there can be no confusion regarding the items to be matched. A question should not be unnecessarily long and confusing but should be stated as briefly and as clearly as possible.

Bi-weekly objective examinations of fifty-minute duration were given throughout the past year and these examinations dealt only with the material which had been presented in the course for the two preceding weeks. Such frequent examinations lightened the burden of reviewing for the student, permitted a more thorough examination, and afforded a more complete and accurate record of the students' ability when the final averages were compiled. Generally, these bi-weekly examinations consisted of three, sometimes four, parts. For example, 100 True-False statements, 20 to 25 Match-List questions, and 15 to 25 reactions, syntheses of various types were frequently included. Variations of this particular type of examination were made to suit the particular phase of work concerned.

One great disadvantage in beginning the use of objective examinations is the time consumed in formulating them. Whereas an essay type of examination requires but a few minutes for preparation, a typical objective examination to cover a fifty-minute period generally requires some five to six hours for its preparation. It is hoped that this time of preparation will be materially decreased after an adequate file of objective questions has been prepared. However, it is the feeling of the authors that such a file cannot be regarded as permanent and must continually undergo revision according to the advancements in the subject. The disadvantage encountered in the length of time for preparation was to some degree compensated

by the ease and rapidity with which this type of examination could be marked and evaluated, an operation which could be accomplished in about one-third the time required for grading the essay type of examination.

The personal element of the instructor's attitude or feeling toward any given student was eliminated almost entirely by the objective examination and still further by the fact that papers were numbered instead of bearing the student's name. Slips of paper, each bearing a different number, were drawn by the students immediately preceding an examination. Each student signed the slip, the slips were then placed in an envelope which was passed around for that purpose, and the envelope sealed, not to be opened until after the grades had been placed on the papers and posted, according to number, on the bulletin board. The name of any student corresponding to his examination paper was ascertained by the instructor only after publication of the grades and then solely for the purpose of filing his record. All examination papers, excepting the final examinations, after being corrected and graded were returned to the students in order that they might observe their errors and profit thereby in future examinations.

The results of each examination were posted according to the students' numbers rather than their names and revealed the student's actual examination grade, his relative class standing and his standing as compared to previous examinations. While students of lower class standing did not know the name or names of those having higher standings, they at least knew some one was above them and thus the incentive to raise their class standing was aroused. Those students who possessed a high standing in the class were likewise determined to retain their positions.

During the second semester daily quizzes were used in order to provoke continuous review and lessen the customary cramming for the fifty-minute examinations. These quizzes, which were objective in nature and generally of five to ten minutes' duration, were given at each meeting of the class, except the period of the bi-weekly examination and the period immediately following. Each daily quiz was based on material presented in the preceding lecture.

Objective examinations were successfully extended to laboratory work. Two of these examinations were given each semester and were similar in form to the examinations used in lecture work, except that in addition to the usual types of questions another type requiring inductive reasoning on the part of the student was employed. In this type of question a number of facts pertaining to some work within the scope of the examination were given and from these facts the student was required to draw the logical conclusion. This was found to be a very favorable type of question.

The class records for the year indicated a steady improvement as the year progressed. The improvement was particularly noticeable from the beginning of the second semester to the close of the school year. Since this marked improvement was associated with the consistent study and review made necessary by the daily quizzes, it is believed that such development may be directly attributed, at least to a large extent, to the daily quizzes. However, comprehension of the work and familiarity with the subject matter undoubtedly had something to do with it. Consequently, the authors propose to reverse the process during the coming year, giving the daily quizzes during the first semester only. A year from now we may be able to say more definitely something concerning the actual value of daily quizzes.

This particular class which served as guinea-pigs for this first application of objective examinations manifested to rather a marked degree a tendency to memorize rather than analyze, for the inclination to memorize facts predominated as exemplified by the ability of the class to answer True-False statements and Match-List questions in a very satisfactory manner on the one hand, and its failure to satisfactorily cope with reactions, syntheses and problems on the other hand. This condition was rather striking in view of the fact that the instructors made unusually strong efforts to stress the use of reasoning in the course. Perhaps this class was no worse than preceding classes with respect to this mental viscosity, but, if not, the objective examinations certainly served to bring out the fact in a very striking way.

There was a rather remarkable correlation between the semester averages of individual students in the lecture examinations, the daily quizzes and the laboratory examinations despite the fact that the records of these examinations were filed separately throughout the year. It is barely possible this correlation was accidental but the fact remains that it was much closer than had been previously observed under the essay type of examination.

In conclusion, the authors wish to point out that they are not sold on the objective type of examination. It is believed that this type of examination has its purpose and that it is serving admirably in the present study of objectives, but the authors would not care to recommend its use as a general thing in education nor, after using the objective examination, would they care to revert completely to the essay type, but rather to a careful combination of the two types. The more important facts observed during the first year's experience with objective examinations may be summarized as follows:

1. The objective examination requires an unusual amount of time and consideration for its preparation.
2. The objective examination, if properly prepared, affords an accurate means of following any given list of objectives, and testing each student's knowledge of those objectives.
3. In preparing to take an objective examination, students have a tendency to memorize facts and to discount the importance of reasoning.
4. The objective examination is perhaps the fairest yardstick for the measurement of relative achievement.

BELIEVED GERM OF LEPROSY ISOLATED.

Dr. Earl B. McKinley, of George Washington University, has expressed his belief that "the germ of leprosy has been isolated." Dr. McKinley is dean of medicine at the University and, formerly, with the Rockefeller Foundation in the Philippines. He is arranging for further research work at Crillon Island, the home of nearly 6000 lepers. Dr. McKinley taught successively at Michigan, Baylor and Columbia Universities and for three years was director of the School of Tropical Medicine at the University of Puerto Rico.

HOSPITAL FOR NARCOTICS.

The corner-stone for the Federal Government's new hospital for narcotics has been laid. It is located near Fort Worth, Texas, and represents a marked advance in the treatment of victims of narcotics.

The new hospital and farm, which will accommodate 1200 patients, will be equipped with an adequate staff of resident physicians. Patients will include several groups of addicts: Federal prisoners, those who choose to remain after completion of their sentences, those placed on probation by Federal courts and any who may seek treatment voluntarily.