

HOUSING

A block of rooms has been reserved at the following motels. Please make reservations prior to October 1 and specify that you are a MACTLAC member. If you are sharing a room with another participant, please include that information with your request. Rates (excluding tax) for single (S) and twin double (TD) rooms are listed.

HOLIDAY INN, US 31 and 32nd St., Holland, MI 49423. Tel: 616-396-1424. S, \$16.50; TD, \$23.00. Location can be determined on enclosed map. Two miles from campus.

POINT WEST, Macatawa Park, MI 49423. Tel: 616-335-5894. S, \$20; TD, \$25. Location of this luxury motel is on South Shore Drive near Lake Michigan. See enclosed map. Five miles from campus.

WOODEN SHOE MOTEL, US 31 at 16th St., Holland, MI, 49423. Tel: 616-392-8521. S, \$16; TD, \$20. See enclosed map. One mile from campus.

WARM FRIEND MOTOR INN, 5 East 8th St., Holland, MI 49423. Tel: 616-392-3131. S, \$12; TD, \$16. Hotel type accommodations. Three blocks from campus.

Additional motels in the Holland area are available on a first-come basis.

PARK VILLA MOTEL, 1159 South Shore Drive, Holland, MI 49423. Tel: 616-335-5502. S, \$16; TD, \$20. See map. Four miles from campus.

CAROUSEL MOUNTAIN MOTEL, P. O. Box 58, Macatawa Park, MI 49423. Tel: 616-335-5823. S, \$14; TD, \$16. One-half mile south of 32nd St. on 66th St. Five miles from campus.

BUSH'S MOTEL, 3896 S. Washington, Holland, MI 49423. Tel: 616-392-2644. S, \$10; TD, \$14. South of I 196 - US 31 - Old 31 interchange on Blue Star (S. Washington or A-2 or Old 31) highway. Seven miles from campus.

SHANGRAI-LA MOTEL, Blue Star Memorial Highway, Saugatuck, MI 49453. Tel: 616-857-2040. S, \$16; TD, \$20. One-half mile north of I 196 Saugatuck exit on Blue Star Highway. 10 miles from campus.

Excellent motels are also available in Saugatuck, 12 miles south; Grand Haven - Spring Lake, 20 miles north; and Grand Rapids, 30 miles northeast.

TRANSPORTATION

The Grand Rapids Airport, served by United and North Central Airlines, is located about 40 miles from the campus. We will arrange to send cars to meet arrivals at the airport for those who request this service on the enclosed form. The cost will be \$4.00 per person.

The Holland area and campus insert on the enclosed map give directions for those who drive to the campus. De Witt Center (#54) and Peale Science Center (#16) are both located on 12th Street. Street parking adjacent to campus is recommended, although campus parking lots will also be available.

A Greyhound Bus depot is located three blocks from campus.

Persons having questions on travel or housing should contact Eugene C. Jekel, Department of Chemistry, Hope College, Holland, MI 49423. Tel: 616-392-5111.

MACTLAC OFFICERS

President	Sister Mary Thompson
President Elect	College of St. Catherine
Secretary-	Cornell College
Treasurer	Marvin P. Dixon
	William Jewel College

ELECTED STATE REPRESENTATIVES SERVING ON MACTLAC COUNCIL

Illinois	William B. Martin
Indiana	Lake Forest College
Iowa	John F. Zimmermann
Michigan	Wabash College
Minnesota	Peter J. Hansen
Missouri	Northwestern College
Wisconsin	Richard J. Cook
	Kalamazoo College
	Patricia A. Fish
	College of St. Catherine
	Thomas Holloway
	William Jewell College
	Arild J. Miller
	The Institute of Paper Chemistry

HOPE COLLEGE

welcomes
you
to the

TWENTY-FOURTH

ANNUAL MEETING

of

MACTLAC

Midwest Association

of

Chemistry Teachers

in

Liberal Arts Colleges

October 8 and 9, 1976
Holland, Michigan

PROGRAM

FRIDAY, OCTOBER 8

10:30 a.m. - EXECUTIVE COUNCIL MEETING AND LUNCHEON - De Witt Center 231

11:00 a.m. to 1:30 p.m. - REGISTRATION
Peale Science Center 201

1:30 p.m. - GENERAL MEETING - De Witt Center 204

Greetings from Gordon J. Van Wylan,
President of Hope College.

Address: *Where Do We Want Academic Chemistry to be by 1984?* W. Thomas Lippincott, University of Arizona; Editor, *Journal of Chemical Education*.

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Resource Person: W. T. Lippincott.

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4. *Workshop on the Use of Chemical Abstracts Concentrates* - Includes reports from users and a review of the service of the Institute of Paper Chemistry; a discussion of the merits of the annual subscription vs. computerized services. Coordinator: Berwyn E. Jones, Upper Iowa University. Resource Person: John Church, Research Associate, Computer Center, Institute of Paper Chemistry.

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SATURDAY, OCTOBER 9

8:00 a.m. - Breakfast buffet followed by business meeting. Durfee Hall, Terrace Room.

9:30 a.m. - PANEL - De Witt Center 204

New Approaches for Providing Learning Experiences for Chemistry Majors. Panel Moderator: Michael P. Doyle, Hope College.

Undergraduate Research on Campus. Panelist: Richard J. Cook, Kalamazoo College.

Student and Faculty Development from the Perspective of a Private Foundation.

Panelist: Brian H. Andreen, Research Corporation.

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Resource Persons: All panelists listed above.

Most of the Friday group discussions will be repeated.

12:30 p.m. - COUNCIL MEETING and LUNCHEON

Phelps Hall, Conference Room, South Section.

Lunch will be available in a separate room on campus for others who wish to remain.

Interested persons should use the cafeteria line in Phelps Hall and eat in the Conference Room, North Section.

PROGRAM ARRANGEMENTS

Eugene C. Jekel, Program Chairman, and the chemistry faculty of Hope College: Barbara J. Barker, Rodney F. Boyer, Irwin J. Brink, Michael P. Doyle, Donald M. Friedrich, David H. Klein, William S. Mungall, F. Sheldon Wetzack and Donald H. Williams

MINUTES OF THE EXECUTIVE COMMITTEE AND GENERAL BUSINESS SESSION
OF THE 24TH MEETING OF MACTLAC AT HOPE COLLEGE, HOLLAND, MICHIGAN,
OCTOBER 11, 1976

The executive committee met October 11, 1976 at 10:00 a.m. in the Student Union of Hope College, Holland, Michigan. Present were:

Daniel Hoy	(Monmouth College)
Richard L. Keift	(Monmouth College)
Bill Martin	(Illinois)
Quentin Petersen	(Placement Service)
Richard Cook	(Michigan)
John Zimmerman	(Indiana)
Tom Holloway	(Missouri)
Sister Mary Thompson	(President)
Patricia Fish	(Minnesota)
Addison Ault	(President Elect)

Bill Martin moved the acceptance of the printed minutes of the executive committee. Patricia Fish seconded.

Daniel Hoy, from Monmouth, spoke on their plans for the 21st anniversary meeting of MACTLAC. They plan to focus on the history of the organization. A posted list of charter members were suggested as well as minutes of the first meeting. The charter members to be recognized as guest at the banquet dinner. Discussion focused on obtaining part of the archives from Arild Miller for display. Contact between the secretary and Daniel Hoy in early spring concerning programming, exact dates, etc., in order to mail a program in mid-August to members.

John Zimmerman moved MACTLAC provide additional support for any charter member. The extent of that support to be negotiated by the President and program chairman for the dinner and other specific items deemed necessary.

The printed treasurers report was approved. (See attached report). The treasurer responded that a savings certificate had not been obtained. The executive committee continued to recommend the acquisition of a savings certificate.

Richard Cook moved that the treasurers report in the future be broken down into income from dues, income from registration and associated expenses. Bill Martin seconded the motion. The motion passed.

Richard Cook moved that Beloit be our meeting site for 1979 and that Cornell be the 1980 meeting place. The president is to confirm the acceptance of these locations by MACTLAC with representatives of these institutions. John Zimmerman seconded the motion. The motion passed.

Quentin Petersen submitted a report on the placement activities of MACTLAC. It was suggested that MACTLAC be billed for some of the costs of the program. Postage was the largest item. Twenty dollars was estimated as probably amount necessary. It was noted that there were twice as many openings as there were candidates.

Bud Hudson reported that the committee on OSHA activities has done nothing except what he has done personally. He requested permission to issue a recommendation at the end of this years meeting. Further he wishes to advertise for volunteers. After Bud has reassembled a committee, the committee will be reappointed by Addison Ault.

Berwyn Jones' report on the activities of the CA committee was received. The committee is to be continued with Berwyn as chairman. Their main thrust for the coming year is to identify the CA and ACS counselors who could be of assistance to MACTLAC Schools with the problems of date acquisition.

It was reported that Jim Finholt had refused the chairmanship of the Committee on Political Awareness. Richard Cook will assume the chairmanship of that Committee for one year. Bill Martin and Berwyn Jones are to be members. The committee will report next year to the executive committee.

The scrolls for Honorary Members were found to be available from Jostens for a minimum of 100 copies at \$104.00 by Jack Cook. They could be printed as a single form for honorary membership as well as emeritus membership. After a discussion of costs with Quentin and Sister Mary Thompson volunteering to perform certain tasks, it was moved by Tom Holloway that Sister Mary Thompson investigate the cost of printing of the scrolls on her campus and that Quentin Petersen prepare the written content of the scrolls. Richard seconded and the motion passed.

The nominating committee had no report, therefore the executive committee as a whole served as nominating committee.

Names suggested for president elect were: Herman Broene, Forest Frank, Eugene Jekel, Joe Woods and Arild Miller. The committee agree to approach Joe Woods and if he was amenable to the nomination he would be the executive committee's nominee for president elect.

GENERAL BUSINESS SESSION

The general business session of MACTLAC for 1976 met October 12, 1976 at 8:30 a.m. at Hope College, Holland, Michigan. Sister Mary Thompson was the presiding officer. The minutes of the October 11, 1975 meetings, printed in the newsletter, were approved as printed.

Dr. Jekel introduced William Joy, Director, Environmental Health and Safety Division, University of Michigan; Jack Young, Director, Safety Division, Dow Chemical Company and Joe Rogers representing ERDA as guest of MACTLAC.

The newly elected representatives were announced. For three year terms they are:

Illinois: Larry Funck, Wheaton College
Michigan: Eugene Jekel, Hope College

Actions of the Executive Committee were announced.

1. The Political Awareness Committee is to be chaired by Richard Cook with Bill Martin and Berwyn Jones as members.
2. A scroll is to be developed for honorary members and one for emeritus members by Sister Mary Thompson and Quentin Petersen.
3. Letters of recommendation for a colleague to the status of honorary member must be in the hands of the state representatives by August 1, 1977. All members are encouraged to give this matter serious consideration, especially is this true of the year 1977 since we will be celebrating our 25th anniversary.

4. The future sites for annual MACTIAC meetings were announced as follows:

1977-Monmouth College, Monmouth, Illinois
1978-Carelton College, Northfield, Minnesota
1979-Beloit College, Beloit, Wisconsin

Patricia Fished presented the report of the nominating committee:
Addison Ault-Cornell College - President
Joe Woods-Drake University - President Elect
Marvin Dixon-William Jewell College - Sec.-Treas.

The floor was opened for further nominees. None were offered, so it was moved that nominations be closed and that the slate of nominees be the officers of MACTIAC for 1977. The motion was seconded and passed.

Quentin Petersen reported on the placement service noting that the Department Chairmen informed him of 23 positions which were open for which he had 18 candidates. Some time early in January each MACTIAC member will receive a mailing on guidelines and existing openings. He encouraged us to pass along information about the Placement Service to other faculty members of MACTIAC schools even though they are not personally members. The executive Council is to support his mailing activities.

Berwyn Jones reported on the activities of the CA committee. He ask that he be informed about any changes in an institution use of Chemical Abstract His address is:
Chemistry Department
Northern Iowa University
Cedar Falls, Iowa 50613

At present twelve colleges are involved with the paper institute for computer search of CA. Others plan to join the program in January 1977. The written report that Berwyn read is as follows:

I have been active on three fronts this year:

- (1) A survey of MACTIAC schools on their status as regards CA subscriptions;
(2) implementation of the use of CA Concentrates service + Section Groupings in MACTIAC colleges; and (3) cooperation with Dr. Donald E. Jones of MAALACT.

I. Results of Survey. (54 reports)

A. Colleges now taking CA=24

1. Average student body=1820
2. Average number of chemistry majors=15 per year
(Total majors 360 per year)
3. Also taking Collective Indexes=13
Have dropped Collettive Indexes=9
4. Considering cancelling CA= 9
(Total majors 108 per year)
(Average distance from nearest CA=28 mi.)
(26 mi. for those not considering dropping)

B. Colleges not now taking CA = 31

1. Average student body = 1050
2. Average number of chemistry majors = 5 per year
(Total majors 155/per year)
3. Average distance from nearest CA=24 mi.
4. When CA was dropped

1970's	13
1960's	9
1950's	0
before 1950	1
never had it	3

C. List of colleges responding:

Adrian	Central	
Aquinas	Clarke	
Augsburg	Cornell	
Aurora	Culver-Stockton	
Beloit	DePauw	
Bradley (u)	Dordt	
Butler (u)	Dubuque (w)	
Calvin	Elmhurst	
	Evansville (u)	Nazareth
	Fortbonne	North Central
	Grinnell	Northland
	Gustavus Adolphus	North Park
	Hanover	Northwestern
	Hillsdale	Olivet Nazarene
	Hope	Park
	Illinois	Pipon
	Illinois Benedictine	Rosary
	Illinois Wesleyan (u)	St. Catherine
	Indiana Central	St. Mary's (Winona)
	Kalamazoo	St. Thomas
	Lake Forest	S. W. State (Minn.)
	Lawrence	Valparaiso
	Lindenwood	Wabash
	Luther	William Jewell
	MacMurray	William Penn
	Marygrove	Upper Iowa

II. Implementation of IPC service using CA Concentrates.

- A. Consortium of 5 Twin-Cities colleges got a grant to try it. No. full report yet, but feeling is mixed.
- B. Several other colleges are trying it. They will report impressions at Hope.
- C. IPC will again have a representative at the meeting; comments are invited.

III. Don Jones is attempting to persuade CA to allow colleges to purchase micro-form CA at the end of each year, at a much reduced rate, without the (current) requirement that the paper CA be purchased also.

I recommend the following resolution be passed by MACTIAC, and that I be allowed to transmit it to various officials of ACS and CAS. I will be prepared to distribute copies to the membership.

Resolution on Chemical Abstracts
in the Small Colleges

We, the members of MACTIAC, are and have been for many years concerned about the increasing price of Chemical Abstracts. This price has now reached a level at which, from the results of a recent survey, over 50% of our colleges can no longer afford to subscribe. We fear that very soon this number will approach 75%. We believe that ready access to Chemical Abstracts is necessary for the proper operation of an undergraduate department offering a major in chemistry. We assert that the small colleges are still an important "cradles of budding chemists" (Hung, Narl C., J. Chem. Education 53, 53#9 565-570 (1976)).

We believe that Chemical Abstracts is a service, not a product. Those who use the service the most should pay the most. However, present pricing policies, which load virtually all data-base-development costs onto the printed copy subscriber discriminates in favor of the large users (university and particularly corporate) at the expense of the small colleges, which, as best we can ascertain, still account for nearly 1/3 of all CA subscriptions, although we are not represented on any of the boards which influence CAS policy.

Therefore we advocate that the following alternative be given careful scrutiny:

- (1) Allow undergraduate colleges to subscribe to printed CA at a rate representing only the actual printing costs plus a reasonable mark-up.
- (2) Exempt undergraduate colleges from having to purchase a printed CA in order to receive the micro-form CA.
- (3) Work toward a "per-use" and "per -hit" price schedule as CA moves into computerized data retrieval.
- (4) Provide, at reasonable cost, annual indices to Section Groupings subscribers.
- (5) MOST IMPORTANTLY, provide for representation from the undergraduate colleges on the Board Committee and the Council Committee on Chemical Abstracts as well as on the CAS Advisory Board.

The adoption of the Resolution on Chemical Abstracts in the Small Colleges was moved by Berwyn Jones. Several seconds were made followed by unanimous affirmative action of the membership MACTLAC present at the business meeting.

Arild Miller reported on the Archives. He asked that we send him articles of historical significance at

Institute of Paper Chemistry
Appleton, Wisconsin 54911

These articles may be letters, photographs, programs, anecdotes, etc.

Tom Holloway announced his willingness to coordinate a workshop on instrumental troubleshooting and repair. The workshop is to be held at the University of Arkansas and will be taught by Ken McElvin. If a group of 8-12 individuals can be assembled the University would conduct such a course. The projected dates are Jan. 10-14, 1978 beginning Monday at noon and proceeding through noon Friday. Estimated cost is \$20-\$25. for registration, insurance, and electrical parts. Meals, lodging and transportation will be the responsibility of the individual. All who are interested are to contact Tom Holloway at lunch today or by mail later.

Dick Ramette encouraged us to increase our subscriptions to J. Chem. Ed. Pleasure was expressed for the fine work Tom Lippincott has performed as editor of J. Chem. Ed. It was announced that Tom plans to relinquish that responsibility in 1979. A search committee has been formed to seek a new editor. If you know of someone truly interested in being editor of J. Chem. E., be it yourself or a colleague, please let Dick Ramette know of your ideas.

President, Addison Ault expressed the feelings of MACTLAC when he stated that MACTLAC is very appreciative of the efforts of Eugene Jekel and his staff in conducting a well planned and executed meeting in beautiful surroundings.

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1. The Political Awareness Committee is to be chaired by Richard Cook with Bill Martin and Berwyn Jones as members.
2. A scroll is to be developed for honorary members and one for emeritus members by Sister Mary Thompson and Quentin Petersen.
3. Letters of recommendation for a colleague to the status of honorary member must be in the hands of the state representatives by August 1, 1977. All members are encouraged to give this matter serious consideration, especially is this true of the year 1977 since we will be celebrating our 25th anniversary.

4. The future sites for annual MACTLAC meetings were announced as follows:

- 1977-Monmouth College, Monmouth, Illinois
- 1978-Carelton College, Northfield, Minnesota
- 1979-Beloit College, Beloit, Wisconsin

Patricia Fished presented the report of the nominating committee:

- Addison Ault-Cornell College - President
- Joe Woods-Drake University - President Elect
- Marvin Dixon-William Jewell College - Sec.-Treas.

The floor was opened for further nominees. None were offered, so it was moved that nominations be closed and that the slate of nominees be the officers of MACTLAC for 1977. The motion was seconded and passed.

Quentin Petersen reported on the placement service noting that the Department Chairmen informed him of 23 positions which were open for which he had 18 candidates. Some time early in January each MACTLAC member will receive a mailing on guidelines and existing openings. He encouraged us to pass along information about the Placement Service to other faculty members of MACTLAC schools even though they are not personally members. The executive Council is to support his mailing activities.

Berwyn Jones reported on the activities of the CA committee. He ask that he be informed about any changes in an institution use of Chemical Abstract His address is:
Chemistry Department
Northern Iowa University
Cedar Falls, Iowa 50613

At present twelve colleges are involved with the paper institute for computer search of CA. Others plan to join the program in January 1977. The written report that Berwyn read is as follows:

I have been active on three fronts this year:

- (1) A survey of MACTLAC schools on their status as regards CA subscriptions;
- (2) implementation of the use of CA Concentrates service + Section Groupings in MACTLAC colleges; and
- (3) cooperation with Dr. Donald E. Jones of MAALACT.

I. Results of Survey. (54 reports)

A. Colleges now taking CA=24

- 1. Average student body=1820
- 2. Average number of chemistry majors=15 per year
(Total majors 360 per year)
- 3. Also taking Collective Indexes=13
Have dropped Collettive Indexes=9
- 4. Considering cancelling CA= 9
(Total majors 108 per year)
(Average distance from nearest CA=28 mi.)
(26 mi. for those not considering dropping)

B. Colleges not now taking CA = 31

- 1. Average student body = 1050
- 2. Average number of chemistry majors = 5 per year
(Total majors 155/per year)
- 3. Average distance from nearest CA=24 mi.
- 4. When CA was dropped

1970's	13
1960's	9
1950's	0
before 1950	1

C. List of colleges responding:

Adrian	Central	
Aquinas	Clarke	
Augsburg	Cornell	
Aurora	Culver-Stockton	
Beloit	DePauw	
Bradley (u)	Dordt	
Butler (u)	Dubuque (w)	
Calvin	Elmhurst	
	Evansville (u)	Nazareth
	Fortbonne	North Central
	Grinnell	Northland
	Gustavus Adolphus	North Park
	Hanover	Northwestern
	Hillsdale	Olivet Nazarene
	Hope	Park
	Illinois	Pipon
	Illinois Benedictine	Rosary
	Illinois Wesleyan (u)	St. Catherine
	Indiana Central	St. Mary's (Winona)
	Kalamazoo	St. Thomas
	Lake Forest	S. W. State (Minn.)
	Lawrence	Valparaiso
	Lindenwood	Wabash
	Luther	William Jewell
	MacMurray	William Penn
	Marygrove	Upper Iowa

II. Implementation of IPC service using CA Concentrates.

- A. Consortium of 5 Twin-Cities colleges got a grant to try it. No. full report yet, but feeling is mixed.
- B. Several other colleges are trying it. They will report impressions at Hope.
- C. IPC will again have a representative at the meeting; comments are invited.

III. Don Jones is attempting to persuade CA to allow colleges to purchase micro-form CA at the end of each year, at a much reduced rate, without the (current) requirement that the paper CA be purchased also.

I recommend the following resolution be passed by MACTLAC, and that I be allowed to transmit it to various officials of ACS and CAS. I will be prepared to distribute copies to the membership.

Resolution on Chemical Abstracts
in the Small Colleges

We, the members of MACTLAC, are and have been for many years concerned about the increasing price of Chemical Abstracts. This price has now reached a level at which, from the results of a recent survey, over 50% of our colleges can no longer afford to subscribe. We fear that very soon this number will approach 75%. We believe that ready access to Chemical Abstracts is necessary for the proper operation of an undergraduate department offering a major in chemistry. We assert that the small colleges are still an important "cradles of budding chemists" (Hung, Narl C., J. Chem. Education 53,53#9 565-570 (1976)).

We believe that Chemical Abstracts is a service, not a product. Those who use the service the most should pay the most. However, present pricing policies, which load virtually all data-base-development costs onto the printed copy subscriber discriminates in favor of the large users (university and particularly corporate) at the expense of the small colleges, which, as best we can ascertain, still account for nearly 1/3 of all CA subscriptions, although we are not represented on any of the boards which influence CAS policy.

Therefore we advocate that the following alternative be given careful scrutiny:

- (1) Allow undergraduate colleges to subscribe to printed CA at a rate representing only the actual printing costs plus a reasonable mark-up.
- (2) Exempt undergraduate colleges from having to purchase a printed CA in order to receive the micro-form CA.
- (3) Work toward a "per-use" and "per-hit" price schedule as CA moves into computerized data retrieval.
- (4) Provide, at reasonable cost, annual indices to Section Groupings subscribers.
- (5) MOST IMPORTANTLY, provide for representation from the undergraduate colleges on the Board Committee and the Council Committee on Chemical Abstracts as well as on the CAS Advisory Board.

The adoption of the Resolution on Chemical Abstracts in the Small Colleges was moved by Berwyn Jones. Several seconds were made followed by unanimous affirmative action of the membership MACTLAC present at the business meeting.

Arild Miller reported on the Archives. He asked that we send him articles of historical significance at

Institute of Paper Chemistry
Appleton, Wisconsin 54911

These articles may be letters, photographs, programs, anecdotes, etc.

Tom Holloway announced his willingness to coordinate a workshop on instrumental troubleshooting and repair. The workshop is to be held at the University of Arkansas and will be taught by Ken McElvin. If a group of 8-12 individuals can be assembled the University would conduct such a course. The projected dates are Jan. 10-14, 1978 beginning Monday at noon and proceeding through noon Friday. Estimated cost is \$20-\$25. for registration, insurance, and electrical parts. Meals, lodging and transportation will be the responsibility of the individual. All who are interested are to contact Tom Holloway at lunch today or by mail later.

Dick Ramette encouraged us to increase our subscriptions to J. Chem. Ed. Pleasure was expressed for the fine work Tom Lippincott has performed as editor of J. Chem. Ed. It was announced that Tom plans to relinquish that responsibility in 1979. A search committee has been formed to seek a new editor. If you know of someone truly interested in being editor of J. Chem. E., be it yourself or a colleague, please let Dick Ramette know of your ideas.

President, Addison Ault expressed the feelings of MACTLAC when he stated that MACTLAC is very appreciative of the efforts of Eugene Jekel and his staff in conducting a well planned and executed meeting in beautiful surroundings.

MACTLAC

Midwestern Association of College Teachers in Liberal Arts Colleges

Twenty-fourth Annual Meeting held at

HOPE COLLEGE

Holland, Michigan

October 8 and 9, 1976

Registration List

Martin Allen	College of St. Thomas
Brian Andreen	Research Corporation
Robert Armstrong	Albion College
Addison Ault	Cornell College
Mark Bacon	Millikin University
Jerry Baird	Argonne National Laboratory
Dennis Baker	Albion College
Dorothy Banfill	Illinois Wesleyan University
Barbara J. Barker	Hope College
Sr. Marquita Barnard	College of St. Catherine
Richard E. Bayer	Carroll College
J. Philip Bays	Grinnell College
Jeff Bechner	Marian College
Keith Beck	Elmhurst College
J. D. Benson	Mercy College of Detroit
Robert A. Berntsen	Augustana College
Arthur J. Bosch	Central College
Rodney F. Boyer	Hope College
Irwin J. Brink	Hope College
Herman H. Broene	Calvin College
Neal O. Bruce	Wheaton College
Ray V. Buhl	Hope College
Stanley L. Burden	Taylor University
Duane Carr	Coe College
Peter Chereson	Hope College
Derek A. Chignell	Wheaton College
William C. Child	Carleton College
John Church	Institute of Paper Chemistry
Donald G. Clemens	Goshen College
Michael Collins	Viterbo College
Paul Cook	Albion College

Richard J. Cook	Kalamazoo College
John W. Coutts	Lake Forest College
Bryce Crawford	University of Minnesota
David Crichton	Central College
Joe Danforth	Grinnell College
Roger DeKock	Calvin College
William A. Deskin	Cornell College
David G. DeWit	Augustana College
Jacob J. DeYoung	Alma College
Lawrence J. Dieterman	St. Mary's College
T. P. Dirkse	Calvin College
Kathy Dixon	William Jewell College
Marvin P. Dixon	William Jewell College
Michael P. Doyle	Hope College
Sr. Helen Duggan	Siena Heights College
Donald H. Ebeling	Wheaton College
Luther Erickson	Grinnell College
M. Patricia Faber	Barat College
Harold A. Fiess	Wheaton College
Don P. Filson	Illinois College
James E. Finholt	Carleton College
Forrest Frank	Illinois Wesleyan University
Charles Freidline	Central Methodist College
Donald M. Friedrich	Hope College
Larry Funck	Wheaton College
John Ganchoff	Elmhurst College
Robert H. Glazier	Washburn University
Robert Glogovsky	Elmhurst College
Clarence E. Grothaus	Olivet Nazarene College
Roger Gurira	Grinnell College
Kenneth L. Hamm	Carthage College
Steven E. Hannum	Aurora College
Paul V. Hansen	Carthage College
John Hanson	Olivet Nazarene College
James J. Hazdra	Illinois Benedictine College
R. E. Herbener	Hillsdale College
Wallis G. Hines	Kalamazoo, Michigan
Tom Hodge	Franklin College
Tom Holloway	William Jewell College

Bernard E. Hoogenboom	Gustavus Adolphus College
Daniel J. Hoy	Monmouth College
Bud Hudson	Carroll College
Narl Hung	Wheaton College
Alan Hutchcroft	Rockford College
Eugene C. Jekel	Hope College
Ray L. Johnson	Hillsdale College
Berwyn E. Jones	Upper Iowa University
Truman H. Jordan	Cornell College
Clarence Josefson	Millikin University
William Joy	Environmental Health and Safety Division University of Michigan
Jeffrey Keiser	Coe College
Richard L. Kieft	Monmouth College
David H. Klein	Hope College
Harold Kolenbrander	Central College
William Kramer	St. Joseph College
Richard Kriens	Ashland College
Joseph T. Kurek	Franklin College
Roger Lembke	Central Methodist College
Ronald Lenox	Wabash College
W. Thomas Lippincott	University of Arizona
Wilson B. Lutz	Manchester College
Robert G. Mayer	Earlham College
E. Daniel McKenna	Concordia College
Arild J. Miller	Institute of Paper Chemistry
Edward Miller	Manchester College
Jerry R. Mohrig	Carleton College
Richard J. Morath	College of St. Thomas
William A. Morrison	University of Evansville
William S. Mungall	Hope College
Terry M. Nagel	Sheboygan, Wisconsin
Bernard A. Nelson	Wheaton College
Jerry Neufeld	Anderson College
Everett J. Nienhouse	Ferris State University
Paul J. Ogren	Central College
Charles Ophardt	Elmhurst College
Sr. Mary del Rey O'Sullivan	Saint Xavier College
Quentin R. Petersen	Central Michigan University
Melbert E. Peterson	Augustana College

David L. Pippert	Upper Iowa University
Kenneth Pohlmann	Sheboygan, Wisconsin
Bruce R. Prall	Marian College
Gerald J. Putz	Barat College
Richard W. Ramette	Carleton College
Ronald Rich	Bethel College
Ronald Richards	Greenville College
Gerald Roehrig	Aurora College
Joseph E. Rogers	Office of University Programs, ERDA
Bernard Siegfried	Hope College
Jan William Simek	Kalamazoo College
Charles E. Skinner	Alma College
Emil J. Slowinski	Macalester College
Brock Spencer	Beloit College
Paul L. Splitstone	Alma College
Frank Starkey	Illinois Wesleyan University
Daniel M. Steffenson	Albion College
Dennis P. Strommen	Carthage College
Sr. Mary Thompson	College of St. Catherine
Sidneye T. Trowbridge	College of St. Catherine
Bro. Ambrose Trusk	St. Mary's College
Alvin VanderKolk	Michigan Occupational Safety and Health Administration
William Van Doorne	Calvin College
Robert J. Van Lanen	St. Xavier College
Stanley Watkins	Coe College
Robert F. Watson	National Science Foundation
E. Eugene Weaver	Ford Motor Company
Henry D. Weaver	Goshen College
James Webb	Viterbo College
Sr. Sharon Weber	Siena Heights College
Lowell E. Weller	University of Evansville
F. Sheldon Wettack	Hope College
Donald H. Williams	Hope College
Laurence E. Wilson	Kalamazoo College
Frank Wiseman	Greenville College
Wayne C. Wolsey	Macalester College
Joe D. Woods	Drake University
Stewart D. Work	Coe College

Gene G. Wubbels
Margaret E. Yates
Jack D. Young
John F. Zimmerman

Grinnell College
Saint Xavier College
Dow Chemical Company
Wabash College

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THE INDEPENDENT COLLEGES OFFICE

Memorandum Number 47

February 3, 1977

TO: ICO and GLCA Science and Social Science Department Chairmen

FROM: Ida Wallace, Director

SUBJECT: Request for Assistance to Make our Case for National Science Foundation Education Programs

President Wenzlau of Ohio Wesleyan will be testifying on the National Science Foundation Education Directorate budget for Fiscal 1978 on February 16. He will be speaking for GLCA and also the Associated Colleges of the Midwest, the American Association of State Colleges and Universities and the National Association of Independent Colleges and Universities before Congressional Committees. We are requesting to appear in March and April also.

This is to let you know some of the things happening at the National Science Foundation:

- + The Science Education budget request for FY 1978 is presently \$75.7 million, including \$12.4 million for Graduate Fellowships and Minority Graduate Traineeships -- a little better than the past five years in actual dollars but no better in real dollars.
- + The Undergraduate Research Participation (URP) program is being cut back by \$400,000 to a total of \$2.1 million. In Fiscal 1966, URP's budget was a high of \$6.8 million. The rationale for the reduction this year is that the number of scientists is becoming too great; therefore, this program, which stimulates the production of scientists must be cut back.

In the past, our scientists and social scientists have ranked URP as their favorite NSF program. Please write the Independent Colleges Office of your experiences with this program and your arguments to support it (or not) to incorporate into our testimony. Send me rough drafts or handwritten letters but do please send your responses soon if you feel strongly about this program.

- + Several plans for a new cabinet-level Department of Education would affect NSF Education programs. One bill, introduced by Senator Humphrey, would shift the Science Education programs from NSF to the new Education Department. This would interfere with what we have termed in previous testimony, the necessary continuum of science which must include science education at all levels with the total science concern. Another plan would shift all NSF to the Department of Education. Your comments on these possibilities are welcome.
- + NSF is preparing a report requested by Congress on research grants to four-year colleges. We have discussed with staff the data NSF is compiling, and I am forced to conclude that our institutions must make a separate case on their position on this. My cursory review proves that our scientists are less likely to receive basic research grants from NSF now than they were in the 60's, something NSF staff deny. But lumping our colleges with all the four-year colleges may bolster NSF's contention that, "Good people get funding" and, by implication, less able ones don't. NSF staff feel that getting four-year college faculty to university campuses to work with their grantees as research associates is a good answer to our problems. As for the argument about the value of research taking place on our campuses, I was told, "NSF will resist mightily."

We would appreciate your views about ways around these dilemmas and your priorities among NSF programs on the enclosed sheet. We hope you will send us your answers as soon as possible.

IW/kdh

enclosure to all: NSF Program Questionnaire

February 24, 1977

Dr. Addison Ault
President, MACTLAC
Department of Chemistry
Cornell College
Mount Vernon, Iowa 52314

Dear Addison:

As chairman of the Political Awareness Committee of MACTLAC, my major function is to keep abreast of events in the political arena which may have significant effects upon chemistry departments at small colleges. It had been mentioned at the Hope College meeting last fall that such events might be publicized to the MACTLAC membership along with regular mailings or through a special mailing. The enclosed release from the Independent Colleges Office describes recent developments at NSF which may have serious impact in our departments. Do you think that it might be worthwhile to notify MACTLAC departments of this development and urge those concerned to write their congressmen, NSF, etc? If so, we must act soon.

Sincerely,

Richard J. Cook
Assistant Professor
Department of Chemistry

enc

cc: Dr. William B. Martin
Lake Forest College
Political Awareness Committee

Dr. Michael Collins
Viterbo College
Political Awareness Committee

Dr. Marvin P. Dixon
William Jewel College
Secretary-Treasurer

RJC/kab

March 11, 1977

Dr. Richard J. Cook
Assistant Professor
Department of Chemistry
Kalamazoo College
Kalamazoo, MI 49007

Dear Dick:

I got my copy of the letter you sent to Addison regarding NSF-URP developments. It got me to thinking that

1. MACTLAC membership ought to get involved in some way - as in the form of a resolution;
2. It's a long way to October & too much can happen by then.

With this in mind, I had the following idea: each spring there is a secretary-treasurer report mailed out including the minutes of the last meeting, etc. Perhaps we could include in that mailing a copy of the memo you sent me; and a mailing card upon which each member could ask that his name be included on a resolution or petition refuting the NSF arguments and asking for continued funding of undergraduate research. This resolution could be printed on the return card. It would probably not be "officially" MACTLAC originated, but would be useful nonetheless.

It seems to me the petition could point out the potential ability of imaginative scientists in solving immediate and long term energy, medical, and other technological problems society faces; point out the history of liberal arts colleges and educating scientists; and urge a national policy which would make better use of scientific personell in the future.

I'm sure that as chairman, you can handle the boring details. I'm just an idea man . . . Maybe send copies to Carter (or Ford or whoever's president right now . . . someday I've got to get more aware politically). I think, seriously, that the NSF premise that research at small schools necessarily leads to More scientists is at fault: Better, certainly; more, not necessarily. NSF's attitude is, we both know, extremely short-sighted and bureaucratic-immediate-return-cost-benefit-analysis; self-deceiving efficiency-at-the-big-school attitudes. Right?

We've got to communicate this as a group, in some capacity, to our congressmen and to Carter!

I'll quit before I start hopping onto soap boxes. Have a pleasant spring and summer. See you, hopefully, at Monmouth.

Michael J. Collins
Asst. Professor of Chemistry

KALAMAZOO COLLEGE

Kalamazoo, Michigan 49007

*Mike
Thanks
response.*
*for your
think it's a
good idea
but I've
yet to hear
anything from
Addison, even on
the initials*

March 18, 1977

Dr. Addison Ault
President, MACTLAC
Department of Chemistry
Cornell College
Mount Vernon, Iowa 52314

*Hope you
don't mind
my copying
your letter
and sending
it around.*
Richard

Dear Addison:

Enclosed is a copy of a letter from Mike Collins in response to my earlier letter regarding NSF research funding. I think the idea of a widespread response from MACTLAC schools is a good one. The petition may be the simplest and most effective way to provide a response although a letter-writing campaign might be a possibility. Somehow I suspect that many signatures could be gathered whereas letters probably wouldn't get written.

Two questions arise: (1) do we want to get involved in this (2) do we have a mailing through which we can notify the MACTLAC membership. Personally, I think this matter is so important that we cannot afford to remain uninvolved. I look forward to your response, would like to urge others being sent this to register their opinion.

Sincerely,

Richard J. Cook
Assistant Professor
Department of Chemistry

enc

- cc: Dr. William B. Martin
Lake Forest College
Political Awareness Committee
- Dr. Michael Collins
Viterbo College
Political Awareness Committee
- Dr. Marvin P. Dixon
William Jewel College
Secretary Treasurer

KALAMAZOO COLLEGE

Kalamazoo, Michigan 49007

April 6, 1977

Dr. Addison Ault
Department of Chemistry
Cornell College
Mount Vernon, Iowa 52314

Dear Addison:

Thanks for your letter, and my apologies for being so difficult to contact by phone. This quarter is a particularly busy one for me with some twenty-two contact hours. I did attempt to return your calls but was unable to get an answer.

I have been in touch with Ida Wallace at the Independent Colleges Office in Washington. She is pleased that MACTLAC is considering action on this matter and has promised to send me her most recent information. As soon as I receive it I will attempt to draw up a statement, which I will send to you and the others to which copies of this letter are being sent. Ida feels that a response from MACTLAC could have a significant effect upon the outcome of NSF allocations for URP, CAUSE, ISEP and other programs.

You will be hearing from me shortly.

Sincerely,

Richard J. Cook
Assistant Professor
Department of Chemistry

cc: Dr. Michael Collins ✓
Viterbo College

Dr. Marvin Dixon
William Jewel College

Dr. William Martin
Lake Forest College

Sister Mary Thompson
College of Saint Catherine

RJC/kab

Please assist your organization. A few minutes of your time spent responding to the following questions will be appreciated by those planning the twenty fifth meeting of MACTIAC at Kormout. Please return your completed copy to Marvin Dixon BEFORE YOU DEPART OR MAIL IT TO: Marvin Dixon, Department of Chemistry, William Jewell College, Liberty, Missouri 64068.

1. Would you like to resume discussion of topics initiated at this meeting? If so, which one(s)?
 - a. Chemistry Abstracts
 - b. No
 - c. General Chemistry
 - d. Undergraduate Research
 - e. Curriculum Innovations
 - f. The open forum research report we had in Joe Penforth's room
 - g. OSHA
 - h. Psychology in Teaching Methods
 - i. Nos. 6, 8, & 9
 - j. Chem. Ed. & OSHA
 - k. Implications of OSHA
 - l. Fac Devel. NSF
 - m. Future Courses of Chemistry
 - n. Use of Statistical in analytical Chem.
 - o. Experimental design
 - p. Analytical Chem. . . . in the Real World
 - q. Amicular Approaches which providefor Vocational funds in Chem.
 - r. Whether or not it is the responsibility of Liberal Arts Colleges to train people to pass the MCAT exam.
 - s. Nos. 3, 4, 5, 6, 8, & 9
 - t. Discussion of courses offered during the Jan. term.
 - u. the C.A.S. Problem
 - v. Career-oriented education
 - w. Faculty Development in General
 - x. Health Professions

2. What new topics do feel should be discussed by MACTIAC?
 - a. Allied Health Profession Yes 41 No 2
 - b. Psychology in Teaching Methods (Piaget and Others) Yes 53 No 6
 - c. Tenure Yes 16 No 21
 - d. Non Graduate School oriented Curriculum Yes 42 No 4
 - e. Other 4
1. Instrument repair (costs)
2. S.I. unit usage
3. Evaluation of Keller-type courses
4. Making money stretch in a problem, but equally pressing is making time stretch
5. How "values" are dealt with in Chemistry courses for majors and non-majors
6. Grading in Chemistry
7. Alternative careers for faculty losing position in college teaching; How to re-tool, etc.
8. Inspiring Lecture Demonstration and/or Lab experiences
9. Use of facilities during summers
10. Brief presentation of faculty research
11. How to deal with students attitudes as discovered by Tom Lipincott
12. Requirements and Guidelines for ACS Certification
13. Use of lecture demonstration
14. Undergrad research
15. Tropical group discussions
16. Transfer students from community colleges
17. Retirement possibilities
18. Seminars in Teaching Methods

3. A dimension of the Mannouth meeting will be reflection of the twenty five year history of the organization known as MACTIAC. Please suggest major topics or themes related to this dimension.

- a. Revise the programs presented in the past 25 years to determine the topics which came up most frequently. A discussion of progress made could be presented.
- b. Women in Chemistry
- c. The role of Tradition in Chemistry
- d. Changes in emphasis during 25 years
- e. Changes in the Liberal Arts colleges over the past 25 years due to enrollment process.
- f. I would like a list showing where previous meetings of MACTIAC were held, no. of persons present, officers, and no. of MACTIAC members.
- g. Recognize Charter members
- h. Please don't emphasize this aspect too much
- i. Problems then vs. now
- j. Brief summary of history and purpose
- k. MACTIAC will be an old men's club if it looks back. The emphasis must be looking 25 or 50 years ahead. The meeting must be futuristic
- l. Need an Historical perspective of college teaching - How has it changed, How is it the same, Should we panic or not _____ should we be worried?
- m. Change in students and change in needed today
- n. Alternative teaching delivery system for adult education
- o. History
- p. How unique is the Liberal Arts, Chemistry curriculum in comparison to University Chemistry Curriculum. I would like a session on research in which member schools gave brief descriptions of what was going on
- q. Evolution of the major courses in Chemistry
 - 1. Intro
 - 2. Organic
 - 3. Physics
 - 4. Analytical
- r. Changes in textbooks and changes in lab exercises
- s. I would like to know the "Great men of MACTIAC"
- t. Want to expand different topics such as: cost effectiveness, role of description chemistry, and role of instrumentative
- v. Suggest that each college bring a photo of their sciences building as it was in 1952, when MACTIAC began and a current photo of their present science building.

in their schools

4. What feature or feature of the MACTIAC meetings held this year did you like best?

- 1. The group discussions on Friday afternoon
 - 2. Hope College's inspiring and impressive facilities and faculty.
 - 3. Speakers were excellent
 - 4. Keynote and dinner speakers
 - 5. Breakfast plus business meeting
 - 6. Bryce Crawford's address
 - 7. Mixer
 - 8. Panel on Saturday
 - 9. Renewing acquaintances
 - 10. Timing of events
 - 11. The whole conference was an enjoyable experience
 - 12. Arrangements were excellent for the meeting
 - 13. A very good program
 - 14. The topics on MCAT, Chemistry Abstract, and Vocations
 - 15. Both major presentations were interesting.
 - 16. NSF Talks
 - 17. The Social Hour
 - 18. Small group meetings
 - 19. Talk by Lippincott and Crawford
 - 20. Good rooms for discussion
 - 21. The after dinner speech
 - 22. Business meeting at breakfast
 - 23. The tape recordings
 - 24. The past history of MACTIAC
 - 25. Private discussions with friends
- Least?
- 1. Nothing
 - 2. Saturday Morning Panel - too structured and obvious
 - 3. Panels
 - 4. Several sections were held at the same time so some did not get a chance to see them all
 - 5. Expected more from Lippincott's address
 - 6. Need to forbid smoking at the meetings
 - 7. Keynote speakers
 - 8. A few signs are needed to indicate where to find the registration area when needed
 - 9. Projector difficulties
 - 10. Projector light problems
 - 11. Some individuals talked too long
 - 12. After seeing the Chem dept here, I was ready to go home in despair
 - 13. Configuration particularly was bad for the opening speech
 - 14. An auditorium is much more satisfactory; both major speakers weren't particularly effective
 - 15. We need an earlier notice of dates
 - 16. Let's stop bringing in outsiders and listen to each other. At least, let's use guest from other undergrad colleges. The eastern schools. We should know them better and be willing to swap information.

5. What would you like to see MACTIAC do for its twenty fifth anniversary?

- a. Have Kent Wilson of the University of California speak
- b. Brief History of MACTIAC with acknowledgements to founders
- c. The strength and purpose of MACTIAC
- d. Have as many original members attend as possible - discuss changes in 25 years
- e. Recognition of Charter members
- f. Have the same discussion groups that were developed at the first meeting
- g. Make arrangements for a group picture of all MACTIAC members attending the 25th year meeting
- h. Have a good retrospective address
- i. History of MACTIAC
- j. Have a return visit by Professor H. Alyea from Princeton
- k. Put all surviving charter members on display - have them reminisce for us
- l. Laboratory for 70's
- m. Have a large birthday cake
- n. Some type of display indicating the contributions of each member departments to Chemistry
- o. Have a program that doesn't focus too much (if at all) on MACTIAC itself
- p. Have a big party
- q. Develop a teaching award for recognized members of MACTIAC

Please suggest major speakers for this dimension.

- a. Jack Courts
 - b. Arild Miller
 - c. Alt
 - d. Algbirth
 - e. Latlham
 - f. Dick Raynette
 - g. Anne Harrison
 - h. Ed Harisane
 - i. Joe Danforth
 - j. Charter members of MACTIAC an outsider
 - k. Any department chairman from MACTIAC
 - l. Anna Jane Harrison of Mt. Holyoke
 - m. Isaac Asimo
 - n. Ed Fuller -- Bolect College
 - o. An original member who has been continuously active during the 25 years
- Slowinski*

6. Are you aware of the MACTIAC placement services?

Yes 53 No 1

Do you know how it works?

Yes 23 No 7

HOPE COLLEGE

HOLLAND, MICHIGAN 49423



June 18, 1976

Sister Mary Thompson
Department of Chemistry
The College of St. Catherine
St. Paul, MN 55105

Dear Sister Mary:

Enclosed is an updated tentative program for the fall MACTLAC meeting. I appreciate your assistance in our telephone conversation of last week. If you have any editorial changes or other comments regarding the program please do not hesitate to write or telephone me.

I talked with our audio visual director at Hope College. He is willing to supply personnel and equipment to tape all major addresses and discussion groups. He is also willing to sell tapes at minimum cost to those who may wish to order them. What do you think of this idea? I would not advertize the availability of tapes in the MACTLAC brochure, but a mimeographed order form would be available to conference delegates when they arrive at Hope College. The chemistry secretary at Hope College would be in charge of mailing the tapes. Let Marvin know if you want this question to be posed to the officers and/or state reps. or perhaps you want to make this decision yourself. I hope to mail the tentative MACTLAC program to Marvin next week after I learn of Crawford's decision on the post-banquet talk.

When I talked to Earl Hudson he was not sure if he was chairman of MACTLAC's OSHA committee. He was unable to attend the meeting at Drake and nothing has been communicated to him about that committee. Perhaps you could inform him of his status in that regard.

With best regards.

Sincerely,

Eugene C. Jekel
Professor of Chemistry

ECJ:np

Enclosure

Preliminary Plans for MACTLAC, 1976

Hope College

Date: October 8 and 9

Projected Attendance: at least 150

Schools represented: at least 75

Schedule:

Friday

1:30 Keynote address

W. Thomas Lippincott, University of Arizona;
Editor, Journal of Chemical Education

2:30 Refreshments

3:00 Discussion groups

1. Spontaneous group relating to the content of the previous address.
Resource person: W. Thomas Lippincott
Chairman:
2. Budgets and Departmental Management
Includes such items as supplies and equipment, maintenance, student labor, travel, capital improvement, supporting professional help, telephone, library, etc.
Resource person: Joseph D. Danforth, Grinnell College
Chairman:
3. Chemical Education and OSHA liability,
Includes new Federal regulations, safety, disposal of laboratory wastes, problems of chemical storage, etc.
Chairman: Earl N. Hudson, Carroll College
Resource person:
4. Workshop on the Use of Chemical Abstracts Concentrates
Includes reports from users and a review of the service of the Institute of Paper Chemistry; a discussion of the merits of the annual subscription vs. computerized services.
Chairman: Berwyn E. Jones, Upper Iowa University
Resource Person: (A representative of the Institute of Paper Chemistry is being contacted)
5. A Curriculum to Meet the Recent Trends in Vocationalism in Chemistry
Includes a discussion of the wide variety of non-traditional careers now available to chemistry majors, including chemical engineering, environmental sciences, energy, etc.
Chairman: F. Sheldon Wettack, Hope College
Resource person:

6. A Chemistry Curriculum to Meet the Needs of the 70's in the Area of the Health Professions
Includes a discussion of the possible effects of the new MCAT examination, which will report a separate score in Chemistry.
Chairman: John R. Holum, Augsburg College (contacted, but not confirmed)
Resource Person: A person informed on the new chemistry MCAT examination
7. Analytical Chemistry: Sampling, Statistics and Analysis in the Real World.
Chairman: David H. Klein, Hope College
Resource Person: A chemist from a government testing laboratory such as FDA.
8. Faculty Development Programs in NSF
Chairman: Harold M. Kolenbrander, Central College, Iowa
Resource Person: Robert F. Watson, Coordinator
Education Program Restructuring NSF
9. General Chemistry
Includes a discussion of selection of lecture topics and laboratory experiments to meet the wide interest range of students in the 70's; methods to handle increased enrollments; use of student laboratory assistants, etc.
Chairman: James E. Finholt, Carleton College

6:30 Banquet

8:00 Address: "Symmetry in Chemistry"
Bryce L. Crawford, University of Minnesota. (contacted, but not confirmed)

9:30 Mixer in a local motel.

Saturday

8:00 Breakfast buffet followed by business meeting.

9:30 Panel: "New Approaches for Providing Learning Experiences for Chemistry Majors"

Panel Moderator: Michael P. Doyle, Hope College

"Undergraduate Research, on Campus"

Panelist:

"Student and Faculty Development as Perceived by a Private Funding Agency."

Panelist: Brian H. Andreen, Research Corporation

"Industrial and Cooperative Work-Study Experiences, Off Campus"

Panelist: Richard E. Bayer, Carroll College

"Comments on Various NSF Programs Appropriate for Liberal Arts Colleges"

Panelist: Robert F. Watson, NSF

"Research Opportunities in Government Laboratories"

Panelist: Jerry Baird, Argonne National Laboratory

10:45 Refreshments

11:00 Discussion Groups

The Friday groups will be repeated.

A spontaneous group relating to the previous panel will also meet with all panelists available as resource persons.

12:30 Lunch is available in a separate room on campus for those who wish to remain.

October 12, 1976 Executive Committee Meeting

The Executive Committee met for lunch and business at noon. Present were:

Arild Miller	Patricia Fish
Tom Holloway	John Zimmerman
Gene Jekel	Larry Funck
Sister Mary Thompson	Joe Woods
Duane Carr	Addison Ault
Marvin Dixon	

Duane Carr was appointed chairman of the nominating committee.

A copy of the current mailing list is to be sent to the State Representative in addition to a list of officers of MACTIAC, Past & Present. Quentin Petersen is to send a list of MACTIAC schools to the executive board.

The secretary-treasurer is checked for the availability of a postal permit. If it is not available then he is to obtain one from the postal services.

The meeting announcement needs to come out much earlier. The membership needs to know the date early. Obtain from Monmouth the date of the meeting.

Respectfully submitted

Marvin Porter Dixon
Secretary

1975-76 TREASURER'S REPORT

10/10/75	Balance on Hand	\$1,854.41	
			Income Expenditures
10/10/75	Drake University Annual Meeting, MACTLAC	\$268.42	
11/25/75	Henry Bent-Travel & Honorarium Ck. #102		\$250.00
11/25/75	Robert Hansen-Travel & Honorarium Ck. #103		50.00
11/25/75	Prairie Queen Foods, Ck. #104		109.70
11/25/75	Drake Chemistry Dept. Postage Ck. #105		45.00
11/25/75	Olmsted Center Food Service, Ck. #106 Exec. Luncheons		39.90
11/25/75	Joe D. Woods-reimburse for Banquet ticket paid to MACTLAC Ck. #108 (Ck. #107 void)		23.75
8/9/76	Dues	4.00	
8/9/76	Litton Educational Publishing Company Royalties for Physical Chemistry Laboratory Manual	28.64	
10/1/76	U.S. Post Office-Newsletter postage Ck. #109		108.00
10/1/76	U.S. Post Office-Newsletter postage Ck. #110		1.96
10/6/76	Marvin P. Dixon, Sec.-Treas. Stipend, Ck. #111		25.00
	TOTAL	<u>\$301.06</u>	<u>\$653.31</u>
	BALANCE ON HAND 10/7/76		\$1,509.16



THE COLLEGE OF ST. CATHERINE, ST. PAUL, MINNESOTA 55105

Department of Chemistry

June 29, 1976

TO: Members of the Executive Council, MACTLAC

RE: Fall meeting of MACTLAC at Hope College

Enclosed you will find a copy of the latest preliminary draft from Gene Jekel of Hope College. If you have any suggestions or reservations about what is planned please write him at Hope College.

For the fall meeting at Hope, I would like to remind you that the State Representatives form the Nominating Committee. I would ask you to send your suggestions to Patricia Fish, College of St. Catherine, the Minnesota representative, who will serve as the chairman of that committee. Also a reminder: be sure that you have obtained the permission of those you nominate or propose to nominate before the Executive Council meeting on Friday, October 8, 1976, at Hope. Marvin Dixon as secretary still has a one-year unwritten term to serve as secretary-treasurer since the secretary-treasurer office is designed to provide needed continuity for the organization -- loose as it is. Thus, only the office of President-elect need be filled. Addison Ault was elected as President-elect at the Drake meeting last October and would move to the president's chair on Saturday, October 9, 1976, at the Hope College meeting.

I would like the members of the Executive Council to consider the continuance of OSHA Committee, the Chemical Abstracts Committee, and the Placement Service that we are now providing through Quentin Peterson. I will ask those in charge of the committees to make reports at the Executive Council meeting so that we may see what has happened and still needs to happen in these areas. If the Political Action Committee (to examine the stance of MACTLAC with respect to such action) has a report by then, they will also be called upon, as will the archives office.

Next year (1977) will be the twenty-fifth anniversary of MACTLAC, Monmouth has asked to host that meeting, and Daniel Hoy from Monmouth will be present at the Executive Council meeting to present preliminary plans for the meeting and to ask for suggestions. If you have something in mind that you believe should be a part of that meeting, please come prepared with your ideas -- even written out for the rest of us to see.

I plan to have only the Friday morning meeting time so that you can plan on attending the whole program at Hope College. If there are other items that you believe should be on our meeting agenda, please let me know by September 15, 1976.

Sincerely,

Sister Mary Thompson

Sister Mary Thompson
President, MACTLAC

The discussion session "Where do we go from here?" led by Joe Danforth, Grinnell, followed the old-fashioned MACTLAC format: Introduction of participants, suggestions of topics for discussion, and pertinent and non-pertinent introductory discussions. The topics considered during the two day session included: Planning for the next five years, departmental budgets, numbers of chemistry majors and (possibly) a changing interest of these majors, new safety regulations, effects of inflation, new curricula and new course structures, changing objectives of departments of chemistry, acquisition and servicing of large equipment on pinched budgets, faculty development and problems created by low faculty turnover, research opportunities for students at Argonne, and practical vs. theoretical courses.

For the Saturday morning session some participants were asked to present information for discussion on the following topics:

New courses and new course structures, Kathleen Parson, Macalester and James Webb, Viterbo.

Curricular requirements, Dean Schwartz, Macalester.

Five year planning and departmental budgets, Dick Bayer, Carroll College.

Meaningful discussions and exchanges of information on these topics occurred during the Saturday session. Especially meaningful exchanges and discussions about departmental budgets developed.

It soon became apparent that there was much information on budgets, purchase and maintenance of equipment, etc. that could be useful to members of MACTLAC. Eugene Jekel, Hope, agreed to see that there would be a session at next year's meeting devoted to these topics and Joe Danforth, Grinnell, agreed to assemble from representative colleges information that might be pertinent to a meaningful discussion.

Addendum to
Registration List

MACTLAC

Hope College

October 8 & 9

Robert Albers	Calvin College
A. J. Anglin	Taylor University
Paul Barks	North Hennepin Community College
William R. Bartlett	Saint John's University
Kenneth Cook	Anderson College
Tom Cummings	Bradley University
Roger S. Danley	Parke-Davis
Frank E. De Boer	North Park College
Paul Ellefsen	Hanover College
A. H. Elve	Grand Rapids Junior College
Larry Ferren	Olivet Nazarene College
Kurt Field	Bradley University
Patricia Fish	College of St. Catherine
Calvin Fleser	Grand Rapids Junior College
Don Glover	Bradley University
Sr. Patricia Hylen	Aquinas College
Kenneth E. Kolb	Bradley University
Charles A. Long	Lake Forest College
William B. Martin	Lake Forest College
Richard D. McCormick	Aquinas College
Mary McLaughlin	Minneapolis, MN
Sigurd Nelson	Grand Rapids Junior College
Kenneth Piers	Calvin College
T. Richard Schmidt	Olivet Nazarene College
M. Lee Thompson	Lake Forest College
Richard Watkins	Carroll College
Enno Wolthuis	Calvin College

Cassette Tape Order Form

MACTLAC Annual Meeting

Hope College

October 8, 1976

Friday discussion group tapes at \$2.25 each.

	Number of tapes	Cost
1. Spontaneous discussion relating to the opening address. Coordinator: Donald H. Williams. Resource Person: W.T. Lippincott.	_____	_____
2. Budgets and Departmental Management. Coordinator: Jeffrey E. Keiser. Resource Person: Joseph D. Danforth.	_____	_____
3. Chemical Education and OSHA. Coordinator: James J. Hazdra. Resource Persons: William Joy & Jack Young.	_____	_____
4. Workshop on the Use of Chemical Abstracts Concentrates. Coordinator: Berwyn E. Jones. Resource Person: John Church.	_____	_____
5. Curricular Approaches which Provide for Vocational Trends in Chemistry. Coordinator: F. Sheldon Wettack. Resource Persons: J. Brock Spencer & Jerry Mohrig.	_____	_____
6. A Chemistry Curriculum to Meet the Needs of the 70's in the Area of the Health Professions. Chairman: William S. Mungall, Hope College.	_____	_____
7. Analytical Chemistry: Sampling, Statistics and Analysis in the Real World. Coordinator: David H. Klein. Resource Person: Alvin Vander Kolk.	_____	_____
8. Faculty Development Programs in NSF. Coordinator: Harold M. Kolenbrander, Central College, Iowa. Research Person: Robert F. Watson.	_____	_____
9. General Chemistry. Chairman: James E. Finholt, Carleton College.	_____	_____
Saturday panel tape and discussion tape at \$2.25 each.		
10. New Approaches for Providing Learning Experiences for Chemistry Majors. Moderator: Michael P. Doyle. Undergraduate Research, on Campus- Richard J. Cook. Student and Faculty Development from the Perspective of a Private Foundation- Brian H. Andreen Industrial and Cooperative Work-Study Experiences, off Campus- Richard E. Bayer Comments on Various NSF Programs Appropriate for Liberal Arts Colleges- Robert F. Watson. Research Opportunities in Government Laboratories- Jerry Baird.	_____	_____
11. Spontaneous discussion relating to the previous panel. Coordinator: Michael P. Doyle. Resource Persons: The panelists listed above.	_____	_____
TOTALS	_____	_____

Please make checks payable to Hope College.

Persons may make payment to E.C. Jekel (or the chemistry secretary in Peale 201) at this meeting, or mail this order form with remittance to:

Dr. Eugene C. Jekel
Department of Chemistry
Hope College
Holland, Michigan 49423

Orders must be received prior to October 20, 1976.

It is also acceptable for your business office to send a purchase order prior to October 20, 1976. In that case, payment can be made after your receipt of the tape(s).

The above costs include mailing charges. Tapes will be mailed during the last week of October.

Your name _____
address _____

TO: MACTLAC Board of Directors
FROM: Berwyn Jones, Chemical Abstracts Chairman
SUBJECT: Annual Report of Committee Activities

I have been active on three fronts this year:

(1) A survey of MACTLAC schools on their status as regards CA subscriptions;
(2) implementation of the use of CA Concentrates service + Section Groupings in MACTLAC colleges; and (3) cooperation with Dr. Donald E. Jones, of MAALACT.

I. Results of Survey. (54 reports=list attached)

A. Colleges now taking CA=24

1. Average student body=1820
2. Average number of chemistry majors=15 per year
(Total majors 360 per year)
3. Also taking Collective Indexes=13
Have dropped Collective Indexes=9
4. Considering cancelling CA= 9
(Total majors 108 per year)
(Average distance from nearest CA=28 mi.)
(26 mi. for those not considering dropping)

B. Colleges not now taking CA = 31

1. Average student body = 1050
2. Average number of chemistry majors = 5 per year
(Total majors 155/per year)
3. Average distance from nearest CA=24 mi.
4. When CA was dropped

1970's	13
1960's	9
1950's	0
before 1950	1
never had it	3
5. Reason for dropping: cost only factor mentioned.

C. List of colleges responding:

Adrian	Central
Aquinas	Clarke
Augsburg	Cornell
Aurora	CuIver-Stockton
Beloit	DePauw
Bradley (u)	Dordt
Butler (u)	Dubuque (w)
Calvin	Elmhurst

Evansville (u)	Nazareth
Fortbonne	North Central
Grinnell	Northland
Gustavus Adolphus	North Park
Hanover	Northwestern
Hillsdale	Olivet Nazarene
Hope	Park
Illinois	Pipon
Illinois Benedictine	Rosary
Illinois Wesleyan (u)	St. Catherine
Indiana Central	St. Mary's (Winona)
Kalamazoo	St. Thomas
Lake Forest	S. W. State (Minn)
Lawrence	Valparaiso
Lindenwood	Wabash
Luther	Wm. Jewel
MacMurray	Wm. Penn
Marygrove	Upper Iowa

II. Implementation of IPC service using CA Concentrates.

- A. Consortium of 5 Twin-Cities colleges got a grant to try it. No. full report yet, but feeling is mixed.
- B. Several other colleges are trying it. They will report impressions at Hope.
- C. IPC will again have a representative at the meeting; comments are invited.

III. Don Jones is attempting to persuade CA to allow colleges to purchase micro-form CA at the end of each year, at a much reduced rate, without the (current) requirement that the paper CA be purchased also.

I recommend the following resolution be passed by MACTLAC, and that I be allowed to transmit it to various officials of ACS and CAS. I will be prepared to distribute copies to the membership.

Resolution on Chemical Abstracts in the Small Colleges

We, the members of NACTLAC, are and have been for many years concerned about the increasing price of Chemical Abstracts. This price has now reached a level at which, from the results of a recent survey, over 50% of our colleges can no longer afford to subscribe. We fear that very soon this number will approach 75%. We believe that ready access to Chemical Abstracts is necessary for the proper operation of an undergraduate department offering a major in chemistry. We assert that the small colleges are still an important "cradles of budding chemists" [Hung, Nari C., J Chem. Education 53, 53#9, 565-570(1976)].

We believe that Chemical Abstracts is a service, not a product. Those who use the service the most should pay the most. However, present pricing policies, which load virtually all data-base-development costs onto the discrimination in favor of the large users (university and particularly corporate) at the expense of the small colleges, which, as best we can ascertain, still account for nearly 1/3 of all CA subscriptions, although we are not represented on any of the boards which influence CAS policy.

Therefore we advocate that the following alternative be given careful scrutiny:

- (1) Allow undergraduate colleges to subscribe to printed CA at a rate representing only the actual printing costs plus a reasonable markup.
- (2) Exempt undergraduate colleges from having to purchase a printed CA in order to receive the micro-form CA.
- (3) Work toward a "per-use" and "per-hit" price schedule as CA moves into computerized data retrieval.
- (4) Provide, at reasonable cost, annual indices to Section Groupings subscribers.
- (5) MOST IMPORTANTLY, provide for representation from the undergraduate colleges on the Board Committee and the Council Committee on Chemical Abstracts as well as on the CAS Advisory Board.

MACTLAC 1976

Please assist your organization. A few minutes of your time spent responding to the following questions will be appreciated by those planning the twenty fifth meeting of MACTLAC at Monmouth. Please return your completed copy to Marvin Dixon BEFORE YOU DEPART OR MAIL IT TO: Marvin Dixon, Department of Chemistry, William Jewell College, Liberty, Missouri 64068.

1. Would you like to resume discussion of topics initiated at this meeting?
If so, which one(s)?

2. What new topics do feel should be discussed by MACTLAC?

	Yes	No	Comment
a. Allied Health Profession	___	___	
b. Psychology in Teaching Methods(Piaget and others)	___	___	
c. Tenure	___	___	
d. Non Graduate School oriented Curriculum	___	___	
e. Other			

3. A dimension of the Monmouth meeting will be a reflection of the twenty five year history of the organization known as MACTLAC. Please suggest major topics or themes related to this dimension.

Please suggest major speakers for this dimension.

4. What feature or features of the MACTLAC meeting held this year did you like best?

least?

5. What would you like to see MACTLAC do for its twenty fifth anniversary?

6. Are you aware of the MACTLAC placement service? Do you know how it works?

MACTLAC 1976

Please assist your organization. A few minutes of your time spent responding to the following questions will be appreciated by those planning the twenty fifth meeting of MACTAC at Monmouth. Please return your completed copy to Marvin Dixon BEFORE YOU DEPART OR MAIL IT TO: Marvin Dixon, Department of Chemistry, William Jewell College, Liberty, Missouri 64068.

-]. Would you like to resume discussion of topics initiated at this meeting? If so, which one(s)?
 - a. Chemistry Abstracts
 - b. No
 - c. General Chemistry
 - d. Undergraduate Research
 - e. Curriculum innovations
 - f. The open forum research report we had in Joe Danforth's room
 - g. OSHA
 - h. Psychology in Teaching Methods
 - i. , nos. 6, 8, & 9
 - j. Chem. Ed. & OSHA
 - k. Implications of OSHA
 - l. Fac Devel. NSF
 - m. Future Courses of Chemistry
 - n. Use of Statistical in analytical Chem.
 - o. Experimental design
 - p. Analytical Chem. . . . in the Real World
 - q. Amicular Approaches which provide for Vocational funds in Chem.
 - r. Whether or not it is the responsibility of Liberal Arts Colleges to train people to pass the MCAT exam.
 - s. Nos. 3, 4, 5, 6, 8, & 9
 - t. Discussion of courses offered during the Jan. term.
 - u. the C.A.S. problem
 - v. Career- oriented education
 - w. Faculty Development in General
 - x. Health Professions

2. What new topics do feel should be discussed by MACTLAC?
- A. Allied Health Profession Yes 41 No 2
- b. Psychology in Teaching Methods (Piaget and others)
Yes 53 No 6
- c. Tenure Yes 16 No 21
- d. Non Graduate School oriented Curriculum Yes 42
No 4
- e: Other
1. Instrument repair (costs)
 2. S.I. unit usage
 3. Evaluation of Keller-type courses
 4. Making money stretch in a problem, but equally pressing is making time stretch
 5. How "values" are dealt with in Chemistry courses for majors and non-majors
 6. Grading in Chemistry
 7. Alternative careers for faculty losing position in college teaching; How to re-tool, etc.
 8. Inspiring Lecture Demonstration and/or Lab experiences
 9. Use of facilities during summers
 10. Brief presentation of faculty research
 11. How to deal with students attitudes as discovered by Tom Lippincott
 12. Requirements and Guidelines for ACS Certification
 13. Use of lecture demonstration
 14. Undergrad research
 15. Tropical group discussions
 16. Transfer students from community colleges
 17. Retirement possibilities
 18. Seminars in Teaching Methods

Notes on Watson Meeting at MACTLAC, October 8, 1976, Hope College--

Approximately twenty persons attended the session entitled "Faculty Development Programs in NSF" at which Dr. Robert F. Watson was the presenter.

Dr. Watson began by noting that the budget for the NSF Science Education Directorate for Fiscal Year 1977 is \$69 million; the budget for FY 76 was \$62.5 million. He then provided a specific description of the administrative structure of the Science Education Directorate.

Dr. Watson noted that he believes all of the programs operated from the Science Education Directorate have faculty development aspects to them, so he did not seek to speak only about the "faculty development programs," but also provided information about a number of the programs, such as the Undergraduate Research Participation Program, the Student-Originated Studies Program, and the Secondary School Student Science Training Program. Brief descriptions of all of the programs are included in a "Guide to Science Education Programs for Fiscal Year 1977," which is available from NSF. You can obtain this booklet from the National Science Foundation, Washington, D.C., 20550.

For those of you working with preparation of SOS Proposals, Dr. Watson indicated that a copy of the "book" of Project Directors' Reports can be obtained from the NSF. You may need to pay some duplication fee for this service, but it is relatively nominal.

A couple of questions were asked regarding the Program EHVIST (Ethical and Human Value Implications of Science and Technology) concerning availability of funding for small-scale curriculum revision projects. Dr. Watson noted that no funds are available for this purpose at the present time and there are no plans as far as he knows to go in that direction.

Regarding faculty development per se, Dr. Watson stated that there are three programs which are oriented in this direction. The Chautauqua-Type College Faculty Short Courses (information about these courses may be obtained by writing Chautauqua-Type Short Courses, Box B, AAAS, 1776 Massachusetts Avenue, N.W., Washington, D.C., 20036), administered for the National Science Foundation by the AAAS, has been a very effective program, spending somewhat less than \$1 million per year and touching several thousand faculty members each year. Dr. Watson noted that in addition to participation in the courses offered, if you are interested in developing a course to be offered through the Chautauqua series, you should also let this be known.

The Science Faculty Professional Development Program is a second faculty development program and is designed to replace the Science Faculty Fellowship Program. You can obtain more information about

it by requesting Brochure SE 77-28, Science Faculty Professional Development Program, from the NSF. The booklet should be available very soon and the deadline for receipt of applications under this program will be January 7, 1977. Through this program, support will be provided to strengthen science faculty research and teaching capabilities in areas of national needs. Grants will be awarded competitively on the basis of demonstrated aptitude for research or teaching related to national needs, and on a showing that the proposed activities would enhance such capabilities. Grantees will receive stipends to allow them to undertake from three to twelve months of research or advanced study, plus a modest activity-support allowance. Competition is open only to U.S. citizens or nationals.

Finally, the Science Teacher Training Program is a third faculty development program. This program will replace the High School Science Teacher Institutes of a few years back. Four million dollars is being provided for this program for the fiscal year 1977. Additional information about the program can be obtained by requesting Brochure SE 77-27, which will be available by November. The primary objective of the program is to improve subject-matter knowledge of teachers of science and mathematics in Grades K through 12.

Dr. Watson also spoke briefly about the CAUSE (Comprehensive Assistance to Undergraduate Science Education) Program. He noted that the maximum allowable for three-year projects under the new guidelines will be \$250,000. He further observed that last year 650 proposals were received and approximately 50 grants were made.

Additionally, Dr. Watson described the LOCI (Local Course Improvement) Program that will provide small grants with more "focus" than that possible with a CAUSE proposal. National impact is not a necessary factor but it would help in making LOCI grant applications competitive. Dr. Watson told the group that the September 27 issue of Chemical and Engineering News contains an interesting report about a project funded through this program.

The session ended with a question-answer period in which Dr. Watson answered a number of NSF "nuts-and-bolts" type questions about the several NSF Programs.

24th Annual NACTLAC

October 8-9, 1976

Chemical Educator and OSHA

Organizer: Dr. Bud Hudson, Carroll College

Coordinator: Dr. James J. Hazdra, Illinois Benedictine College

Speakers: Mr. William Joy
Director of Occupational Safety and Environmental Health
University of Michigan

Mr. Jack Young
Safety Manager
Dow Chemical Company
Midland, Michigan

A progress report submitted to the American Chemical Society on the impact of OSHA in academic research and teaching was presented.

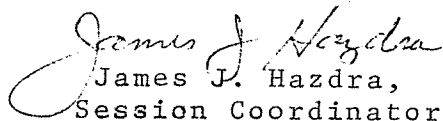
A discussion was centered on the general description of OSHA and other standards on personal protective equipment to the safe use of chemicals (National Fire Protection Standard Number 45). Described were the problems involved in record keeping and the types of records that should be kept in a college or university, the type of OSHA inspections, violations, and the general duty clause. The sixteen carcinogens were mentioned and the types of facilities and record keeping that is necessary for the use of these compounds was discussed.

Finally, a list of what college chemistry teachers can do to meet OSHA standards and provide a safe environment was given:

- 1.) Make learning how to be safe an integral and important part of the chemical education process.
- 2.) Set a good safety example and design experiments to be fail-safe.
- 3.) Have a safety coordinator and/or safety committee.
- 4.) Routinely participate in safety meetings.
- 5.) Conduct regular laboratory inspections.
- 6.) Correct recognized unsafe conditions and practices.

- 7.) Allocate funds for safety.
- 8.) Provide incentives for safety performance.
- 9.) Have a laboratory safety manual.
- 10.) Have a safety reference library.
- 11.) Evaluate potential hazards before experiments are conducted.
- 12.) Employ proper personal protection (goggles, gloves, etc.).
- 13.) Wear safety glasses -- always.
- 14.) Report all accidents resulting in injury.
- 15.) Alert co-workers/students to their unsafe practices or hazardous conditions.
- 16.) Consider safety to be as important as productivity.
- 17.) Along with your supervisors, have a genuine concern for your own well-being and that of your co-workers/students.
- 18.) Have an adequate supply of safety facilities -- showers, eye-baths, fire extinguishers, and first aid equipment.
- 19.) Have a plan for handling an emergency.
- 20.) Believe that all accidents can be prevented.

It was also suggested that the Manufacturing Chemist Association "Guide for Safety in a Chemical Laboratory" should be obtained by every chemistry department.


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