ORGANIC CHEMISTRY SECTION

The discussions of the section centered around five general topics: prerequisites for organic chemistry, the presentation of subject matter, examinations, laboratory work, and qualitative organic analysis.

Prerequisites: Most of the colleges represented require that a student complete both general chemistry and analytical chemistry before studying organic chemistry. Some exceptions are made for pre-medical and pre-dental students. It was the conclusion of the group that the teaching of basic concepts as well as recent developments in theoretical organic chemistry is less difficult if the student is well grounded in the fundamentals of chemistry. Therefore, it was recommended that two years of college chemistry are desirable as a prerequisite for organic chemistry.

Presentation of Subject Matter: The question as to whether aliphatic and aromatic chemistry should be presented simultaneously or separately was a warmly debated subject. Some maintained that it is best to present the material in the order of increasing complexity beginning with saturated aliphatic compounds and proceeding through olefins before discussing aromatic compounds. Others claimed that this creates an unnecessary division of the subject matter. They believed that aliphatic and aromatic compounds should be discussed simultaneously, making mention of the similarities and differences between the two classes. It was pointed out that, since a large percentage of laboratory syntheses involve aromatic compounds, it is desirable to introduce the chemistry of these compounds early in the course. A great variety of organic textbooks are being used by the participants. The majority of the group agreed that it is the responsibility of the teacher to emphasize the important material in the course so that the student can separate the salient features from the wealth of descriptive

material in the texts. A need was expressed for a new organic problem book with answers.

Examinations: It was agreed that frequent examinations are useful in the teaching of organic chemistry. On the average some kind of examination is given every two weeks. The multiple choice type of question is used by very few of the teachers.

Laboratory Work: There was a prolonged discussion of laboratory practice. Some believe that it is best to keep the subject matter of laboratory work in phase with the lecture material. Others feel that there is instructional value in the presentation of material in the laboratory before it is mentioned in lecture. There was no agreement on whether special laboratory techniques such as melting point determinations, crystallization and distillation should be studied as preliminary experiments or introduced as needed for a specific preparation. It was agreed that close contact between student and instructor is essential to effective laboratory training. In this connection it was mentioned that oral examinations over laboratory work are good but time consuming. Provision for students to work on special preparations and group study of variations on a reaction were mentioned as means of stimulating interest in laboratory work. Semi-macro methods which make use of standard types of equipment were considered to be superior to semi-micro methods. The use of safety glasses at all times in the organic laboratory was recommended.

Qualitative Organic Analysis: The colleges represented offer qualitative organic analysis courses varying from two to four semester hours' credit. The majority felt that the equivalent of four semester hours is necessary for the best course. There is considerable variation in practice

in the number of unknowns assigned and the amount of preliminary laboratory work required before the identification of unknowns is started. It was agreed that qualitative organic chemistry is the best advanced course in organic chemistry.

Notes on the Discussion by the Physical Chemistry Teachers of Midwest Liberal Arts Colleges, Monmouth College, Nov. 14-15, 1952

Participating in the discussion:

Maurice Armstrong	Millikin University, Decatur, Ill.
John Biester	Beloit College, Beloit, Wis.
E. R. Ericson	Augustana, College, Rock Island, Ill.
Harold R. Grady	Muskingum College, New Concord, Ohio
Clifford R. Keizer	Central College, Pella, Iowa
Lawrence L. Motiff	St. Norbert College, West De Pere, Wis.
H. G. Nachtsheim	College of St. Thomas, St. Paul, Minn.
Ben H. Peterson	Coe College, Cedar Rapids, Iowa
S. J. Vellenga	Monmouth College, Monmouth, Ill.
Eugene Weaver	Wabash College, Crawfordsville, Ind.

Ben Peterson was chosen to act as chairman of the group and Cliff Keizer as secretary.

At one time or another in the discussion periods, these topics came in for some batting around:

1. Special courses--intended for pre-meds, non-majors;
2. Mathematics prerequisites for P. Chem. courses;
3. Textbooks and laboratory manuals;
4. Plan of laboratory work;
5. Laboratory reports, data;
6. Redistribution of topics;
7. Preparation for graduate work;
8. Advanced P. Chem. courses.

1. Approximately one-half of the colleges represented offer more than one elementary P. Chem. course; the one intended for pre-meds and non-majors usually does not require calculus as a prerequisite. It was agreed that where staff, space, and student personnel permit such an arrangement, it is convenient to have such a course. This permits giving chemistry majors a more intensive course.

2. The standard prerequisite of calculus makes it impossible in most colleges to offer P. Chem. to majors in their junior year.

3. It was found that the group was almost evenly divided in the use of the two most popular textbooks. There was not complete satisfaction with either one, particularly in the treatment of thermodynamics. Few use published laboratory manuals.

4. Some instructors prefer to assign a comprehensive project rather than a series of weekly experiments. There is value in each method.

5. Practice varies as to data treatment; some require a permanent record in a bound notebook; others ask for a record on loose leaf sheets, with a duplicate copy to be turned in to the instructor at the end of the experiment. Reports vary from the fill-in type to extensive surveys on comprehensive topics. Grading of reports is based on (a) quality of experimental work, (b) quality of write-up, neatness, comprehension of principles, (c) attitude in laboratory. Grading preferably on a semester or long term basis rather than on individual reports.