

DISCUSSION GROUPS*

I. FRIDAY 3:00-4:00	II. FRIDAY 4:00-5:00	III. SATURDAY 10:30-11:30
A. Discussion with Stan Smith CSC 202 Roger Lembke	F. Discussion Group on Analytical Chemistry CSC 202 David Bailey	K. Discussion with Garland Marshall CSC 202 Riley Hastings
B. Discussion Group on Biochemistry CSC 302 William Martin	G. Discussion Group on Organic Chemistry CSC 302 Jeffrey Keiser	L. Kekulé's (Fictitious) Dream - John Wotiz CSC 105 John Schultz
C. Discussion Group on Inorganic Chemistry CSC 301 Robert Gayhart	H. Discussion Group on Physical Chemistry CSC 301 Luther Erickson	M. Discussion Group on General Chemistry (for science majors) CSC 302 Peter Wickham
D. Undergraduate Research (NSF) - Ted Reid CSC 105 Dan Hammond	I. Undergraduate Research (PRF & Research Corp.) John Malin & Brian Andreen CSC 105 Gene Wubbels	N. Discussion Group on Introductory Chemistry (for nonscience majors) CSC 301 Stanley Watkins
E. Computer Software (evaluation & exchange) CSC 104 Phillip Bays	J. Chemical Applications of Microcomputers CSC 205 Stan Burden & Harry Neumiller	O. Chemical Applications of Microcomputers CSC 205 John Zimmerman & Michael Collins
Callaway Nuclear Power Plant Tours Group I: Friday 2:45-5:15 p.m. Group II: Saturday 10:00-12:15 p.m.		P. General Topics (student assessment, faculty develop., etc.) CSC 108 Harold Anderson

WESTMINSTER COLLEGE

*Welcomes you**to the*THIRTY-FIFTH
ANNUAL MEETING

of

MACTLAC

*Midwestern Association**of**Chemistry Teachers**in**Liberal Arts Colleges**October 23 and 24, 1987**Fulton, Missouri*

* CSC = Coulter Science Center

Westminster College Dept. of ChemistryProf. Charles Brauer, Chairman
Dr. Glen Frerichs, MACTLAC Coordinator
Dr. Riley Hastings
Dr. John Schultz (on admin. leave)

PROGRAM
 Friday, October 23, 1987

10:00 EXECUTIVE COUNCIL MEETING & LUNCH
 College Inn (Adjoining Champ Lounge)

11:00-1:15 REGISTRATION
 (Late reg. until 5)
 Coulter Science Center (Lobby)

12:00-1:00 LUNCH
 Robertson Dining Hall

1:15 GENERAL MEETING
 CSC Lecture Hall
 Welcome and Introductions
 Dr. J. Harvey Saunders, Pres.
 Westminster College

1:30 SPEAKER
 Dr. Stan Smith
 Professor of Chemistry
 University of Illinois
 Urbana-Champaign
TOPIC
 Interactive Video-disk Technology
 in General Chemistry

2:30 REFRESHMENTS
 Champ Lounge

3:00 DISCUSSION GROUP SESSION I

4:00 DISCUSSION GROUP SESSION II

5:00 REFRESHMENTS/VENDOR'S DISPLAYS
 Champ Lounge
TOUR OF CHURCHILL MEMORIAL AND LIBRARY
 Church of St. Mary Aldermanbury
 (Adjoining Champ Lounge)
TOUR OF COULTER SCIENCE CENTER

7:00 BANQUET
 Robertson Dining Hall

8:15 SPEAKER
 Dr. John Wotiz
 Professor of Chemistry
 Southern Illinois University,
 Carbondale
TOPIC
 European History of Chemistry
 Museums & Exhibits
 CSC Lecture Hall

9:30 Mixer, Kings Row Restaurant

Saturday, October 24, 1987

8:15 ANNUAL BUSINESS MEETING
 CSC Lecture Hall

9:00 SPEAKER: Dr. Garland Marshall
 Professor of Pharmacology
 Washington Univ. School of
 Medicine, St. Louis
TOPIC: Computer-assisted Drug
Design and Molecular Modeling.

10:00 REFRESHMENTS, Champ Lounge

10:30 DISCUSSION GROUP SESSION III

11:30 EXECUTIVE COUNCIL MEETING AND LUNCH
 College Inn (Adjoining
 Champ Lounge)

11-12:30 BRUNCH
 Robertson Dining Hall

MACTLAC Executive Committee for 1987
 Dr. Donald E. Koeltzow, President (MO)
 Dr. Jerry Mohrig, President Elect (MN)
 Dr. Forrest Frank, Secretary-Treasurer (IL)
 Dr. Mike Collins (WI)
 Dr. Ray Johnson (MI)
 Dr. Riley Hastings (MO)
 Dr. William Martin (IL)
 Dr. Carolyn Mottley (IA)
 Dr. John Dwyer (MN)
 Dr. Phillip Bays (IN)
 Dr. Gene Wubbels, Past President (IA)
 Dr. Anne T. Sherren, Archivist and
 Placement Officer (IL)

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 114 Cedar Grove Dr.
 St. Charles, MO 63303
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 Jefferson City, MO 65101
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 (314)636-6502

(Cost of refreshments covered by vendors' fees)

MACTLAC

MIDWESTERN ASSOCIATION OF CHEMISTRY TEACHERS IN LIBERAL ARTS COLLEGES



TO: MACTLAC MEMBERS
 FROM: OFFICE OF THE SECRETARY-TREASURER
 ILLINOIS WESLEYAN UNIVERSITY
 BLOOMINGTON, IL 61701

APRIL 1988

SUBJECT: 1987-88 ANNUAL REPORT

THE WESTMINSTER COLLEGE MEETING - OCTOBER 23-24, 1987

Approximately 60 members of MACTLAC met on the campus of Westminster College for the thirty-fifth annual meeting which was well organized by Dr. Glen Frerichs of Westminster College.

The meeting began on Friday afternoon with an excellent welcoming statement by the President of Westminster College, Dr. J. Harvey Saunders. Dr. Frerichs introduced the speaker Dr. Stan Smith of the University of Illinois who gave a stimulating talk about Interactive Video-disk Technology in General Chemistry.

Following a break, the conferees attended two one-hour discussion groups. Refreshments, vendor's displays, and tours including Churchill Memorial & Library were followed by a banquet in the Robertson Dining Hall. After the meal, Dr. Jay Karr of Westminster College entertained us with results of his research about Fulton's belatedly appreciated claim to fame as being the twin depicted in the novel "King's Row" by H. Bellamann. The evening speaker was Dr. John Wotiz of Southern Illinois University Carbondale who discussed European History of Chemistry via Museums and Exhibits.

Saturday morning began with the Annual Business Meeting whose minutes follow. Dr. Garland Marshall, Professor of Pharmacology at the Washington University School of Medicine, St. Louis gave the talk on Computer-assisted Drug Design and Molecular Modeling. One more discussion period followed; the minutes of discussion sections which were given to me are attached to this report along with a list of the discussion groups.

REMINDER ABOUT HONORARY AND EMERITUS MEMBERSHIPS: All members are reminded that one must nominate persons for Honorary and Emeritus Membership. All nominations should reach the Secretary-Treasurer prior to October 1, 1988 for consideration at the 1988 Annual Meeting.

CURRENT STATUS OF FUTURE MEETINGS: The Executive Council has set the following meeting schedule: 1988 Saint Mary's College, Notre Dame, Indiana; 1989 Luther College, Decorah, Iowa; 1990 Lake Forest College, Lake Forest, Illinois; 1991 Albion College, Albion, Michigan; 1992 Grinnell College, Grinnell, Iowa

PLEASE SEND ANY OPENINGS AVAILABLE IN YOUR SCHOOL TO OUR PLACEMENT OFFICER, ANNE SHERREN (NORTH CENTRAL COLLEGE, NAPERVILLE, IL 60566. QUITE A FEW PERSONS HAVE INQUIRED ABOUT FACULTY OPENINGS.

EQUIPMENT COMMITTEE: If you have equipment which you wish to give away or sell cheaply, please send a description for posting on a bulletin board at the next annual meeting.

PLACEMENT OFFICER: PLEASE SEND ANY OPENINGS AVAILABLE IN YOUR SCHOOL TO ANNE SHERREN (NORTH CENTRAL COLLEGE, NAPERVILLE, IL 60566. QUITE A FEW PERSONS HAVE INQUIRED ABOUT FACULTY OPENINGS.

REQUEST FOR ARCHIVAL MATERIALS: Those of you who have any archival materials, please contact Anne Sherren at the above address.

My thanks to all of you who have made my job easier this first year as your Secretary-Treasurer.

Respectfully submitted,

Forrest J. Frank, Secretary-Treasurer of MACTLAC

PROGRAM			SPEAKER
Friday, October 23, 1987			
10:30	EXECUTIVE COUNCIL MEETING & LUNCH College Inn (Adjoining Champ Lounge)	8:15	Dr. John Wotiz Professor of Chemistry Southern Illinois University, Carbondale
11:30-1:15	REGISTRATION (Take reg. until 5) Coulter Science Center (Lobby)		TOPIC European History of Chemistry Museums & Exhibits CSC Lecture Hall
12:00-1:00	LUNCH Robertson Dining Hall	9:30	Mixer, Kings Row Restaurant
1:15	GENERAL MEETING CSC Lecture Hall Welcome and Introductions Dr. J. Harvey Saunders, Pres. Westminster College	Saturday, October 24, 1987	
1:30	SPEAKER Dr. Stan Smith Professor of Chemistry University of Illinois Urbana-Champaign	3:15	ANNUAL BUSINESS MEETING CSC Lecture Hall
2:30	REFRESHMENTS Champ Lounge	9:00	SPEAKER: Dr. Garland Marshall Professor of Pharmacology Washington Univ. School of Medicine, St. Louis TOPIC: Computer-assisted Drug Design and Molecular Modeling.
3:00	DISCUSSION GROUP SESSION I	10:00	REFRESHMENTS, Champ Lounge
4:00	DISCUSSION GROUP SESSION II	10:30	DISCUSSION GROUP SESSION III
5:00	REFRESHMENTS/VENDOR'S DISPLAYS Champ Lounge TOUR OF CHURCHILL MEMORIAL AND LIBRARY Church of St. Mary Aldermanbury (Adjoining Champ Lounge) TOUR OF COULTER SCIENCE CENTER	11:30	EXECUTIVE COUNCIL MEETING AND LUNCH College Inn (Adjoining Champ Lounge)
7:00	BANQUET Robertson Dining Hall	11-12:30	BRUNCH Robertson Dining Hall
			MACTLAC Executive Committee for 1987 Dr. Donald E. Koeltzow, President (MO) Dr. Jerry Mohrig, President Elect (NH) Dr. Forrest Frank, Secretary-Treasurer (IL) Dr. Mike Collins (MI) Dr. Ray Johnson (MI) Dr. Riley Hastings (MO) Dr. William Martin (IL) Dr. Carolyn Nottley (IA) Dr. John Dwyer (NH) Dr. Phillip Bays (IR) Dr. Gene Hubbels, Past President (IA) Dr. Anne T. Sherren, Archivist and Placement Officer (IL)

GENERAL BUSINESS MEETING
Saturday, October 24, 1987

1. President Koeltzow called the meeting to order at 8:15 AM.
2. A moment of silence was observed for Dr. Howard Potter, Alma College, MI, a longtime NACTLAC member who passed away recently.
3. The Secretary-Treasurer reported on the Executive Council Meeting of the previous day. Items mentioned included:
 - a. A summary of the treasurer's report. The balance is \$1358.25.
 - b. Meeting sites through 1992.
 - 1988 Saint Mary's College, Notre Dame, Indiana
 - 1989 Luther College, Decorah, Iowa
 - 1990 Lake Forest College, Lake Forest, Illinois
 - 1991 Albion College, Albion, Michigan
 - 1992 Grinnell College, Grinnell, Iowa
 - c. A reminder that nominations are solicited for both Honorary and Emeritus Membership with the deadline October 1, 1989.
 - d. Equipment which two colleges have to give away. Descriptions are posted on the bulletin board by the registration table.
4. Placement and Archive Officer reports were given by Anne Sherren.

	1983-84	1984-85	1985-86	1987-88
Applicants	2	5	10	6
Positions	4	27	20	5

This is a small number of applicants and positions in 1987 which seems to occur for the first year when a new Placement Officer takes over. She needs announcements of openings in our schools sent to her! As Archivist, she asked for help identifying persons in pictures from NACTLAC posted on the bulletin board. She is also taking pictures at this meeting. Please send anything from the past which you think might be of interest.

5. New State Representatives were announced and introduced:
 - Minnesota - Pat Fisher, College of St. Catherine
 - Missouri - Rava R. Servoss, Rockhurst College
 - Wisconsin - Larry Scheich, St. Norbert College
6. Nominating Committee: John Dwyer, chairperson of the Nominating Committee, nominated Larry Funck of Wheaton College as President-Elect. After opportunity was given for nominations from the floor, the motion was moved, seconded and passed that Larry Funck be elected by acclamation.
7. Introduction of New President: Jerry Mohrig of Carleton College was introduced as the new President. Applause followed. Jerry issued an invitation to a national conference next July 13-14 at Carleton College about undergraduate research operation and funding.
8. New Business:
 - a. Phil Bays from Saint Mary's College told us about the 1988 meeting of NACTLAC to be held at Notre Dame, Indiana on October 28-29, 1988. The theme will be graduate education in chemistry.
 - b. Carolyn Hottley moved that the members of NACTLAC express our sincere thanks and appreciation to Donald Koeltzow of Luther College for his service to NACTLAC in the capacity of President. Seconded and carried with applause.
 - c. John Dwyer moved that NACTLAC direct the Secretary-Treasurer to write letters of thanks to the President and Chemistry Department of Westminster College for hosting the 1987 meeting. Seconded and carried with applause.
 - d. Anne Sherren announced the Chicago Section of the ACS Career Conference on November 14.
 - e. Anne Sherren announced that the Iota Sigma Pi awards for Senior women have a February 1 deadline.
9. The meeting was adjourned at 9:10 AM.

DISCUSSION GROUP A - Discussion with Stan Smith
Leader - Roger Lembke; Recorder - David Bailey

Stan Smith presented a continuation of the talk that he had given earlier in the afternoon with additional illustrations of the use of interactive video for instructional purposes. The audience asked a number of questions to which Stan gave answers. A sampling of the questions and answers follows:

- Q. How sensitive (fragile) is the video disk?
 - A. Quite hardy - similar to a CD Audio disk. The players are also quite hardy provided that the mechanism is locked down prior to moving them.
- Q. What is the total cost of the system?
 - A. An industrial video disk player which must have random access capabilities is available for about \$1300 list. The computer must be an IBM XT, AT, or PC-30 (or fully compatible). These are presently selling for about \$800 without monitor but you should think seriously of getting the model with a hard disk for about \$1200. The computer must be equipped with an EGA output card, a General Purpose Interface card to communicate with the monitor and an EGA jumper card to communicate between the EGA and General Purpose Interface cards. The total cost of these cards was not mentioned (or at least this reported did not catch that in the discussion). The monitor they are using at U of Illinois is the IBM InfoWindow monitor which currently costs \$2770 and is available only through your IBM campus representative (not through ComputerLand, et. al.).
- Q. Any other companies make similar equipment?
 - A. Yes, one model of Sony TV will work when coupled with a MicroKey card (Video Associates, Austin, TX). This TV does not have the touch sensitive screen of the IBM monitor but overlays are available to achieve that capability. The touch sensitive screen has proven to be an advantage. The IBM monitor also has sound generation capability but this does not seem to be wanted by the students - they almost always turn off the sound even though the computer never says bad things to them.
- Q. Are the programs commercially available?
 - A. Yes, soon to be released by COMPRESS at a price of about \$300-400 per video disk lesson.
- Q. What is the ideal mix of video and lab?
 - A. That is a hard question because we must first re-think what we want to do with lab. Currently we expect about 50% video usage when all of the lessons are ready.
- Q. What type(s) of assessment have been done?
 - A. None, really, it is still too new. They do know that short-term learning is somewhat better with the video system as measured by quizzes given a short time after the lessons are administered, but do not know about long-term learning.
- Q. What student load can be put on the system?
 - A. Their system averages a total of about 50 students per station.

DISCUSSION GROUP C - Inorganic Chemistry
Leader - Bob Gayhart; Recorder - Richard Biagioni
Attendance: 8

Most of the attendees were involved in senior level courses. There was general agreement that students come to this course with little recall from General Chemistry. This problem was coped with by: using organic examples, reminding (commanding) students to review freshman text (freshman text required for advanced course), recommending reading from Day and Corono (a General Chemistry review text) prior to course, tutoring and assisting.

Discussion of assigned papers followed: cover chemistry of a selected element including economic aspects, include literature references, submit preliminary outline for approval, give a schedule for developing paper in stages, give outline of typical features found in papers.

Laboratory and texts were discussed. Group theory and quantum mechanics received very limited coverage.

DISCUSSION GROUP E - Computer Software Evaluation & Exchange
Leader - Philip Bays; Recorder - Max Taylor
Attendance: 13

The software being used was discussed. Butler CAI package for Freshman Chemistry (Wiley) was given a good rating for drill and practice. Bays' stereochemistry package (Compress) was reported to be good by several persons. KSIMS (Conduit) is a useful kinetics package for upper level courses. Science Toolkit is a useful demonstration package for light and temperature experiments. Vernier Software produces physics packages which are useful in many chemistry labs. Spreadsheets were discussed as tools for data tables, iterative calculations, error analysis and graphing of data.

A number of questions and comments followed. Are we behind in computer use? What are the reasons to use computers in labs? Ease of analysis and plotting by computers is encouraging students to do more thorough data analysis. Why are we doing our labs? Note the changes in lab content and goals over the time. Key concept is knowing what is happening in computer use. Going through manual processes and building up the use can help to get graduates to THINK about data. The computer can be useful in animating a lecture to provide movement to the pictures in the book.

How do you evaluate software effectiveness and utility? Self-paced vs turning pages. Can introductory material be bypassed? How is it keyed to the text? Drill and practice problems. Symphony by Lotus is a useful scientific software package. The Egg and Spellbinder are poor. ChemDraw for the Mac is excellent.

DISCUSSION GROUP F - Analytical Chemistry
Leader - David Bailey; Recorder - Barry Ferron

The discussion on analytical chemistry addressed a number of issues ranging from how the content of analytical chemistry courses has undergone little change in the last thirty years to how unknowns are graded in the various classes.

A central theme that occurred several times was related to what we teach in our courses and how we do it. Most of the participants in the session still use many of the standard analyses that have traditionally been done. Gravimetric experiments are still taught, but not as many are used as in the past. It was felt that the central purpose of analytical chemistry is to teach the student patience and careful technique in the laboratory. At this point "students" are supposed to be transformed into "chemists". It was felt that the standard analyses accomplish this. The problem of coordinating lecture and lab was mentioned. Some attempted to coordinate the two while others did not.

DISCUSSION GROUP B - Biochemistry
Leader - William Martin; Recorder - Laura Kateley Klingbeil

The discussion was more wide-ranging this year and was not limited to the laboratory. The three areas of concern were traditional: text, lecture, and laboratory.

All participants felt that in their Biochemistry courses the emphasis was on chemistry and not molecular biology. Therefore, all had and feel the need for a prerequisite of Organic Chemistry--most a full year.

In general, the lecture format was used and all courses had required laboratory of three to four hours per week. There is still considerable variation in course length, that is, one-versus two-semester programs. However, the one-semester courses seemed not to be survey courses but are simply focused on a smaller range of topics. In general, it was felt that considerable interest was present for Biochemistry, but that the liberal arts time limitations would, at present, place a constraint on the expansion of Biochemistry.

There was considerable interest and concern about the current state of textbooks. Lehninger, both the regular and the newer "Principles," have great merit but different limitations: the regular due to old publication date and the newer "Principles" since much of the chemistry had been removed. The death of Professor Lehninger will be severely felt in the loss of these two well regarded textbooks. Stryer, Zubay, and Bohinski are used. A new Stryer will be available soon but probably not changed significantly. Its weakness was judged to be in not enough chemistry; Zubay was considered hard to read and uneven and, again, not enough chemistry. No one was presently using Rawn. It was noted that a new Conn and Stumpf et al. is now available.

In general, considerable searching and experimentation is going on in the area of textbooks usage, and it is clear that no one book is dominant at this time. Many felt that this lack of a strong textbook was considered to be a weakness in the present teaching of Biochemistry.

Laboratory continues to be of great interest, although only a brief amount of time was available for discussion. It is clear that the laboratory project type of activity enjoys interest and success in the hands of liberal arts teachers. Perhaps this project type laboratory would be a profitable topic for future discussion at MACTLAC. Most worked in student groups of usually two, but some, three. There was a limited use of simulated laboratories, both with and without computer interaction. It was noted that Enzkin is now available for PC. A source of ideas and projects can often be found in Biochemical Education and J. Chem. Ed., the former most interesting since it covers activity outside the United States.

There is no doubt Biochemistry continues to be an area for productive discussion for MACTLAC members.

Considerable time was spent comparing the way different colleges administer their courses. Areas of discussion included:

1. Texts used in the first semester analytical chemistry course
2. Ways of grading precision without the students falsifying results to get high precision grades.
3. How we deal with incorrectly calculated results- Should students be allowed to recalculate or not?
4. Benefits versus problems encountered when students calibrate their limits (more problems than benefits)
5. Should expendable pipettes be allowed in the first semester analytical chemistry course, and if so, how should they be used? (Yes for 1 or 2 mL; they are just as good as pipets.)
6. Use of repeating pipets (pumps) for measuring volumes of reagents that need not be too accurate. (popular feeling)
7. How various departments take care of the wastes generated in the course. (Evaporate to solids and dispose of solids.)
8. How water of sufficient purity is obtained for analytical chemistry? (still, mixed resin beds, Reverse Osmosis)
9. How many hours of lecture-lab per week are involved in the typical course? (either 2 or 3 lecture & 4-6 lab)

DISCUSSION GROUP H - Physical Chemistry
Leader - Luther Erickson; Recorder - Jonn Dwyer

In discussing text books, most of those present indicated that they were using the current edition of Atkins. The insuing discussion centered on the relative merits and problems of Atkins and a number of other texts including Moore, Bromberg, Levine, Daniels and Alberty and Adamson.

In discussing available computer tools and applications the utility of various numerical methods was mentioned. Specific software which various people had found useful in this regard included RS-1 for VAX and LOTUS for the PC (both spreadsheet based with graphics capabilities), STELLA for the Mac which is useful for solving differential equations, and EUREKA for Berland Software which is useful for performing a wide variety of numerical operations including solving sets of simultaneous polynomial equations on the PC.

With respect to laboratory experiments, Philip Kinsey of the University of Evansville mentioned a procedure for measuring the vapor pressure of subliming ammonium carbonate using a computer interfaced pressure transducer (Mr. Kinsey indicated he could provide details upon request). He noted that this system avoided the toxicity problems associated with the more commonly employed dinitrogen tetroxide system.

Finally, the general issue of course content with respect to the proper balance between applications and theory was brought up. Although no concensus was achieved, some lively discussion was observed.

DISCUSSION GROUP I - Undergraduate Research Funding (PRF & Research Corp.)
Leader & Recorder - Gene Wubbels

Brian Andreen (Director of Grants of Research Corporation) and John Malin (Program Officer at ACS-PRF) each made 15-20 minute presentations on the funding programs of their agencies. The group of about 15 persons asked questions.

Brian emphasized that the demographic trends of the last 30 or 40 years made it harder for small college science departments to produce graduates who become scientists. Several studies indicate that this is true, and that our problem in bucking the trend is to build a stronger base in our science programs. He suspects it will be more and more difficult for many college chemistry departments to offer full baccalaureate degrees as the demand declines. Many possible improvements in our science base can be made: instrumentation, facilities, faculty development, student/faculty research all can be areas for improvements that increase our capacity to offer sound chemistry programs. Research is an activity that improves a department in many areas at once. Research Corporation, despite changes in its university-oriented programs, continues to welcome proposals for individual reasearch by college chemistry faculty. A preliminary inquiry to Andreen is highly recommended. The success ratio at Research Corporation for its College Science Program is about 40%. Brians's phone number is 602-296-6771.

John described the organization of ACS-PRF and emphasized that "the petroleum field" supported by PRF encompasses most of chemistry. The type B grants are aimed at college faculty in non-doctoral institutions. In the recent year, they funded 57 of 107 proposals for a success ratio of 53%; a very favorable success rate. PRF Type B awards now provide up to \$20,000 for two years, and salary up to \$4000 per summer for the principal investigator. PRF also has the possibility of supporting college faculty as an add-on to an existing PRF Type AC award for summer research at a research institution. PRF recommends that a proposal be started by requesting application forms. John can be reached at 202-872-4481.

DISCUSSION GROUP J - Chemical Applications of Microcomputers: Interfacing
Recorder - Stan Burden

Stan Burden and Dan Hammond from Taylor University described several on-line systems used at Taylor. These included the following:

(a) A computerized electronic weighing system which utilized a Cahn top loading 0.1 mg analytical balance interfaced to an Apple IIe with an ADALAB card. The system was used to accomplish a number of different routine laboratory weighing functions as well as to enable standard solutions and dilutions to be prepared without the use of volumetric glassware.

(b) A low cost pH/mv meter and solution delivery system which was used for computerized titrations, computer assisted direct analysis with ion selective electrodes and computerized multiple standard addition analysis with ion selective electrodes. The total system could be constructed for approximately \$200 (not including the electrodes) and was interfaced to the computer via the game port. The solution delivery system utilized Hach digital titrator controlled by a stepper motor.

(c) A research project involving thermometric titrations in which the stepper motor controlled Hach titrator was employed along with an ADALAB card and thermistors for acquiring data.

DISCUSSION GROUP D - Undergraduate Research (NSF)
 Leader - Ted Reid

Ted Reid from the Office of Science and Engineering Education (SEE) at the National Science Foundation.

Support from the National Science Foundation for undergraduate institutions reached a high in the late 1960's, but funding virtually disappeared in the early 1980's. The NSF has once again realized the importance of the undergraduate experience and support is now approaching the high mark of the mid 1960's. However, during the past 20 years, the total NSF budget has increased by a factor of 4-5 while the total support to undergraduate instiof the total NSF budget than in the 1960's.

The National Science Board Report called for an infusion of \$100,000,000 to be divided among undergraduate research, stipends, and faculty enhancement. For FY 1988, the proposed NSF budget for undergraduate institutions (see below) approaches that recommendation.

	\$M
Instrumentation and Lab Development Program	21.4
SEE	9.5
rest of NSF	11.9
Research Experience for Undergraduates (REU)	18.4
Faculty Enhancement	5.5
Curriculum Development	7.0
Career Access	3.7
RUI & ROA	15.5
	\$71.5

This \$71.5 can be divided in a different manner

	\$M
Math and Physical Science	15.2
Engineering	11.2
Biology, Behavioral and Social	14.2
Geoscience	8.2
Computer and Informational Science	4.7
SEE	18.0
	\$71.5

The Office of Undergraduate SEE was created to manage and coordinate the disbursement of this money and to stimulate the improvement of undergraduate institutions. They have direct control of only a portion of the \$71M.

Target Date for Proposal Submission

Instrument and Lab Improvement (replaces CSIP)	November 20
REU	December 1
Undergrad Faculty Enhancement	December 11 and March 4
Career Access	December 15
Curriculum	March 1

REQUEST GUIDELINES FROM:
 FORMS AND PUBLICATION UNIT, ROOM 232
 NATIONAL SCIENCE FOUNDATION
 18005 STWY
 WASHINGTON, DC 20560

REU \$18M

1. Site Grants
 - a. One or more related projects
 - b. 4-6 students
 - c. ~ \$4,000 / student
 - d. Deadline December 1
 - e. No overhead

2. Supplements to Existing NSF Research Grant

NOTE: Last year the average site grant was \$36,000 / site. There were 144 proposals submitted and 27 awards. About 5-10 of the grants were to undergraduate institutions.

Undergraduate Faculty Enhancement

1. Few days to few weeks in duration
2. Participants paid small stipends
3. Apply directly to project director
 - a. \$3.0 SEE
 - b. \$2.5 in rest of NSF
4. Travel cost not paid by NSF
5. Seminars, workshops, and conferences

Career Access

1. Regional Centers
2. Model projects for women, minorities, and disabled

Review of CSIP for FY 1987

970 Proposals	required
337 Awards	\$26M
	8.6M

34.7% success

	# Award
Biology	73
Chemistry	81
Computer Science	21
English	56
Physics	36
Math	5
	etc.

DISCUSSION GROUP M - General Chemistry
 Leader & Recorder - Peter Wickham
 Attendance: 12

A tally of texts used showed: Masterton-Slowinski 3, Brady-Humiston 2, Kotz-Purcell 3, and McQuarrie-Rook 1. Some do thermochemistry early but often not much done with thermodynamics. About three early lectures on enthalpy; most have section in second term on entropy and free energy. Kinetics is about three lectures in second term. Descriptive chemistry attracts interest. Derivations etc. arise to solve chemistry problems. Is there too much emphasis on the physical chemistry type topics?

Lab is a good way to present descriptive chemistry. Variations on the qual scheme are: (1) have students write flow sheet for randomly selected samples of 3 or 4 elements of a given group then on an unknown containing those elements (2) give quizzes before unknowns. Concern was expressed about qual schemes that were too much like recipes. Demonstrations were discussed in term of actual demonstrations, video and text book illustrations of reactions. Often students "lay down their pencils" when demonstrations are done. Most agreed that too much time can be spent on them. An historical approach was discussed but it was universally thought to be poor if its too confusing.

Instrumentation in lab: most use Spec 20, pH meters, spectroscope, some use AA. Approaches to independence of thought: lab mostly, some special projects, literature searches and writing assignments. Students need to do writing about chemical subjects or experiments.

Thirty-Sixth Annual MACTLAC Meeting

October 28-29, 1988

Saint Mary's College
South Bend, Indiana

What Happens to our students when they go to Graduate School ?
Symposium addressing problems faced by 1 & 2 member Departments.

Discussion groups in all disciplines of Chemistry.
Representatives from Major Research Funding Agencies.

New/Renovated Science Facility
Tours the University of Notre Dame Chemistry Department

South Bend is easily accessible by train, air, and car.

Remember these Dates - October 28-29, 1988

11. SATURDAY 10:30-11:30	111. SATURDAY 4:00-5:00	11. FRIDAY 4:00-5:00	1. FRIDAY 3:00-4:00
K. Discussion with Garland Marshall CSC 202 Riley Hastings	F. Discussion Group on Analytical Chemistry CSC 202 David Malley	A. Discussion with Stan Smith CSC 202 Roger Lemcke	
L. Kekulé's (Fictitious) Dream - John Motiz CSC 105 John Schultz	G. Discussion Group on Organic Chemistry CSC 302 Jeffrey Kelsner	B. Discussion Group on Biochemistry CSC 302 William Martin	
H. Discussion Group on General Chemistry (for science majors) CSC 302 Peter Wickham	H. Discussion Group on Physical Chemistry CSC 301 Luther Erickson	C. Discussion Group on Inorganic Chemistry CSC 301 Robert Gayhart	
N. Discussion Group on Introductory Chemistry (for non-science majors) CSC 301 Stanley Watkins	I. Undergraduate Research (PRF & Research Corp.) John Hallin & Brian Andrew Gene Mubbeles CSC 303	D. Undergraduate Research Ted Reid NSF - (NSF) Dan Hammond CSC 105	
O. Chemical Applications of Microcomputers CSC 205 John Zimmerman & Michael Collins	J. Chemical Applications of Microcomputers CSC 205 Stan Burden & Harry Neumiller	E. Computer Software Exchange & Evaluation Beys CSC 401 CSC 303	
P. General Topics (student assessment, faculty develop., etc.) Harold Anderson		F. Saturday: 11:00-12:15 p.m. Nuclear Power Plant Tours Sunday: 11:00-12:15 p.m. Nuclear Power Plant Tours	

Westminster College Dept. of Chemistry
Prof. Charles Brauer, Chairman
Dr. Glen Frerichs, MACTLAC Coordinator
Dr. Riley Hastings

Westminster College Science Center

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DISCUSSION GROUPS*

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