Computers in Chemical Education Newsletter
Fall 1993

First Electronic Chemistry Conference a rousing success.

Congratulations to
Don Rosenthal and Tom O'Haver

Some Supported Word Processors	File Format
DCA files	.DCA
Microsoft Windows Write	.WRI
Microsoft Word	.DOC
MultiMate	.DOC
WordPerfect	.WP
WordStar 3.3	.WS
XyWrite III	.XYW

For example if you use WordPerfect to make a file named foo send it as foo.WP. FOR OTHER WORD PROCESSORS SEE Aldus PageMaker 4.1. We can read ASCII FILES.

FROM THE CHAIR — Donald Rosenthal Box 5810, Department of Chemistry, Clarkson University, Potsdam NY 13699-5810
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The Committee on Computers in Chemical Education (C.C.C.E.)promotes and publicizes the use of computers in chemical education. The Committee publishes this Newsletter, organizes workshops andsessions at nationalmeetings and promotes and organizes on-line conferences via electronic mail. Some of these activities are described below.

FUTURE SESSIONS AT NATIONAL MEETINGS

13th Biennial Conference on Chemical Education at Bucknell University,July 31 to August 4, 1994

Symposium on "Overview of Computer Use in Chemical Education:High School, General, Organic and Analytical Chemistry Courses"

There will be four quarter-day sessions devoted to the above fourtopics. Each session will consist of two half-hour presentations byinvited speakers and a half-hour devotedto questions, discussion and comments.

Each invited speaker will describe what software and hardware isused in his or her course. - how it is used - what computer use isrequired of the student and what is optional - what works well andwhat does not work very well - how the use of computers modified theteaching of the course and the activities of students in the course.

This symposium will give teachers who are contemplating introducing more or different computer use in their courses a betteridea of hardware and software requirements, what works well and whatdoesn't work well, and what successful programs are like.

The invited speakers are: High School Chemistry - Barry E. Rowe (Champaign Centennial High School, Chamgaign, IL) and William J. Sondgerath (Harrison High School, West Lafayette, IN);

General Chemistry - Loretta Jones (University of Northern Colorado) and John W. Moore (University of Wisconsin - Madison);

Organic Chemistry - Joseph Casanova (California State University - Los Angeles) and Stanley G. Smith (University of Illinois)

Analytical Chemistry - Robert Megargle (Cleveland State University) and John C. Wright (University of Wisconsin - Madison)

During the half-hour allocated for discussion the two speakers in each session will be available to answer questions or respond to comments. A minute or two will be available during the discussion period for those in the audience to describe what they are doing at their schools. If any of you readers plan to submit a paper or participate in a poster session at the Biennial Meeting, you might wish to "advertise" your contribution briefly during the discussion.

If you are interested in participating in the discussion, please let me know so that I will be sure to call on you.

The Committee on Computers in Chemical Education will hold an open meeting during the 1994 Biennial Meeting. If you attend the Biennial, we hope you'll plan to meet with us. Check the program for time and place. Many members of the C.C.C.E. will be present. We'll tell you about some of the things we're doing and would welcome suggestions and comments from you.

Fall ACS National Meeting in Washington, DC, August 21 through August 26, 1994 A symposium on Computers in Chemical Education spon-

sored by C.C.C.E.:
Session 1 - "Use of Internet by Chemists" Chaired and Organized by T h o m a s O ' H a v e r <TO2@UMAIL.UMD.EDU>
Session 2 - "Integrating Computers into the Undergraduate Chemistry Curriculum" Chaired and Organized by Harry Pence <PENCEHE@SNYONEVA>

Sessions 3 and 4 - "What Chemists Need to Know About Computers and Computing" Co-sponsored by the Divisions of Chemical Education and Computers in Chemistry Chaired and Organized by Kenneth Loach <LOACHKW@SNYPLAVA> and Angelo Rossi <ROSSI@WATSON.IBM.COM>

ON-LINE COMPUTER CONFERENCES

The summer 1993 conference is described in an article elsewhere in this Newsletter.

During the late spring of 1994 an Open Meeting of the ACS Division of Chemical Education's Executive Committee will be held via LISTSERV. Some of the Division's activities and problems will be discussed and an opportunity will be provided for on-line participants to ask questions and make suggestions. A follow-up session to the on-line meeting will be a conventional (non-computer) session held at the 13th Biennial Conference on Chemical Education at Bucknell University in August 1994. Donald E. Jones, 1993 Chair of the Division's Executive Committee, will organize and manage the meeting. (Donald E. Jones, Western Maryland College, Westminster MD 21157 E-mail:DJONES@NSF.GOV).

Tom O'Haver <TO2@UMAIL.UMD.EDU> is helping the International Chemometrics Society to organize the International Chemometrics Internet Conference. This conference will be held during October

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1994. For further information contact Barry M. Wise, Molecular Science Research Center K2-12, Battelle Pacific Northwest Laboratories, P.O. Box 999, Richland, Wash. 99352 e-mail: bm_wise@ccmail.pnl.gov).

Another Computer Conference will be held during the summer of 1995. It will be sponsored by the Division of Chemical Education. The theme of this conference has not yet been decided.

Anyone interested in helping to organize a future computer conference should contact Thomas O'Haver or myself.

NEWSLETTER

The Spring 1994 Newsletter will be distributed at the 13th Biennial Meeting at Bucknell University. Anyone wishing to submit an article for publication in this Newsletter should contact Brian J.Pankuch, editor.

EDITOR

A neophyte on Internet:
by Brian Pankuch, Department of Chemistry, Union County College, Cranford, NJ 07016 pankuch@hawk.ucc.edu

I was fortunate this last year in that my college got on Internet in time for me to experience part of the first electronic Chemistry Conference on teaching chemistry. Part of the reason we got on Internet was because I kept explaining to two of our vice presidents how important it would be to be part of the first Conference. For the benefit of those of you who don't have electronic mail

or are in the process of bringing your faculty electronic mail let me give you my first impressions.

My situation was less than ideal since the only machine available with electronic mail was 2 buildings away and frequently not available due to other users, etc. The e-mail system in use was reminiscent of the first teletype I used in the late 60's. The only way to correct an error was to delete everything on the line to the error. The only way to check the mail was to go through piece by piece.

Innocently signing up for the conference I found myself getting hundreds of messages a week. With this primitive system this required reading or looking at each to find personal messages. If you ignored it for a while the system would fill over 430 messages on average, then start trashing anything that came in. Another problem with the old system was that I could only send 1 to 3 lines, and only about half of the messages got through. With no indication on my side of which were successful.

I could of course shut it off at any time, but it is fun seeing how many pearls you find in the downpour. I found the wide range of questions and opinions addictive. I found myself looking forward to certain individuals' comments and responses.

I serve as the chair of a college wide computer committee, and decided long before this that I would do my best to make computing as painless a way as possible. Learning to deal directly with a VAX is certainly possible, I used to program one. It is not something most faculty are going to enjoy. So I relentlessly applied pressure to get things simplified.

A real improvement came when our systems people finally relented and

put up a more modern system. If you are using a VAX as a server the latest version of DecNet and Mail for Macintosh is a vast improvement for e-mail. The new system allowed me to look at all my mail finding out who sent it and what the subject is. It is the difference between driving on a clear day able to see in all directions, versus traveling in a dense fog at night.

To illustrate the interesting way in which we each perceive reality I complemented our main systems engineer on the new mail system and he said it was the same system, just a different interface. Which is of course true, but the new interface allows a novice to learn how to use e-mail in about a minute and bring over their expertise from the word processor of their choice. This as opposed to spending hours or days learning VAX commands and editors. Not the same from the user standpoint by a mile.

About a week after the conference was over I got a Mac in my own lab, so I can play with e-mail anytime I have a few spare minutes.

Several programs were mentioned that make e-mail and navigating networks easier. Eudora apparently makes handling e-mail much easier. There is a free version and a $25 commercial version, but you apparently need a NU Pop server on the Vax or other server to make it work. I haven't used either but the comments from those who have are very positive. You can get more information on the commercial version of Eudora from Eudora — sales@qualcomm.com. The free version is available at "ftp.acns.nwu.edu" in the /pub/nupop directory logging in as anonymous. NuPop is available from the same ftp address. Gopher allows you to find things on networks it was spoken of less but still positively.

Another Computer Conference is planned during the summer of 1995

(see above). I highly recommend signing up as a participant, and planning for 40-50 messages a day. I would strongly suggest planning someway of having your system automatically sort incoming mail — Eudora or its equivalent. If you don't have e-mail yet this may be a good opportunity to use this conference as I did to get connected to Internet. I've heard over a million new users are signing up every month. For those of us who usually can't make it to national meetings, this is an interesting way to be part of a conference. If you have any suggestions about topics you'd like to have covered, tell Don Rosenthal or Tom O'Haver.

SOFTWARE REVIEW: IR TUTOR, version 1.0 by Charles B. Abrams

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The Perkin-Elmer Corporation (Mail Station 12, 761 Main Ave., Norwalk, CT 06856-9966) has recently released a program called IR TUTOR as part of their 1600 Series FT-IR educational package. The entire package is listed at $2,000 but the price is reduced to $500 for purchasers of Perkin-Elmer IRs. I tested a pre-release copy of IR TUTOR the past summer in the second semester of introductory organic chemistry, and found the program to be a superb introduction to infrared spectroscopy. Not only did the students really enjoy using it, but what is more important, they learned how to interpret IR spectra. Twenty students had four unknowns each, and all of the IR spectra which they ran were interpreted correctly. The unknowns were taken from a much larger list of unknowns of varying difficulty that we have been using for some time. The students received no other training on IR spectroscopy except that which they got during exams.

The most striking feature of IR TUTOR is the animations of the bond vibrations that cause peaks in the IR spectra. Once you see these, you will never be happy with any other way of teaching about bond vibrations. The other animations are outstanding, particularly the illustration of light as a wave and the graphics that combined a graph of the energy with the state of the molecular vibration. The animated diagrams of different types of IR instruments were also excellent. The best way I can describe the quality of the program is to state this is what CAI will be like ten years from now.

The most useful feature of IR TUTOR is the ability to overlay two spectra and compare them, which allows an easy correlation of peaks with functional groups. This is a very useful teaching tool, and the program takes advantage of it. The program allows the user to select a peak, like one which might be apparent from the difference between two overlaid spectra; when the peak is selected, the program will display the vibration responsible for that peak.

The only problem I found with the program was that you could not enter spectra into it. The author has informed me that the next version will allow the import of spectra from the P-E 1600 IR. The next version will also include an interactive, animated, correlation table and more theory, including a detailed explanation of the Fourier transform.

IR TUTOR could be used in the lecture part of a course, as a part of the lab, or as an independent assignment. Students seem to need from two to two and a half hours to finish the program. Students who have had no microcomputer experi-

ence are able to complete the program without help in running it. I am fortunate to have access to a lab with ten Mac Quadras, to which I assigned students in pairs; while I walked around the room commenting, teaching, or looking for students with problems running the program. (There weren't any.) IR TUTOR could be used with a single projection TV in a classroom. I did use it with an expensive LCD panel projector, but I wonder if it would work satisfactorily with the less expensive LCDs, because of problems in displaying the animated bond vibrations.

IR TUTOR comes in versions for both the Macintosh, (SE II Series, LC II, Powerbook 180, Quadra, Performa) and IBM PC or clone under Windows. A color monitor is desirable. The Mac and IBM versions look identical if the PC monitor is set to 256 colors. The author of the program used a very interesting way to produce the Mac and IBM versions essentially at the same time. (Macromind Director and Windows Player from Macromedia, 600 Townsend St., San Francisco, CA 94103). This system produces really superb CAI, with spectacular animations.

Rumor at the Chicago ACS Meeting was that Perkin-Elmer would accept the serial number of a Perkin-Elmer IR as sufficient evidence to get the discount.

An outline of the program follows:

I. Introduction to Spectroscopy

   A. Definition of Spectroscopy

   B. Nature of Light

   C. Measurement of an Infrared Spectrum

II. Theory of Infrared Spectroscopy

   A. Classical Model of a Molecule

   B. Quantum Mechanical Model of

THE ON-LINE COMPUTER CONFERENCE

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INTRODUCTION

An article on computer conferencing appeared in the Fall 1992 issue of this Newsletter (p. 24 to 26). The Spring 1993 issue of the Newsletter (p. 10 to 13) described the results of the February trial session. In this article the on-line conference on "Applications of Technology in Teaching Chemistry" will be briefly described, and the participant responses to the questions on an evaluation form will be summarized.

PRE-CONFERENCE ACTIVITIES

The Conference was publicized at the 12th Biennial Conference on Chemical Education at the University of California - Davis during the summer of 1992. Announcements were sent out via the Chemistry Education Discussion List (CHEMED-L) and other computer discussion lists. An announcement appeared in the Fall 1992 issue of this Newsletter (p. 3). An article on the Conference was in the February 15 issue of Chemical and Engineering News (p. 25).

Titles of papers and abstracts were requested by February 1, 1993 and the full papers were expected to be sent to Thomas O'Haver conference manager) by May 1. Registration via e-mail occurred mostly between October 1, 1992 and June 1, 1993. The number of participants varied with new registrants signing on and some registrants signing off during the period of the conference. There were about 450 registrants from 33 countries. 74 % of the registrants were from the United States and 26 % were from other countries.

THE ON-LINE CONFERENCE - June 14 to August 20, 1993

The on-line Conference consisted of three sessions. The duration of each session was three weeks and five papers were presented in each session. A week was devoted to evaluation and general discussion at the end of the Conference. Most of the papers were available on June 14 -the first day of the Conference. During the first week of each session, participants were expected to read the five papers in the session and publicly ask short questions of the authors or other participants.

Participants wishing to call attention to typographical or other errors were asked to communicate with the authors privately rather than publicly. For each paper one day during the first week of the session was devoted to short questions. Discussion of the papers did not begin until the second week. Authors and participants had at least a week to prepare responses to the short questions. The authors of papers had been asked to include a few short questions to participants at the end of their papers. These short questions were designed to promote and focus discussion. Discussion of the papers occurred in the second and third weeks of the session. Two days were allocated for the discussion of each of the five papers. The weekends could be used for general discussion.

The fifteen papers which were presented (five per session) were:

1. The Use of Computers in a Junior-Level Analytical Chemistry - Physical Chemistry Laboratory Course
Donald Rosenthal, Department of Chemistry, Clarkson University, Potsdam, NY
1 3 6 9 9 - 5 8 1 0

(ROSEN1@CLVM.BITNET)

2. For LANS Sake: Suggestions for the Use of Networked Computers in Chemical Education B. James Hood, Dept. of Chemistry & Physics, Middle Tennessee State University; bjhood@knuth.mtsu.edu (INTERNET) or PrfJimHood (America Online)

3. Visualizing Chemical Reactions John P. Ranck, Elizabethtown College, Department of Chemistry, Elizabethtown, PA 17022-2298; Internet: ranck@vax.etown.edu

4. Cultural Differences Reflected by an Integrated Media Chemistry Course - An American/Israeli Perspective *Nava Ben-Zvi, **William S. Harwood, *Ahuva Leopold, **Lisa L. Ragsdale, *Hebrew University, Jerusalem, Israel 91904, **University of Maryland, College Park, MD 20742 (201226@UMDD.UMD.EDU)

5. It's How You Play the Game: Design of an Electronic Assistant for Organic Qualitative Analysis Joyce C. Brockwell, Northwestern University, Department of Chemistry, 2145 Sheridan Road, Evanston, IL 60208-3113 (jcb@nwu.edu)

6. Individual Computer-Generated Graphical Problem Sets Frank M. Lanzafame, Monroe Community College, Chemistry Dept., 1000 East Henrietta Rd., Rochester, NY 14623 (FLANZAFAME@ECKERT. ACADCOMP.MONROECC.EDU)

7. Integrating Computers into the High School Chemistry Classroom William J. Sondgerath, Chemistry Teacher, Harrison High School, West Lafayette, IN (BSONDGER@VM.CC.PURDUE.EDU)

8. Using the Airwaves: A Satellite M. S. for Industrial Chemists Keith J. Schray, N.D. Heindel, J. E. Brown, and M. A. Kercsmar, Department of Chemistry and Office of Distance Education, Lehigh University, Bethlehem, PA, 18015 (kjs0@Lehigh.EDU)

9. Staff Development is the Biggest Cost in Computing David W. Brooks, Center for Curriculum and Instruction, University of Nebraska-Lincoln, Lincoln, NE 68588-0355. (dbrooks@unlinfo.unl.edu)

10. Personal Computers in Teaching Physical Chemistry A.A.Kubasov, V.S.Lyutsarev, K.V.Ermakov, Chemical Faculty of Moscow State University, Moscow, Russian Republic. (LASER@mch.chem.msu.su)

11. Applications of Networked Computers and Electronic Mail in a Chemistry Course for Nonscience Students Carl H. Snyder, Chemistry Department, University of Miami, Coral Gables, FL 33124 (CSNYDER@umiami.ir.miami.edu), and James Shelley, Academic and Research Systems, Information Resources, University of Miami, Coral Gables, FL 33124 (JSHELLEY@umiami.ir.miami.edu)

12. The Computer Co-Op: Teaching Organic Chemistry on a Conference in an Interdisciplinary Macintosh Lab Carolyn Sweeney Judd, M.A. (cjudd@tenet.edu), Faculty, Chemistry, and Robert G. Ford, Ph.D., Faculty, English, Central College, Houston Community College System, 1300 Holman Houston TX 77004

13. Finite Difference Solution of the Diffusion Equation in a Spreadsheet Douglas A. Coe, Montana College of Mineral Science and Technology, Butte, MT 59701 (DACOE@MTVMS2.MTECH.EDU)

14. CHEMULATE! A Simulator of UV/Vis Kinetics Experiments for the Macintosh Richard S. Moog. Franklin and Marshall College (R_Moog@acad.fandm.edu)

15. Menu Driven Programming for Students and Teachers Reed Howald, Department of Chemistry and Biochemistry, Montana State University, Bozeman, MT 59717 (uchrh%planet.dnet@ terra.oscs.montana.edu)

This computer conference contained papers which were generally longer and more detailed than a paper presented at the usual conference. Also, there was much more discussion. At the usual conference the questions and answers generally represent a dialog between the author and participants; and answers and questions are generally quite short. In the computer conference two days were available for discussion and discussion could continue into periods set aside for general discussion. Those participating in discussion had time to consider and even research what they wished to say. Much of the discussion did not involve the author, but consisted of discussion between participants. The number of words devoted to short questions and discussion exceded the length of the paper. For example, Paper 1 consisted of about 7,000 words plus fourteen tables and figures. Short questions and discussion of Paper 1 consisted of about 78 messages from 37 participants and about 31,000 words. Paper 1 was the longest paper presented. The shortest paper had about 1500 words of text and the average paper contained about 3700 words of text. Many of the papers had figures associated with them which were sent as separate e-mail messages in text-encoded form. In order to view the figures participants needed to use the transmitted files with special software on a terminal or personal computer with graphic capabilities. Both color and black and white figures were employed by authors. Instructions for viewing figures and general instructions were transmitted when participants registered for the Conference.

One distinct advantage of computer conferencing is that a permanent record of all papers, questions and discussion are available during and after the conference and can be accessed via e-mail.

Readers of this article can sign on to the conference LISTSERV by sending the message SUBSCRIBE CHEMCONF to LISTSERV@UMDD.UMD.EDU or to LISTSERV@UMDD.BITNET. Instructions for retrieving the conference proceedings will be distributed. Also, for Internet users, the proceedings can be obtained by anonymous FTP (Host: info.umd.edu Path: info/Teaching/ ChemConference).

Contact Thomas O'Haver (Conference manager) if you have any difficulties. (Professor Thomas C. O'Haver, Department of Chemistry and Biochemistry, University of Maryland, College Park, MD 20742. Internet: to2@umail.umd.edu).

EVALUATION OF THE CONFERENCE

An evaluation form consisting of twenty-six different items was distributed at the beginning and the end of the conference. Participants were asked to return the evaluation form during the final week of discussion (August 15 to August 20). Seventy-one of the 450 participants (16%) returned the form. Unfortunately, it is difficult to determine how representative the evaluation form respondents were of the Conference participants. Not all evaluation forms were completely filled out. It is difficult to summarize all the evaluation form questions. What follows is a summary of some of the salient responses to the questionnaire.

Of the 71 respondents 81% were college or university teachers, 6% were high school teachers and there were 13% others. 78% of the respondents were from the United States and 22% from other countries.

Participants were asked to indicate their computer expertise and facility using electronic mail on a scale from 1 to 5 where 1 represents beginner, 3 average and 5 expert. Computer expertise (69 respondents) - average 3.62 (S.D. = 0.092 - S.D. represents the standard deviation of the mean throughout this article), 12% expert (5), 45% 4 on scale of 5, 38% average (3), 6% 2 on scale of 5 and no beginners (1). Facility using electronic mail (69) - average 3.52 (S.D. = 0.12), 14.5% expert (5), 43% 4, 25% average (3), 16% 2, and 1.5 % beginner (1) on scale of 5.

Information was provided by the respondents about the number of papers read. (63 respondents) - average 9.0 papers (S.D.= 0.7), 29% read all 15 papers, 19% read 10 to 14 papers, 24% read 6 to 9 papers, 22% read 1 to 5 papers, and 6% read none of the papers. Some of the respondents who read no or only one paper still actively followed the discussion. One individual was not able to download the papers. A few others were away for much of the conference but had downloaded the papers expecting to read some of them at a later time. One respondent wrote: "Year's end is a particularly busy time for us. I manage to read my mail every day, but I have to put long texts in a folder for later reading. I retrieved most of the papers with FTP (for myself and two colleagues) but I could not find time to read them properly. After our holiday started I wasn't able at all to follow the discussions. I returned yesterday to find my mailbox overflowing (more than 4,000 messages, so at the moment I am trying to catch up on it, while preparing for the start of the academic year. I intend to read the papers more carefully when I have a little more time."

49 respondents indicated the total amount of time they devoted to the Conference. The average was 24 hours (S.D. = 4). The median was 14 hours. The largest amount of time spent was 135 hours (next largest 126 hours). The least amount of time reported was 3 hours. 10% of respondents devoted between three and six hours, 20% devoted 7 to 10 hours, 20% devoted between 11 and 14 hours, 20% devoted between 15 and 27 hours, 20% devoted between 31 and 42 hours and 10% between 50 and 135 hours.

Respondents were asked to provide an overall evaluation of the papers on a scale from 1 to 5 as above. An average of 3.66 was obtained from 58 respondents. (S.D. = 0.08) 9% of the respondents rated the papers as excellent (5), 41% as average (3) and 50% as 4.

Sixty-two respondents provided an overall evaluation of the discussion. The average was 4.17 (S.D. = 0.09). 35% rated the discussion as excellent, 16% as average (3) and 48% as 4. There was one 2.5 rating.

54 respondents provided an overall evaluation of the meeting. The average evaluation was 4.44 (S.D. = 0.09). 56% rated the meeting as excellent, 11% as average (3) and 33% as 4.

Examination of the conference papers indicate they were quite different in length, approach and topic. The organizers of this conference were interested in learning what sort of papers best lend themselves to computer conferencing. The questionnaire asked respondents which paper they considered best and to rate the best paper on the 1 to 5 scale. Thirty-eight responses were obtained. Each paper received at least one vote for being best. Those papers which received three or more best votes were (Number of votes in parentheses): Paper 1 (7), Paper 11 (6), Paper 14

(5), Paper 7 (4), Paper 12 (4) and Paper 9 (3). The average evaluation assigned by respondents to their choice of the best paper was 4.56 (S.D. = 0.08). The lowest rating was 4. Respondents were asked to explain the reason for their choice. Answers were quite varied. In several cases the topic or some of the ideas were of most interest to the respondent. Some of the individual comments were: "was most explicit. ... Some of the other papers were too short ...",
"presented more data to support the effectiveness of what he was doing.", "stimulated .. discussion about what we are trying to do in education", "best written .. well referenced", "my favorite because it represented the future direction that .. chemical education will move in ..", and "I find it very difficult to choose a "best" paper. They were too different to compare this way" (respondent did not select a best paper).

Respondents were asked to indicate which paper had the best discussion associated with it. Thirty six responses were obtained. Those having three or more best votes were: Paper 11 (11), Paper 9 (10), Paper 14 (6) and Paper 12 (3). Thirty two respondents evaluated the best discussion on a scale from 1 to 5. The average was 4.5 (S.D. = 0.1). 59% of respondents rated the best discussion as excellent (5), 7% rated the best discussion as average and 34% rated the best discussion as 4 on the 5 point scale. Some of the comments: Several papers "generated some interesting and provocative new threads: New Tools vs Old Methods, Learning to Learn and how different people learn. The discussion of the virtues and faults of simulations lead . .to a discussion of how we (the professors) think/learn compared to how they (our students) think/learn. An increased awareness on our part of this difference can have a profound and positive impact on how we teach and the effectiveness of our message to our studends." "Lots of thoughtful discussion" "Paper .. gen-

erated a great deal of discussion. The people commenting here actually seemed to know what they were talking about." " .. The new vs old methods discussion was good - I have been thinking about the best way to use spreadsheets with first year students, and the discussion helped me sort out my own views." "The intellectual stimulation and feeling of being in the same boat as a wide range of colleagues is refreshing."

"The topics in the discussion involving learning, critical thinking, and cooperative learning are of special interest to me. The variety of students at our community college forces us to consider alternative learning techniques. The discussion made me believe that others are also interested in these topics" "The discussion of what chemistry majors should know and not know about computers and computing was very interesting to me, especially since we are offering a two semester course, "Computers for Chemists", for the first time this fall." " .. an important issue - the use of simulation in teaching. As a theoretical chemist simulation and models are my research. ... I think that students should be exposed to simulations as tools of research and therefore simulations are an important part of the lab training of a chemist." "The discussion of Paper .. was simply outstanding, and I didn't even read the paper."
" .. it has been sheer joy to gain insights into the ideas, plans, achievements, uncertainties and enthusiasm of all those who did contribute."
"Among the best discussions were those on how students learn and on how teachers learn (or don't learn) to teach new things. I suspect that there is more wisdom among chemists about teaching than there is in some of the University units which have been set up to promote good teaching. The exchange of ideas in this conference was very useful to me because those ideas were in

much the same context as that in which I work."
"Paper .. .. and the discussion that followed allowed me to think through a lot of things that I had never really thought much about before." "I most liked the discussion about what should we include/use and what not . . the experiences that people already have with a lot of methods/software, etc. in their curriculum."

Four of the items from the questionnaire were:
Item 22: What did you like most about the computer conference?
Item 23: What did you like least about the computer conference?
Item 24: What changes could be made to improve the computer conference? (Papers, Short Question Sessions, Discussion Sessions, etc.)
Item 25: Compare this conference with the usual conference.

Responses to these items were summarized by Thomas O'Haver and are included in the article which follows this article.

POST CONFERENCE ACTIVITIES

Towards the end of the Conference (July 25) Ted Labuza (Department of Food Science Nutrition, University of Minnesota, St. Paul MN 55108)) suggested that a few discussion topics lend themselves to further discussion. He suggested that additional time be devoted to these
topics and that articles be written based upon some of this discussion. The idea of writing papers which represent the collective wisdom of many conference participants seemed to be a novel. interesting and challenging idea. Five topics, which had generated considerable discussion during the conference, were selected for further discussion:
New Tools vs. Old Methods
The Use of Networks and Elec-

tronic Mail in Chemical Education What Chemists (or Chemistry Students) Need to Know about Computers and Computing The Use of Simulations Testing and Sharing Examination Questions

Facilitators volunteered for each of the above topics. A week of further discussion was devoted to each of these topics during the period from August 30 through October 3. The facilitators managed these discussions.

Thomas O'Haver (CHEMCONF manager) edited and sorted the discussion files. They are available by anonymous FTP, gopher or telnet from infom.umd.edu (/Educational Resources/ChemConference/ PostConference). The plain ASCII files (number of bytes indicated in parentheses) are:
  TopicA. NewTools.txt (341,892 bytes)
TopicB.Email.txt (171,655 bytes)
TopicC.WhatEvery.txt (258,384 bytes)
TopicD.Simulation.txt (220,280 bytes)
TopicE.Sharing.txt (106,278 bytes)

Papers are now being prepared by the topic facilitators. These papers will be distributed via CHEMCONF on January 3, 1994. Discussion of these papers will occur between January 3 and February 14 with a week being devoted to each paper.

RESPONSES TO SOME QUESTIONS ABOUT THE COMPUTER CONFERENCE Compiled by Thomas C. O'Haver, Department of Chemistry and Biochemistry, University of Maryland, College Park MD 20742, to2@umail.umd.edu.

22. What did you like most about the computer conference?

I could do it from home except for downloading large files - also it was spread out over several weeks Exchange of ideas generated by the papers provided food for thought There were a number of things which I liked: 1) the informal atmosphere and the ability to access the conference proceeding at my own pace; 2) the inducement to learn more about the computer in my office AND the Mail system so that I might be able to get the most out of the offerings of the conference; 3) the threads of discussion which developed --especially New Tools Vs. Old Methods, How students Learn, Why Organic is so Hard? Cooperative/Collaborative Learning. These are among the issue which I have been tossing around extensively since I began teaching in the spring of 1990. My colleagues have received my ideas with varying degrees of interest (ranging from luke-warm and skeptical to high enthusiasm). I've found it educational and gratifying to learn how others are dealing with these concepts; their thoughts and their strategies for implementation. I didn't learn much about teaching in graduate school; this conference has been an important part of my education. My perspective has been broadened and perhaps am developing a new (more effective??) angle. I found that leaving the safe shadow of the lurker and posting my own ideas to be a valuable experience. Ideas were validated, constructive feedback was exchanged and new contacts were made. In theory (and in practice) this happens at "live" conferences as well. I think, however, that the network adds flexibility to the discussion and as Carolyn Judd pointed out, there is a certain anonymity to the network which might help overcome the psychological barrier of "going public". local site - no travel

ease of attendance, large number of participants, participating in new form

COULD GET GOOD INFORMATION W/O LEAVING OFFICE

The interesting conversations that devoloped, and the wealth of input from the participants.
It was accessible at my leisure.
This conference forced me to learn more about the use of the email system. I sat in the background, read all the communications even though I havent read all the papers yet, and printed out copies of almost everything that has been transmitted or that I have transferred. I've learned a lot by making a lot of mistakes. For example, it has taken me almost three hours to complete this evaluation form with this very unfriendly editor system we have on our sun systems. I have transferred most DOS graphical files even though I don't know what to do with them yet. I still have to do the graphical files for the Mac. This will give me a lot of material to work with over the next academic year. I have never been to a meeting or workshop which has given me this much of an education and so long to think about it. It is self-paced so that I can complete it as I get time from other things I must do. I am indeed grateful to the both of you for your effort in putting this program together. I left graduate school 32 years ago this November. This is a breath of fresh air .

The format allows many questions and much discussion, combined with time for analysis and reflection and then, further discussion, before the topic is changed.

I began the conference enthusiastically and read several of the papers. I didn't participate in any discussions but kept up with them daily by reading all messages that came through. I picked up some good information and communicated by private e-mail with a few of the participants. In this way, the conference was invaluable. I now have e-mail addresses of a wide variety of

people that I can call on with questions, etc.

Availability of full transcript
The chance to participate in discussions of the papers, this oppurtunity is not available at regular conferences.

The discussions made me think more about how I should update my teaching methods, and made me more aware of the philosophy of teaching. I
enjoyed being able to access the discussion at my convinence. Even though I did not contribute to the discussion, I found the "give and take" between other participants to be enlightening.
I
ENJOYED THE WHOLE CONFERENCE. I COULD HAVE ACCESS TO ALL THE PAPERS AND DISCUSSIONS WITHOUT TRAVELING THAT FAR.

I could participate· at times convenient to me and not miss anything. I got to be a part of every discussion. Also I got the email addresses of some very knowledgeable colleagues.

I thought the papers that I read were good and the discussions were excellent. It removed some of the isolation of the small college atmosphere. ftp for retrieval of papers was a good idea (vs direct mail)

It is very interesting to hear what is going on at other schools, the triumphs and the pitfalls. It is convenient to be able to "listen" in on one's own time schedule. There was a fairly wide range of topics that did a good job of covering ideas that many of us are trying out at our own schools, so that in my case, I found something useful and interesting in all the papers.

Being able to interact with academic scientists with similar interests. I can't make the trip Outside very frequently.

no problem with missing someone's comment. Know who made which comment.

The chance to touch base with others in the field, at the times of the day when it was most convenient for me. This ChemConference is going to long remain one of my favorite conventions, for the accessibility (both financial and geographic), for the ideas, for the inspiration, for the great papers, and for the leaders. The leadership provided by both Tom and Donald literally made this all possible. Your encouragement and patience were critical to the making of the conference.

I was able to use it as a spring board. I learned a hell of a lot about e)mail, anonymous FTP, and graphics. I enjoyed looking into the thoughts and problems facing modern acidemia.

E-mail puts everyone on equal footing: I can ask questions or state opinions with- out fear that they will be ignored because of my relative inexperience. (although I only asked one set of questions and I MAY have written one opinion, but I dont recall)

interactions with others

1. That I could participate when it was convenient for me (during office hours or at night at home). 2. That I could fetch the papers by ftp (and can do it even now, if I want to read those papers I have not yet read. 3. It was (is) easy to participate the written discussion.
I
could come and go as I pleased. I could skip boring discussions without impolite.

THE PAPERS. READING WHEN YOU LIKE YOURSELF
Being able to access the conference when I had free time.
I
t certainly provided a great deal of insight into where we're going with the use of computers in chemical

education. It was first conference using e-mail and I liked the free-wheeling aspects of the discussions. I was happy to see that the conference content will be available at an ftp site. I used this conference to hone my e-mail skills.

The questionaire is not long enough for me to tell you all the things I liked, but I will try. 1. Believe it or not, I felt that I had more interaction with the conference participants, and that those interactions were more productive than in the usual meeting. No sooner did I ask a question than ZAP... an answer usually appeared on my screen. People were very generous about taking time to respond to questions. 2. Anyone who participated in discussion was automatically identified by name and address. Discussion could be continued later on a one-to-one basis very conveniently. 3. Backup materials were available for reading and reflection. 4. A permanent record of all papers and discussion was automatically created, making further reading and reflection possible. 5. There was no feeling of being rushed. Essentially unlimited time was available for discussion. 6. Did I mention that it didn't cost anything? Perhaps the best things in life really are free. 7. Even though it consumed more time than I expected, it was consumed by productive activity. 8. It was possible to attend to other things at the same time, since the conference activities could be flexibly scheduled.
Being able to be involved in a discussion or at least listen in on a running discussion of the use of computers in chemical education, where I had time to consider what was being said.

The wide range of experiences and responses with many people dealing with the same or similar problems to those we have.
Paricipants have ample time to read and think about the papers and ask questions and engage in discussion. Authors have more time to

respond to questions.

There is more discussion.
extent of discussion vs live I would not take the time to attend a chem ed conference. This allowed me to participate without making large committment of time and money.
I
[was] very pleased with the ftp site access, especially using FETCH. Thanks for having it so well organized.

I liked the ability to exchange ideas on more than a superficial level and with out the constraints of a five minute question period. The discussions also helped me to formulate and clarify my on positions on a variety of topics.
That is was ongoing over a period and could be digested at my own pace. I also liked the fact that most of the comments were well thought out (one of the advantages of having to put the words on paper).

I found this general experience to be very satisfying. I often found that my questions or comments were already being made by someone else, so I did not contribute much but I did learn much. The same is true for many at regular meetings -- there are always far more people in the room than questions asked, and most are learning. I think that conferences such as this will always have a number of "lurkers" who will learn by "listening" (reading), and that is good.

I like the focus that the papers brought to the discussion. I also participate in the more general and free alowing chemed-l discussion. I think that there is a place for both types of discussion and I look forward to more conferences of this type as well as continued general discussion. The usual conference where you go an focus intensely on a topic will also have a place. It is useful to go off where there are no interruptions, and I don't believe that computer conferences will ever re-

place those. I really think that we have added a new format that will have its own place.

The ability to attend without using non-existent travel funds. Worldwide contact.

The amount of learning which can be obtained in a short period of time.

First time I have seen one. A good idea.

Overall, the Conference was excellent, and I believe that that the next one will be even better because this type of conference serves wonderfully to bring people of common interests together to deal with common problems and aspirations. It was interesting to me that there were so few responses from the major research universities, despite the fact that they would presumably have generally had network access for the longest time. And it was very heartwarming (if I could be permitted to indulge myself) to see how many teachers really do care about doing the best thing for both chemistry and their students.

The idea of storing the ChemConf documents at your ftp site is also excellent, because there are several papers to which I hope to read carefully (on the basis of the ideas that they brought out in the discussion).

I have been one of those silent observers who has read every single letter (but, sadly, none of the papers, yet) with great interest and enthusiasm, but without contributing. ... But it has been sheer joy to gain insights into the ideas, plans, achievements, uncertainties and enthusiasm of all those who did contribute.

Among the best discussions were those on how students learn and on how teachers learn (or don't learn) to teach new things. I suspect that there is more wisdom among chem-

ists about teaching than their is in some of the University units which have been set up to promote good teaching. The exchange of ideas in this conference was very useful to me because those ideas were in much the same context as that in which I work.

I liked the time available for thinking and responding, and reading other people's considered comments. I also liked the fact that in some cases, the programs that were actually used were available to us. That really makes this kind of conference unique.

Being able to "attend" a conference without actually going somewhere and at no cost.

It can be a truly worldwide conference, with no need for expenditure of travel expense or travel time -- at least for those who are near computers and modems. Moreover, the electronic conference allows an extend discussion of the more interesting topics, and in some depth. There is less a sense of a limit on the duration discussion or on the detail of comments and responses.
I not only enjoyed but benefitted from the discussions of the various papers. (It was the discussion, rather than the papers, that I read and responded to.) It seems to me that an electronic conference serves as a complement to the traditional conference, each with its own strengths. Since the strengths of the electronic conference are not widelyl appreciated, this form of communication must be promoted for the good of the profession until it is as widely accepted and becomes as common as the traditional form.

I enjoyed being able to access discussion on my schedule, the constant grind of a "normal" conference gets old by the end of the week. I also enjoyed being able to listen in to the authors and others who are much more knowledgable. In a "normal" conference the barriers be-

tween people are much higher. (This is similar to the arguments for using e-mail in teaching)

This has been an extremely rich learning experinece for me.
The ability to "listen" to so many relevant comments during the discussions.

The range of the discussions.

The ability to participate in an international conference when there is little or no chance (regretfully) to visit such a conference, especially when it is abroad. Also I find it very interesting that a medium that I like (email, of course) is put to such good use.

extent of discussion vs live conf. where you may do well to have one question & seldom get the audience arguing

I was able to learn important information at my own pace -- when I had the time

Gave me an insight into the issues concerning the use of computers in the academic world. I was also excited about the ability of being able to communicate with others all over the world. I have been in the health and safety field for 20 years and the issues facing us today are truly global. With the changes in Europe and Russia the need to communicate on the health and safety issues will become increasingly important. The Industrial Hygiene Conference which is held each year is attended by individuals from all over the world and this type of conference has some very real applications. I also liked the fact that you can spent time at home and after work reading the papers and even " attending" the conference.

Being able to participate after hours, on my own schedule.
The great differences in papers/ ideas/contibutions/discussion etc.

Chance to hear many different points of view about use of computers in educati Stimulating and thought provoking discussion on many related issues and threads. I thoroughly enjoyed being an "observer" and learned a great deal.

I think this is a great way to reach the faculty that are more involved in i or are located at smaller schools that don't have the resources to provide travel.
I liked the availabilty of papers in e-format by ftp/gopher, and the ability to engage in discussion in the asynchronous fashion allowed by email.

The ability to leisurely participate in a conference without the investments which are usually required. Specificity of questions and responses, as well as lack of inhibition to ask questions

the frank discussion and exchange of ideas. At a non-electronic conference you don't get as much *public* interchange (some private conversations might bring about additional understanding of ideas).

discussion of 9-12 : nuts and bolts of administration

The conference was a tremendous benefit. It revealed strengths and weaknesses of computer applications and allowed a quick appraisal of where important opportunities lay ahead.

I liked best about the conference: hearing what people are doing in the classroom to enhance the learning experience; getting new ideas for my own teaching; communicating with people who are designing software programs and simulations...I have come away with this conference with twenty new ideas to try this year.

convenient access to many different viewpoints

The GIF pictures and the software

worked great.

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23. What did you like least about the computer conference?

In the discussions many people did not list the Paper # in the subject line - with several lists going on for me at once this took extra effort to connect the discussion with the conference

Especially in the trial session, some people seemed to be sending out messages which were not particularly relevant, which was a bit of a waste of time
I can't say much here. I must admit that the overflow of EMail (especially after coming back from a 4-day absence) was overwhelming but not intimidating to the point of driving me away from participating. It would be nice to know what all of us look like; I recall the same comment was made regarding the trial session in January.

technical glitches, clumsiness of getting materials

NOT ENOUGH TIME(MY PROBLEM) TO PARTICIPATE IN DISCUSSION

The confusion that sometimes devoloped due to the variety of responses which showed up when the e-mail was downloaded.

domination of the discussion by a few people talking at each other
The large number of messages sometimes over-filled my email space.

As the summer progressed. I spent several weeks at workshops. vacation and a conference. As a result, I got very behind on the discussions. On returning to my office after these various commitments, my mailbox was always full of numerous letters

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which I simply copied to my hard disk to read at a later date. I became so overwhelmed by the volume of it that I got a bit discouraged. In this regard, I found the conference to be too long. While the organizational set up seemed to make alot of sense to me (one paper to be discussed for several days at a time), things dragged on so long that I sort of lost interest. It also might not be such a good idea to have an education conference in the summer. Again, initially I would have thought this would be a good idea since many educators are less busy with day to day responsibilities in the summer, but I'm sure others found themselves in the position of being away from their computer for long stretches of time during which they could neither keep up with nor participate in the discussions.

Getting too many E-mail messages I wasn't interested in

The limited discussion time. I was also somewhat annoyed at the overlap of discussion, since some people did not follow the guidelines to the letter. This may be a result of the limited discussion time. At least when your annoyed in an email conference, there's always the delete key.

having to learn how to retrieve files. Wasting my time on messages that were not intended for me. (sign on/ offs, messages to manager, etc.)

I HAD SOME PROBLEMS WITH GRAPHICS.

The volume of mail to read! Seriously, it was not bad. Some posts were lengthy, and certain people were "hyperactive" at times, but that is to be expected. We are all human.

Since I got in late at the beginning (I learned about it from a colleague), I was behind from the beginning, so I never found the time to actually participate in the discussions. I was spending the time I felt I could justify in reading the papers and keeping up on reading the discussions. By the time I had formulated something useful to share, we were on to another topic.

I wasn't as compelled to speak as frequently as I might at a face to face meeting. (Easy to lurk)

the fact that no pointers were given as to the zip programs used for the zipped files

Being dyslectic, I find e-mail very (frustrating) time consuming. My vocabulary becomes severely limited. Written discussion is simply a night)mare. This is not my preferred medium of communication.

Very long letters by some participants. E-mail is somewhere between talking and writing, but in terms of 'hot air' it is worse than talking. Fortunately it doesn't offend anyone if you delete their message! By very long I mean more than a couple screens of full text (excluding Archie info or summaries of what others had written).

having to fill out these forms
not enough time to get on line

Missed the pretty girls. The way some people dominate the discussion, long answers.

THE RESPONSE TO QUESTIONS SEEMS A LITTLE ARBITRARY

in order to read all the papers and discussions a great deal of time was involved.

My e-mail got cluttered very quickly; the system used here is not very user friendly and this made things ackward at times.

Scheduling discussions etc. on weekends is not a good idea. Even though that time is available for use, it should be in addition to other times.

The time I had to spend just managing files and the copious amounts information that exceeded my storage quota on the VAX. I did enjoy learning how to deal with these problems, however.

The fact that I frequently got very behind with reading.... my fault not yours.

Some participants are not very polite. Discussion can not as easily managed as at a traditional meeting.

The time involved was huge. I spent one or two hours per day, every day, reading, studying and thinking about the materials presented by all of the participants. I am exhausted. I must admit you guys kept me busy this summer.

It was possible to lose the thread and become confused when comments overlapped and the authors did not take care to reference the paper or topic. For the most part participants were very good at keeping the thread, but some lapses did occur.

Nothing comes to mind. I enjoyed it thoroughly.

Can't think of anything.

Too many of us did not participate. I am not complaining about those who did, because they "made" the conference for me. I am curious how many silent participants there were. (Silence does not mean lack of interest! There are personality differences among teachers as well as among students.)

I for one had to learn more than I previously knew about ftp, telnet, gifs, etc., and this involved a good deal of time... you didn't inquire how much time we spent on this kind of preparation! Tell me I'm lazy, tell me I'm slow, but what I really want is a network system that's smart enough to just transfer and decode the gif files along with the paper. As it is, it's just too much work! I assume

that future generations will look at this as the slide rule of networked conferneces!

I'd say that the weakest part of this or any other electronic conference is the lack of a necessary commitment to place and time. To attend a traditional conference you must be in a specific location during a specific time period, because that's were and when the conference is held. It focuses the attention. With an electronic conference there's a sense that you can do two things at the same time: teach summer school, for example, and also attend the conference. My schedule this past summer did not permit full attention to the conference. Had it been a traditional conference I would have had to skip it. Maybe the summer is just a bad time to hold an electronic conference. I'd like to see one in the Spring Semester, when there's presumably more time available.

I learned too much. :)...

Some flame mail. The repetition of some of the discussions

The timing

Discussion being cut off. at a real live conference if you wanted to say more you left the room and talked to people over coffee abandoning the next speaker. In the e-mail universe both the next speaker and the previous discussion coexist -- especially given listserv delays and holidays over the summer - & Chem. conf. is interspersed with other lists, research and teaching e-mail -- its not as if CHEMCONF was coming in pure to my e-mail -- it was about 40% of my traffic on busy days.

Difficult to find the time to devote to the conferece when working on normal duties.

The volume of notes I got on E-mail which were supposed to be sent to an individual and were sent to everyone. I was unable to use much of

the technical information because of the very nature of the conference.

Toward the end, things piled up too much. In retrospect, I think that ten papers is probably a more appropriate size.

Extraneous discussion that was clearly off subject.

I feel that the timing of the discussions and intervals between papers was too short to allow full availability to all involved given that people had

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24. What changes could be made to improve the computer conference?

It was a little too long and too intense. It might have been good to have a break in the middle, or to just have it be shorter.

Some discussion participants did not include their names and/or affiliations making it difficult to understand who they were and what the context was for their comments.

I noted that an informal "general discussion" developed over the weekend at the end of Session 2. This was a nice development. Perhaps this could become a regular part.

Dynamic discussion rather than e-mail. Too much recopying of the "jw said: Blah" style

Request that participants not include so much text from other's comments in their replies; require that figures,

etc. be encoded according to uniform standards; make the conference shorter
NO CHANGES--WILL GET BETTER ON SECOND TRY

I can't think of any. I thought the organization was excellent.

I suggest that some respondents need to exercise self restraint in the use of introductory messages and sign-off signatures.

Initially one could send out longer abstracts, sufficient enough to allow people to decide which papers they are interested in. Some of the ones used here were too short. Did you send the abstracts to everyone automatically? I have forgotten, but I would. One might suggest that the participants make a calendar of when they will want their mail on and when off, depending on which papers are of interest. This will avoid flooding their email with uninteresting mail.

Participants who want to comment on a previous participant's comments should not reproduce the whole of the previous participant's (perhaps quite lengthy) message, but only the salient bits. This will reduce the size of the mail burden each participant receives.

Perhaps a group of papers could be discussed at once, particularly interesting would be a group of papers with opposing views. this may help focus the discussion a little more. It maybe however, that an unfocussed discussion is better. This appears to be uncharted waters.

15 papers seemed a bit too many, although I would not object to another conference of the same length. I'm not sure short questions and answers need to be separated from short discussion sessions, but maybe that is easier on the authors. Considering weekends, vacations, and internet delays, it would be better to allow 3 days for discussion

rather than 2, and to "allow" some overlap for successive papers(it occurred anyway). By the time for general discussion at the end of the conference, I have to review papers to reignite my interest; it is better to have discussion when things are fresh on one's mind.

TO PROVIDE AT THE VERY BEGINNING INSTRUCTIONS FOR RECOVERING ALL THE GRAPHICS FOR THOSE WHO ARE NOT EXPERTS. A COMMON SOFTWARE COULD BE USED BY THE PARTICIPANTS. A COMMON SOFTWARE FOR TEXTS LIKE WORDPERFECT; FOR DATA LIKE LOTUS OR QUATTRO; FOR GRAPHICS LIKE QUATTRO OR ONE AVAILABLE THROUGH SHARE WARE.

As the technical aspects of electronic mail improve, this kind of conference will become much more effective. You deserve a great deal of credit for organizing this one and making it run as well as it did We hope this will be the first of many conferences.

This was my first experience using e-mail, so I was using it as a learning experience. I found it very rewarding, and expect to continue using e-mail when it makes sense. Many of the discussion comments and ideas in the papers will be passed on to our Dean for consideration, as well as shared with other faculty. The fact that it is in writing, rather than just notes from a conference, makes it easier to organize.

At some point, the number of contributors (or length of the contributions to The discussions) will have to be limited. There were probably less than 40 people who actually contributed to the discussion. This appears to be about 10%. This percentage will grow , as will the number of participants in the future. Imagine the info overload if there were 100 people contributing to the OLD Tools vs New methods debate.

I can't think of a good way to do this, however.

Since this is my first conference, it took me a while to decide where to store things for easy retrieval. Some guidelines from experienced conferees to newcomers would be helpful along these line.

Make the info more accessible with Gopher, which is much more convenient to use than FTP. I found that some binary files would appear as ASCII files and be unretrievable with Gopher. And some ASCII files would terminate and therefore not be retrievable.

It would help me access and store messages properly if the subject of each message included the paper number.

It would help in retrieving files if the first 8 characters of all file names were unique since I retrieve into a PC from the server. (this is obviously a PC limitation, not a MAC).

Emphasize several times to newcomers and new users of email that the automatic reply option may send messages to unintended people. Explain what they have to do to reply to only the original sender.

Maybe require that a simple one or two word message be placed at the top of each message sent to CHEMCONF, and have the listserver reject all messages without this particular introduction. That would eliminate the messages that get sent unintentionally to everyone by the automatic reply on email menus. Perhaps encourage shorter posts during discussions...they are more likely to be read.

I think that the short question period should have included all papers in a particular session and gone for fewer days. It took too long to get to the actual discussion. I found that I had forgotten what the particulars were about a paper before the discussion

got going.
Give directions for using Gopher, it is a lot easier than directly dealing with ftp, and it makes our University Computing Services people a lot happier!

Might it be possible to open another parallel list for discussion to continue when the official discussion period is over.? I missed some time due to vacation and summer school constraints that I might have been more involved, after the official two day period.
Instead of having a single paper each two days, I think five papers over a two week period would allow for more flexibility. On days when I was out of town or busy off-campus, I missed the opportu- nity to get in my "ShortQuestions"

I'm not sure how to handle this, but a brief intro to downloading from the host system would have been very helpful (for example, I didn't realize for a long time that the directory designations for the umd ftp site were case-sensitive

Perhaps Strings could be suggested by the authors instead of the questions at the end of the papers.

I would have liked to seen more papers relating to secondary science education. (Oddly Paper #6 did not hold my attention.) (How many high school teachers were participating?)

Include a suggestion in the initial message that the most effective e-mail letters are fairly short.

I thing the general format is fine.

have more time have someone put discussion in chronological order

Keep replies succint, perhaps use abstracts.

It would be nice to be able to peel of the general noise and only take part in specific discussion forums. Could

we have sub-LISTSERVers running for each paper. I don't want to be limited to personal e-mail, thus a small forum seems most appropriate.

perhaps fewer papers and have fall winter spring summer sessions for just a 2-3 week interval.

Do not include more papers in future conferences. A larger number of papers will be just too overwhelming, especially if one wants to have a peek at the different discussions going on. You never know what goodies they'll give you.

Perhaps, very specialized conferences are the way to go -- keep the range of topics very narrow so that participants are not overwhelmed with a tremondous amount of information. Once people become comfortable with e-mail, the amount of discussion will "explode". I probably spent more time on this conference than indicated above. I didn't really monitor my time very accurately. If anything, the numbers given above are on the low side.

Combine short questions and discussion. I thought that separation was a little artificial, although I understood the reason for it. This would save a little time.

It was a well-run conference, especially for a first try. I don't have many suggestions. 1. You might try breaking the longer conference documents (such as "Welcome") into shorter ones and sending them out at different times. They might be read more carefully and absorbed better. 2. As I mentioned in another message, include reference to materials at info.md.edu in introductory mailings for other conferences.

Find a way to work in more time for discussion of past papers or issues. Provide a way to thread discussions much as Network News Groups do. I orgainized the

discussion by paper, but for paper 9 in which there were 91 discussion postings ranging over a variety of topics, this approach broke down.

Obtain better papers. The quality of the conference depends upon the quality of the papers.

I think it was Ok as it was. A lot of work for all involved.

I think it went very well as done (I think that a great deal was learned from the early trial in February). I think that another of about the same format should be tried before extensive changes are made.

It would have been better if more of the "lurkers" had participated. From the list, it was clear that many people kept their heads down.

Not a lot I can say. I have found idea interesting, but the topic (section 3) is not one in which I have any expertise.

Have more network conferences!
I would like to see the whole process speeded up a little, despite the fact that I also liked the time to think. The conference protocol was carefully thought out and organized, but anything can seem tedious when stretched out for a whole summer.

I would change the short question session. Have questions sent directly to the authors and then have their response (with the questions and the source) begin the discussion period. This would allow more discussion time which I felt was the most valuable part of the conference. Alternatively would it be possible to carry out parallel sessions by using "sub-lists". This might make it easier to only listen to topics of interest.

I am very interested in the ideas for exchanging more complex documents, hence my questions about PINE and NuPop. It appears that there are two standards MIME and binhex. We all need to push our computer centers towards providing support for this type

of exchange. I am working on a book with someone across the country and being able to exchange ideas electronicly will (I hope) cut lots of time from the development process. It would also be useful for a conference like this to exchange more complex documents than ASCII allows.

It might be possible to schedule question and discussion times for several papers in parallel (eg. several streams, with one paper per stream at the same time). In that way you could extend question and discussion periods, without having the conference dragging on for too long. Everyone can choose which discussion they want to participate in. The beauty of an electronic conference, as opposed to a traditional one is that if you can spare the time you can join all discussions.

authors should test that their software is sufficiently standard to be FTP'd or e-mailed so that it will work on the majority of the machines.

questions re time and number of interventions etc are meaningless --who keeps track -- I respond to my e-mail multiple times during the day and it would have taken more time to do the bookkeeping than to participate.

For me personnally, I need to get the operation of downloading the papers down so that it is not a problems. Also must have corrected the problems that we have had here with our mail/network system.

Please continue this interaction. Please present us all summary information on what is available out there via our terminals.

More information on the general use of computers for improving productivity and discussion on teaching techniques on getting people to understand the value of computers and how to use them.

I liked it the it was. It was already better than the trail session. Other time of the year would be better for me.

I am interested in the results of someone who was going to try something like this with his students and a external specialist.

Perhaps you could make a paper for non-USA listmembers how the american system works and what terms like PChem etc mean.

I think the format used is satisfactory. I would like to see some way for threads to spin off the main conference just to keep the E-mail load manageable. However, that would require conference joiners to be somewhat proficient in the E-mail, which many appear not to be at this stage.

papers should be accessible with special features encoded (and decoder provided) rather than as separate files for text/graphics/programs.

I am usually an overly critical person. I'm at a loss to come up with suggestions! Everything went so smooth, at least from my lurking viewpoint, that I don't think major changes are needed. Of course, this opinion springs from someone that didn't read most of the papers. I did have some trouble with viewing some graphics in the mini-conference, so that probably kept me from attempting it in this meeting.

organization was good--maybe filter the flow to purge out mail mistakes and endless repetitions of the same "can somebody tell me how to...." queries

The questionnaire in its presented form defeated the economy of time through electronic delivery. Perhaps the next conference will have a user friendly final survey.

because I was gone part of the summer, I fell behind in some discussions I would very much like to have particpated in. How about doing this in the spring?

Some helpful information regarding LISTSERVES, USENETS, other references and workshops has surfaced during the discussions. Would

it be realistic to attempt to summarize these and distribute them at the end of the conference?

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25. Compare this Conference with the usual conference. --------------
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THERE IS NO COMPARISON. I MUCH PREFER THIS TYPE OF CONFERENCE. I LOOK FORWARD TO THE NEXT ONE AND WILL REGISTER FOR IT.

Much easier to take notes of what people are saying! Also, in general, easier to know who it is that is making a particular comment.

There are doubtless advantages and disadvantages of this format compared to "the usual conference". Because everything is in print, I didn't miss out on any of the presentations or discussion. I was able to carry out most of my other duties/responsibilities while still participating in the conference and I won't have the usual deluge of mail, etc waiting for me when I "get back". The computer format also provided a strong incentive to learn more about the capabilities of the computer in my office and the mail hardware/software (also developed a better rapport with our VAX facility -- and we all know how *valuable* those connections are). I may be wrong here, but I feel that the inertia barrier to developing *and maintaining* new contacts is easier with the EMail format: you start up an EMail conversation because you want more information and the connection stays

open. There are some disadvantages -- and I'll refrain from passing judgement here. There is something exciting about going to a new city or different part of the country (especially if it means a break from the current weather pattern). At the "usual conference" we talk with our college "face to face" and know a few other quirks (nothing to stop idle side-line "chit chat" over EMail). My overall feeling is that some of each is in order --to whatever extent it is possible.

The availability of the software and the extensive directions for obtaining this is an excellent aspect of the conference. Like others who participated in the trial session in January, I toyed with obtaining software from the sites listed; guess that if I was a well-seasoned INTERNET user, this might not have been as difficult. I liked the format used to make the papers, logs and other messages available to the conferees.

ALLOWED MORE TIME FOR THOT & BETTER INTERACTION. DO IT EVERY SUMMER!!!

I rarely attend actual conferences so it gave me a chance to read and respond. I think it was well done and enjoyed it.

I enjoyed the great variety of respondents.

CHEMCONF is more convenient, less costly, and more time efficient. I think the QUALITY of questioning and discussion is improved, along with the quantity. Questioning and discussion are little more than formalities at most formal conferences. CHEMCONF, with its emphasis on author-listener interaction, allows a deeper and more detailed examination of the work. It is more of an educational experience, with a kind of tutorial character. Later, the audience can digest and extend the topic with a much larger group of interested participants than would be physically possible.

Disadvatages-no personal interac-

tion (ie, face-to-face) Advantages- can "attend" all presentations at an e-mail conference. At the usual conference, it is often difficult to choose between simultaneous presentations. Also, at an e-mail conference, you automatically get a "copy" of all talks and discussion which you can save for subsequent perusal.

Better. I dislike the disruption of travel. Also, this format made it easier to access participants' thoughts and ideas

I learned more and contributed more. I didn't miss anything I wanted to see. I didn't eat as well, or see any interesting places (definitly no perq's). All and all I much prefer this type of conference.

There is more time to get involved with discussions, and more time to "listen" to participants. I enjoyed the discussions more than the original papers. I miss the personal contact; knowing who these people are.

MUCH CHEAPER AND YOU CAN GET ALL THE PAPERS. NOT JUST THE PAR-TICULAR ONE THAT IT IS ATTENDED IN A CONFERENCE.
I liked having copies of the papers to read before the discussion. The econference is more convenient. Of course, there is less "personal" contact.

Although there was more time to think about what was being discussed, it took more time to formulate and type out questions, etc., (compared to speaking out at usual conferences)! And you have to check your spelling first! I never quite got the activation energy up to do this. This was my first listserv-er and navigating through Gopher so maybe I will get the hang of it next time.

A comparison is difficult. I relish the opportunity to conference without the absolute constraints placed by airfare, instructional commitments. The electronic conference in MUCH, MUCH, MUCH better than nothing.

In many ways, it is superior to a usual conference, if for no other reason that one can have two (or) more days to formulate questions, comments, suggestions. I perceived a much larger than "normal" level of discussion among MANY people.

Now that I am more familiar with accessing documents and figures, I feel that this type of conference has several advantages in terms of fitting into the busy schedules with which most of us are faced. I miss, however, the face-to-face contact with others and long discussions that might have resulted.

Because we participated in a very personal way, I received a lot more than from just listening to 15 papers. Also, I would never have had the opportunity to spend so much time with the authors of papers at a regular convention. I also have a written record of the convention -- an added bonus!

It was nice to participate from home when I could find the time.
One thing that I really look forward to in a conference is making contacts with colleagues - perhaps just discussing a topic of mutual interest, or even collaborating. I did not expect to make many contacts through the conference, but was surprised that it was easy to do. Perhaps the best thing about a computer conference is that you don't have to worry that you're going to miss one great talk while you're sitting in another one. On the other hand, part of what makes a great talk is the presentation by the speaker, which is essentially lost in text format.

Waste far less time!

Great to do discussion at 2 am from home, but no time to share beer with colleagues

I wonder what had happened if there had been more active participants in the discussion periods. The written discussion is more coherent than

spoken - but also much more slow.

No social, but many contacts that could develop into sabatical visits.

THIS HAS BEEN THE ONLY WAY OF ATTENDING BECAUSE OF LONG DISTANCE (EUROPE)

I believe both formats should continue, miss the socialization aspects of a regular conference and also at a usual conference, I am not doing as many other regular activities and sandwiching the conference into free moments as I have done this summer.

I miss the personal interaction that occurs at the usual conference, but there's a permanent record of activities available in this format, and one can store the info and look at it at a later time.
It's like comparing filet mignon with a hot dog. This was vastly superior, especially as a learning experience.

I thought it was much better. I got a lot more out of this conference than the usual ones I attend at meetings. It is cheaper, excuse me I mean more inexpensive, than the usual conference. There are many more particpants than in the usual conference. While the discussion may not be more profound, it is certainly more in depth and more extended and gives the particpants more time to reflect on it.

Terrific....you "heard" everything that was going on, not just a few peoples opinions as is usually the case at conferences... missed the social side though 8-).

The author of a paper generally plays a less central role in the discussion. Discussion is more interesting and informative.

There was more time for in-depth analysis and discussion of a topic. It was a lot of hard work and it really let me sharpen my skills.

The extended time period allowed for much more reflection than is true in the usual short meeting.
Just as good, but different. Both have their place, but you can't beat this one for the price.
This conference brought people together who would not otherwise have attented an international conference on Chemical Education.

In some ways I do miss the personal interactions, and the use of inflections to convey meanings, relative importance of points, etc. But I think it is made up for by factors mentioned in Q. 22.

Much more discussion than when there is limited time between talks at at a conference. Also, comments that I found of particular interest I could easily save for future reference.

The face to face contact is lost, but for someone who is new to teaching it provided remarkable access to discussion. At a usual conference I would not have known who to introduce myself to and who's conversations to evesdrop on.

I honestly believe that I got a lot more out of this conference than is possible at the usual conference, since I could select and save those comments that were most relevant.

In some ways it is better in that I get the opinions of many more people. Not being face to face does make discussion a little labored.
Better than most -- discussion worth more than the papers on the whole.

The personnal interaction at a regular conference has its place and was missed. However, this format is a valuable new tool for learning and exchanging information.

In one word "excellent". I just had more time to participate. The cost was very low.

I missed the informal "networking"

that takes place outside the conference sessions at other conferences but it was a decent trade-off to be able to attend without having to kill a week in travel to another site.

You can plan your own time. Even if your on vacation you can learn from the contributions. Costs (for someone from europe to go to USA).

The best thing about this format is that you can be assured you don't miss an papers you want to "attend". Also, you can choose the time you want to attend.

More dialog from more participants with more differing viewpoints than the usual conference
In many ways it was better. There was a permanent record of suggestions and ideas. I could easily file useful information, like names and locations of programs that I could investigate later. I "met" some people, too. I sent personal messages to people that seemed to have similar interests or ideas to mine. I made some good professional connections during this meeting, which is one of the *main* reasons that I go to traditional conferences. I missed drinking a beer with my new friends, but it was a most efficient way to learn about other peoples' ideas. I was frustrated by viewing figures, so I guess I prefer an in-person conference when I will be learning from data presented visually. In this conference I learned from the discussion, not the papers. So viewing figures was not that critical for me. I wish I had more time to work that out.

still get nonsensical chatter, but no travel expense

The flexibility and ease of accessing papers, questions and comments was the conference's biggest asset.

Because of my poor keyboarding, it was a little hard to communicate as naturally as speaking to a person; however I communicated in depth

with a lot more people and made more contacts than I probably would at a conference.
Positives - There is more time to digest the presented information at convenient times. A record of the entire discussion is immediately available. Considerably less expensive - in both money and travel time. Little interference with teaching schedule. Negatives - The opportunity for more personal interaction is missing. Body language and vocal intonations by presenters and participants in discussions are not observable.