Annual Report 1980-81

SCHOOL OF CHEMICAL SCIENCES

Biochemistry, Chemical Engineering, Chemistry

March, 1982

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*Sections taken largely from reports of committee chairmen (or equivalent).

Summary for 1980-81

This report for 1980-81 is "a bit late" in arriving. However, it may have some archival value even though many of the problems outlined have been displaced by new ones. As usual in recent years, there has been both good news and bad news. A selection of each is given below.

Our enrollment/budget problems for the year were less acute than for the preceding year. Average salary increases of about 7% were provided for faculty and staff. Student enrollments were down by nearly 5% and the School did get a small increase in its base budget from the state plus an infusion of ~$60,000 in non-recurring funds to help out on some of our most urgent remodelling needs. We were able to roll back the teaching loads a bit from their highs of the past few years. The enrollment drop was caused mainly by ceilings placed upon undergraduate admissions in engineering, including chemical engineering. The credentials of those being admitted are now the highest ever. Also, there were fewer premeds in biochemistry.

In the spring of 1981 Chem and Engr. News reported that for the eighth consecutive year, the School led the nation in 1979-80 in the number of degrees conferred in chemistry and chemical engineering, for a total of 343 bachelor's, master's and doctoral degrees, with Purdue and Berkeley trailing with 311 and 298. That total for us includes an all-time high of about 140 BS degrees in chemical engineering which, however, dropped back to 90 in 1980-81. This drop was largely balanced by an increase from 60 to 90 in PhDs (the highest since 107 in 1969-70) so we may again be first in total degrees for 1980-81.

The achievements of our alumni and faculty continue undiminished. More than 30 of our alumni were honored in major ways during the year. The following are some of the more notable events: Arnold O. Beckman (BS, 1922; MS, 1923) received the ISCO Award sponsored by Instrument Specialties Co.; Robert C. Brasted (PhD, 1942) was presented the James Flack Norris Award for Outstanding Teaching; Minor J. Coon (PhD, 1946), the Bernard B. Brodie Award in Drug Metabolism; Marcetta York Darensbourg (PhD, 1967), the triennial Agnes Fay Morgan Research Award of Iota Sigma Pi; Allan S. Hay (PhD, 1955) has been named a Fellow of the Royal Society of London; Lester J. Reed (PhD, 1946) was elected a member of the American Academy of Arts and Sciences; Phillip A. Sharp (PhD, 1969) received the Eli Lilly Award in Biological Chemistry; Quentin F. Soper (PhD, 1943) was awarded the John Scott Medal; and John F. Welch, Jr. (PhD, Chem Engr, 1960) became the chief executive officer of General Electric Co., the youngest ever.

The alumni support our programs in ways beyond their own success. Financial gifts to the various funds we have in the University of Illinois Foundation totaled over $66,000 for the year, mostly in gifts of less than a thousand dollars. Mention must also be made of the $5 million gift of Arnold O. Beckman (BS, 1922; MS, 1923) to the Campaign for Illinois. Given on a matching basis, it will (if matched) be an endowment for the Research Board of this campus. The School is heavily dependent upon the Research Board for start-up funds for young faculty, for matching funds, for major research equipment, and for other major non-recurring needs. This "shoring up" of the Research Board program will enable them to be more of a help to us in the years ahead.

Invited lectures are an important index of faculty research. During the year, our faculty gave at least 330 invited lectures, of which 4 were honorary "name" lectures (by Belford, Gutowsky, Hager and Martin). Moreover, over 70 of the lectures were abroad. Twenty-five of our faculty served on the editorial boards of fifty journals. Half (~30) of the faculty were engaged in eighty activities such as being an officer or committee member of a professional society or serving on a panel/committee of a federal agency like NIH or NSF.

As to faculty awards, David Chandler received a Guggenheim Fellowship, Ana Jonas a Fogarty International Fellowship and Peter Wolynes a Sloan Fellowship. T. J. Hanratty was elected a Fellow of the American Academy of Mechanics and David Chandler and Jiri Jonas were elected Fellows of the AAAS; and Bill Flygare received the Irving Langmuir Prize in Chemical Physics, bringing the number of recipients from the School up to four (Gutowsky, Drickamer, Marcus, Flygare); Nelson Leonard had a banner year, receiving an honorary degree from Adam Mickiewicz University, Poland, and the Roger Adams Award in Organic Chemistry; and Eric Oldfield was awarded the Louis N. Katz Research Prize of the American Heart Association.

Undergraduate teaching is an important responsibility of the School, which is not taken lightly. This year's evidence is Steve Zumdahl, Associate Director and Lecturer in the General Chemistry program, who was given two teaching awards -- the Campus Award for Excellence in Undergraduate Teaching (received in earlier years by John Clark from bio and Roger Schmitz in chem engr) and the Alpha Lambda Delta Award for Outstanding Teaching of Freshmen. Steve's appointment is academic/professional, a category which has increased markedly in the last decade or so in order to meet the need for highly gifted, PhD-level staff in major supportive roles.

The versatility of our faculty and staff is shown by the fact that Peter Beak, Stanley Smith and Arthur Gaylord (Senior Research Programmer in the School) received an award in the Johns Hopkins' national search for "Personal Computing to Aid the Handicapped." They devised a system that allows severely handicapped persons to write messages, control appliances, and make telephone calls using a single button. The system was developed for use by W. H. Flygare, whose progressive affliction with a form of sclerosis led to his death in May, 1981. His death is a great personal and professional loss. It leaves a gap of major proportions in the lives of our students and staff as well as in our experimental chemical physics program.

On the positive side, four new faculty were recruited in chemistry to start in the fall of 1981, one each in inorganic (Walter G. Klemperer, professor, from Columbia), physical (James M. Lisy, asst prof), analytical (Alexander Scheeline, asst prof) and bioinorganic (Robert A. Scott, asst prof).

Moreover, the market for our graduates remains very strong, especially in chemical engineering. It was a highly active recruiting year, with an increased fraction accepting positions with oil companies (Exxon, Amoco, Shell, Chevron, Mobil) and fewer with the more traditional chemical companies (Monsanto, DuPont, Dow). Most of the graduates continue to accept initial employment in the Midwest, but the Gulf Coast/Texas region is gaining ground. Industrial support of the chemical engineering program was $166,000 for the year, double that of the year before, probably because of the competition for our graduates.

In summary, the year was largely a "holding operation" with no major changes in the resources, facilities and organization required by the School to meet its responsibilities and challenges. Nonetheless, I think the year was a bit better overall than that preceding, enough so for me to be optimistic about the future.

H. S. Gutowsky

H. S. Gutowsky
Director

I. Academic Appointments and Activities

A. Changes

1. Losses

School

Broga, Kenneth M., Assistant Spectroscopist (Mass Spec Lab), resigned as of January 9, 1981 to accept employment in the private sector.

Ulrich, Stephen E., Spectroscopist in charge of NMR Lab, resigned as of August 16, 1981 to accept appointment with Nicolet in Mountain View, California.

Biochemistry

Baldwin, Thomas O., Assistant Professor, resigned as of August 31, 1981 to take a position as Associate Professor at Texas A&M University.

Chemistry

Flygare, Willis H., Professor, died on May 18, 1981.

Fox, Jane L., Assistant Professor, resigned as of August 20, 1981, to take a postdoctoral position with the Carnegie Institution.

Kaufmann, Kenneth J., Assistant Professor, resigned as of August 20, 1981, to take a position with McGraw Edison.

2. Additions (non-visiting)

School

Cochran, Mark K., Assistant Spectroscopist in Mass Spec Lab, effective June 22, 1981.

Married
Degree: BS, University of Illinois, 1974

Mr. Cochran spent one and a half years as a Toxicologist at Burnham Hospital, Champaign, before joining the School.

Milberg, Richard M., Assistant Spectroscopist in Mass Spec Lab, effective April 15, 1981.

Married
Degrees: BS, University of Miami (Coral Gables), 1968
PhD, University of California (Berkeley), 1972

Dr. Milberg has been a Research Associate in the Mass Spec Lab since November, 1975.

Chemical Engineering

Dummitt, Diana E., Assistant to Head of Department, effective November 3, 1980.

Married
Degrees: BS, University of Illinois, 1972
MS, Eastern Illinois University, 1974
MS, University of Illinois, 1979

Ms. Dummitt was a teaching assistant in the Child Development Laboratory, University of Illinois from 1977 until she joined us.

Chemistry

Klemperer, Walter G., Professor, effective September 1, 1981.

Married
Degrees: BA, magna cum laude, Harvard College, 1968
PhD, MIT, 1973

Dr. Klemperer did his doctoral work under the direction of Professor F. A. Cotton at MIT. He was a member of the faculty at Columbia University from 1973-81 (Asst. Prof., 1973-78; Assoc. Prof., 1978-79, and Professor, 1979-81). His research interests are in inorganic chemistry and include the synthesis, structure and reactivity of organometallic and polyoxanion complexes and the electronic structure of transition metal complexes.

Lisy, James M., Assistant Professor, effective August 21, 1981.

Married
Degrees: BS, Iowa State University, 1974
MA, Harvard University, 1977
PhD, Harvard University, 1979

Dr. Lisy completed his doctoral thesis under the direction of Dr. William Klemperer in the study of excited electronic states and molecules. During 1979-81, Dr. Lisy was an NSF Fellow at the University of California with Professor Yuan T. Lee.

Scheeline, Alexander, Assistant Professor, effective August 21, 1981.

Single
Degrees: BS, Michigan State University, 1974
PhD, University of Wisconsin-Madison, 1978

Dr. Scheeline completed his doctoral thesis under the direction of Dr. John P. Walters in the field of emission spectrochemical analysis. In 1978-79, Dr. Scheeline was a Postdoctoral Associate with Dr. J. R. Devoe at the National Bureau of Standards, Washington, D.C. In 1979-81, Dr. Scheeline was an Assistant Professor at the University of Iowa.

Scott, Robert A., Assistant Professor, effective August 21, 1981.

Married
Degrees: BS, University of Illinois, 1975
PhD, California Institute of Technology, 1980

Dr. Scott completed his doctoral thesis under the direction of Professor H. B. Gray in the field of "Metalloprotein Electron Transfer." For 1979-81, he was an NIH Fellow at Stanford University.

3. Promotions

Chemistry

Belford, R. Linn, Associate Professor to Professor
Schuster, Gary B., Associate Professor to Professor
Secrest, Don, Associate Professor to Professor
Nieman, Timothy A., Assistant Professor to Associate Professor

B. Visiting Appointments

For the 1981 Summer Session (of individuals not here in 1980-81)

Biochemistry

Becher, Brian, Visiting Lecturer, from Visiting Assistant Professor, University of Michigan, Dearborn

Chemistry

Davis, Phillip H., Visiting Lecturer, from Professor of Chemistry, University of Tennessee, Martin

For the 1981-82 Academic Year

Chemical Engineering

Jepson, W. Paul, Visiting Professor from Lecturer, Heriot-Watt University, Edinburgh, Scotland

Chemistry

Barrett, Martha B., Visiting Assistant Professor (General) from Assistant Professor, University of Colorado, Denver

Howlader, Nepal C., Visiting Assistant Professor (General) from Visiting Assistant Professor (General), 1980-81

Jones, Loretta, Visiting Assistant Professor (General) from Visiting Assistant Professor (General), 1980-81

C. Leaves and Special Appointments for 1981-82

Chemistry

Chandler, David, Sem I and II, sabbatical leave

Faulkner, Larry R., Sem I, sabbatical leave

Haight, Gilbert P., Jr., Sem I and II, sabbatical leave

Pirkle, William H., Sem II, sabbatical leave

Rauchfuss, Thomas B., Sem I, Fellow, Center for Advanced Study

D. Awards and Similar Recognition During 1980-81

Biochemistry

Gunsalus, I. C.	Elected Chairman of Biochemistry Section, National Academy of Sciences
Hager, L. P.	Wendell H. Griffith Lecturer at St. Louis University
Jonas, Ana	Fogarty International Fellow

Chemical Engineering

Hanratty, T. J.	Elected Fellow of American Academy of Mechanics

Chemistry

Bailar, J. C., Jr.	Honored at Fall ACS meeting for being a member of the Council for 38 years
Belford, R. L.	Mobay Lecturer, University of New Hampshire
Chandler, David	Guggenheim Fellow; Elected Fellow of AAAS
Flygare, W. H.	Irving Langmuir Prize in Chemical Physics
Gutowsky, H. S.	Kistiakowsky Lecturer at Harvard University

Haight, G. P.	Visiting Scholar, Monmouth College
Jonas, Jiri	Elected Fellow of AAAS
Leonard, N. J.	Honorary Degree from Adam Mickiewicz University, Poland; Roger Adams Award in Organic Chemistry
Martin, J. C.	Jeremy Musher Lecturer, Hebrew University
Oldfield, Eric	American Heart Association Louis N. Katz Research Prize
Wolynes, Peter	Alfred P. Sloan Research Fellowship
Zumdahl, Steve S.	Campus Award for Excellence in Undergraduate Teaching and Alpha Lambda Delta Award for Outstanding Teaching of Freshmen

Group Award

Peter Beak, Stanley Smith and Arthur Gaylord (Senior Research Programmer in the School) have received an award in the Johns Hopkins' national search for "Personal Computing to Aid the Handicapped." They devised a system that allows severely handicapped persons to write messages, control appliances, and make telephone calls using a single button. The system was developed for use by W. H. Flygare.

E. Invited Lectures and Professional Meetings Attended

In addition to the items listed above, a great deal of other professional recognition has been accorded to our faculty. An important component is the giving of invited lectures at seminars, symposia, and colloquia held at other institutions or in connection with meetings of professional societies or groups. The table given below summarizes the extent of such activities. The names of our regular faculty are listed according to department, along with the numbers of lectures given and of meetings attended. Lectures and meetings outside the U.S. or Canada are given as a second digit, where appropriate and where known.

Biochemistry

Name	Lect.	Attend.
Baldwin, T. O.	5	2
Clark, J. M., Jr.	2	-
Conrad, H. E.	2	2
Glaser, M.	2	-
Gumport, R. I.	-	1
Gunsalus, I. C.	2,1	8,1
Hager, L. P.	6	7
Jaehning, Judith A.	-	-
Jonas, Ana	1,7	1,2
Mangel, W. F.	-	1
Ordal, G. W.	1	-
Shapiro, D. J.	5,2	3,1
Switzer, R. L.	6,1	2,2
Uhlenbeck, Olke	8,2	3
Weber, Gregorio	?	?

Chemical Engineering

Name	Lect.	Attend.
†Alkire, R. C.	8	5
Drickamer, H. G.	4	4
†Eckert, C. A.	4	3
†Hanratty, T. J.	4	5,1
Higdon, J. L.	-	2
Larson, R. S.	-	1
McHugh, A. J.	6,1	4
†Masel, R. I.	1	1
Shaeiwitz, J. A.	-	2
Stadtherr, M. A.	3	2
Westwater, J. W.	3,1	5,1

Chemistry

Name	Lect.	Attend.
Applequist, D. E.	-	-
Arduengo, A. J., III	-	2
Avery, J. P.	3	2
Bailar, J. C., Jr.	9	2
Beak, Peter	5,1	2
Belford, R. L.	1	1
Brown, T. L.	7	2
Chandler, David	6,1	2,1
Coates, R. M.	6	4
Cook, K. D.	4	5
Curtin, D. Y.	3	-
Denmark, S. E.	-	1
Dlott, D. D.	?	?
Drago, R. S.	?	?
Dykstra, C. E.	1	2
†Faulkner, L. R.	13,4	5,1
Fox, Jane	2	3
Gennis, R. B.	-,10	-,1
Gutowsky, H. S.	1	6,1
†Haight, G. P., Jr.	4	6,1
†Hendrickson, D. N.	9,6	2,1
Hummel, J. P.	1	-
Jonas, Jiri	4,6	4,1
†Katzenellenbogen, J.	14	5
†Kaufmann, K. J.	1	2
Leonard, N. J.	4,6	3,3
McDonald, J. D.	?	?
Malmstadt, H. V.	5,1	3,1
†Martin, J. C.	8,5	6,1
Melhado, Evan	1	2
†Nieman, T. A.	2	5
Oldfield, Eric	12,1	5,2
†Paul, I. C.	-,2	2
Pirkle, W. H.	11	3
Rauchfuss, T. B.	2	4
Rinehart, K. L.	8,6	4,5
†Rogers, E. P.	-	4
Schuster, G. B.	18,2	-
Secrest, D. H.	1	1
Shapley, J. R.	4	-
Smith, S. G.	5,1	-
†Suslick, K. S.	4	4
Wolynes, P. G.	7	5
Yankwich, P. E.	?	?

†These individuals also organized and chaired a symposium or similar event.

F. Other Professional Activities

Two other types of professional activities are summarized in the table given below. The first of these (Ed. Bd.) is service on the editorial boards of journals and other science-related periodicals. The second (Prof.) is membership on the wide variety of advisory panels and committees for professional societies, federal and state agencies and for other institutions; included in this category is service as an officer of a professional society. The numbers of such activities are listed for each faculty member, insofar as they are known.

Biochemistry

Name	Ed. Bd.	Prof.
Glaser, Michael	-	2
Gunsalus, I. C.	5	6
Hager, L. P.	-	3
Jonas, Ana	-	4
Shapiro, D. J.	-	1
Switzer, R. L.	3	1
Uhlenbeck, Olke	-	1

Chemical Engineering

Name	Ed. Bd.	Prof.
Alkire, R. C.	2	4
Drickamer, H. G.	2	2
Eckert, C. A.	-	2
Hanratty, T. J.	3	8
Stadtherr, M. A.	-	2
Westwater, J. W.	3	5

Chemistry

Applequist, D. E.	-	1	Haight, G. P., Jr.	2	4
Bailar, J. C., Jr.	3	-	Jonas, Jiri	2	-
Beak, Peter	1	2	Katzenellenbogen, J.	1	2
Belford, R. L.	2	1	Leonard, N. J.	1	3
Brown, T. L.	3	1	Malmstadt, H. V.	2	-
Chandler, David	3	-	Martin, J. C.	-	4
Coates, R. M.	2	3	Paul, I. C.	1	1
Curtin D. Y.	2	-	Oldfield, Eric	-	1
Faulkner, L. R.	1	5	Rinehart, K. L.	3	3
Flygare, W. H.	-	3	Schuster, G. B.	1	-
Gennis, R. B.	1	-	Secrest, D. H.	1	-
Gutowsky, H. S.	-	6	Shapley, J. R.	1	-

II. Undergraduate Programs

A. Registration During 1980-81

Given in the table below is a summary, by class, of the number of undergraduate students enrolled in each of the two specialized curricula and in the several programs for S&L majors in the School. The numbers below are averages of the fall and spring enrollments taken from Registration Summaries for the School.

	Fr.	So.	Jr.	Sr.	Total
Biochemistry					
32-14-06 (majors)	13	18	19	24	74
32-16-06 (premeds)	32	22	23	31	107
Totals	45	40	42	55	181
Chemical Engineering					
32-06 (curriculum)	89	89	100	165	443
Chemistry					
32-07 (curriculum)	59	54	59	72	244
32-14-07 (majors)	35	13	20	21	89
32-15-07 (prejournalism)	0	0	1	0	1
32-16-07 (premeds)	63	24	18	18	123
32-18-07 (prelaw)	1	1	2	1	5
32-71 (teaching)	0	0	3	2	5
Totals	158	92	103	114	467

B. Five-Year Enrollment Trends

Comparisons of total registrations by semester in the undergraduate programs for the past five years are given below. The numbers are taken from the LAS Field of Concentration and Curriculum Counts. The main change is a fall-off of about 75 students in the chemical engineering curriculum.

Sem.	1976-77	1977-78	1978-79	1979-80	1980-81
		Biochemistry - S&L Majors			
I	237	213	212	204	188
II	196	199	182	172	162
		Chemical Engineering - Curriculum			
I	389	465	540	540	455
II	345	461	490	478	424
		Chemistry - Curriculum			
I	123	134	160	238	239
II	108	127	170	214	212
		Chemistry - S& L Majors & Teaching			
I	227	209	155	197	191
II	191	165	194	168	172
		Totals - All Undergraduate Programs			
I	976	1031	1067	1179	1073
II	840	952	1036	1032	970

C. Degrees Granted over the Five-Year Period 1976-81

Degrees granted in the various undergraduate programs during the past five years are summarized below. Data for 1980-81 are taken from the tentative graduation lists. The most dramatic change is in chemical engineering, for which the number of graduates this year is about 95, down by 50 from the preceding years all-time high of 142. Also, degrees in all of the other curricula are down slightly.

Mo.	1976-77	1977-78	1978-79	1979-80	1980-81
Biochemistry - BA and BS Degrees in the S&L Majors					
Aug.	3	5	3	1	3
Oct.	1	0	0	0	0
Jan.	5	2	4	6	2
May	22	26	28	39	32
	31	33	35	46	37
Chemical Engineering - BS Degrees in Curriculum					
Aug.	3	4	2	2	2
Oct.	0	0	0	1	1
Jan.	17	14	27	40	22
May	41	41	74	99	68
	61	59	103	142	93
Chemistry - BS Degrees in Curriculum					
Aug.	4	4	4	2	2
Oct.	2	2	0	1	1
Jan.	6	5	6	9	5
May	16	17	13	29	28
	28	28	23	41	36
Chemistry - BA and BS Degrees in All S&L Majors					
Aug.	5	0	1	7	2
Oct.	1	0	0	0	1
Jan.	4	9	10	8	2
May	29	26	33	24*	24
	29	35	44	39	29
Totals - All Undergraduate Progams					
Aug.	15	13	10	12	9
Oct.	4	2	0	2	3
Jan.	32	30	47	63	31
May	108	110	148	191	152
	159	155	205	268	195

*Includes 1 teaching of chemistry.

D. Undergraduate Scholarships and Awards*

The following undergraduate awards were made by the School this year:

Donald E. Eisele Memorial Award (Chem. Engr. Alpha Chi Sigma)	- James A. Leistra
American Institute of Chemists	- Paul W. Jahn
Chemical Rubber Company Achievement Award	- Keven S. Ehlert
Reynold C. Fuson Award	- Richard C. Reem
Worth H. Rodebush Award	- Donald L. Helfer
Kendall Award (Phi Lambda Upsilon)	- Allen G. Sault
Kodak Scholars Program	- Joseph D. Augspurger
	- Paul W. Jahn
	- Pauline C. Ting
Merck Index Award	- Robert Starkston
	- Richard J. Fairley
	- Timothy R. Aksamit
Elliott Ritchie Alexander Award (Phi Lambda Upsilon)	- Edmund G. Seebauer
	- Natalie A. Gilbert
	- Mitchel H. Covinsky
	- Brad A. Kirchhofer
	- Daniel J. Johnson
	- Jerome Walsh
	- James J. Herdegen
Arthur W. Sloan Prize	- Valeria S. Ratts
	- Patricia F. Wojcik
	- Michael Bors
Phi Lambda Upsilon Cup	- Valeria S. Ratts
	- Patricia F. Wojcik
	- Michael Bors
	- John L. Fox
	- Chris N. Velisaris
American Institute of Chemical Engineers Scholarship Award	- Brad A. Kirchhofer

In addition, Paul Schiller and Anthony Cacish were recognized by the College of Engineering as Knights of St. Pat. Terry Westpfahl received the Honeywell Award from the College of Engineering.

The following donors supplied scholarships in Chemical Engineering for undergraduate students:

Air Products Company
Aloca Foundation
Eastman Kodak
Janice I. Ackerman Memorial Fund
Marathon Oil Company
Standard Oil of California
Stauffer Chemical Company
UOP Foundation

*Report of Placement and Chemistry Advising Office.

E. Co-Op Activities*

The total number of students involved in the co-op program appears to be the same as last year. However, as with any student program, there is considerable movement before the final count is known. Companies which discontinue programs necessitating "replacement" of students, students who for their own reasons make other career choices, and others who drop from the program due to personal reasons, etc., are not reflected in the final tally. Of these students, resumes are requested weekly and many are placed by the beginning of the fall semester.

The following table summarizes the activity of the program over the last three years:

	1978-79		1979-80		1980-81	
	Chem	ChE	Chem	ChE	Chem	ChE
Requesting information	4	15	15	36	10	18
Formal applications	2	6	6	28	7	9
Placed	1	2	2	11	1	5
Graduated	2	2	2	5	3	2
Plans after graduation						
Industry	-	1	1	4	1	2
Grad School	2	1	1	1	2	-
Continuing in Fall (as of June 1981)	8	18	8	21	4	22

The GPA averages for those continuing in the program in Fall, 1981-82, are as follows: Chemists: 4.01, ChE's: 4.12.

Through the efforts of the Freshman Chemistry Office, the student chapters of ACS and AIChE, and many faculty, information about co-op seems to be more broadly disseminated. Although fewer students requested information, more followed through with formal applications. The Office appreciates the support of faculty referrals.

*Report of the Placement and Chemistry Advising Office.

III. Graduate Programs and Activities

A. Enrollment Trends and Degrees Granted

Graduate enrollment data for the fall semester of the past five years are summarized below. Spring semester totals are also given. Two or three students registered in absentia are included. The main change is a drop of 20 in chemistry enrollments because of a small entering class.

Total Graduate Enrollments by Department and Area

Dept.-Area	1976-77	1977-78	1978-79	1979-80	1980-81
Biochemistry	84	87	85	92	85
Chem. Engr.	52	59	61	72	76
Analytical	49	43	37	41	40
Biophysical	6	8	12	12	10
Inorganic	64	57	71	78	67
Organic	102	107	113	114	105
Physical	59	55	55	56	54
Chem. Physics	9	7	6	8	7
Undecided	12	16	10	1	9
T. of Chem.	2	0	0	2	0
Chemistry	303	293	304	312	292
Semester I	439	439	450	476	453
Semester II	389	421	429	454	436

The number of PhD degrees granted this year is up sharply in all three departments, to give a total of 92, second only to the all-time high of 107 for 1969-70. However, the MS degrees continued at the mid-forties level. It is noteworthy that for 1979-80, according to ACS statistics the School led the country for the eighth consecutive year in the number of degrees conferred in the chemical sciences. In the past 16 years, we have been first in the totals 14 times and second the other two!

Summary by Department of Advanced Degrees Granted

	1976-77	1977-78	1978-79	1979-80	1980-81
Biochemistry					
MS	11	8	8	10	2
PhD	9	9	7	10	18
Chemical Engr.					
MS	10	16	12	14	17
PhD	7	11	10	6	12
Chemistry					
MS	31	25	29	18	26
†PhD	39	53	47	45	62
Total					
MS	52	49	49	42	45
PhD	55	73	64	61	92

†PhD degrees in chemical physics are included here.

B. Graduate Student Recruitment and Admissions†

Biochemistry--As has been the case in the recent past, initial inquiries concerning graduate study in biochemistry continued to rise significantly (556 plus 31 inquiries from medical scholars compared to 405/42 last year) while completed applications showed only a slight increase (58/53). Thirty-nine offers were made and 15 acceptances received. Thirteen students to whom offers were made visited the Department, and of these, 3 accepted. The acceptance rate is comparable to that of last year when we enrolled 14 in the Fall '80 term and 3 in the Spring.

Chemical Engineering--Eighteen graduate students entered from August 1980 to June 1981. The August 1981 group will be an all-time high of 33, resulting from the following:

Number of inquiries = 249 U.S. + 654 foreign	= 903
Completed applications	= 161
Offers made	= 63
Offers accepted = 25 U.S. + 8 foreign	= 33
Amount of 12-month support for 1981-82	=$6700 to $10,000

Chemistry--In contrast to a year ago when most of the statistics associated with graduate admissions in Chemistry were down, most of them were up this past year. The number of inquiries about graduate work was up 6% for domestic students and 30% for foreign students and the total number of applications was up 20%. This resulted in an increased number of offers for admission and financial support (183 this year versus 155 last year) which, coupled with an increase in the acceptance rate from 33% to 39%, yielded a considerably larger group of students entering in June and August (72 this year versus 51 last year). Although the class size was up dramatically, it still was only slightly larger than the average for the last six or seven years, indicating just how bad last year's results were.

The improvement in the number of entering students reflects a considerable amount of hard work on the part of the admissions committee in two different areas. One involved a greater effort to identify prospective students and to get them to apply. This primarily involved mailings to selected students that were listed in the ACS listing of College Chemistry Seniors. The other area of increased and improved activity involved the follow-up of offers and the programming of visits made by the prospective students. These are very time consuming activities but they appear to be necessary in the face of increased competition by other schools.

School--Students entering in June and projected for August, 1981, and the totals for each of the four years preceding are summarized in the table below for the School as a whole.

†Taken from reports of the departments.

Graduate Student Acceptance of Admission Offers*

Dept.-Area	1977-78	1978-79	1979-80	1980-81	1981-82
Biochemistry	20	15	21	15	15
Chemical Engr.	19	26	20	19	29
Analytical	2	10	11	8	7
Inorganic	8	18	12	7	10
Organic	22	28	21	17	27
Physical	19	13	19	7	12
Chemical Physics	-	-	-	1	1
Undecided	9	9	14	11	16
Teaching of Chem.	-	-	-	-	1
Chemistry	60	78	77	50	74
Total	96	119	118	84	118

*The 1977-81 figures are actual enrollments, including students entering in February. The 1981-82 data are projections and do not include January admissions. Biophysical students are listed under physical, organic and biochemistry; and chemical physics students usually appear initially under physical.

C. Fellowship and Traineeship Support

1. Fellowship and Traineeship Support - These nonassistantship appointments have dropped again, to a new low of 91, after having leveled off in the 100 range for three years. The drop was due to further erosion in the NIH traineeship program, plus a drop in industrial fellowships. The severity of the long-range drop is evident if one recalls that the peak in such support was 197 students in 1967-68.

Type of Appointment	1976-77	1977-78	1978-79	1979-80	1980-81
Natl. Science Foundation					
National Fellow	6	9	5	7	4
Trainee	10	4	1	0	0
U.S. Public Health Serv.					
Trainee	28	25	24	26	19
	44	38	30	33	23
Institutional Fellowships					
University	25	25	25	23	26
Industrial - Dept.	41	40	43	52	42
Other	7	1	1	-	-
Total	117	104	99	108	91

The distribution of these appointments among the three departments in 1980-81 is given in the next table. It's much the same as for last year except for the two decreases noted above.

Department	NSF	NIH	Univ.	Indust.	Total
Biochemistry	0	16	2	1	19
Chemical Engr.	3	0	9	14	26
Chemistry	1	3	15	27	46
	4	19	26	42	91

Also, it is noteworthy that Charles R. Powley and Julie Strong Pflug were awarded Summer Fellowships by the Analytical Division of the ACS.

2. Industrial Support - A synopsis is given below of the industrial donors who have made "unrestricted" grants during 1980-81 to support graduate fellowships and/or research in one of the departments. The list does not include the smaller undergraduate scholarship grants nor industrial grants and contracts to support a particular faculty member's research. The amounts received total about $166,000 for Chemical Engineering as compared to $80,000 for the preceding year, and $155,000 for Chemistry compared to $150,000 for the preceding year. Most of these funds are being used for graduate fellowships and start-up costs of new faculty. Also, some are being used to support the seminar programs and staff recruitment, for which some entertainment expenses can not be charged to state funds.

Biochemistry

None

Chemical Engineering

Air Products
Allied Chemical Company
American Oil Company
Arco Oil
Atlantic Richfield
Celanese Chemical Corporation
Chevron Oil
Conoco
CPC International
Continental Oil
Diamond Shamrock
Dow Chemical
DuPont
Eastman Kodak
Exxon
General Electric
Gulf Oil
Mead Corporation
*Minnesota Mining & Manufacturing
Mobil
Monsanto
Shell Oil
Standard Oil
Stauffer Chemical
Union Carbide
Universal Oil

Chemistry

American Chemical Society
Atlantic Richfield
Celanese Chemical Corporation
Chevron Research
Conoco
Dow
DuPont
Eastman Kodak
Exxon
General Electric
Eli Lilly
Lubrizol
*Minnesota Mining & Manufacturing
Mobay
*Monsanto
Owens Corning
Phillips Petroleum
Procter & Gamble
Rohm & Haas
Sherwin Williams
Sohio
Union Carbide

*Departmental grants-in-aid that can be used for purposes other than graduate fellowships.

Industrial and other private support of research of particular faculty members or of a particular program is also noteworthy. In biochemistry, it totaled $20,350 from the American Heart Association. In chemical engineering, it totaled $131,000 in 1980-81 from Bethlehem Steel, IBM, National Steel, Occidental Research Corporation, Phillips Petroleum and American Chemical Society. In chemistry, it was $200,000 from American Chemical Society, American Heart, Dow, Exxon, Research Corporation, Shell Development Company, Monsanto and the A. P. Sloan Foundation.

D. Postdoctorates

Given below is a five-year synopsis of the numbers of postdoctorates in each department. The numbers fluctuate appreciably during the year as individuals come and go almost at random, so the figures given are the total numbers appointed at some time during each year. After a steady state of 60 for 1975-79, there was a large jump to 76 last year reflecting increased availability of federal funds, and this year's figure of 71 is still high.

Department	1976-77	1977-78	1978-79	1979-80	1980-81
Biochemistry	16	22	16	26	23
Chemical Engr.	2	2	2	-	2
Chemistry	44	38	39	50	46
Total	62	62	57	76	71

E. Special Lectures, Seminars and Activities During 1980-81

A number and variety of activities related to the graduate research programs of the School took place during the year. They are enumerated below, starting with the two name lectureships sponsored by the School that were held this year, the Ada Doisy and W. A. Noyes lectures.

1. Ada Doisy Lecture in Biochemistry

Leroy E. Hood, Cal Tech., April 22 & 23, "Antibodies: Split Genes and Jumping Genes" and "The Area-Code Hypothesis, Microchemical Instrumentation, and Genes of the Major Histocompatibility Complex"

2. W. A. Noyes Lecture

Herbert C. Brown, Purdue University, March 10, "From Little Acorns to Tall Oaks - From Boranes Through Organoboranes"

3. Alpha Chi Sigma Krug Lecture

Herbert C. Brown, Purdue University, March 10, "Adventures in Research"

4. Wednesday Night at the Lab ("popular" lectures organized by Alpha Chi Sigma, supported by funds from DuPont)

K. L. Rinehart, University of Illinois, March 25, "Drugs from the Sea"

Vivian Gornick, Journalist-Writer from New York City, April 22, "The Real Thing: Women in Science"

5. Local ACS Section Lectures

Lectures of the local ACS section were cosponsored this year by one or another of the areas/departments with a regular seminar program. The speakers included Stephen J. Benkovic of Penn State (Mechanisms of Enzyme Catalyzed Group Transfer Reactions), Clifford Mathews of UI at Chicago Circle (Cosmic Metabolism: The origins of Molecules), Becky Simon of our Placement Office (Careers in Chemistry), J. L. Beauchamp of Cal Tech (Photoexcitation and Photodissociation of Ions and Molecules with Infrared Lasers, and Fundamental Studies of Reactive Intermediates in Organometallic Chemistry), W. C. Stwalley of Iowa (Long-Range Interatomic Forces and Long-Range Molecules), R. L. Biltonen of Virginia (Role of Lipid Structural Fluctuation in Membrane Function), William Geiger of Vermont (Organometallic Electrochemistry: What Happens After the Electron Goes In), Lewis Friedman of Brookhaven (Low Temperature Mass Spectrometry: Application of Thermonuclear Fusion), Christopher S. Foote of UCLA (Oxidations Sensitized by Cyanoaromatics), William A. Pryor of Louisiana State (Accelerated Mechanisms of Radical Production), and Dennis C. Prieve of Carnegie-Mellon (Migration of Colloidal Particles in Solute Gradients).

6. W. C. Rose Lecture in Biochemistry and Nutrition

M. Daniel Lane, Johns Hopkins University School of Medicine, was chosen by the Nutrition Foundation to give the 3rd lecture honoring W. C. Rose. Dr. Lane spoke here on March 27; his topic was "Regulation of Insulin Receptor Metabolism."

7. Special School Seminars

The School joined with the Institute for Environmental Studies to sponsor two lectures by Dr. James Epler of Oak Ridge National Laboratory:

April 22 - "The Use of Genetic Toxicology in the Isolation and Identification of Chemical Hazards in Complex Mixtures"

April 23 - "Genetic Toxicology--The Impact on Our Environment"

In addition, Gil Haight, Director of the General Chemistry Program, gave his traditional Christmas Lecture to a packed house in 100 NL. Due to popular demand it was given three times this year, on December 8 and twice on December 9. The title is "The Wonderful World of Liquid Air."

8. Visiting Speakers in Seminars

The number and variety of seminars by visiting scientists continued at a high level, though down a bit from last year's 130. There were at least 100 such seminars this year, 11 of which were by speakers from other countries. Talks were distributed among the various areas as follows, where the first number gives the talks by U.S. visitors and the second by foreign visitors: Biochemistry (18,2), Chemical Engineering (9,1) and in Chemistry--Analytical (13,1), Inorganic (16,3), Organic (12,2), and Physical (20,3). It is noteworthy that the fraction of the talks by industrial scientists has increased in recent years; it was about 1/5 this year.

9. ACS Student Affiliates

This local group of our undergraduates, mainly in chemistry, has become more active in recent years, with the encouragement of their advisor, Steve Zumdahl. One of their activities was to sponsor a lecture by Edward O. Sherman, of Eastern Illinois University, titled "Industrical Chemistry - What is it?"

10. Fuson Awards to Graduate Students in Organic Chemistry

Last year, the Fuson bequest was used to institute awards for graduate students. These awards are given to defray the expenses of students who attend National ACS Meetings to present papers on their research results. The awards are made in competition in which the various entries are judged on the basis of submitted abstracts of proposed talks. This year a Fuson Award Symposium was held on March 9, in which the three recipients gave brief (15 min.) talks, as follows:

Tuyen T. Nguyen: "A Dialkoxyarylbrominane. Synthesis Stability and Reactions"

David W. Robertson: "In Quest of Receptor-Mediated Cytotoxicity: The Synthesis and Biochemical Evaluation of Chemically Reactive Tamoxifen Analogs"

Peter D. Senter: "Synthesis of the Ophiobolane Ring System"

11. Pig Roast

Last but not least, the School of Porcine Sciences held a pig roast at Professor John Clark's farm, near Farmer City!

IV. Instructional Program

A. Curricular Matters

1. Courses and Curricula Committee†

The largest curricular change this year was the creation of a new curriculum in Biochemistry, a professional curriculum in the College of Liberal Arts and Sciences, but outside the Sciences and Letters Curriculum. The new curriculum has so far been approved by the College faculty, but not yet by the Senate. The content of the curriculum is essentially that of the old concentration in biochemistry (which is to be discontinued). The curriculum was created to avoid damage to the concentration from the increased requirements in general education in Sciences and Letters.

The Curriculum in Teaching of Chemistry was revised to remove a four-hour requirement in biological science, and thus to free time for other electives of comparable value to a high-school chemistry teacher.

The Curriculum in Chemical Engineering was revised to increase the requirement in social sciences and humanities from 12 hours to 16 hours. The change was in response to a requirement of the Accreditation Board for Engineering and Technology.

The requirements of the Sciences and Letters Curriculum in general education have undergone further revision during the year, even though the changes of 1979 were never put into effect. A summary of the requirements which our chemistry concentrators will have to meet under the new revision is as follows: (1) Literature, 1 course; (2) Historical and philosophical perspectives, 1 course; (3) Social perspectives, 1 course; (4) Non-western cultures, 1 course; (5) Biological sciences, 1 course; (6) Behavioral science, 1 course; and (7) Further work in categories (1), (2), and (3), 1 course. The total load is thus seven courses, where previously six courses met the traditional requirement of a sequence in each of the three major areas (humanities, social sciences, and biological sciences). The full impact on our students will not be clear until the lists of approved courses have appeared.

Two minor changes have been made in graduate curricula, both having to do with examination requirements:

The cumulative examination requirement in Chemistry for the PhD degree has been restated (not substantively modified) to require passing 6 exams out of 18 instead of 6 out of 14, but with no "free" exams in the first semester.

The registration examination requirement in physical chemistry for graduate students in biochemistry has been revised and clarified. For a three-year trial period, the examination results will be used as follows:

Quantum Mechanics Exam	Classical Physical Chemistry Exam	Response
Fail	Fail	342 and 344, or 340 and 346 required
Fail	Pass	342 recommended
Pass	Fail	344, or 340 and 346 required
Pass	Pass	No courses required

†Report of the committee chairman, D. E. Applequist

2. General Chemistry Program*

The general chemistry program continues to provide:

1) Audio tutorial and PLATO-assisted instruction to Chemistry 100.

2) TV-assisted instruction to Chemistry 101 and 102B. Five new tapes were produced for Chemistry 101 by Mary Ulrich, one on periodic classification and four on acid/base. Production of a TV course 102P has been undertaken, directed by Loretta Jones, with advice from Professor Sherman Brown in Ceramic Engineering, Steven Zumdahl and Gilbert Haight. The program is gathering momentum with 15 lessons in hand. Testing of materials will begin next year with full use scheduled for the year following.

3) Our majors courses, 107-110, are directed and taught by Steven Zumdahl, who was named top teacher of freshmen on campus by Alpha Lambda Delta, and one of five top teachers of undergraduates in the all-campus competition.

Loretta Jones and Mary Ulrich have received a summer undergraduate instructional award to develop laboratory experiments for 102P (for engineering students). Loretta Jones received such an award last summer (1980) to develop TV taped demonstrations and her report merited a $1000 award from AMOCO as one of the three best.

Coping with increased enrollment, increased costs, environmental regulations and rapid turnover of personnel has produced problems for 101-2 labs, which will be a primary concern in the coming year.

Elizabeth Rogers has investigated the teaching of chemistry in surrounding high schools and found an acute shortage of teachers trained in chemistry, and a tendency to either drop the subject or have it taught by people with little or no training in the subject.

Steven Zumdahl has directed the development of a student affiliate of ACS from a non-existent body three years ago to the largest in the nation, enlivening our undergraduate chemistry program.

Visiting Professor Philip Kinsey taught 102P and honed our program for computer recording and scaling of grades. He reports more positive feedback from our students (~600) than previously at the University of Evansville (Indiana).

Loretta Jones and Mary Ulrich have submitted proposals (through Gilbert Haight) to NSF for CAUSE and LOCI grants. These appear doomed by the virtual elimination of new education programs under NSF.

TV tapes and lecture demonstrations from this program were featured at the VIth Biennial meeting of DIVCHED in Rochester, Summer 1980, and at a symposium on lecture demonstrations in Macomb, Illinois (Jones, Haight, Ulrich). We were invited to describe the role of physical chemistry in general chemistry courses at the Atlanta ACS meeting (Zumdahl, Jones, Haight).

*Report by G. P. Haight, Jr.

3. Special Courses

Two special graduate-level courses were offered to acquaint our students with some of the more industrial aspects of chemistry. In the fall semester, Peter Beak arranged a half-unit course, Chem 433 "Chemical Research in Industry"--an opportunity for those who are interested in industrial careers to learn more about successful industrial research. Professor Beak's prospectus of the course is given below:

> Prior to October 6, students will be expected to complete Professor Smith's polymer chemistry course which will be available on PLATO. The topics covered include the nomenclature of common polymers, structure of common polymers, molecular weight measurements, types of polymerization, and the kinetics of chain and step-growth polymerizations.
>
> Students enrolled in the course and serious auditors should register with Pat Webb in 271 RAL by the start of the fall semester so that access to the PLATO programs can be arranged.
>
> The lecturers in the course will be scientists who are currently active in industrial research. Each lecturer will give 3-4 lectures in their area of specialization as indicated below:
>
> The week of October 6, Dr. Arthur W. Anderson of DuPont will lecture on the organic chemistry of polymers and monomers and on fluorocarbon chemistry.
>
> The week of October 20, Dr. Jack Ehrmantraut of Dow will lecture on process development research.
>
> The week of October 27, Dr. A. J. Speziale of Monsanto will lecture on agricultural chemical research and research management.
>
> The week of November 3, Dr. James Burke of Rohm and Haas will lecture on preparation for and development of an industrial career.

In the spring semester, Kelsey Cook arranged a more specialized set of lectures by visiting lecturers on the characterization of polymers, using the Chem 424 rubric (Special Topics in Analytical Chemistry). The schedule for the course is listed below:

> March 24 - Dr. Joe Ray, Amoco: Polymer Structure by NMR.
>
> March 31 to April 2 - Dr. Al Kenyon, Monsanto: Polymer Solution Properties, Dynamic Mechanics, Gel Permeation Chromatography, Light Scattering.
>
> April 7-9 - Dr. John Reffner, American Cyanamide: Polymer Microscopy and Thermal Analysis.
>
> April 14-16 - Dr. Steve Harris, Texaco: Water Soluble Polymers in Oil Recovery.

April 21-23 - Dr. Norm Colthup, American Cyanamide: Polymer Vibrational Spectroscopy.

April 27-28 - Dr. Don Freed, ICI: Pyrolysis and Chemical Methods of Polymer Analysis.

April 30 - Dr. Mike Deveney, Amoco: Spectroscopic Solutions to Polymer Problems.

April 29-30 - Dr. Steve Martin, Dow Chemical: Synergism in Molecular Weight Determinations, and Applications of Pyrolysis Gas Chromatography.

(To be determined) - Dr. Phil Geil, University of Illinois: X-ray and Electron Microscopic of Polymer Morphology.

B. Overall Registration

Comparisons of total instructional units, and, separately, of those in General Chemistry are given below on a semester basis for the 1976-81 period. IUs for this year were down 5% from the previous year's all-time high of 57,739, but still the equivalent of nearly 2,000 full-time students. The decrease probably reflects curtailment of admissions to the chemical engineering program and a drop in pre-med enrollments.

Semester	1976-77	1977-78	1978-79	1979-80	1980-81
		Total Instructional Units in All Courses*			
I	25,638	26,683	27,872	29,781	28,498
II	24,407	27,268	25,530	27,958	26,706
Total	50,045	53,951	53,402	57,739	55,204
		Instructional Units in General Chemistry			
I	11,689	12,006	12,193	13,024	12,502
II	11,473	13,016	10,440	12,341	11,548
Total	23,162	25,022	22,633	25,365	24,050

*An instructional unit is a student semester credit hour or equivalent (one graduate unit equals four semester hours).

C. TA Teaching Loads

The ratio of total IUs to FTE TAs employed is a reasonably good indicator of teaching loads for TAs. It doesn't reflect changes in faculty size; however, the latter have been small compared with changes in IUs and FTE TAs. In any event, summarized below is a five-year history of FTE TAs and of IUs/FTE.

Semester	1976-77	1977-78	1978-79	1979-80	1980-81
		Graduate Teaching Assistants Employed			
I	97.45	98.12	102.80	110.91	111.30
II	93.61	101.82	96.01	105.51	101.55
Average	95.53	99.97	99.41	108.21	106.43
		Ratio of Total Instructional Units to FTE Teaching Assistants			
I	263	272	271	269	256
II	261	268	266	265	263
Average	262	270	269	267	260

It is seen that the ratio has been quite uniform over the past 5 years, ranging from 261 to 271 over the 10 semesters. However, the current ratio is still up a bit from the 250+ figure in the late '60s and early '70s.

D. Teaching Evaluation and Awards*

Top Twenty Percent of Faculty Instructors, 1980-81

Form FL (lecture)	Semester I	Semester II
100-level	Chem 107 Zumdahl	Chem 108 Zumdahl
200- and 300-level	339 Coates	349 Dykstra
	Ch E 388 Alkire	Ch E 371 Higdon
	Chem 392 Paul	377 Stadtherr
	336 Leonard	
400-level	407 Brown	Chem 432 Katzenellenbogen
	406 Hendrickson	
	407 Shapley	

Form FB (laboratory)	Semester I	Semester II
100-level	Chem 181 Rauchfuss	Chem 102 Kinsey
		122 Nieman
300- and 400-level	322 Faulkner	337 Applequist
	Bio 355 Clark	Bio 355 Switzer
		Chem 422 Faulkner

*Report submitted by D. E. Applequist, chairman of the ad hoc committee.

Based on nominations by the Committee, the Kodak-du Pont teaching awards for 1980 were presented that August to faculty members H. Edward Conrad (Biochemistry), and Nelson J. Leonard (Chemistry). Teaching assistants receiving awards at the same time were Scott Landvatter (Chemistry), Peter Woyciesjes (Chemistry), and Paul Schubert (Chemistry).

The Committee served as the screening committee for nominations from SOCS for the Campus Teaching Award. One nomination, that of Steve Zumdahl, was forwarded to the College, and he was subsequently given the award. He becomes the third member of the SOCS faculty to receive the award, and the first member of the Department of Chemistry

V. Services and Facilities

A. Chemistry Library

Report of the Library Committee* - We began the academic year with a long meeting in which we outlined and discussed several areas of concern. Some progress has been made in a few of these areas. In particular, a new Xerox machine has been placed in the Library, and a sign indicating that "Priority is given to those using the collection" has been hung in the Library. We have also received approval for the Organic faculty to share a key to the Library. Finally, the Librarian has agreed on a limited basis to help chemistry researchers obtain needed volumes which are checked out by contacting the person who has the volume to see if immediate access can be obtained.

Unfortunately, we have made no further progress towards resolving the issues of real concern to the chemistry students, faculty and researchers. The most significant of these are:

1. General access to the Library. It is truly incredible that the entire research body of the SCS does not have keys to the SCS Library. The benefits of such a policy are obvious (increased availability, financial savings due to requiring fewer staff to keep the Library open), while the deficits are minor (the Physics Library does not incur unusual losses due to the key policy).

2. Circulation policy for journals. Chemical researchers need rapid access to the research liberature. Journals should never be freely circulated (as is now allowed), and when a faculty member identifies a series of volumes as a journal series, the Library should have these volumes catalogued as such.

The basic difficulty in making progress seems to be the inflexibility and non-research service philosophy of our current library policy. As examples of the difficulties we face, consider the following:

1. In the matter of priority library access for those using the collection, which is University policy, a delay of over six months, plus substantial efforts by Professor Gutowsky were required before the staff of the Chemistry Library began to adhere to the policy, and to respond to our stated needs.

2. The Chemistry Librarian, Dr. Wert, requested a poll be taken of our faculty concerning circulation policies for journals. The poll revealed that the faculty strongly opposed the circulation of any journals that were needed for their research. Nevertheless, there has been no change from the policy of free circulation.

3. In one effort to relieve the overcrowding of the SCS Library, the Library Committee proposed a flexible experiment in which many 300-level courses would place their reserve material in the Undergraduate Library. Instead of describing the flexible policy as proposed by the Library Committee and forwarded by Professor Gutowsky to the University Library, Dr. Wert

* Excerpts from the report submitted by the committee chairman, David Chandler. Views on general access to the Library were somewhat mixed, and one member of the Committee did not endorse the report.

> circulated an uninformative announcement that responsibility for the majority of the 300-level courses had been transferred from the Chemistry Library to the Undergraduate Library, and she refused to provide helpful advice to faculty who preferred to use reserve materials that might appear to fall outside of those acceptable to the Undergraduate Library.

These examples serve to highlight the concerns of the School faculty that some of the present Library policies are detrimental to the Library's usefulness. . . . Undoubtedly, lack of understanding is the underlying cause of the difficulties that have arisen, for we do believe that Dr. Wert is sincerely interested in the betterment of our Library.

After all of these remarks, it should not be forgotten that the Chemistry Library is already a very good library. It is not, however, among the very best--a level we always strive for and usually demand in Chemistry at the University of Illinois. I hope that in the near future, the understanding and responsiveness to our needs and requests can be improved. If not, the Library will have failed us in our efforts to uphold the standard of excellence that we are recognized for.

Report of the Chemistry Librarian† - This has been a year of change for the Chemistry Library. The expansion project was completed by January of 1981. This project allowed us to arrange the Library in a more logical fashion, new seats were added, and noisy functions were consolidated in one room. These changes meant more space for the library user and an easier collection to use and maintain. Combined with a regular weeding project the expansion leaves room for three to five years of growth. Reactions to these changes were, for the most part, positive.

With the expansion project complete, time was devoted to progress in other areas, improvement of service in particular. A reference desk was established to help library users use the Chemistry Library effectively. A new guide to the library was completed and should be available soon.

From February to July the Chemistry Librarian was on sabbatical, leaving the Assistant Chemistry Librarian in charge. Ground continues to be lost in terms of hourly student employees. Minimum wage, again, increased while the amount budgeted remained the same. This trend is likely to continue in the future.

The budget for monographic publications remained adequate, but serials and periodicals continue to be a problem. Five serial and periodical titles were added to the Chemistry Library collection, but we will be unable to add additional titles without sacrificing titles already in the collection.

Library-use statistics and LCS (Library Circulation System) show that use of the Chemistry Library continues to rise. Space added by the expansion has been adequate to handle the increase. Use of online bibliographic searching has also increased. Chemical Abstracts is still searched most often, and Science Citation Index is next.

†Annual report submitted by Lucille Wert.

B. Placement Office*

Recruiting - It is noteworthy of the 1980-81 season that more companies set up schedules while the number of candidates interviewing was smaller than in 1979-80. The table below indicates it was a very active recruiting year.

The following composite data (Fall and Spring) compare the current year with the three preceding:

	1977-78	1978-79	1979-80	1980-81
Employer Visits Scheduled	211	214	237	253
Cancellations	19	22	27	26
Employer Visits Completed	192	192	210	227
Number of Recruiter Days	364	309	425	334
Total Student Interviews Completed	3059	3631	4868	4227
Resumes Sent (Overflow)	186	324	806	270
Average Interviews/Recruiter Day	8.4	11.8	11.4	12.6

As in the past, employer visits were cancelled typically for one of the following reasons: An insufficient number of candidates showed interest in the company and/or position; or, the company's need for candidates decreased and they reduced their recruiting.

Workshops - Representatives from Dow Chemical U.S.A., DuPont, Procter & Gamble, and Hooker Chemical spoke to candidates at the Fall and Spring pre-recruiting workshop. A decision-making workshop was held in November by Dr. James Burke, a former recruiter, from Rohm & Haas.

For the past two years, a workshop sponsored by ACS and AIChE student chapters has been presented on co-op, summer employment and graduate study. These workshops have involved company representatives, active co-op students, and students who had worked in industry the previous summer. A similar program is being organized for early in the coming Fall semester.

Placement Data for BS Students - The following data were collected from several sources. They reflect information reported by baccalaureate graduates from August 1980 through May 1981, and the (incomplete) totals are usually less than the number actually graduating. The numbers are down this year, reflecting the decrease in graduates (Sec. II. C).

Baccalaureate Graduates	Biochem.	Chem.	Chem. Engr.
Employed	-	10	69
Graduate/Professional School	24	39	12
No Definite Information	9	2	-
Seeking Employment	3	-	8
Seeking Graduate School	2	4	-
Other	-	-	-
Totals	38	55	89

*Report of Rebecca Simon, director of the Office.

Industrial Hiring and Geographical Distribution - Listed below are the companies hiring the largest numbers of our 1980-81 graduates. It became obvious as candidates began to notify the office of job acceptances that the oil companies were hiring a larger percentage of our graduates than for last year, when Monsanto (15 hires), DuPont (15) and Dow Chemical (12) were the top three.

Complete data are available in the Placement Office.

		Chemistry						Chem. Engr.		
		BS	MS	PhD				BS	MS	PhD
4 or More Hires	Total			An	In	Or	Ph			
Exxon USA	13				1	2	1	6		3
DuPont	11				1	2	2	6		
Dow USA	6			1	2	1	2			
Amoco	6					1		5		
Shell	4	1			1			1	1	
Chevron	4							4		
Mobil Oil	4				1			3		

2-3 Hires

25 companies (6 oil companies)

1 Hire

24 companies (8 of these did not recruit through our office)

Geographical shifts towards the Gulf Coast and Texas areas were also noticeable. The 1979-80 data and the data collected for this year appear below in percentages.

	PhD		BS/MS		All Degrees	
	1979-80	1980-81	1979-80	1980-81	1979-80	1980-81
Far West	7	12.5	16.5	8.1	13.3	9.4
Midwest	31.6	31.2	62.6	47.2	52.3	42.4
TX & LA	14.0	21.9	13.9	35.1	14.0	31.1
East	47.3	34.3	6.9	9.4	20.3	17.0
Total No. of Graduates	57	32	115	74	172	106

The tally of employment this year at locations in Texas (28), Illinois (27), Ohio (10), Louisiana (6) and Michigan (6) indicates that while most of our graduates continue to accept initial employment in the Midwest, the Gulf Coast/Texas region is gaining ground compared to last year.

Starting Salaries - Given below is a synopsis of industrial starting salaries offered to the various categories of our graduates. The original data were tabulated separately for men and women; however, there are no significant systematic differences so only the totals are given here.

	No. Offers	High	Low	Average
BS Degree				
Chemical Engineering	293	2291/mo	1725/mo	2020/mo
Chemistry	22	1925	1250	1672
MS Degree				
Chemical Engineering	10	2390	2025	2230
Chemistry	16	2225	1767	1919
PhD Degree				
Chemical Engineering	37	3000	2700	2883
Chemistry	94	2750	2166	2505
Analytical	14	2708	2300	2521
Inorganic	20	2708	2250	2533
Organic	31	2750	2083	2473
Physical	29	2750	2250	2480
Postdoctorals				
Academic	6	3000	1850	2050
Industrial	6	2792	2333	2599

C. Shops and Service Facilities*

Personnel Changes - Dr. Stephen Ulrich, supervisor of the Molecular Spectroscopy Lab, resigned to accept a position at Nicolet Instruments, effective July, 1981. There were no other changes in the Molecular Spectroscopy Lab personnel, but the Regional NMR Facility added David Vander Velde, assistant spectroscopist, and Dr. Michael Meadows, spectroscopist. Suzanne Volk, assistant spectroscopist in the Regional NMR Facility resigned during the year.

In the Mass Spectroscopy Lab, Michael Broga resigned and was replaced by Richard Milberg, assistant spectroscopist. A new assistant spectroscopist is expected to be hired shortly.

Instrumentation - In the Molecular Spectroscopy Lab an obsolete HA-100 NMR spectrometer has been retired from service. A new Nicolet model 7199 Fourier transform IR spectrometer is scheduled for delivery soon, which will replace an old Perkin-Elmer IR spectrometer. The School will participate in the establishment of an ESR spectrometry center to be housed in the Medical Sciences Building. The School will contribute a relatively little used "Q-band" spectrometer and 15" magnet to this facility.

In the Mass Spectrometry Lab a new VG multispec Data System, which provides the capacity to handle data from two spectrometers simultaneously, has been put into operation. Also received on temporary consignment for research, development, and demonstration is a new VG model 7070 double focusing mass spectrometer. This instrument provides the following new capabilities: negative ion spectrometry, rapid-scan capillary gas chromatograph-mass spectrometry, linked scanning, and use of the alternate EI-CI mode.

*From the report of the committee chairman, R. L. Switzer.

D. Safety Activities*

Safety Committee Meetings - Two meetings of the safety committee were held during the spring semester. It was agreed that it would be desirable to institute a program of regular safety inspections of the school research laboratories as has been done in the organic area for the past two years under the supervision of A. J. Arduengo. Preliminary safety inspection check lists and procedures have been prepared by area representatives. A formal proposal to begin school-wide inspections will be submitted soon.

The refrigerator fire on the fourth floor in the older part of RAL called attention to the absence of an audible alarm when the fire alarms there, in Noyes Laboratory, and in the Chemistry Annex are activated. The possibility of installing an audible alarm system by connecting the alarm to the class bells, or to a new network of alarm bells, is under consideration. Sentiment among the biochemists favors changing to an audible alarm for the older section of RAL.

Ed Curran has arranged for a trial of a safety commitment letter in general chemistry this summer. It is hoped that requiring the students to read and sign the letter will increase their awareness of laboratory safety.

At the suggestion of Jiri Jonas, standardized cards to display emergency information (occupants' and supervisors' names and telephone numbers, etc.) were printed. The doors or entranceways to most laboratories in the school should have the cards in place by now. The information on the cards should be updated as necessary. Additional cards may be obtained from Cope Hubert (43 RAL) or the Business Office (105 NL).

Other Safety Activities - Brenda Suib and other inorganic graduate students have taken the initiative to form an inorganic safety committee. Their committee met several times during the spring semester. In this short time, a laboratory inspection program has been started, guidelines for chemical waste disposal have been prescribed, the emergency telephone number has been posted on all lab phones, and first aid kits were placed in each lab. The committee is to be commended for improving safety conditions and awareness in the inorganic area.

The weekly waste solvent collection begun last year for RAL under the supervision of A. J. Arduengo has been expanded to include Noyes Laboratory. On Friday afternoons waste solvent is brought to the collection area (west parking lot of RAL) and placed in one of the three drums for non-chlorinated solvents, chlorinated solvents, and oil.

The safety movie "28 grams of Prevention" by Fischer Scientific was shown as usual during the orientation program for new graduate students and teaching assistants prior to the beginning of the fall semester. In addition, Dr. Nelson Slavik of the Division of Environmental Health and Safety presented a lecture on laboratory safety. Fire Department personnel presented a film and demonstration showing the proper use of ABC, BC, and C fire extinguishers and air masks.

*This report was prepared by the safety committee chairman, R. M. Coates, with information provided by several committee members.

Eye wash fountains and fire blankets have been installed in the inorganic area of Noyes Lab, thanks to the efforts of Mary Fox and John Hummel. The eye wash stations in the school were tested on a regular basis and the safety showers were checked once during the year. Personnel from the Fire Department successfully tested the foam extinguisher in the solvent storage area (29c, RAL) twice during the year. Last summer the plumber began back-washing the system once each month. The procedure seems to prevent clogging of the Venturi orifice which had previously caused frequent malfunctions during the tests.

Chemical Waste Disposal - The University has now engaged a private contractor to pack and dispose of waste chemicals. The first regular disposal was carried out October 10 and 11, 1980, and an estimated 120 drums of waste chemicals and solvents were removed by the contractor. Eleven drums and 18 pails of waste chemicals from 260 Noyes Laboratory (Gaylen Stucky's former lab) were disposed of in a special clean-up, November 11, 1980. The second regular waste disposal is tentatively scheduled for June, 1981. In the meantime, drums of waste solvents are being stored on the South Farms.

Since the contractor will not accept unknowns, there is at present no mechanism for their disposal. As a result, a large quantity of unknown chemicals has accumulated and is being temporarily stored in the shed near Davenport Hall. It is important for School faculty and students to make an effort to ensure that all chemicals and samples are properly and securely labelled in order to minimize the number of unknowns appearing in the chemical clean-up.

There is also no means for disposal of toxic, pyrophoric, and explosive chemical waste. The contractor will not accept these materials and burning on the South Farms is no longer allowed.

Accidents - A review of the accidental injury and fire alarm reports filed during the past year (4/1/80-3/31/81) indicated that there were two rather serious laboratory accidents reported. One of the two (Allen Sault, 4/11/80) was mentioned in last year's annual report. The other occurred in 372 RAL on March 7, 1981, during a distillation being carried out by Steve Hobbs, an organic student. Toward the end of the distillation, the liquid exploded and the apparatus shattered. Although Steve was cut by flying glass and sprayed with the chemical, the injuries fortunately proved to be minor. The explosion was probably caused by peroxides which may have formed during storage of the acetylenic ether and/or by a highly exothermic polymerization.

A summary of all accidents reported this year is given below. The totals for each of the preceding three years were 52, 39, and 36 for 1977-78, 1978-79, and 1979-80, respectively.

1. Physical injuries

Cuts	17	
Bodily injuries	5	
Thermal and electrical burns	2	
Total		24

2. Chemical burns and injuries

Acids	2	
Bases	1	
Unknowns	1	
Chemicals in the eyes	5	
Allergic reaction	1	
Total		10

3. Miscellaneous	3
Total	37

Fires - During the past year there were 35 fire-alarm calls, compared with 34 for last year and 24 for the year before that. The one serious fire occurred on March 30, 1981, when a refrigerator in the hallway by room 490 in the Biochemistry space in RAL exploded. A considerable fire resulted from ignition of the volatile, flammable solvents stored in the refrigerator. The refrigerator and its contents were destroyed and the walls, doors, and ceiling of the hallway were blackened. The damage was estimated at $4,000 in the original fire-alarm report. The explosion was evidently caused by ignition of isopentane vapors which had accumulated in the refrigerator following a failure of the refrigeration unit.

A summary of the fire-alarm reports is given below.

1. Fires

chemical and solvent	9	
electrical	2	
others	2	
Total		13

2. Gas leaks and mercaptan odors	8

3. Accidents and emergency aid

laboratory accidents	4	
persons trapped in elevators	3	
chemical spills and disposal	2	
others	2	
Total		12

4. False alarms	2
Total	35

E. Building and Space*

The remodeling and renovation work completed in the School during 1980-81 involved the expenditure of about $150,000. This represents about a 50% increase over the level of past years primarily because of the infusion of a significant amount of non-recurring funds from the College and Campus (~$60,000). The major projects involved the renovation of the Chemistry 385 (Chemical Fundamentals) teaching lab in 124 Noyes Lab (partially funded by Campus funds), the improvement of research facilities in Noyes Lab for inorganic chemistry (463 NL) and for physical chemistry (20-30 NL and 170-174 NL), and the renovation of a computer room (314-316 NL) and offices (366A,B NL) for use by theoretical students and faculty. The latter are the first stages in a remodeling project designed to provide a consolidated area on the third floor of Noyes Lab for research in theoretical chemistry, a project that is being substantially funded by the College and Campus. Planning is nearly complete for this project and it is expected that the remaining remodeling will be completed in 1981-82. Planning has also largely been completed for three remodeling projects in the original part of RAL to provide increased office space for staff and students in the chemical engineering program. These projects will be completed in 1981-82 also with the aid of some College Funds.

Although these projects have produced some significant improvements in the quality of our space, it should be noted that they have responded to only a small part of our most pressing needs. Much of Noyes Lab is antiquated and far below current laboratory standards. We need additional space for chemical engineering research and the animal facilities in RAL are in need of upgrading. And, even in our newer areas, remodeling is often required as the nature of the research and teaching activities evolves. The needs are clearly well beyond the capability of the School to handle without greatly increased amounts of outside help.

F. Dispensing of Supplies*

In addition to the normal supervision of the School's dispensing stations, the Supplies Committee devoted considerable time to two special areas. One was the continuing inventory reduction program that was started in 1978-79. The other was a review of the utilization of personnel in the School's dispensing stations.

This was the third year of the inventory reduction program. During the three year period, an overall inventory reduction target of 16% was programmed. Progress during the first two years was slow and uneven with only two of the School's stations reaching their targets. During the past year, efforts were concentrated on the other stations with the result that all except two stations have now generated significant dollar savings. Overall, we are about 40% of the way towards the planned targets which means that we are about a year and a half behind schedule. We expect to make up a good share of the difference in 1981-82.

A general review of personnel utilization was prompted by the loss of Russ Brown who announced his retirement from the Noyes Consolidated Station effective August, 1981. Russ has served admirably as a storekeeper for us for 35 years. As a result of the review, John Mullen will be assuming a supervisory role in the Noyes station and Lou Lafenhagen has been selected as Russ's replacement to handle the day-to-day operation there. Several other adjustments in assignments have also been made elsewhere in the School, leading to better utilization of personnel.

*Reports of the committee chairman, J. P. Hummel.

VI. Administration

A. Affirmative Action Program*

Our efforts to increase the numbers of minority students and women in the School have continued in much the same pattern as before. The enrollment figures for the past three years for students in the undergraduate programs are shown in the table below. The fraction of women is tending to continue its increase in all three areas.

	Total			Women			Minority members[a]		
	1978-79	1979-80	1980-81	1978-79	1979-80	1980-81	1978-79	1979-80	1980-81
Chemistry	319	374	462	78	90	107	28	40	40
Chem. Engr.	490	482	443	83	76	91	51	59	45
Biochm.	182	161	181	50	40	53	18	24	26

[a]Blacks, Asians and Spanish surnames, ascertained by voluntary self-selection.

At the graduate level the fraction of women and minorities appears to have leveled off. This may be seen by comparing the composition given below of the incoming class with that of all current graduate students.

	Total	Women	Minority Members
Present enrollment	436	89 (20%)	13 (3%)
Entering in 1981-82			
Chem. Engr.	31	5	1
Biochem.	9	4	0
Chemistry	66	9	2
Total	106	18 (17%)	3 (3%)

This year, attempts were made to attract minority graduate students from ten institutions cooperating in the CIC (Committee on Institutional Cooperation) by writing personal letters to minority students with expressed interest in the chemical and biochemical sciences. In cooperation with the Minority Student Affairs Office, an application for federally-funded minority student fellowships (GPOP - Graduate and Professional Opportunities Program) was prepared and submitted.

B. Financial Support

1. State Support - Inflationary erosion of the state budget for the School has continued to be a major problem. In particular the operating budget (wages, expense and equipment) has been given a lower priority at the University level for a decade than has funds for salary increases. As a consequence, state funds for operating costs have been effectively cut in half over the decade. An increasing fraction of those costs has been charged to the users, mainly to research grants. For example, this year we inaugurated the recovery of supply and maintenance costs for the Computer Center, which total about $25,000/year.

*Report of J. A. Katzenellenbogen, chairman of the School's AA Committee.

On the positive side, enrollments for the year proved to be a bit lower (~5%) than had been predicted. This is an outcome of reduced admissions to the undergraduate program in chemical engineering plus ceilings on overall engineering enrollments and decreased interest in premed curricula. Even so, the School closed out the 1980-81 fiscal year with an overall deficit in state and ICR (indirect cost recovery) funds of about $100,000.

2. Outside Support - Federal and other outside support has continued strong, enabling further shifting of research costs from state to outside funds. The major sources and amounts of funds are summarized below for the past 6 years. Included in the totals are 58 NIH grants, including the training grant in molecular biology, 62 NSF, 12 MRL (4 DOE and 8 NSF), 2 DOE, 3 ONR, 1 AFOSR, 2 USEPA Coop agreements, 115 gifts and grants from private sources and 19 from the Research Board.

An important part of our outside support is the help NSF provides for departmental equipment. In the competition for such grants, our Department of Chemistry has fared relatively well. The NSF Chemistry Division recently prepared a synopsis of the program which has granted $44.4 million for chemical research instruments in 23 years of the program's existence (1957-80). Our department ranked at the top of the list with $1.29 million trailed by UCLA with $1.16 million. Cal Tech, Berkeley, Chicago, Harvard and Wisconsin also received over $1 million.

SOURCES OF OUTSIDE RESEARCH EXPENDITURES

Six Year Synopsis

	1975-76*	1976-77*	1977-78*	1978-79*	1979-80[1]	1980-81[1]
NIH Research Grants	2,036	2,149	2,420	2,585	2,809	3,390
NIH Training Grants	323	282	367	317	368	330
NIH Postdoctoral Allowances	---	15	17	15	7	4
TOTAL NIH	2,359	2,446	2,804	2,917	3,184	3,724
National Science Foundation	1,426	1,552	1,502	1,558	2,474[2]	3,379
MRL (ERDA/DOE)	67	136	283	285	322	288
MRL (NSF)	130	122	192	180	214	146
MRL (AFOSR)	46	32	---	---	---	---
Army Research Office	20	5	---	---	---	63
Department of Energy	---	---	30	51	72	121
Air Force Office of Scientific Research	29	35	37	39	50	45
Office of Naval Research	23	61	107	87	111	110
EPA-Coop Agreement	---	---	---	---	---	8
TOTAL U.S. GOVERNMENT:	4,100	4,389	4,955	5,117	6,427	7,884
Grants from Private Sources:	314	425	451	482	563	622
Graduate Research Board**	187	180	238	417	541	317
GRAND TOTAL:	4,601	4,994	5,644	6,016	7,531	8,823

NOTES: The data are given in thousands of dollars.
*Projections based on first ten (10) months actual expenditures
**Includes computer allocation
[1]Projections based on first nine (9) months actual expenditures
[2]$333,000 of increase over 1978-79 represents major awards for VAX computer purchase and Regional Instrumentation Facilities Grant

VII. Alumni Affairs*

A. Activities

The annual Alumni Newsletter was sent to about 7,000 alumni and friends. This has brought a good response in letters from the recipients and in gifts to the School.

Contributions by alumni and others to the various funds of the School in the U of I Foundation during the past year and the current balances in these funds are shown below:

Fund	Contributions	Balance
Illini Chemists Fund	$ 1,860	$ 900
Roger Adams Fund	37,170	187,730
C. S. Marvel Fund	11,930	29,590
John & Florence Bailar Fund	4,210	27,540
R. C. Fuson Fund	9,240	56,740
L. F. Audrieth Fund	470	1,890
W. H. Rodebush Fund	1,360	13,130
Totals	$66,240	$317,520

A luncheon for Illini Chemists was held at the 1980 Fall meeting of the ACS in Las Vegas, and a social hour (with "free" drinks and hors d'oeuvres) at the 1981 Spring meeting in Atlanta. Both were well attended and highly successful.

It is noteworthy that several friends of chemistry at Illinois are setting up the Chemistry Trust Fund of Urbana. Restrictions on the use of funds in the U of I Foundation have increased considerably in recent years, and on several occasions it would have been helpful to have funds subject only to the IRS limitations on use. It appears that such a fund can be built up at the rate of about $10,000/year for a few years.

B. Awards

The following awards and other professional recognitions to our alumni and former faculty have come to our attention:

Arnold O. Beckman (BS, 1922; MS, 1923), founder and board chairman of Beckman Instruments, has received the ISCO Award sponsored by Instrument Specialties Co. of Lincoln, Nebraska. This award is given for outstanding contributions to biochemical instrumentation.

Irving S. Benglesdorf (BS, 1943), contributing science columnist for the Los Angeles Herald Examiner, received the annual Award for Service Through Chemistry of the Orange County ACS Section.

The Northeastern Section of the American Society has presented the James Flack Norris Award for Outstanding Achievement in the Teaching of Chemistry to Robert C. Brasted (PhD, 1942). Brasted is Director of the General Chemistry Program at the University of Minnesota, where he has been a member of the staff for thirty-four years. He was also awarded the Minnesota Award of the Minnesota Section.

*Taken largely from report of J. C. Bailar, chairman of the Alumni Affairs Committee.

Daryle H. Busch (PhD, 1954) of the Chemistry Department at the Ohio State University was a recipient of a University Distinguished Research Award for 1981 from OSU.

Former students of Herbert E. Carter (AM, 1931; PhD, 1934; staff 1932-71), head of the department of biochemistry at the University of Arizona, gathered there on September 25-26, 1980 for a symposium on "Antibiotics and Lipids" on the occasion of his 70th birthday.

David H. Chadwick (PhD, 1946), was voted "citizen of the year" by the Jaycees in New Martinsville, West Virginia. Dr. Chadwick is in the research department of the Mobay Chemical Company.

Alfred Clark (PhD, 1935), a retired employee of Phillips Petroleum Company, has been awarded the 1981 Oklahoma Chemist Award of the American Chemical Society for his outstanding contributions to the field of chemical catalysis.

Minor J. Coon (PhD, 1946), professor and chairman of the Department of Biological Chemistry at the University of Michigan, has received the Bernard B. Brodie Award in Drug Metabolism from the American Society of Pharmacology and Experimental Therapeutics. The award, which includes a medal and an honorarium of $2,000, recognizes Dr. Coon's studies on the isolation, characterization, and mechanism of action of liver enzymes which metabolize drugs, anesthetics, insecticides, carcinogens, and other environmental chemicals.

Marcetta York Darensbourg (PhD, 1967), now professor of chemistry at Tulane University has been named the recipient of the 1981 Agnes Fay Morgan Research Award given by the national Iota Sigma Pi Chemistry Honor Society. The award is presented only once every three years to a young woman chemist (under 40 years of age) for outstanding research achievement. Dr. Darensbourgh was recognized for her contributions to the field of inorganic and organometallic chemistry.

Willard H. Harrison (PhD, 1964), chairman of the chemistry department at the University of Virginia, has been presented a distinguished service award by the American Chemical Society, Virginia section.

Allan S. Hay (PhD, 1955), research and development manager for chemical science and engineering at the General Electric Research and Development Center in Schenectady has been named a Fellow of the Royal Society of London.

John S. Huizenga (PhD, 1949), Tracy H. Harris Professor of Chemistry and Physics at the University of Rochester, has been elected to fellowship in the American Association for the Advancement of Science.

William B. Krantz (BS, Chem Eng, 1962) of the Department of Chemical Engineering at the University of Colorado recently received the following awards: The 1980 George Westinghouse Award of the American Society for Engineering Education given to the outstanding engineering educator in the U.S. under the age of 45; a Fulbright-Hays Senior Research Fellowship for Advanced Study at Aachen Technical University in West Germany during the 1981-82 academic year; a Faculty Fellowship from the Council on Research and Creative Work of the University of Colorado for research on underground coal gasification to be conducted in West Germany during 1981-82.

Joseph Larner (MS, 1949) of the Pharmacology Department at the University of Virginia was presented the David Rumbaugh Scientific Award by the Juvenile Diabetes Foundation. The award recognized his work leading to the discovery of the second messenger of insulin which may explain the action of insulin in cells.

The fourth biennial Carl S. Marvel (MA, 1961; PhD, 1920; staff, 1920-61) Sympoisum was held at the University of Arizona in Tucson on March 16 and 17, 1981. The title of the Symposium was "Molecular Aspects of Catalysis and Metal-Assisted Chemistry." The University of Illinois was well represented among the list of speakers which included George W. Parshall (PhD, 1954), John K. Stille (PhD, 1957), and John Shapley (staff). The banquet address was given by John C. Bailar, Jr. (staff).

R. W. Parry (PhD, 1946) has been elected President-Elect of the American Chemical Society for 1981. He will automatically be elevated to the Presidency on January 1, 1982. William F. Bailey (PhD, 1933) has been elected Chairman of the Board of Directors for 1981. Clayton Callis (PhD, 1948) and Paul V. Smith (PhD, 1945) are also members of the Board. Rodney N. Hader (BS, Chem Eng, 1944), who has been Secretary of the Society for some years, has assumed the additional responsibility of Chief Operating Officer for ACS Washington operations.

E. G. Perkins (BS, Chem, 1956) has been elected president of the American Oil Chemists Society for 1981-82. Dr. Perkins is a professor of food chemistry and environmental toxicology at the University of Illinois-Urbana.

Lester J. Reed (PhD, 1946), Director of the Clayton Foundation Biochemical Institute at the University of Texas was elected to membership in the American Academy of Arts and Sciences.

Richard S. Schreiber (PhD, 1935) was a recipient of the Alumni Award of Merit from Wabash College in 1981. Dr. Schreiber is a retired vice-president from the Upjohn Company.

Bassam Shakashiri (post-doc, 1967; staff, 1968-70), now Coordinator of the General Chemistry Program at the University of Wisconsin (Madison) has been given the Kiekhofer Award for excellence in teaching at that University. The award is accompanied by a cash gift of one thousand dollars.

Phillip A. Sharp (PhD, 1969), professor of biology at MIT received the 1980 Eli Lilly Award in Biological Chemistry. The $2,000 award is given annually by the ACS to a scientist under 36 who has accomplished outstanding research in biological chemistry, with emphasis on independence of thought and originality.

Two of the four speakers at the AIChE Chemical Pioneers Program in May, 1981 were alumni of the School -- John H. Sinfelt (PhD, Chem Eng, 1954), Senior Research Advisor at Exxon; and Quentin F. Soper (PhD, 1943), Research Advisor for Eli Lilly and Co. They spoke on "Bimetallic Cluster Catalysts" and "A Billion Dollar Herbicide," respectively.

Quentin F. Soper (PhD, 1943) has received the John Scott Medal Award for his discovery of the dinitroaniline herbicides. The award consists of a citation, a medal, and $4,000. Soper is Research Advisor for Eli Lilly & Co. The best known of the dinitroanilines is Treflan, which kills weeds as they germinate, and is used on a wide variety of crops. A Scottish chemist, John Scott, established this award in 1816 to honor inventors for their contributions to society. Previous winners include Marie Curie, Frederick G. Banting, Orville Wright, Thomas A. Edison, Guglielmo Marconi, Sir Alexander Fleming and R. Buckminster Fuller.

Morgan Sparks (PhD, 1943), president of the Sandia Corporation, was selected to give the annual Frank Bromilow Lecture at New Mexico State University.

George R. Tilton (BS, 1947), professor of geological sciences at the University of California-Santa Barbara, was selected as the faculty research lecturer for 1981 at UCSB.

Klaus Timmerhaus (BS, 1948; MS, 1949; PhD, 1952), Professor of Chemical Engineering and Associate Dean of the College of Engineering and Applied Science at the University of Colorado, is one of the five faculty members at that institution to be chosen by the alumni to receive the Sterns Award. This Award is given to faculty and staff members for outstanding service, either in teaching, work with students, significant research, service to the University, or off-campus public service. Timmerhaus was cited especially for directing the growth of engineering graduate programs.

John F. Welch, Jr. (PhD, Chem Eng, 1960) became chief executive officer of General Electric Company, the youngest ever and only the eighth person to hold that post in the firm's 102-year history.

C. Deaths

We are saddened to report the deaths of the following alumni and staff:

Willis H. Flygare, professor of physical chemistry, died May 18, 1981 at the age of 44. A member of the National Academy of Science, he had just recently received the Langmuir Prize in Chemical Physics in recognition of his outstanding work in molecular structure. He was well known for his enthusiastic teaching both in the classroom and in working with thesis students. The W. H. Flygare Memorial Fund has been established at the University of Illinois Foundation in his memory.

William Albert Noyes, Jr. (Hon. ScD, 1964), died on November 25, 1980. He was eighty-two years old. Noyes was the eldest son of Professor W. A. Noyes, who headed the Chemistry Department at the University of Illinois from 1907 to 1926, and for whom one of the chemistry buildings is named. The younger Noyes took his bachelor's degree at Grinnell College in 1919, and his doctor's degree at the University of Paris in 1920. He had also studied at the University of California (Berkeley) and the University of Geneva. His long career included professorships at Brown University, the University of Rochester and the University of Texas. Noyes was an early worker in photochemistry and published widely in that field. He was also editor of Chemical Reviews (1939-49), Journal of the American Chemical Society (1950-62) and Journal of Physical Chemistry (1952-64). He was President of the American Chemical Society in 1947 and of the International Union of Pure and Applied Chemistry from 1959-63. He won many awards for his research and his service to government.

Frederick G. Straub (BS, Chem Eng, 1920), a member of the staff in Chemical Engineering from 1924 until his retirement in 1963, died on November 13, 1980 in Honolulu. Professor Straub's chief research interest was in the embrittlement of steel in boilers, an area to which he made great contributions.