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.

Some may question the wisdom of a College of Pharmacy offering courses that involve food analysis on the assumption that Agriculture and Home Economic Colleges should give such courses. Professor Glover makes it clear why Colleges of Pharmacy are especially fitted to prepare analysts for state and federal laboratories and for control laboratories. All persons interested in such a course in food and drug analysis will find Professor Glover's paper worth perusing as it contains many valuable suggestions regarding the teaching of such a course.—C. B. JORDAN, *Editor.*

TEACHING OF FOOD AND DRUG ANALYSIS.

BY. C. C. GLOVER.*

Soon after the enactment of the Pure Food and Drug Act in 1906 it became apparent that men and women training for positions in state, federal and municipal laboratories maintained as a necessary part of the enforcement machinery should have something more than a straight chemical preparation. Agricultural colleges were able to supply chemists equipped to handle the food work and colleges of pharmacy could meet the demand for drug analysts, but the ideal combination of training in both food and drug analysis in the same school was hard to get. Since agricultural colleges were not equipped to furnish the necessary training about drugs, it was only natural that some colleges of pharmacy should undertake to supply the demand by adding food analysis to the pharmaceutical curriculum which already included an adequate chemical background.

The Food and Drug Act at once adopted the U. S. P. and N. F. tests for identity and purity and assay procedure, but methods for food analysis and control had to be developed through the medium of the Association of Agricultural Chemists. Analytical procedures for food control have been developed and perfected and official methods of food analysis are published in book form under the title of "Official and Tentative Methods of Analysis."

The food and drug chemist must not only be a competent analyst but must further be capable of presenting evidence in court. Some knowledge of court procedure is therefore highly desirable. With these requirements in mind the training of the food and drug chemist should include not only laboratory exercises to familiarize the student with the various analytical procedures necessary to check the identity, quality and purity of various foods, beverages, confectionery and condiments, but also interpretation of analytical results should be discussed and library reference reading assigned in order to acquaint the student with the literature in this special field.

Experience has shown that most of the fundamentals in a laboratory course in food analysis may be covered in a single semester of three or four hours' credit, leaving a second semester of two or three additional hours for more advanced study.

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It is here assumed that students are not ready to take up a course in food analysis until they have had qualitative and quantitative analysis and organic chemistry. Too often, in order to save time in laboratory courses, most of the reagents and volumetric solutions are prepared for the students, but we believe that the preparation of some of these solutions and reagents have a decided instructional value and will tend to give the worker greater confidence when later entering a control laboratory.

Laboratory exercises should be carefully selected to include the use of all the special apparatus and instruments commonly employed in the up-to-date laboratory. The skill and accuracy of each student may be developed and checked at will by preparing unknowns for analysis whose composition is known to the instructor and the results reported may be graded not only according to accuracy, but also upon the speed of the worker. For one student may promptly report the correct result of an analysis while another may require double the time or may spoil the unknown and require a refill two or three times before completing the analysis.

Report blanks may be provided in printed forms which have space for analytical data and the interpretation of results by the analyst.

In order to impress the laboratory worker with the necessity for care in handling expensive laboratory equipment, students may be requested to prepare a list of all special apparatus required in a modern analytical laboratory and to estimate the cost of equipment after consulting apparatus catalogs.

Nearly a third of the lecture or class-room periods may well be devoted to the working of mathematical problems based upon laboratory data, for too often a student, after completing a quantitative laboratory experiment, is unable to complete the necessary calculations or may not know the reasons why if able to follow detailed instructions.

The importance of alcohol determinations seems to justify the analysis of two or more beverages both for per cent of alcohol and denaturants. This exercise includes work with the immersion refractometer and Geissler pycnometer.

The detection of artificial food colors may be presented by giving each student at least five solutions and two or more colored candies.

A vinegar analysis involves a variety of tests both qualitative and quantitative and requires the use of the polariscope. Likewise, vanilla extract analysis provides opportunity for use of the colorimeter and the tintometer.

Although modern sterilization processes in canning would seem to make the use of chemical preservatives unnecessary, nevertheless, such products as catsup have been found on the market containing a liberal amount of sodium fluoride and hamburg steak and other ground meats are too often loaded with sulphites.

In the opinion of the writer work on butter and milk had best be preceded by a study of salad oils and fats and usually these three last mentioned items are best placed at the end of the course because of their complexity. Laboratory work with this group brings into use the Abbé Refractometer, Westphal Balance, viscosimeter, lactometer, Babcock apparatus and many others.

To a course of four hours may be added baking powder analysis involving gasometric apparatus, work on spices and condiments, and spore and mold counting in tomato products. The determination of spray residues from the use of insecticides

offers an interesting field and one which is steadily growing in importance to the health of our nation.

In conclusion, while recognizing the importance of developing skill in laboratory technique, we believe that too much emphasis cannot be laid upon the importance of reference reading and habitual contact with current literature.

As a necessary stimulus to that end we have found it very effective to prepare lists of questions on each subject covered in the laboratory outline which the student is required to answer in writing and hand in to the instructor. Such written reports not only serve to direct the student in his reading but also supply the instructor with another check upon the diligence and comprehension of each student.

MINIMUM STANDARDS FOR A HOSPITAL PHARMACY.*

BY EDWARD SPEASE[1] AND ROBERT M. PORTER.[2]

It goes without saying that any one person who attempts to outline these standards will be governed entirely by his own experiences and observations. It is our belief that the necessity for pharmaceutical service in hospitals is now so generally accepted that it is unnecessary to discuss it in this paper.

It would appear that the thing most needed at the present time is the development of a set of principles which can govern those whose duty it is to inspect and approve hospitals. Hospitals are of so many different types and serve such a variety of purposes that, if we should make the attempt to set forth a detailed list of standards, equipment and procedures, we should only provoke endless and futile discussions and so it would seem wise to leave the details which in time will become necessary to be decided in a more orderly manner.

We might offer as a suggested method that a committee chosen from each of the existing hospital associations with the inspecting organization's representative as arbiter would very quickly settle all details.

We have already submitted five principles to Dr. MacEachern of the American College of Surgeons and receiving no adverse criticism of them we shall again present them here with some explanation of them attached.

PRINCIPLE NO. 1.

Every hospital must have pharmaceutical service.

(*a*) The full time of a graduate registered pharmacist, or

(*b*) Pharmaceutical service from an approved adjacent pharmacy.

Under the heading (*a*) there will be some opposition to the use of the word, "graduate." We have given this subject much thought and inasmuch as these are principles to guide an inspecting officer and are not statute law it would seem to us wise to retain this word. No organization working for the good of hospitals would insist upon the removal of a pharmacist because he or she is not a college graduate if the service can be satisfactory, but if due consideration is to be given to the safety of the patient and if necessary service and coöperation is to be offered to the physician, it appears that all replacements and all new pharmacists added should be graduates of recognized colleges of pharmacy.

Under the heading (*b*) there are no standards for an approved pharmacy but as the AMERICAN PHARMACEUTICAL ASSOCIATION is now considering such standards it would appear that their

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