MIDWESTERN ASSOCIATION OF CHEMISTRY TEACHERS
IN LIBERAL ARTS COLLEGES

Office of the Secretary-Treasurer
Earlham College
Richmond, Indiana

April 15, 1964

TO: MACTLAC Members in Good Standing

SUBJECT: Report of the Twelfth Annual Meeting, held at Wabash College on October 18-19, 1963

The twelfth annual meeting set a new record for attendance, with 175 members and guests present. Ed Haenish and his colleagues had done an admirable job of making arrangements for the meeting and, despite the unexpectedly large attendance, everything worked out quite well. The afternoon program consisted, as usual, of discussion groups, brief summaries of which are enclosed for your information.

The banquet on Friday evening was an enjoyable occasion, and was followed by an interesting and provocative talk by Quentin (Pete) Peterson of Wabash College on "Faculty Research in Liberal Arts Colleges." Pete took many of us by surprise with what he had to say, and forced us to re-examine our philosophy toward undergraduate student research. He argued that student participation in research requires a good deal of faculty time in training and supervision and that the student often accomplishes very little. The student may actually benefit to a greater degree by classroom contact with a faculty member who is himself actively pursuing research activities without the involvement with student assistants. After Pete's talk, there were informal tours of the science buildings and opportunities to talk with Wabash faculty in the various sciences about their research activities.

On Saturday morning we had a lively panel discussion on, "The Role of Descriptive Chemistry in the College Curriculum." The panel consisted of three outstanding chemistry teachers from larger institutions -- Harry Sisler, University of Florida; Robert Brasted, University of Minnesota; and M. Kent Wilson, Tufts University. Everyone agreed that descriptive chemistry is still important, but it was difficult to define what is meant by descriptive chemistry or to agree on how best to teach it. We had hoped to have Harry Lewis report on a recent survey of research in MACTLAC colleges but, due to his wife's illness, he was unable to attend. He did prepare a mimeographed report which was distributed, and additional copies may be obtained by writing to him at The Insititute of Paper Chemistry, Appleton, Wisconsin.

At the business meeting, the executive council recommended that the time has come to review the organizational structure of MACTLAC. In particular, the increase in attendance at the annual meetings and the increasing number of people applying for associate membership pose some questions about the nature of the organization. A committee consisting of Harry Lewis (Chairman), Dick Ramette, Jack Powers, and Perry Moore was asked to study the matter and report next fall. William Oelke (Grinnell College) presented a report of the MACTLAC Physical Chemistry Lab Manual Project, and urged people to submit experiments for testing and possible inclusion in the manual.

The officers for the current year are:

President: Paul Carnell, Albion College
President-Elect: Martin Allen, College of St. Thomas
Secretary-Treasurer: Wilmer Stratton, Earlham College

The newly-elected state representatives, chosen in caucus by members present from their states, are:

Minnesota: Chester Shiflett, Macalester College
Missouri: Joseph Huselton, William Jewell College
Wisconsin: Robert Rosenberg, Lawrence College

The state representatives who have another year to serve are:

Illinois: Jack Coutts, Lake Forest College
Indiana: Henry Weaver, Goshen College
Iowa: Emmitt Jacob, Drake University
Michigan: Jacob DeYoung, Alma College

The 1964 meeting will be held at Lake Forest College, Lake Forest, Illinois, with Jack Coutts as program chairman. The dates are October 23-24.

The 1965 meeting will be held at Lawrence College, Appleton, Wisconsin.

Although it is a little late in the year, I might remind you that MACTLAC has a Teacher Placement Directory, designed to bring together individuals looking for teaching positions in MACTLAC colleges and institutions seeking faculty members. Individuals may write to Arild Miller, The Institute of Paper Chemistry, Appleton, Wisconsin, giving name, address, degrees, and fields of teaching competence. Colleges are encouraged to inform Arild of openings which are available. In addition, colleges might wish to notify Arild of any of their recent graduates who may be interested in teaching positions in liberal arts colleges.

Sincerely,

Wilmer J. Stratton

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Financial Statement

Balance as of 1 January 1963	$497
Income (dues) during 1963	$308
Expenses during 1963	$327
Balance as of 1 January 1964	$478

Membership as of January 1964 275

WRITTEN SUMMARIES FROM DISCUSSION GROUPS

1963 MACTLAC Meeting

Group 1. NEW IDEAS IN GENERAL CHEMISTRY LABORATORY
Chairman: Dr. Robert Rosenberg, Lawrence College
Resource People: Dr. Gerald Bakker, Earlham College
Dr. W. T. Lippincott, Ohio State University

Dr. Lippincott described an honors program at Ohio State involving fifteen students. These students are selected during the summer before their Freshman year on the basis of ACS exams, ATC scores and other data. The first quarter is concerned with structure, the second quarter is devoted to thermodynamics and quantitative analysis, with the emphasis in the laboratory being design of experiments and inorganic preps. The third quarter has as its theme "Reactivity and Structure." Research type problems are assigned during the last quarter. Modern equipment is introduced such as NMR, I.R., and X-Ray equipment. Three staff members are involved in the program. Students take Claculus concurrently with this course.

The Earlham program was described by Dr. Bakker. The normal program, which involves about 100 students, includes one course each term during the freshman year. The first course is titled Particles of Chemistry, the second is States of Matter, and the third is Covalent Bond. A second group of about 25 students, selected on the basis of exam scores, follows a somewhat accelerated program combining Mathematics, Physics and Chemistry in the first year. The laboratory program at Earlham is designed around three precepts:

(1) Laboratory work should be an integral part of the course, both building on past lectures and providing the data and understanding for coming lectures.
(2) The student should see the laboratory problem as intellectually sound, that is, the answer should not be immediately obvious and the techniques he uses should be understandable to him.
(3) There should be a "vertical development" of laboratory ideas and techniques. New experiments must build on previous ideas and techniques.

The discussion afterwards centered on specific experiments which could be used. The point was made by Dr. Young that the pre-laboratory discussion of such experiements follows programmed instruction principles.

Group 2. PROBLEMS ARISING FROM ACADEMIC CALENDAR CHANGES
Chairman: Dr. Allen Hanson, St. Olaf College
Resource People: Dr. Kurt Kaufman, Kalamazoo College
Dr. James Finholt, Carleton College

This group was concerned with the effect of calendar changes on the chemistry program. Dr. Kaufman described the unique Kalamazoo plan in which students follow a staggered sequence of eleven-week quarters which includes eleven terms on campus, two in study abroad, and two vacation quarters in a year-round program. Offsetting the admitted gain in reducing student provincialism, Dr. Kaufmann observed the chief drawbacks to be:

(1) reduced time available to laboratory
(2) one quarter too short for senior thesis, and
(3) difficulty in recruiting student assistants and in promoting learning through inter-class associations.

Dr. Finholt of Carleton described the 3-3 program in which students take three courses in each ten-week term. He reported considerable flexibility in arranging student programs but noted a shortage of laboratory time. Speaking on the 4-1-4 plan to go into effect at St. Olaf, Dr. Hanson mentioned that chemistry majors' programs get "tighter" under a reduced course load but that the four-week Interim of one course provided challenging opportunities for project work and allowed total concentration on Qualitative Organic Analysis in the junior year. In general, the newer programs include fewer courses in the total program, hence decrease flexibility in choice of courses but some increased flexibility in schedule arrangement. Many found greater difficulty under calendar change to meet A.C.S. standards in certain details, but no one reported serious trouble.

Group 3. WAYS AND MEANS OF MEETING THE NEW A.C.S. MINIMUM STANDARDS
Chairman: Dr. Joseph Danforth, Grinnell College
Resource Person: Dr. Laurence Strong, Earlham College

The meeting opened with a general discussion of the new standards and some of their implications. A number of specific questions were then directed to Dr. Haenisch as a member of the Committee on Professional Training of the A.C.S. Some of the questions and Dr. Haenisch's answers were as follows:

(1) Use of student assistants and calculation of faculty contact hours. Dr. Haenisch felt that the Committee encourages the use of undergraduate student assistants in liberal arts colleges. Faculty contact time should be computed on the basis of actual time spent.
(2) In many schools courses in analytical and biochemistry are taken by pre-medical students and biology majors who have not had physical chemistry. Can all students be enrolled in the same course but with different exams given to chemistry majors and non-chemistry majors? Dr. Haenisch felt the Committee would frown on such a procedure, but might favor a course where chemistry majors received additional lectures as well as a separate examination.
(3) In view of the different academic calendars now in use, it is difficult to equate course hours to a 15 week semester. Dr. Haenisch felt the Committee is more interested in evaluation of the overall program rather than evaluation of course hours.

Group 3. (continued)

(4) German requirement. Dr. Haenisch felt the Committee would not approve a department if another language was substituted for German. He also pointed out that the Committee wants to see evidence of the use of German in chemistry courses.

(5) How rigidly is the requirement of a four man staff enforced? Dr. Haenisch felt this would depend on the staff loads and fields. If a school offered a limited freshman program, then a three man staff might be acceptable.

Group 4. THE USE OF VISUAL AIDS
Chairman: Dr. Paul Wright, Wheaton College
Resource Person: Grovenor Rust, Southern Illinois University

(1) Programmed Learning - Several types of programs are available, including linear programs and scrambled book presentations. Some programs may be used by themselves while others are best used along with a text. Much depends on how well the program has been written and the progression of material. Criterion tests are essential. Programs do not do away with teachers -- teachers are essential for the successful use of programs. Mr. Rust expressed a willingness to accept invitations to address college faculties on the subject of programmed learning.

(2) Modecular models and Films were discussed briefly. Many large companies have films on specific processes which they are willing to loan on request.

(3) Transparencies - These are very useful with large classes. A plastic sheet material is available from 3M Company which can be used in Thermofax and Xerox machines for rapid making of transparencies (black and white or color) for use with overhead projectors. A wax pencil can be used for additions in class. Zipitone and Transpak provide colored plastic sheets for transparencies (available from Welch and Central Scientific). Mr. Rust recommended that projectors older than about 1957 models should be replaced with the newer and more convenient models. Organic equations, notes and diagrams made into transparencies and then into ditto masters on Xerox or Thermofax machines can also be a wonderful time saver.

Group 5. NEW IDEAS IN ORGANIC LABORATORY
Chairman: Dr. William Martin, Lake Forest College
Resource Person: Dr. John Crump, Albion College

(A) Organic qualitative analysis

The group present felt that organic qualitative analysis was most important and a survey of the group clearly indicated that it is offered in some form or another at most schools. Many offer organic qualitative analysis as a separate advanced laboratory while others incorporate a large amount of it in the latter part of the elementary organic laboratory. Further discussion indicated that the classical organic qualitative analysis course should be modified so as to make realistic use of infrared and gas-liquid chromatography techniques.

Group 5. (continued)

(B) Instrumentation

The two instrumental techniques that are in widespread use in modern organic chemistry are infrared and gas-liquid chromatography.

Approximately one half of those present had operating infrared instruments and about one third of these use this technique in some way in the elementary organic laboratory. Most have a student assistant working closely with the student and in many cases the assistant actually prepares the sample and operates the instrument with the student as an observer. It was felt by many that this was not a desirable situation. Some schools have been making use of printed spectra for student practice in interpreting infrared spectra. This seemed to most to be a good teaching procedure to follow and was used by a few schools that did not have an infrared instrument available.

Again about one half of those present had operating gas-liquid chromatography instruments. Approximately one half of these use this technique in the elementary organic laboratory. A number plan to use this technique for complete product analysis in the beginning organic laboratory in order to make the usual preparation experiments more meaningful. Most use is made of this technique at the present to follow distribution of products and to establish product purity. In most cases the operating variables, temperature, flow rate, etc., were set by the instructor with the student then carrying out the sample injection and interpretation of the chromatogram.

(C) General

About one fourth of those present use standard taper ground jointed glassware in the elementary organic laboratory and all favored the use of this equipment. Most seemed to be planning for a shift to this equipment in the near future. There was general discussion and general agreement that "open ended experiements" and "individual project experiments" were good and many schools are inserting experiments of this type into their programs.