

DEPARTMENT OF CHEMISTRY
CORNELL UNIVERSITY
ITHACA, NEW YORK 14850

NEWSLETTER

Issue No. 2

August 1968

The response to the first issue of the Chemistry Department Newsletter was extremely gratifying and well worth the effort put into it. As promised, the Newsletter will come out twice a year, each issue about a month before the national American Chemical Society meetings. A number of "lost" names turned up as a result of the first issue and also some very interesting letters, parts of which have led to stories in Lauby's Recollections column. It even generated visits by some of you. I hope all of this keeps up; we'd like to hear from and see more of you. Another result of the first Newsletter was the tremendous attendance at the Cornell Social Hour at the San Francisco meeting. While other social hours have been well attended, the one in San Francisco was pleasantly crowded. It made for renewal of many old friendships and the making of some new ones. We're hoping for an even bigger and better one at the Atlantic City meeting. There the Cornell Social Hour is scheduled for 5:30, Tuesday afternoon, September 10, in the Diamond Jim Brady Room of the Shelburne Hotel.

The plans for Baker renovation are moving rapidly. The renovation has gone out for bid and bids are due back at about the time this Newsletter will be mailed. The contract should be signed shortly thereafter. The actual renovation will start in late August or very early September. Financing of the project is a large task but so far we have been fairly successful in raising the funds necessary. While we have not raised the entire amount, enough has been pledged to allow us to start the project. We are seeking broad support from the chemical industry and people associated with it, and so far their response has been generous.

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Summer at Cornell — a great time of year! It is truly a pleasant time in the Department because it is one of the periods of peak activity and yet it is a period when deadlines are not the reason for the activity. Instead, the activity stems from the fact that all the graduate students are in residence and are busily working at their research without the interruptions caused by course work and teaching assistant duties. This makes for an ideal situation of professor and his students working together, learning together, and sharing the excitement of research and instruction.

However, summer does not find us a completely graduate department. The summer session is in full swing with students studying full-time a year's work in either General Chemistry or Organic Chemistry. The esprit de corps of the summer students is different from that of the academic year students. This stems partly from the full-time study of only a single course, and partly from the composition of the classes. For example, the General Chemistry course is made up of a majority of high school students who have been specially selected as being outstanding in science. These are students who, by being treated to a college course while still in high school, take full advantage of the special opportunity which is theirs. In addition, we have a number of our undergraduate chemistry majors who are spending the summer doing special research problems. For these students it is a chance to get to put into practice the chemistry they have been learning in their courses during the year. Finally, there are a number of high school teachers, sponsored by the Shell Oil Company, who are working on laboratory experiments and demonstrations to be used in their classroom teaching. They serve as one more ingredient to making the summer a time of really worthwhile activity in chemistry at Cornell.

Summer also provides a time for faculty members to take stock of their academic year teaching assignments and of the chemistry curriculum in general. Thus a frequent topic of luncheon conversation and of formal faculty meetings during the summer is the undergraduate curriculum in chemistry. Hardly a year goes by without our making at least one change in the undergraduate curriculum. Such changes are dictated by at least two major sources of pressure. The first is the growth of the subject. The present rate of growth

of the chemical literature as reflected in Chemical Abstracts is a doubling every six years. As a result, we are having to introduce into the undergraduate curriculum large amounts of material previously reserved for graduate courses. The problem comes not in introducing the new material but in deciding whether any of the old material is expendable. Our second problem is an attempt to anticipate the future of our subject. The students we are training today will be the practicing chemists of the next generation. What will chemistry be like then?

It seems safe to assume that there will be two major changes. In the first place, I would guess that the basic goal of much research will shift from structure determination to an understanding of the dynamics of chemical change. It will no longer be sufficient to describe the molecular and electronic structure of reactants and products in their ground states. Instead, we will demand an understanding of the entire course of a chemical reaction in the region between reactants and products. The second change I would predict is that increasing numbers of chemists are going to be interested in the chemical basis of biological processes. This will be true not only in academic research but also in industrial research. We are not yet at the point where biochemicals are on an equal par with organic chemicals and inorganic chemicals, but that day is not far off. Meanwhile, our faculty is seriously debating curriculum changes allowing students to elect courses which will expose them to the chemical basis of biology, prior to deciding on their ultimate field of chemistry. These two problems plus the general concern of how we can do an ever better job of teaching chemistry in the laboratory will no doubt continue to occupy much of our thinking during the summer months.

Throughout all of this, you might have wondered whether any of us take vacations in the summer. I think it's fair to say that vacations are looked on as necessary only to fulfill family obligations. After all, Ithaca is itself an ideal spot for summer vacations, so that most of us ask "why leave"? In this regard, we hope that Ithaca will figure on your vacation itinerary and hope that we can count on your stopping by the Department to renew old acquaintances and see how we're doing.

The renovation, while it has been something that everyone has been looking forward to and anticipating, does present some problems. These problems boil down to one thing — lack of space. With the exception of the already renovated area in the basement and the teaching laboratories, all of Baker must be evacuated for the renovation. This means that about half of the Chemistry research program must be moved into the new Chemistry Research Building and all the recitations and lectures must be moved to other buildings around campus. This has necessitated quite a bit of squeezing-in and slight crowding as far as research groups go, with some of our groups now located in Clark Hall and Rockefeller Hall. Some of our recitations are being carried out in places such as Plant Science, various Engineering buildings and even in the new Noyes Student Center, located on Stewart Avenue! While this causes some hardships, the educational process will go on. Most people are being very cooperative and adopting the attitude of "grin and bear it". The reasonable estimates for completion of Baker renovation are approximately 18 months, which means that around Spring of 1970 we should be fully occupying Baker Laboratory again with only the renovation of the teaching labs to go.

One of the most talked about subjects in the Department besides Baker renovation is the draft and how it will affect the Department. From a strictly departmental point of view, loss of graduate students will have a serious effect on two main areas. One is the research productivity of the Department. The bulk of the research in this Department is done by graduate students and reduction in the number of graduate students will mean a concomitant drop in productivity. The other area is teaching. Most of the undergraduate laboratories and some recitations are supervised by graduate students. Loss of many of our graduate students would mean that we would have to increase the size of the laboratories and recitations. This would negate all the efforts over the past number of years to decrease the number of students in the recitations and laboratories. It would also mean a less effective teaching program and probably a less well-trained chem major. Everyone is working very hard to try to minimize the effects of the draft on our programs. I'll let you know the results in our next issue.

The Debye Memorial Symposium on "Laser Scattering" was held here at Cornell on June 24-26. The Symposium was jointly sponsored by the American Chemical Society and the American Physical Society. There were about 150 attendees, many of whom were students of Professor Debye. The three days of the Symposium were filled with many excellent technical papers, with the evenings set aside for relaxation. A chicken barbecue at the Big Red Barn was a very pleasant affair. One of the highlights of the Symposium was the banquet and the keynote talk given by Art Bueche on "Lessons Learned from Peter Debye". Mrs. Peter J. W. Debye was guest of honor, as were Peter P. Debye (son of Professor Debye), and Nordulf Debye (grandson of Professor Debye). A memorial such as this was indeed a very fitting tribute to Professor Debye.

Another memorial to Professor Debye is a bust of Professor Debye which is now being cast. Professor Victor Colby of Cornell's Fine Arts Department was commissioned to do the bust and has done a truly remarkable job. The bust along with memorabilia will be located in the main lobby of Baker Laboratory after it is renovated.

Computers have become part of the scene in the Chemistry Department. Not only do a large portion of our students and faculty use the central computing facility, but we now have four small computers in the Department and have just received a grant from the National Science Foundation for an on-line computer control and display system. This system will enable many of the research groups to control experiments, changing parameters during the experiment based on data collected and analyzed by the computer. In addition, various kinds of plotters and curve resolvers are part of the system. This is a truly pioneering effort as far as chemistry departments go and one which already has gained widespread interest and recognition. Not content to rest on these laurels, we are going ahead with an even larger and more ambitious program for on-line computer control. I don't think that we are going to replace chemists by computers; I do think though that all chemists will be much more effective and productive scientists.

Lauby's* Cornell Chemical Recollections

In the Newsletter of March 1968, I invited Cornell chemists to join me in the project of collecting material dealing with the history of the Department and the Cornell Baker Lectures. The response has been heartening and my file of information and anecdotes is gradually building up. Forgive me if I don't find time to answer each of you personally. The contribution reaching furthest back in time comes from George W. Pawel, B. Chem., 1911, of Norris, Tennessee. He was at Cornell at a turning point in the Department of Chemistry, a member of the first class to receive the B. Chem. degree. He not only sent a fine two-page letter but also enclosed a copy of Volume 1, No. 2, of "The Cornell Chemist", published in April 1911 — a real bonanza. Since this publication flourished from 1911 until early in the 1930's and is the forerunner of our present Newsletter, it deserves especial mention in this column. Many of the other replies which have come in speak of it warmly. Let me relay to you some of the interesting items of this 1911 vintage.

That issue of "The Cornell Chemist" featured an article by M. J. Brown, a graduate student, entitled "About Chemistry in China". It described Brown's amazing experience teaching in China in the decade following the Boxer Rebellion of 1900, when instruction in chemistry (occidental version) was just beginning. Impressed by the high respect for learning, he predicted that by 1940 progress in science in China would have advanced so rapidly that Chinese research would be flooding the scientific world. How often scientists have underestimated politics!

The completion of the Carnegie Extension to Morse Hall to give the chemists more room is noted and the establishment of the Bachelor of Chemistry degree is described. There had been vociferous objection by the humanists in the College of Arts and Sciences of the award of the A. B. degree to students taking a chemistry curriculum with considerable emphasis on technical courses. Many, including Cornell's President Jacob Gould Schurman, advocated setting up a separate College of Chemistry. The chemistry faculty voted against this and solved the problem for the time being by planning the special Bachelor of Chemistry degree in the College of Arts and Sciences.

The Pittsburg Times-Gazette commented: "Cornell, where the co-eds are so strong, has established a new degree, Bachelor of Chemistry. But what woman, especially one of uncertain age, would care to have B. C. put after her name." Adoption of B. Chem. solved this tough problem; 102 students were enrolled for the B. Chem. in 1911, and Cornell was noted for this degree until it was replaced in the 1930's by the chemical engineering course in the College of Engineering. An A. B. major in the College of Arts and Sciences, with strong emphasis on fundamental chemistry, has allowed the Department of Chemistry to focus on a strong preparation for graduate study.

The B. Chem. course built up a closely-knit group of students, with high morale and strong loyalty to the Department. Get-togethers, song-fests, beer parties and intramural sports pulled the B. Chems. together, and student-faculty contacts were close. The Cornell Chemist played an important role in providing communication with alumni. If any of you have copies of the old "Cornell Chemist", don't discard them but send them on for our files.

George Pawel also contributed several anecdotes. One originated in Professor Chamot's lectures on Water Analysis (a course of great interest in Ithaca where there had been a very disastrous water-borne epidemic of typhoid in 1903-4). Chammy illustrated a point by telling of the farmer whose private cemetery was located on a hill, just above the family water pump. When the State Inspector pointed out the danger of the situation the farmer protested, "but it's all our own folks". Then there was the time that Professor Dennis (The King) made a lasting impression on his class when he blandly stated: "At this point the set-up seemed hazardous so, in order to avoid all danger, I permitted Mr. Anderson (his assistant) to proceed with the experiment."

*A. W. Laubengayer: a member of the B. Chem. class of 1921 and awarded the Cornell Ph. D. in 1926. Joined Cornell faculty in 1927 with successive appointments as lecturer, assistant professor; retiring as Emeritus Professor in 1966, still in residence in Baker Lab.

Many of you, I'm sure, look back to your days in the Department with fond memories. More likely than not however, memories of the large undergraduate teaching laboratories don't raise any pleasant nostalgia. We are doing two things to change this; one is the renovation of Baker Lab which will change all the teaching laboratories from the large dungeon-like rooms to small modular laboratories, housing no more than 20 students each. The other is to change the whole concept of laboratories. As you will recall, laboratories were tied very closely to the lecture course the student was taking. This often led to doing the same type of experiments a number of times, depending on which course the student was taking. Furthermore, these were relatively ineffective as a teaching tool since the student often knew what the experiment was and what was the required outcome. This is being revised into what we call a unified laboratory curriculum. There have been many discussions, both formal and informal, amongst the faculty as to the best way to do this and just recently Professor Charles F. Wilcox received a John Clark Distinguished Teaching Award which will allow him to spend full-time next Spring to designing and setting up this unified laboratory course. The chemistry majors will enroll in laboratory courses early in their Cornell career and continue right through senior research. Early in this course, the student will learn how to synthesize compounds, both inorganic and organic, learn how to purify the compounds, test for their purity, make various spectral measurements on them with interpretation of the significance of these measurements, and go on to make various other physical measurements. It is hoped that this will be more effective in that the student will have a vested interest in the compounds he makes and will better see the significance of the various experiments and measurements made with his compounds. Many universities have talked about doing this, but Cornell is unique in that it is trying to do something about the laboratory curriculum and is actually going to put this unified program into practice.

The much discussed and much written about budgetary problems of the Federal government and tightening of budgets for

support of science have proven to be more than just topic of conversation; they are real! We have already seen the effects in fewer fellowships available, in proposals for support of research programs being turned down or funded at a much lower level than requested, and even reduction in support of programs already underway. This creates great financial problems for the Department since many of our graduate students are supported by these research grants. Reduction or loss of these grants means that other ways have to be found to support these students. From some of the reports I've read and heard, it seems that many of our congressmen and senators have very little factual information on the significance of these budget reductions on the university and on "the national interest". I think the fault here lies as much with scientists as with anybody.

News of the Faculty. Professors Meinwald and Morrison are back from their sabbatics in California (Meinwald at Stanford and Morrison at the University of California at San Diego), extolling the virtues of California but also being happy to be back in Ithaca. Professor Morrison is in charge of the analytical facility here and has received notice that he will be getting the first sample of moon dust for analysis. I hope he doesn't go to too much trouble; everyone knows it's made of green cheese! (Wouldn't it be funny if it really is?) Professor Goldstein will return from his sabbatic at the ETH in Switzerland this month. Sabbatics for the coming year will again find two of our people going to California and one to Europe. Professor Gordon Hammes will take the full academic year, which he will spend at Berkeley working with Professor Kornberg. Professor Widom will be on sabbatic leave the Spring semester in England, while Professor Plane will be spending the Spring semester on sabbatic leave at Berkeley. Quite a few new faculty members are joining us this Fall. Professor Fred W. McLafferty is already here. Professor McLafferty is one of the world's leading authorities on the use of mass spectroscopy in the determination of organic structures. We are very proud to have Professor McLafferty join the Department for two reasons. One is that he is such an outstanding scientist and the other is that he is also a Cornell Ph. D. (1949). Professor McLafferty received his Ph. D. under the guidance of

Professor William T. Miller. Another newcomer who is already on the grounds is Martin Semmelhack. Professor Semmelhack is an organic chemist who is starting a research program in the area of organic electrochemistry. Three other people, who are not here yet but will be soon, are Elliot Elson, a physical chemist who will be studying nucleic acids; Robert R. Rye, also a physical chemist looking at surfaces and catalysis; and George A. Fisk, a physical chemist who works in the area of molecular beams. This is not a sudden great expansion in the size of our faculty but rather a slight increase in size and a replacement of faculty who have left.

Professor Vincent du Vigneaud received an honorary Sc. D. degree from the George Washington University last February. Professor Roald Hoffmann was a Visiting Lecturer at the University of Puerto Rico this past May. Professor Robert E. Hughes assumed the directorship of the Materials Science Center in July. He will be Director for five years and replaces Professor Henri Sack of the Physics Department. Professor Robert A. Plane received an honorary D. Sc. degree from the University of Evansville in June.

Visiting Lecturers. The fall term Baker Lecturer will be Professor Gerhard Herzberg, Director of the Division of Pure Physics of the National Research Council of Canada, will present a series of lectures on atomic and molecular spectroscopy. The spring term Lecturer will be Professor William N. Lipscomb of Harvard University, who will present a series of lectures on protein structures and functions. Professor A. R. Battersby of the University of Liverpool will be the Molecular Biology Lecturer next winter. He will talk on biosynthetic mechanisms. The Debye Lecturer will be Professor Michel Boudart of Stanford University. He will talk on his work in the area of kinetics and catalysis. We are pleased that we have such an outstanding panel of visiting lecturers for the coming year.

I think this brings you up to date on the news and happenings around the Department. I hope to see many of you this year at meetings and here at Cornell. Let me remind you again of the Cornell Social Hour at the Atlantic City American Chemical Society meeting.

Bill Gurowitz

Faculty Members

(Academic Year 1968-69)

A. C. Albrecht	M. J. Goldstein	G. H. Morrison
S. H. Bauer	W. D. Gurowitz	H. Muxfeldt
A. T. Blomquist	G. G. Hammes	R. A. Plane
J. M. Burlitch	J. L. Hoard	R. F. Porter
R. A. Caldwell	R. Hoffmann	R. R. Rye
W. D. Cooke	R. E. Hughes	H. A. Scheraga
V. du Vigneaud	E. S. Kostiner	M. F. Semmelhack
E. Elson	F. A. Long	M. J. Sienko
R. C. Fay	F. W. McLafferty	D. A. Usher
M. E. Fisher	J. Meinwald	B. Widom
G. A. Fisk	W. T. Miller	C. F. Wilcox, Jr.
J. H. Freed		

Emeritus Faculty

J. R. Johnson	M. L. Nichols
A. W. Laubengayer	J. Papish

CORNELL SOCIAL HOUR

ACS Fall Meeting

Tuesday, 10 September, 5:30 p.m.

Diamond Jim Brady Room

Shelburne Hotel

Atlantic City, New Jersey

See you there!

Department of Chemistry
CORNELL UNIVERSITY
Ithaca, New York 14850

FIRST CLASS MAIL
