The Alumni Questionnaire

The magnitude of the response to the questionnaire that appeared in the last issue of Interactions was a pleasant surprise; over 250 were returned. These are, and will be, useful to us in various ways, some of which are discussed below. The department is grateful to all who took the trouble to complete the forms. Here is a summary of the results.

The distribution of responses by year is shown in Table I. We further note that about seven percent of responses were from women, and nearly half the respondents had advanced degrees, results not inconsistent with the statistics on our recent graduates (see The Chairman's Column). The earliest class represented is 1930, in the person of Samuel F. Lybarger, who shares some of his memories with us in his article "Away Back When," appearing on page 2. The earliest class represented by an alumna is 1946, in the person of Julia Randell Weertman, Walter P. Murphy Professor and Chair of Materials Science and Engineering, Northwestern University.

What do our alumni do? The distribution of responses by employment is shown in Table II.

A reasonably random sample of those employed in academia shows that of a group of 20, three are at Pitt, two each are at Illinois, MIT and Carnegie Mellon, and one each is at Penn State, West Virginia, Dartmouth, Florida, Missouri, Toledo, Rutgers, SUNY, Purdue, Wisconsin and UCLA. (We note that the total number of alumni on our faculty is five, with a sixth holding the title of Senior Instructor.) Of a similarly random sample of 20 in industry, we find four at Westinghouse, and one each at Hughes, Pratt and Whitney, Lockheed, PPG, Bellcore, TRW, Van Dyke, Honeywell, Coopers and Librand, Oklahoma Medical Research Foundation, Warren State Hospital, McDonnell-Douglas, PSI Star Associates, L-O-F, Vertex Image Products and DX Imaging.

The categories of "Other" and "Self-Employed" in Table II include government service, military service, several in medical fields (e.g. physician, anesthesiologist, psychiatrist), clergyman, statistician, investments manager and lawyer.

Apparently, training in physics can serve as a foundation for a broad range of careers.

The answers to the questions in Part II of the questionnaire, dealing with the positives and negatives of the curriculum and the student experience, ranged widely and are hard to characterize concisely. However there were certain opinions that appeared frequently in one form or another.

There was very little discussion of the graduate program, and virtually none was negative. This doesn't mean there aren't problems. The faculty have been having frequent and lively discussions among themselves and with students the past year about needed improvements in the graduate program. There will be more about this later. The rest of this article deals with alumni comments and suggestions on the undergraduate program.

Perhaps the most obvious aspect of the responses was that those who went on to post-graduate work in physics valued different things in their education from those who did not. Virtually all those who did were well pleased with the undergraduate curriculum. Apparently, we do a good job preparing students for graduate work, as evidenced by the comments of our alumni who went on to graduate schools, including the very best, all over the country. This is not surprising; we give our undergraduates the kind of preparation we want to see in students we accept into our own graduate program. Having been involved in graduate education most or all of our adult lives, we have a good understanding of what preparation is needed.

On the other hand, since few of us on the faculty had extensive experience in industry, we are less certain of the best way to prepare students for jobs immediately after graduation. The issue is complicated by the fact (continued on page 8).
Many thanks to all of you who took the time to respond to our questionnaire in the first newsletter. We had over 250 responses and we have begun to update our files.

The homecoming weekend cocktail party was attended by over 70 people, about half of whom were alumni, and half faculty and graduate students. The earliest class represented was 1940 and the latest was 1990.

We are taking your responses seriously. Both our graduate and undergraduate curriculum committees have been discussing our offerings and your input is part of the process. See the article "The Alumni Questionnaire" for more details.

At graduation ceremonies on May 19, 10 Ph.D. degrees were awarded. They were quite a diverse group of women and men and they left us for some very exciting jobs waiting for them. Also awarded were 12 master’s degrees and 21 bachelor’s degrees. Among the graduates were six women. Two seniors, Eric Dean and Randy Smith, were awarded National Science Foundation Fellowships. Eric will attend the University of Illinois and Randy will attend the University of Wisconsin. Our graduating senior class was an especially active and interesting group of individuals. I wish them all success in their careers.

The fall of 1991 will bring to us a truly international group of incoming graduate students: USA (2), Soviet Union (1), People’s Republic of China (3), Ecuador (1), Germany (1), India (1), Switzerland (1), Yugoslavia (1).

The department saw some landmark events since I wrote to you last. Mrs. Thelma Bobb, departmental administrative assistant, retired in May. Thelma served as aide and confidante to three chairman, most faculty, and many students during her 13 years with us. She and her husband, Bob, retired in the same year. I wish Thelma well and thank her for her many years of devoted service to the department. Mike Widom’s outstanding research in condensed matter theory has been recognized through the award of an Alfred P. Sloan Foundation Fellowship. Professor Vladimir Gribov from the Landau Institute of the USSR was this year’s Buhi Visiting Lecturer. Professor Gribov and his wife spent a week with us in October, delivered three formal lectures, and was involved in numerous informal discussions. Professor Robert Sekerka, after nine years as dean of our College, has resigned that position. He joins our department this September where he is continuing his research in condensed matter theory. We welcome Bob to the department. The search for a new dean is in progress. John Frelkovich has been named Special Assistant to the President for Academic Affairs, while continuing in the post of associate department head. John’s duties are many; a major focal point is the organization of departmental Advisory Boards for the university. The Physics Department will host its Advisory Board this fall.

During the 1991/92 academic year, Professors Engler, Wolfenstein, Widom and Holman will spend time away from the department to conduct their research. Returning from sabbatical leaves in September will be Professors Griffith, Ferguson and Kissinger. Also, Professor Warren Buck from Hampden University, a nuclear theorist, will visit us for the spring 1992 semester.

You will be interested to hear that a small group of physics faculty along with a committee of engineering faculty has developed an introductory physics program for engineering students. This program is a two-semester sequence and the pilot run is in progress. The department continues to emphasize a strong three-semester program for our own majors and for those students for whom physics is a major component of their curriculum.

This year I received some letters and visits from our graduates offering help and advice. I welcome your comments and suggestions. Drop me a note or stop in when you are in Pittsburgh.

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Alumnus Samuel F. Lybarger graduated from Carnegie Tech with a bachelor of science degree in physics in 1930. He has kindly written us a few of his recollections of life as a physics student in his era.

Mr. Lybarger went on to graduate studies at Tech night school until 1936, while working for Radio Corporation. He stayed with that company, working initially as a hearing aid engineer, and eventually becoming company president. Along the way he was granted 22 patents for his inventions, and was very active in numerous acoustic, electrical and hearing aid engineering societies.

When I started school in 1926, every freshman had to wear a “dink” at all times outside the buildings, and could use only certain less convenient sidewalks and doors. The sophomores would give you a bad time if you didn’t obey their rules. Computers and electronic calculators were unknown. For precision calculations you used five-place logarithms, and for less precise ones a K & E ten-inch slide rule, good to about three significant figures.

In the first year, the curriculum was the same for all engineering and science students. In addition to math, English, chemistry, etc., students took a number of shop
courses. They were pattern, foundry, machine, forge, masonry and pipe shops, three per semester. You got a good feel for materials.

In the second and later years, the curriculum depended on the choice of course—electrical, mechanical, physics, etc. Being interested in ham radio, I originally intended to take electrical engineering, but changed to physics after the first year. Classes for physics majors were very small and frequently included math majors. We had only five physics majors in the 1930 graduating class. Most of the work of the physics department concerned giving standard physics courses to engineering students.

In the sophomore year, in addition to the usual math, physics, etc., physics students took scientific French (or German), physics colloquium, advanced chemistry and elements of electrical engineering.

In the junior year, physics students took elementary German (or French), advanced mechanics, physics colloquium, photometry and illumination, precision of measurements, applied optics, advanced heat and electrical measurements.

In the senior year, my records show that courses included vector analysis, German II, astro-physics, physics colloquium, advanced electricity and magnetism, physical arts (including glassblowing), thesis, physical chemistry, history of physics, advanced sound and waves, advanced light, pyrometry, electricity and matter and trigonometric series.

The physics faculty of 12 included six professors and six instructors, according to the 1930 "Thistle" yearbook. Of these, I remember six quite well. Professor Harry S. Hower, head of the department, had a very friendly personality and was an excellent lecturer and teacher. He was also a consultant in glass technology for Macbeth-Evans in Charleroi. Prof. Prine was an excellent, but fairly tough, teacher and gave courses to physics majors on photometry and illumination and advanced heat. In addition, Prof. Prine supervised the physics night school program, which was quite large at that time. Dr. Nathanson taught advanced courses such as electricity and magnetism and electricity and matter. Prof. Boreman's courses included astro-physics, physical arts, and advanced sound and waves. Mr. Michener and Mr. Williamson primarily taught regular physics courses. Mr. Williamson was particularly well-versed in electronics.

One of the pleasant features of being a physics major was the annual dinner party for faculty and students provided by Prof. Hower. He took us to a very good place, such as the University Club, which was an unusual treat for some of us less affluent students.

Oh, I should mention that tuition in 1926 was $90.00 a semester!
What It's Like to be a Woman in the Physics Department
by Zoa Conner, BS '81

Carnegie Mellon, like most universities, has smaller numbers of women and minorities among its students and faculty than are represented in the general population. The problem is more acute in physics than in many other fields. For example, in the class of 1991 we awarded 21 bachelor's degrees, 12 master's degrees, and 10 Ph.D.'s, of which three, two and zero, respectively, were to women, and none were to "under-represented minorities." Among our tenure-track faculty of 34, one is a woman, and none is a minority member.

To the extent this means that valuable talent is being wasted, it is a problem that demands our attention. We have, of course, no direct control of those aspects of the problem that are rooted in people's experiences during their pre-college years. There are two questions however that we need to address. Can we recruit from the under-represented groups more effectively, and can we be more successful in retaining those that we get?

As part of an attempt to understand the latter question, we asked Zoa Conner to write an article describing her experiences as a student in our department. The following article is her personal account.

Zoa is a 1991 graduate of the department who has just begun graduate work in physics at the University of Maryland. She was awarded a National Physical Science Consortium Graduate Fellowship.

It's a well documented fact that the number of well-prepared high school students has been steadily diminishing in the past few years. This has the important consequence that the number of people entering the sciences will decrease drastically in the next few years. Given the need our society has for scientists and technologically oriented people, we can ill afford this shortfall.

Traditionally, women have been severely under-represented in the sciences. If you look at the relative participation of men and women at different points in the physics educational pipeline (see bar graph), you will see the disproportionate attrition of women in physics. Women make up 52 percent of the population of the U.S. and yet receive only 15 percent of the physics bachelor's degrees awarded annually. At higher educational levels, the numbers become smaller still, with only 10 percent of physics Ph.D.'s going to women, and only two percent of the physics faculty being female.

Why are there so few women in physics? The number of women in other sciences indicates that it is certainly not for lack of scientific ability; as an example, in chemistry, 25 percent of the Ph.D.'s awarded go to women. Nor can these small numbers be blamed on lack of career commitment. The large numbers of women in the medical and law professions attest to that. To what, then, can we attribute this marked difference between men and women in physics? There must be some other difference that affects women so much that they decide either not to enter the field at all, or to leave it at some point. I believe that this "other difference" is that the environment women in physics must live and work in is currently less hospitable to them than to men.

Given our need for more scientists in the near future, I feel it's important to examine the way in which our physics department treats its female students. We can begin to understand the situation facing women in the department by considering the following statistics. In the past three years a total of 75 students have graduated from Carnegie Mellon with bachelor's degrees in physics. Only seven of these students (9.3 percent) have been women. In this same period, only two out of 24 Ph.D.'s (8.3 percent) were awarded to women. Carnegie Mellon has 34 physics faculty members; only one faculty member is a woman. These percentages are equal to or below the national averages (see bar graph). One immediate consequence is that there are few role models for women in the department.

Because of the different environment, a woman in physics has a different educational experience than her male counterparts. One of the environmental factors that is different for women than for men is the feeling of being part of a community. Situations such as the ones listed below have occurred to female students in the department and have had the effect of leaving the women involved feeling uncomfortable and estranged from the Carnegie Mellon physics community:

- Professor A calls women colleagues by their first names and men colleagues by their last names.

- A woman student wears a skirt (instead of pants) to a lab class. A male student asks her if he can "feel her soft legs."

- Professor B remarks that many physics alumni will be returning during homecoming; they will be bringing their wives.

- A woman student addresses questions to Professor C. Professor C does not look at the student while she asks her questions. Professor C's responses are slow and do not address the
posed questions. Occasionally Professor C will say "It's not important" instead of answering her question. A man student addresses questions to Professor C. Professor C makes eye contact with the male student while he asks his questions. Professor C's responses are immediate and fully answer the posed questions.

- A woman is consistently interrupted or cut off by her classmates and her professors. A man is rarely interrupted or cut off.

- Professor E consistently uses example problems in lecture that have only male subjects. Professor E consistently uses "he" and "his" as the generic pronouns during lectures.

The types of situations described above make the women in this department very angry. They make most of us feel that we don't matter as much as men do. The women students do not feel they are always taken seriously and often feel unimportant, inadequate, out of place and invisible.

The women undergraduates currently in our physics department are very intelligent. We have an average GPA of 3.0 for the 89-90 school year. But if you talk to most of us for very long, you will notice that we are not as confident in our abilities to be physicists as our male counterparts. Part of this lack of self confidence comes from ourselves. However, the environment we are in, especially the way we are treated by our professors and colleagues also accounts for a good deal of this feeling.

We are sometimes not treated as serious physics students. We frequently get the impression that it is assumed we will not pursue a graduate degree since we should be getting married. It appears that if a woman decides to pursue a graduate degree, it is assumed that it is partially because she is not involved in a relationship. At Carnegie Mellon, it is sometimes thought that you can be either a woman or a physics major, but not both. I was once informed by another Carnegie Mellon science student that I could not be a physics major because I did not have a beard. I offered to go buy one.

Women's problems and personal situations are often trivialized; I am often asked: "that's such a small thing, how can it bother you?" The seemingly small instances are what this article is about. Each small event in itself probably won't affect someone much. But when 10 or 20 or 50 small events are compounded the effect is huge. The big picture needs to be viewed.

I am not saying that everyone puts women into the types of situations that are listed above. The different treatment of women is not necessarily done on purpose. Furthermore, the people doing it may not even be aware of the effect of their actions. But even the most sensitive man cannot understand the way a woman feels about these types of issues. He can still, without realizing it, make offhand remarks that hurt a woman.

On the positive side, the department has taken steps to try to increase the awareness of these problems. We participated in the most visible event on campus for women in science; the Symposium on Women in Science held on September 18, 1990. The guest speaker was condensed-matter physicist Dr. Judith Franz. There was also an interesting panel discussion in which two physicists participated; department head Dr. Robert Kraemer, and physics graduate student Francesca Crannell. Kraemer also arranged for the senior undergraduate women and the women graduate students to have lunch with Franz before her talk. Another important event was the hiring of the first woman tenure-track faculty member to the department last year: Dr. Sara Majetich. A third thing that the department has done was to send Majetich to a conference on the Recruitment and Retention of Women in Physics in Washington, D.C.

Many things can be done to help the women in physics feel more included. One big positive thing that can help women physics students is (continued on page 8)
High Performance Computing
by Michael J. Levine

Physics, like most other fields, is becoming increasingly dependent on computers. As computers become more powerful, we find that correspondingly more difficult problems are amenable to understanding. The pressures to push the boundaries of knowledge as far as possible lead to parallel pressures for more powerful computers and algorithms. These pressures in turn have led to the development of a whole new sub-field of science: computational science.

Michael J. Levine, professor of physics on our faculty, is one of the world leaders in computational physics. Mike earned his B.S. in 1958 at the University of Illinois, and his Ph.D. in 1963 at the California Institute of Technology, both in physics. His research involves the invention and use of computer-oriented numerical, algebraic and hardware techniques applied to problems in physics. His current area of application is in Quantum Electrodynamics, in particular, high-order corrections to the anomalous magnetic moment of the electron.

Along with Ralph Roskies, professor of physics at the University of Pittsburgh, Mike is co-director of the Pittsburgh Supercomputing Center, one of four such centers supported by the National Science Foundation.

Physics has always depended upon computation as a bridge between observable reality and abstract theory. When the observations are those of a carefully conceived and executed experiment and the theory is comparatively explicit and amenable to analysis, the requisite computations may yield to "pencil and the back of an envelope." Such is the case with a ball rolling down an artfully fretted inclined plane. On the other hand, when the observations are those of natural phenomena, the requisite body of theory quickly grows to encompass all that we know and the computational bridge may require the most powerful computers currently available even for simple limiting cases.

In fact, at a basic theoretical level we know quite a lot. Our theories of phenomena lying in scale between the structure of subatomic particles and the structure of the universe may well be able to describe the wealth of phenomena which we observe in our everyday lives and upon which we depend in commerce and industry. From the forces which shape huge, complex molecules and literally "give them life," through the design of mechanical and electronic contrivances which can shelter, convey and nurture us, to global atmospheric and oceanographic phenomena, we appear to be limited in our power to understand, predict and create or control largely by our computational capabilities.

In this country, most basic and much applied research is done in universities. Approximately five years ago, the National Science Foundation in cooperation with state governments, industry and universities, funded the creation of a handful of "supercomputing centers" to provide the best possible computational resources for academic and industrial researchers, to train and support the users of those re-

sources and to work to advance the state-of-the-art in computational science. Carnegie Mellon University, the University of Pittsburgh and Westinghouse Electric Corporation have cooperated on one of those centers: the Pittsburgh Supercomputing Center (PSC).

Researchers using the PSC come not only from Carnegie Mellon but from universities and corporations across the nation. Their work covers all fields from physics, chemistry and biology to political science and economics. Because of the PSC, dozens of researchers and students at Carnegie Mellon have been able to pursue activities which would otherwise not have been feasible. Because of the PSC, we have improved our understanding in particle and in statistical physics, we are better able to control air pollution, and we provide a better education to our graduate and undergraduate students.

Ralph Roskies, a colleague in particle physics at the University of Pittsburgh, Jim Kasdorf, a trained scientist and experienced manager of high performance computing facilities at Westinghouse, and I have worked together over the past six years to create the PSC so that Pittsburgh can benefit from this superlative research and teaching tool.

We continue to provide vector supercomputing resources on our CRAY YMP while expanding into massively parallel computing with a powerful Connection Machine, CM-2, and rounding out the environment with leading edge networking, file storage and visualization facilities all supported by a staff of approximately 70 people. Through collaboration with colleagues in the Colleges of Science and of Engineering, as well as in the School of Computer Science, we work to create new capabilities and to drive forward Computational Science within the Physics Department and across the university.
CITCOM Clan Member

Congratulations on Interactions
Since I just read "Coming of Age in the Universe," I particularly appreciated Professor Holman's article. (I liked R.T. Schumacher's acoustics story too, it's just that cosmology is so attractively WEIRD, and I can almost understand aperiodicities in musical instruments.)

As a commuter by bicycle or the old 67 Swissville, Rankin and Braddock trolley I missed the value of living on campus. (In those days we commuters had a group we called the CITCOM CLAN.) I met my wife (of 48 years now) on the trolley via physics, when I offered to help her with an optics problem. This was a very productive meeting; we eventually generated a nurse, a dancer and an electrical engineer.

I represent probably the smallest graduating class in Physics Department history — two of us in 1942. I'd like to find out about the other half of that class, Norman Painter, who seems to have vanished.

Frank C. Alexander, Jr. BS '42

Teaching Physics

I appreciated the invitation to the Physics Reception at Homecoming and the opportunity to meet you and speak with you. As we discussed, I will try to write down my thoughts on the education of terminal bachelors in physics. I approach this issue from two directions, from my own personal experience, in the sense that I used almost exclusively my undergraduate education in my field of endeavor (despite earning a Ph.D.), and from the point of view of interviewing and recommending for hire B.S. physicists. Egos being what they are, these two approaches are virtually identical in conclusions.

The most important ability for a physicist in a federal or industrial research laboratory not doing physics research is the ability to think. This individual is not doing physics research (he may not have a Ph.D.), but supporting engineering R&D. He is in a position to be very important because engineering graduates tend to stay close to what they have learned is possible. They also sometimes ignore basic principles of physics (e.g. the second law of thermodynamics). A physicist with a B.S. should understand (not necessarily do) what mechanical, thermal and electrical engineers do. If the facility's business is another science (e.g. JPL and planetary science), the physicist should understand the principles of most of the instruments of that science and be able to communicate with his colleagues working as researchers in that field.

To repeat, the goal of the curriculum must be to train the B.S. physicist to think in a creative way in applying physics principles to engineering and other science situations. I don't think that this could hurt the others. I found the curriculum satisfactory in this regard.

If improvements are attempted, please resist the temptation to teach applications because this is not creative and because the selected applications will seldom be the ones needed. B.S. physicists will work in various fields and businesses. This is a problem with engineering curricula not to be emulated! Two suggestions are:

In the early lab courses, where the results don't typically match textbook theory (of course), instead of just letting the students worry about it, employ the "discrepancies" as the important part of the course (i.e. the study, analysis and understanding of them). This is the situation in the "real world" where the physicist will work.

In the higher level courses, some introduction to problems that cannot be solved should be provided, not just neat textbook problems. These problems don't have to be applications, basic physics may even be more interesting. The thrust here is to find valid approximations and/or limits (in the strict mathematical sense).

I hope that these thoughts are of some help. You are to be commended for seeking this sort of input. My last suggestion is that you specifically target B.S. physicists who have been working for about five years, long enough to have recognized and coped with deficiencies in their education, soon enough to remember them.

Jack Barendoltz PhD '65
that the range of jobs in industry available to our graduates is vast, and the typical student has no idea what job skills will be most important to him or her. Compared to preparing students for graduate school, the problem is less sharply defined, and therefore more difficult. It is not surprising, then, to find that most of the suggestions for changes in the curriculum came from the roughly 50 percent of alumni who did not undertake graduate studies, and that some were mutually contradictory.

Probably the most commonly voiced need was for a greater emphasis on practical courses; that is, courses more directly useful in the alumnus's work. A frequently expressed wish was to have had more emphasis on applied, or classical physics, as opposed to, for example, quantum theory (which is not often used by physicists in industry). The specifics varied depending on the nature of the respondent's work, but some of the areas where greater emphasis was desired were classical mechanics, electromagnetic theory, optics, plasma physics (where we currently have no offering), fluid dynamics and applied math.

There were also relatively frequent mentions of certain courses outside of physics that, in retrospect, some alumni wished they had taken. One such area is economics and marketing. Another is statistics, in particular the statistics of sampling and quality control, and of experimental data analysis. Also of interest were computer-related courses, such as software design.

Many alumni clearly feel that it would have been valuable to have had more and/or better laboratory experience, including opportunities to work with faculty or in industry on "real research." A common complaint was that the undergraduate laboratory facilities are badly in need of upgrading.

Finally, a number of people felt that more attention needs to be paid to improving students' communication skills, both speaking and writing.

What did alumni see as the most valuable aspects of the curriculum? The single most appreciated factor seems to be the concentration on teaching how to solve problems, and doing so with mathematical and scientific rigor. Coming in a close second is the breadth of the physics curriculum. Also, many of you liked the fact that our courses provide a solid grounding in the fundamentals. A source of some gratification to us is that many of you feel we did a good job in teaching you how to learn, a skill that is clearly of long-term value.

It is interesting that even many of those who ended up entirely outside of science or engineering (e.g., in medicine, law, business and even the ministry) feel that their background in physics was valuable.

Questionnaire responses included comments about non-curricular issues as well. Two appeared repeatedly: the advising system should be improved, and there should be increased opportunity for student-faculty interaction on a social level. The two are not unrelated; students who feel comfortable in the company of faculty are more likely to take advantage of their advisory function. More generally, closer student-faculty relations are bound to enhance the educational process in many ways.

Indeed, the responses make clear that the quality of a student's interactions with faculty often played the dominant role in shaping the student's perceptions, positive or negative, of his or her undergraduate experience. Virtually all alumni who reported negative reactions cited unhappy experiences with one or two faculty members. We are pleased to report that all but a very few had little or nothing negative to say about their experience here. (We realize that this is misleading. It is likely that the most disgruntled alumni didn't bother to return their questionnaires. If you are one of those, we urge you to write to tell us why. Your efforts will help us provide a better experience for our present and future students.)

Your responses to our questionnaire have increased our understanding of the problems that we need to work on. Our undergraduate and graduate curriculum committees are hard at work on them this year. In non-curricular matters, our top priorities are to improve the advising system, and to find ways to foster student-faculty interaction. In the curriculum, we are working on revamping the laboratory sequence, including improving the coherence among the several laboratory courses, and placing greater emphasis on the quality of written and oral reports. We are also looking for ways to increase the number of opportunities for undergraduates to participate in "real research" alongside practicing physicists. Other improvements are also being considered; further progress will be reported in the next issue of Interactions.

We are eager to be able to talk with you about our plans and progress. To facilitate discussion, we are arranging an opportunity for you to participate in our planning at our second annual physics alumni reception. See the article at right titled "Physics Alumni Reception."

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**Woman (continued from page 5)**

individual encouragement from the faculty. Having a professor ask "how are you doing?" or "what kinds of problems are you having?" means a lot. It shows the woman that someone knows she exists and that she matters. Women are much more sensitive than men to feedback, be it positive or negative. Often-times, the sorts of things that upset and frustrate women are not even noticed by our male colleagues.

The women in the physics department want to sensitize all physicists and future physicists to the way we feel. We expect to be treated equally and to be given the same opportunities as our male counterparts. The women in this department expect to be given the respect we deserve as physicists. We have earned it.

I would like to invite further discussion on the topic of women in physics. If you have any advice (especially alumni), please tell us in future newsletters. If you have questions or comments, please contact me through the newsletter or the physics department.
Physics Alumni Reception

In the last issue of Interactions, the Physics Department invited all its alumni to a cocktail reception held during homecoming. The event drew over 70 people, about half of whom were alumni and alumni spouses, and the rest, faculty and spouses. The photographs on this page show some of those who attended.

Those of us who were there spent a very relaxed, enjoyable evening renewing old friendships and starting new ones. So much so that we've decided to make it an annual event. This year's reception will be held on Friday, October 4 from 5:30 to 7 p.m. in the faculty dining room, Skibo. We hope you can come. If so, please fill out and mail the enclosed response form.

For those who can come a little early the same afternoon, we hope you will participate in a faculty-student-alumni discussion of the undergraduate curriculum and related issues. We know from the responses to last year's Physics Alumni Questionnaire that many of you are interested in the subject and have useful ideas to contribute, and we feel this would be an effective way for you to aid in the process of curricular revision. The curriculum discussion will take place in Wean Hall 7500 from 3:30 to 4:30 p.m.

Finally, the department will hold an open house the same afternoon from 1:30 to 3:30 p.m. Come to the Physics Department office (Wean Hall 7325) any time during that period for refreshments, to tour the departmental facilities, to re-establish contact with some of your old teachers, to meet new faculty, or just to chat.

The department faculty most cordially invites you to participate in any or all of the above events. Please come!

The scene at the social hour for faculty and alumni at the College Club on October 5, 1990.

Department Head Bob Kraemer and Professor Emeritus Sergio DeBenedetti chat with Arthur Nelkin (BS '40) and his wife Irene.
Help Wanted

In the article "Away Back When," Samuel Lybarger tells us a little of what it was like to be a student here in the 1920s. He also generously sent a copy of a photograph of the physics faculty at that time. There is one person in the photo that Mr. Lybarger could not identify, nor could any member of the faculty. Is there anyone who can tell us who the mystery man is? We would like to complete the identification for our archives.

Does anyone else have photographs or documents that might be of historical interest to the department?

In the letters column, we learn that Frank Alexander has lost track of "the other half" of the almost infinitesimal class of 1942. If you know anything about the missing Norman Painter, please tell us, and we'll pass the word along.

In her article, Zoa Conner recounts her experiences as a student in this department. How typical is her account? Have things changed over the years? If so, how? Like Zoa, we'd like to hear from more of our alumnae on this issue.

As you know, the tuition at Carnegie Mellon is pretty high, and some of our students struggle to raise the necessary funds. Indeed, last year one of our very good students was seriously concerned that he might have to drop out because his prospects for a summer job seemed poor. Fortunately, we were able to help him find a suitable job, but some are not so lucky. Come February, March and April, look around in your company; if there is a summer job available that could be filled by one of our students, tell us about it. We'll try to find one with the necessary qualifications. Of course, at around the same time, our current seniors will be looking for permanent jobs. If you are looking to hire a really well-educated physicist, we have a good supply.