

MIDWESTERN ASSOCIATION OF CHEMISTRY TEACHERS
IN LIBERAL ARTS COLLEGES

OFFICE OF THE SECRETARY-TREASURER

Cornell College
Mount Vernon, Iowa

February 15, 1962

TO: MACTLAC members in good standing
SUBJECT: Report of the Tenth Annual Meeting, held at Cornell College in Mount
Vernon, Iowa on October 27-28, 1961

Cloudy and cool weather greeted some 140 members and guests as Cornell College hosted the Tenth Annual Meeting. Public transportation into Mount Vernon was not too good but most everyone arrived on time.

Arild Miller, the president, opened the first general meeting. Harry Lewis presented a most interesting report for Bill Manuel, who could not be present, on their report of the baccalaureate origins of M.D.'s from our MACTLAC schools.

The discussion groups (see attached summaries) were well attended. From the over-heard comments at coffee breaks and other times your secretary missed another informative meeting. (Note to any future secretary - don't play host while you are secretary.)

Jim Culbertson, the program chairman, and your secretary would like to take credit for those steaks and fish that were enjoyed at the banquet on Friday evening. Unfortunately, we must give all the credit to our food service. The meal was followed by a most stimulating and thought-provoking lecture by Cal Vanderwerf.

Your officers for the current year are as follows:

President: Joe Danforth, Grinnell College
President-Elect: Enno Wolthuis, Calvin College
Secretary-Treasurer: Bill Deskin, Cornell College

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

Iowa - F. Emmitt Jacob, Drake University
Michigan - Jacob DeYoung, Alma College
Minnesota - Jim Finholt, Carleton College
Missouri - Bill Pivonka, Park College
Wisconsin - Dick Bayer, Carroll College

The state representatives who still have a year to serve are:

Illinois - Robert Berntsen, Augustana College
Indiana - Wilmer Stratton, Earlham College

The Eleventh Annual Meeting (1962) will be held at Alma College, Alma, Michigan, with Howard Potter as program chairman. The dates for this meeting are October 12th and 13th, so mark your calendar.

In 1963 we shall meet at Wabash College, Crawfordsville, Indiana with Ed Haenisch as program chairman.

WRITTEN SUMMARIES FROM DISCUSSION GROUPS

Group 1. PHYSICAL CHEMISTRY LABORATORY MANUAL GROUP

Leader: Dr. William C. Oelke, Grinnell College

The physical chemistry laboratory group met to consider further developments on the manual. A motion was passed to the effect that the position of editor be established, that he be the Chairman of the Committee and have power to carry out the usual function as editor and to appoint members of a group known as the Board of Associate Editors. Dr. W. C. Oelke was unanimously elected to this position and reappointed Dr. J. P. Huselton as secretary. Dr. Oelke, who will be on sabbatical, was authorized to write the theoretical portion of the manual with the understanding that he and any others, as authors, will have publishing rights.

The other part of the manual will be flexible. Only workable experiments should be submitted, but three categories are being considered, namely (1) untested ideas, (2) tested experiments, (3) rechecked work. Research-type and open-end experiments are desirable, though some routine-type are needed as are those affording practice in universally-used techniques. Periodical references should be included as well as information about apparatus (home-made and otherwise) as this is often difficult to obtain. Anyone else wishing to be included in the program is invited to send experiments to J. P. Huselton, William Jewell College, Liberty, Missouri. Adequate credit for these is being given in the manual.

In a discussion of methods of financing the manual, it was brought out that conditions for many grants require that the project be well beyond the initial stages. A motion was passed to the effect that the chemistry departments of all MACTLAC schools be asked to contribute \$10.00 toward the MACTLAC Physical Chemistry Laboratory Manual in order to get the project rolling. This request is to be brought before the general meeting. Before adjournment, the group expressed a desire to meet next year at a time that will permit attendance at other MACTLAC discussions.

Submitted by: J. P. Huselton

Group 2. LABORATORY APPROACH TO INTRODUCTORY CHEMISTRY

Leader: Dr. Jay A. Young, King's College

This group participated in a discussion of the functions of the introductory laboratory and the means by which they might be attained. The introductory laboratory has four major functions as outlined by this group. (1) To generate a lively educated interest in chemistry, dependent upon the notion that though much is known, much more remains unknown. (2) To teach the student how to think systematically for himself. (3) To understand that theory and fact are both important, but that theory depends upon fact; hence, in this sense, laboratory is synonymous with chemistry. (4) To acquire, retain, and use information concerning the chemical properties of selected elements and compounds, manipulative skills, the habit and practices of safety and a respect for reagents (as distinguished from the aspects related to safety).

Five approaches were noted by the group which can be used to fulfill one or more of the functions. In practice, an assigned experiment would often incorporate more than one of these approaches simultaneously or consecutively.

A. The student is given specific directions and notes his observed results and makes his calculations on a printed page in appropriated blank spaces.

B. The student is given an unknown, which is known to the instructor, and is asked to determine constituents or composition, or both.

C. The student is directed to perform certain manipulations and observe the phenomena which ensue. This may require information and or methods from a text, reference work or

Group 3 (cont'd)

this at the advanced level (where students have greater maturity and more chemical knowledge) rather than the older practice of including it in general chemistry. A number of useful historical and biographical references were recommended, including the following: (1) the Harvard Case Studies, (2) Alembic Club Reprints, (3) Hildebrand, Science in the Making, (4) Hoffman, Strange Story of the Quantum, (Dover paperback), and (5) Jaffe, Crucibles; The Story of Chemistry (Premier paperback).

Special topics which have been used successfully in seminars include: Use of C-12 for atomic weights; chromatography; least squares fit of data; less well-known elements; the electron microscope and other instruments; "sandwich" compounds; structure proofs; radiochemistry; antimatter; and hydrogen bonding.

By "socio-scientific" topics is meant such things as fluoridation of water, nuclear fall-out, etc. Manchester College has used very successfully a series of films put out by the Washington University sociology department on socio-scientific issues.

As a technique to improve the quality of student participation, some schools ask each student to submit a bibliography on his talk, which is mimeographed and distributed to the other students in advance. Another useful technique is to have a series of student talks on a single major topic, thus creating more student questioning and discussion.

Submitted by: Wilmer Stratton,
Recorder

Group 4 TRENDS IN ENROLLMENTS AND DEGREES IN SCIENCE

Leader: Dr. Arild J. Miller, The Institute of Paper Chemistry

Bachelor's degrees now mainly granted by public institutions (about 60% in 1960), while in 1950 about 50% were granted by private colleges.

The number of Bachelor's degrees in Physics and Mathematics is increasing rapidly; in 1958-59 the number of baccalaureates in Mathematics was greater than the number in Chemistry for the first time. There is some evidence to indicate that the number of Bachelor's degrees in Chemistry is again increasing after being nearly constant for several years.

In terms of percentages; the per cent of baccalaureate degrees with a major in Chemistry has been declining since 1947. At the same time the per cent with a major in Mathematics has been increasing, as has the per cent of those in Physics.

The number of doctorates in Chemistry is greater than the number in Mathematics, Physics, or Biology, and has been stable at approximately 1000 per year since 1949. Physics and Mathematics doctorates are lower, and are also stable for the period 1949-1960.

The proportion of Bachelor graduates who attend graduate school in Chemistry has been increasing; in 1957 only 15% of the ACS certified men went to graduate school, while in 1961, 34% attended graduate school.

Possible reasons for the high rates of increase in baccalaureates in Mathematics and Physics were discussed.

It was agreed that data such as that presented by Dr. Miller should be widely disseminated to chemists, teachers, and high school counselors.

Submitted by: W. D. Larson,
Secretary