MIDWESTERN ASSOCIATION OF CHEMISTRY TEACHERS
IN LIBERAL ARTS COLLEGES

August, 1980

TO: MACTLAC Members in good standing

FROM: Office of the Secretary-Treasurer
Central College
Pella, Iowa 50219

RE: 1979-80 Annual Report

THE BELOIT COLLEGE MEETING - October 26-27, 1979

Beloit College in Beloit, Wisconsin, was the host for the twenty-seventh annual MACTLAC meeting. About 175 members and guests attended the meeting. MACTLAC members owe a large vote of thanks to Dr. Brock Spencer and his staff for the planning and execution of an interesting and well-planned meeting. The weather was excellent as seems to be the case for most MACTLAC meetings that I have attended.

The session on Friday afternoon consisted of three brief talks followed by discussions. Brian Andreen, Research Corporation, spoke on "Update on the Council on Undergraduate Research." He discussed one of their major projects which was the publication of "Research in Chemistry at Private Undergraduate Colleges." Possible plans for the future include a second edition of the Directory of Undergraduate Research, a CUR Newsletter which will attempt to share information on equipment, research facilities, etc., and several workshops on undergraduate research -- perhaps in conjunction with ACS Regional Meetings. Diane Yoder, Chemical Abstracts Services, talked on "Chemical Abstracts Pricing for Small Colleges" which elicited a great amount of interest since the expense of CA to small colleges has been of great concern to MACTLAC members for some time. She discussed a suggested proposal of pricing of CA to various subscribers, including grants to help subsidize those costs. Donald Gaines, University of Wisconsin/Madison, Chemistry Department, talked on "Developing an Academic Safety Program." He discussed some of his observations and recommendations for a safety program at the University of Wisconsin Chemistry Department, since he is the chairman of their Safety Committee.

The Friday evening address was by Dr. Aaron Ihde, University of Wisconsin/Madison. His address was on "The Use of History of Chemistry in Traditional Courses." With the "mushrooming" of information to be included in chemistry courses, there has been the tendency of excluding the historical contexts of chemistry. Dr. Ihde discussed a number of reasons why the history of chemical concepts should be included in our courses and illustrated his talk with a number of examples.

The Saturday morning meeting also included two talks with discussions. Marjorie Gardner, Director of the Division of Science Education Resources Improvement, NSF, spoke on "Learning How to Teach and Teaching

How to Learn Chemistry." She discussed research on Science Education and noted that the NSF has several programs which fund proposals for research on Chemical Education. She also talked about several areas of Chemical Education which she felt were in need of research. Ida Wallace, Director of the Washington office of the Great Lakes Colleges Association, was the second speaker. She talked on "Federal Policy and Funding for Liberal Arts Colleges." She concentrated her remarks on the policy of NSF review of proposals and solicited comments from MACTLAC members on our experience with the NSF staff regarding our proposals.

There were a variety of discussion groups which met on Friday afternoon and Saturday morning. I received summaries of the discussions from seven of the groups and I thank them for their reports. What follows is their summaries:

WRITING PROPOSALS AND GETTING THEM FUNDED - Attendance = approx. 30. Brian Andreen was a valuable resource person. The session began with Andreen answering questions concerning the Council on Undergraduate Research. The decision has been made to keep CUR independent of the American Chemical Society, at least for the forseeable future. The CUR Executive Committee has also concluded that there are already sufficient vehicles for the reporting of undergraduate research. There is no present intention of organizing meetings or publishing a journal for such purposes. The meetings projected would be aimed primarily at faculty and devoted to discussions of how to promote and obtain support for undergraduate research. The suggestion was made that workshops on the subject might be appropriate for future MACTLAC meetings, but Andreen expressed concern that the time available might be too limited. Regional ACS meetings are thought to be more appropriate functions for the projected sessions.

The participants then dove boldly into the alphabet soup of acronymic agencies. The funding possibilities discussed fell into four major categories.

1. Equipment Purchase

   Important Notice #69A was identified as a potentially productive source of funds for research equipment. Three million dollars have been set aside from the Analytical and Synthetic Chemistry Directorate to fund requests from colleges and universities which do not grant doctorates. A number of liberal arts colleges have been successful in obtaining grants under this program. The maximum permissable request is currently set at $25,000 acquisition cost, and there is some requirement for matching, though the formula appears to be negotiable. Proposal reviews are done four times a year and there are no specific deadlines. It appears that for the present, Notice 69A offers a better chance of success than the Instructional Science Equipment Program (ISEP). Limited amounts of equipment can also be purchased under the Local Course Improvement (LOCI) and the Comprehensive Assistance to Undergraduate Science Education (CAUSE) programs.

2. Curriculum Development

Projects involving a single course (e.g., improving a biochemistry laboratory, designing a course in industrial chemistry, developing instructional video-tape modules, etc.) or several related courses (e.g., setting up a comprehensive senior-level laboratory, creating an interdisciplinary course in neurochemistry, etc.) have been funded by the LOCI program of NSF. A limited percentage of grant money can be spent on equipment. Typically the major portion of the grant goes to provide released time for faculty or to pay summer stipends to faculty and students engaged in the curricular planning. Here again, some financial commitment by the institution is required. Comprehensive curricular change, often involving a number of science departments, would more appropriately fall under the CAUSE program which provides grants up to $250,000.

3. Faculty Development

A number of sources of funds to supplement sabbatical leaves or to finance leaves of absence were identified. Several of the MACTLACers in attendance had succeeded in winning Science Faculty Development Grants which permit from three months to a year of study at an academic or other scientific center away from the grantee's home campus. The fact that the tenure under such a program can be spent at an industrial laboratory reflects what appears to be a new NSF interest in fostering closer academic-industrial intercourse. Those present were also reminded that it is relatively easy for a faculty member to "piggy-back" onto an established NSF research grant held by an investigator. Such arrangements have been made for a summer, a semester, or an entire year.

4. Research Support

A traditional source of support for MACTLAC institutions has been the Undergraduate Research Participation (URP) program of the NSF, but the success rate is low -- only 29%. Individual faculty members can apply for funding to various NSF, NIH, and DOE directorates, and their students can apply to the Student Originated Studies (SOS) program of the NSF. Non-governmental sources of research support specifically oriented to small college faculty and students include the Cottrell College Science Grants of the Research Corporation and Type B and Type G grants from the Petroleum Research Fund (PRF) of the American Chemical Society.

Grants from private foundations or industry can sometimes be used to finance any or all of the above categories. In fact, it seems that much of the money from sources such as Du Pont, General Electric, Amoco, Dow, and Johnson's Wax comes with few strings attached. Comments from the group suggested that such grants are difficult to initiate, but once started are quite easy to maintain.

In the course of the discussion, various gambits in grantsperson-ship(?) were mentioned. The most important point is to apply early and often. If you succeed, fine. If not, ask for your reviewers' comments. They can help you improve future proposals, and in some instances the reviewers or the NSF staff can direct you to more appropriate programs. Studying successful proposals (available from the NSF or from the applicants themselves) can sometimes be of considerable assistance. So can serving as a member of a review panel. If you really want the inside view, the NSF is often looking for faculty to hire for a year or two on special temporary appointment. Finally, a satisfied winner offered the good advice that one should not be in too much of a hurry to agree to the financial details proposed by a grants officer. Many of the arrangements (including amount of matching, period of the grant, etc.) are negotiable. Make sure you get your fair share. -A. Truman Schwartz

INDUSTRIAL CHEMISTRY - Attendance = 6.

A sparse attendance of six was all that could be mustered. All of these persons were information seekers rather than contributors of personal experiences with industrial chemistry. Thus the session revolved entirely around the presentation of Wayne Wesolowski of Illinois Benedictine College concerning his department's industrial course. Five major divisions in the course were identified: organic, inorganic, metallic, pharmaceutical, and petrochemical industrial chemistry. A skill was mentioned as a focal point in each of these areas along with a discussion of the actual chemistry involved. It was emphasized that the skills were ones which were of general importance in a career, not just of application to industrial chemistry. Some skills mentioned were lab management in a big company, economics and cost analysis (a pilot plant computer program gave students practical experience), representative sampling, and the importance physical properties (as opposed to focusing only on chemical properties). Feedback from graduates now in industry revealed communications skills as a valuable career asset that was sorely lacking in their college training. -Brad Glorvigen

CO-OP AND OFF-CAMPUS EXPERIENCE - Attendance = ?.

The Beloit College Program was designed for a three semester year around program check-off requirement; no academic credit; dropped field work term last year; now optional. Ranged from positions which paid salaries to those for which the students paid for opportunity to work in particular fields. Field work was not necessarily connected to the field of study. This differs from co-op study where the student works in his/her field of study. Alternating work and study terms are part of a co-op study program, usually more than a four year program.

Off-campus experience gives student a feeling of freedom and independence.

Finding places for the students to work is the most difficult task involved in this program.

The Argonne Program - Students at Argonne must write a report on their work; receive academic credit for their work from their home institutions. Students work with a particular supervisor at Argonne.

Carroll College - Students have some opportunities to have part-time work experiences while attending school. These experiences help for job placement at graduation.

Science jobs are difficult to set up because there are not enough students to keep a job filled from year to year. If colleges make personal contact with companies, the positions are easier to obtain. -Margaret Yates.

BIOCHEMISTRY AND BIOLOGY

After introductions were made, the group surveyed books used, prerequisites required and department of origin of biochemistry courses. Lehninger, Stryer and Metzler are commonly used texts, although the latter is very rigorous and has been dropped by some. Most courses require a year of organic chemistry, or at least one semester of biochemistry is taught within chemistry departments almost exclusively.

Much discussion revolved around the content of cell biology and biochemistry courses. Modern biology is changing radically so that many departments are emphasizing quantitative measurement and molecular mechanisms. Both faculty and students have found this new emphasis difficult, and it has a great impact on the content of cell biology courses, and in turn, of biochemistry courses. Genetics is including molecular genetics (often taught in biochem), microbiology is including immunology, and cell biology is changing its emphasis towards evolutionary adaptation and cellular regulation, with less emphasis on classical cell ultrastructure or histology. How, then, does biochemistry fit into this? Some overlap with cell biology is inevitable, but it seems that intermediary metabolism with an emphasis on mechanisms will be a unique emphasis of biochemistry. Metzler has much to offer in this respect. Regulation, advanced problem solving, and the methodology of biochemistry cannot be adequately covered in a first semester of biochemistry, and seem to fit better into an advanced topics course.

Several variations in the traditional biochemistry course were mentioned. Some students take a biology/chemistry double major to get a range of subjects from both disciplines. Some departments distinguish between major's biochemistry and health or nutrition biochemistry. At the laboratory level this might result in a radical difference of approach. One department is running a biophysical chemistry course as an alternative to physical chemistry, particularly with health-related students in mind (texts: Marshall and/or Tinoco). Another department has a research-oriented laboratory approach with a few experiments carried out in depth. The discussion concluded with a brief tour of the biochemistry facilities at Beloit. -D. A. Chignell.

FEDERAL FUNDING FOR LIBERAL ARTS COLLEGES - Attendance = 19.

Ida Wallace, Director, Washington Office of the Great Lakes Colleges Association answered questions concerning federal funding. Ida expressed a desire to be kept informed of research grant proposals being submitted to NSF by the membership and the outcome of such proposals. High points of the discussion included:

1) In regards to NSF-69A grants for equipment.

   (a) the turnaround time is approximately 6 months

   (b) a review panel is assembled periodically to review the grants. One should check with NSF as to the time of formation of such panels if one wishes to reduce the turnaround time.

2) The question arose as to how the discussion group felt about members of large universities sitting on review panels that evaluated small college proposals. A vote was taken as to the percent of such reviewers desirable.

   0% large university reviewers = 0,
   up to 20% = 10, 20-30% = 8,
   30-50% = 1, 50-100% = 0.

3) Guidelines were suggested for written proposals and their funding.

   (a) Acquire from NSF copies of proposals that have been funded.

   (b) Get the reviewers comments in full.

   (c) Follow-up on a rejection.

4) The group felt that the $25,000 limit on NSF-69A grants should be raised to $35,000.

5) With respect to NSF-69A Proposals, it was suggested that matching funds should not be offered. The proposal may be funded entirely by NSF. -Richard Cook.

INSTRUMENTATION - Attendance = ?

The group discussed the use of instrumentation at various levels in the undergraduate curriculum. The group made no attempt to arrive at a list of instruments which should be introduced at various levels. An attempt was made to find out what the member institutions which were represented were doing. Approximately 20 institutions were represented. For the purpose of discussion the level at which instruments were introduced included the introductory course, organic, analytical, and beyond which may include physical, advanced laboratory, instrumental or other advanced courses.

It was by no means a consensus where a particular instrument should be introduced. In the opinion of the recorder from the discussion it appeared that many introduced instruments early to obtain data to illustrate chemical principles. Often this may also show the power of a particular instrument. In the intermediate level courses the instruments, while also providing data to emphasis principles, were presented for the student to learn to optimize the parameters of the instrument and thus to treat it as more than a black box. Often in the "beyond" group a more diverse treatment of the instruments was evident. Some offered or recommended electronics courses in order to understand how the instrument operated. Others introduced the use of microprocessors to control the instrument and others interfaced the instruments to computers for more sophisticated data treatment. -Bill Deskin.

ORGANOMETALLIC CHEMISTRY - Attendance = 8.

The discussion was led off by Wayne Wolsey who outlined his plans to teach a 4-week course in Organometallic Chemistry for Upperclassmen. None of the others in attendance presently taught a course in Organometallic Chemistry and much of the discussion thus centered on the necessity for a separate course in this subject.

Several of the Organic chemists present pointed out that, despite the current synthetic utility of organotransition (and many other) complexes in Organic synthesis, the large volume of material covered in introductory courses permitted no more than a cursory study of Organometallic Chemistry (generally limited to Grignard reagents and Lithium alkyls) and important areas, such as Ziegler-Natta catalysts, were never mentioned.

The same point was reiterated with respect to the General and Inorganic Chemistry courses. While the preparation of ferrocene was cited as a common experiment incorporated into many Inorganic Chemistry courses, this type of preparation arguably does not allow a student to gain practical experience in the utilization of Organometallic compounds for Organic systhesis.

This prompted much discussion as to which topics should be included in a separate lecture and laboratory course in Organometallic Chemistry. Wayne Wolsey outlined his course as concentrating on catalysis, bonding and structures, the Oxo and Fischer-Tropsch processes, nitrogen fixation and cluster compounds--the general goal being to leave students with a greater familiarity with the chemistry of the elements as a whole.

This coverage of material appeared to coincide with the view of the majority of participants, although there was mention made that some topics could be easily covered in existing Inorganic courses.
-Ken Turnbull.

Other discussion groups were: Computer-Aided Literature Searching, Laboratory Safety and Health, Personal Computers, Learning to Teach and Teaching to Learn, General Chemistry, and Writing Books.

1980 MEETING

The 1980 meeting will be at Earlham College in Richmond, Indiana, on October 17-18. Wilmer Stratton is the Meeting Chairman. Plans for this meeting accompany this report. See you in Richmond.

GENERAL BUSINESS MEETING, October 27, 1979, 8:00 A.M.

1. President Zimmerman called the meeting to order.

2. The Secretary-Treasurer gave a brief report of the Executive Council meeting which met on Friday morning, October 26. Items mentioned were:

   a. 1980 meeting - Earlham College, October 17-18. Wilmer Stratton, probable program chairman.

   b. 1981 and 1982 meeting sites - The Executive Council intends to accept the invitations of Carthage College for 1981 and Cornell College for 1982.

   c. Thank you letters from Enno Wolthuis (awarded Honorary Membership last year) and from Warren McMullen (awarded Emeritus Membership last year) were received by the Executive Council.

      Emeritus Membership unanimously voted for:

      Courtland Agre, Augsburg College
      James Carney, College of St. Thomas
      Adrian Docken, Luther College
      Clarence Grothaus, Olivet Nazarene College
      Rudolph Priepke, Elmhurst

      The MACTLAC members were again reminded to nominate eligible members for either Emeritus and/or Honorary Membership. The necessary information should be sent to either the new President, Eugene Jekel, or the Secretary-Treasurer, Art Bosch.

   d. A summary of the Treasurer's report was given. The balance as of October 18, 1978, was $207.40 and as of October 24, 1979, was $212.60. The treasury stayed about even due primarily to the delinquent dues reminder sent out during the summer which returned $185 for 1977 and 1978 dues. There is also $1,000 in a Certificate of Deposit.

   e. The discussion on the increasing costs of the annual meetings was summarized. In light of these higher costs, the Executive Council passed this motion: "To amend the Constitution By-laws so that there is a $4.00 registration fee for the annual meeting for members and a $5.00 registration fee for the annual meeting for non-members. (The fee formerly was $2.00 for both members and non-members.) Furthermore, MACTLAC will reimburse the Host Institution up to $600.00 for expenses for the annual meeting. (This had been $450.00.) MACTLAC will continue to pay for postage costs."

Annual dues for MACTLAC will continue to be $1.00 which should cover the costs of routine business of MACTLAC. It was felt that the cost of the annual meeting should be paid for by those attending the meeting.

f. Committee Reports

Zimmerman gave a report of the Placement Committee and he will give a more complete report later.

Richard Cook will give a report of the Political Awareness Committee later. It was voted to disband the OSHA Committee. A proposal to form a new Committee on Safety and Health in Academic Laboratories will be considered later.

g. It was announced that even after last summer's request for delinquent dues, there are still over 80 members who have last paid dues in 1976 or earlier. Members were asked to notify the Secretary-Treasurer, or their State Representative if they know of members who still get mailings, and who are no longer at their college or of others who desire to drop their membership in MACTLAC.

3. New State Representatives, Three-year terms

Dr. Martin Lee Thompson, Lake Forest College (Illinois)
Dr. John Crump, Albion College (Michigan)

4. Committee Reports

a. Political Awareness Committee

Richard Cook, Chairman, gave an oral report and responded to questions. (1) He reported that last year's petition drive and letter-writing campaign of MACTLAC members regarding URP and ISIP funding did seem to give results. (2) He took the position that Science Education programs should stay in NSF and not be transferred to the proposed Department of Education. He sent information to the MACTLAC State Representatives urging them to communicate with their legislators regarding that proposed change. Cook also sent mailgrams to Legislative Committee members stating his views. (3) He sent mailgrams urging members to write letters to congressmen stating their views on programs relevant to their colleges. He reminded members that such letters should be sent immediately when such discussions are before a Committee.

Zimmerman suggested that MACTLAC owed a vote of appreciation to Cook for his work. That "vote" was shown with a round of applause.

b. Placement Committee

Zimmerman reported for Don Cook, Chairman. 124 MACTLAC schools were contacted. 30% had some opening, 35% had no opening and

32% did not reply. There were 29 positions available in MACTLAC schools. If members are interested, they should contact Don Cook, DePauw University.

5. President-Elect

Jeff Keiser, Chairman of the nominating committee, nominated Wilmer Stratton, Earlham College, as President-Elect. There were no nominations from the floor. It was moved to elect Stratton by unanimous vote. The motion passed.

6. Old Business

None.

7. New Business

a. Gene Wubbels, Grinnell College, will be the new chairman of the Political Awareness Committee.

b. Richard Bayer, Carroll College, has consented to be the chairman of the new Committee on Safety and Health in Academic Laboratories (to replace the old OSHA Committee). Dick asked those interested in being involved in this committee to meet following the General Meeting this morning.

c. Jekel moved, seconded by someone, that Jim Finholt, Carleton College, be asked to write a letter on behalf of MACTLAC to thank Chemical Abstracts Services and to the American Chemical Society for their recent efforts to reduce the subscription costs of Chemical Abstracts in the Small Colleges Program. The motion passed.

d. Jekel moved, seconded by someone, that the Secretary-Treasurer write a letter of thanks to Brock Spencer, Roc Ordman and the chemistry faculty of Beloit College for the excellent job of hosting the 1979 MACTLAC meeting. The motion was passed with a round of applause.

e. Jekel moved, seconded by someone, that the Secretary-Treasurer write a letter of thanks to the President of Beloit College for their hospitality in hosting the 1979 MACTLAC meeting. The motion passed.

f. Jekel announced the meeting of the Executive Council (including new State Representatives) at 12:00 noon in Chapin Hall.

g. Jekel suggested that we owe a round of applause to John Zimmerman for his work as past-president. Applause.

h. Truman Schwartz announced the Biennial Conference, sponsored by the Division of Chemical Education of the ACS, in Rochester, N. Y., June 22-26, 1980, and in Stillwater, Oklahoma, in 1982.

8. The meeting was adjourned.

HONORARY AND EMERITUS MEMBERSHIP IN MACTLAC

This is another reminder about the criteria for honorary and emeritus membership in MACTLAC. The appropriate sections of the MACTLAC constitution, Article II, on membership read as follows:

> Section 2. Honorary membership shall be granted only by a unanimous vote of the Executive Council, and shall be reserved for those persons who have rendered extra ordinary service to this Association or who have made especially noteworthy contributions to the improvement of chemistry teaching in the member colleges. Election to honorary membership shall be recognized by the presentation of a specially prepared and individualized scroll. Honorary members may also be Emeritus members as described in Section 3.
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> Section 3. Any person who has been an active member for 10 years may, upon retirement, request status as an "Emeritus Member" and be excused from further payment of dues but retains all other rights of membership. Such status will be recognized by the presentation of a printed certificate. Such membership does not exclude the person from consideration for honorary membership.

Nominations for Honorary Membership in MACTLAC should be in the hands of the President, Dr. Eugene C. Jekel, Hope College, or the Secretary-Treasurer, Arthur J. Bosch, Central College, by October 17, 1980. These nominations must be in writing and should have one or two seconding letters accompanying the nomination. PLEASE GIVE THIS MATTER SERIOUS CONSIDERATION.

Those eligible for Emeritus Membership should also notify the President or Secretary-Treasurer.

MEMBERSHIP LIST UPDATE

Enclosed is a form regarding updating our membership and dues file. The appropriate section of our By-Laws states: "The active members shall be those whose dues are not more than one year in arrears. A member who becomes more than one year in arrears for dues shall be removed from the membership list. Reinstatement with full membership privileges shall require payment of back and current dues, but the assessment for back dues shall not exceed two years dues." We would like to keep all interested, eligible chemists on our membership list. If you also want to pay the 1980 dues (which normally are not due until the annual Fall meeting), please indicate such payment on the form.

If this newsletter is addressed to someone at your school who no longer is there or whose address is incorrect, please let the Secretary-Treasurer know. Also indicate prospective MACTLAC members on that form.

Sincerely

Arthur J. Bosch

Arthur J. Bosch
Secretary-Treasurer, MACTLAC