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ABSTRACT

These proceedings are based on edited transcripts of a meeting of representatives from the Society for Technical Communication, the National Science Foundation, the Argonne Center for Educational Affairs, 15 universities, and two community colleges, 9-11 April 1975. In panels and conferences, the participants discussed fund raising, the relationship of the Society for Technical Communication to academic technical communication programs, communication theory, articulation between four-year and two-year programs, student recruitment, and the role of speech in technical communication programs. At the close of the meeting, the participants decided to form an association devoted to the nurture and support of technical communication programs. (Author/AA)

CONFERENCE OF REPRESENTATIVES OF TECHNICAL COMMUNICATION PROGRAMS

PROCEEDINGS

Edited by

Thomas E. Pearsall
University of Minnesota

April 9-11, 1975
Boston University
Boston, Massachusetts

TABLE OF CONTENTS

Thomas E. Pearsall

INTRODUCTION

On 9-11 April 1975, representatives from the Society for Technical Communication, the National Science Foundation, the Argonne Center for Educational Affairs, 15 universities, and 2 community colleges met at Boston University for an information exchange about college technical communication programs. This Boston meeting was an outgrowth of a 1974 meeting held at the University of Minnesota. At Boston, in panels and conferences, the participants discussed fund raising, STC's relationship to academic technical communication programs, communication theory, articulation between 4-year and 2-year programs, student recruitment, and the role of speech in technical communication programs.

Some of the contributions of the panelists became fairly lengthy contributions that were taped and subsequently transcribed. The transcriptions were sent to the panelists for editing. Some of the sense of immediacy and the pungency have been lost in the editing, but coherence has been gained. These edited transcripts form these proceedings.

At the close of the meeting the participants decided to form an association devoted to the nurture and support of technical communication programs. Dues ($10/year) were decided upon and officers elected: Thomas E. Pearsall, president; David G. Clark, secretary; and Bruce Linn, treasurer. A meeting was scheduled for 1976 at Colorado State University at Fort Collins, Colorado. That date has since been confirmed as 15-16 April.

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FUND RAISING

Buchbinder: I want to welcome you today on behalf of two organizations: Boston University's School of Public Communication and the National Science Foundation. While Boston University has made its meeting rooms and its facilities available for our three-day meeting, it's the National Science Foundation that made the meeting possible. As all of you know, those of you who traveled more than 200 miles were given approximately 60% subsidies to enable you to attend this meeting. The National Science Foundation permitted me to budget up to $3,000 from our grant funds to make this meeting possible. That's how we decided what the percentage subsidy could be since we spread that budget around as fairly as possible under the guidance of Tom Pearsall.

Now, why would the National Science Foundation be interested in making it possible for a group of technical communicators heading undergraduate and graduate programs to get together at Boston University? Let me explain. The National Science Foundation has many programs under its aegis. Our NSF grant deals with increasing the public's understanding of science. Their goal is not to attempt to instill in the public attitudes or opinions about any specific scientific or technological subject. Their goal is to increase the public's knowledge of science and technology so that a better informed public can make more sensible and rational decisions at community, city, state and federal levels.

To what extent should technical communicators such as yourselves be interested in these goals and to what extent could you possibly contribute?

These are decisions that you have to make for yourself. I would like to take this opportunity to show you how we attempt to increase the public's understanding of science while we also increase a student's ability to function as a science communicator--with NSF support and without NSF support. The techniques we use may be applicable in your geographic and skill areas. But more than that, perhaps they may form the basis for other ideas you may think of that will enable you:

- to increase our effectiveness as teachers in our programs,
- and to spark us to develop other conventional or unconventional sources of funds for our programs and our students.

All of you represent universities with well-developed programs in technical communications. I haven't spoken to enough of you personally to determine how many of you couple course assignments with outside projects; some of you may be doing some of what I'm about to describe. Perhaps the best way to start is to explain to you some of the things we do, then how we tie in what we do with techniques for raising funds that can be considered unconventional, or different, from how universities usually raise funds--but just as ethical.

Our Master's program in science journalism requires the student to complete three semesters (48 credits) plus a non-credit summer internship. In addition to the required and elective courses described in the brochure I passed out to you, our Science Communication program periodically offers special courses based on student interest. Also, during the second and third semesters, students are required to have one-to two-day working internships for which they receive no credit. However, the work they do on their internships can be counted as part of their "homework" assignments in some of the courses. Starting with the second and third semester, students are

not permitted to write or to make films or videotapes, or broadcast tapes for professors' files. They must write for publication or broadcast, or plan and shoot a film for presentation to a well-defined audience. Of course, some of you are now, I trust, beginning to get the idea of how we get some funds.

As you know, most graduate programs at universities offer scholarships and fellowships to graduate students; many departments fulfill their quotas for graduate study because they do have funds or teaching assistantships. We have no funds we can offer our graduate students. In that sense, those who do come into our program come in knowing that they have to support themselves as well as pay full tuition. We benefit because students who do come into our program certainly do so because what we have to offer them is what they really want to do. We never worry about the possibility of a student entering our program because we have offered more scholarship or fellowship assistance than another university. Because most of our students do have a B.S. or M.S. in a hard science--biology, chemistry, physics, math, engineering--we do spend significant time with each, assuring ourselves that our kind of program is what they want. All of them could qualify for graduate work in sciences and be eligible for financial support. We do indicate that they can earn money but only by working as interns--and we never guarantee internships.

Our educational program correlates a good portion of our course work in class with these outside internships and as I discuss the various techniques we use, you will be able to get a better picture of how internships correlate with the course work.

Our writing programs include many aspects of reporting and editing for newspapers and magazines. Our lectures cover tasks assigned to reporters--

writing staff columns, feature articles, book reviews--indeed, just about everything normally handled by journalists, front-to-back page on newspapers and cover-to-cover on magazines. To give students practical experience in writing for newspapers publication, we had to find out what editors want. So we conducted a survey of over 100 newspapers in New England. We tabulated their circulation area (the local towns they covered), their competing dailies and weeklies; the local industries, the local universities, research centers and hospitals; the topics of particular interest in science and technology in which they might be interested; the desired length of their news features or news articles; their use of photographs; their interest in book reviews; the types of articles they would prefer on topics such as energy, nuclear power plants, land conservation, solid waste disposal, food additives, transportation, marine ecology, air pollution, water pollution, population control. I can give you samples of the detailed questionnaire we submitted to them if any of you are interested in more specific details.

This analysis permitted students to select topics of interest to the newspapers, contact the editor and make specific arrangements to deliver what the editor wanted. In that sense, our students functioned as stringers for the newspapers.

Of course, students prefer paid assignments. Those paid for by newspapers are the lowest, averaging between $25.00 to $75.00 per assignment. Occasionally, a student gets as much as $150.00 to $200.00 for a feature article on a subject of high interest to the newspaper.

For example, the Boston Herald paid one of our students $150.00 for a feature article on acupuncture in their Sunday issue. The Christian Science

Monitor paid a student $50.00 a week for a monthly column on the environment or ecology. Technical newspapers in the area, such as Minicomputer News and Computer World paid much higher rates to have students do special "interview" articles on the design or use of computers. Fees ranged as high as $500.00 per article plus expenses if they were sent out of town.

Engineering and technical magazines pay the highest fees. We are fortunate to have a reasonable variety of technical and engineering magazines published in the Boston area. But we found it possible to make arrangements with magazines published all over the country to cover specific conferences held in the Boston area. Again, our students either covered conferences held in the Boston area, or undertook specific feature articles for the out-of-state publications.

Our students have had articles published in Design News, Electromechanical Design, Digital Design, Laboratory Management, Circuits Manufacturing, Clinical Laboratory Products, Environment Magazine, and others. Honoraria for these articles varied from $100.00 to $500.00 per article based on the length and complexity of the subject. In addition, the publications were willing to pick up travel expenses, hotel bills, and meals. Of course, the extent to which a student is able to meet the needs of the newspapers and magazine depends upon the instructional staff's professional ability to show the student how.

Students in our audio-visual courses get practical experience by making films, videotapes, and displays for museums, aquariums, and engineering trade shows. For example, two students made a film on a new surgical technique for skin cancer. Another five made a 30-minute tape, The Light Fantastic, that introduced the lay public to the applications of lasers in medicine, communications, computers, navigation, holography and machine tools. The film

was aired on Channel 5 in Boston. Five students complete a film for GTE Sylvania explaining to management the benefits of utilizing computers in circuit design techniques. GTE Sylvania paid each of the five students $500.00 for the film and gave them another $2,500 for expenses, equipment and materials.

Some students chose to assist a scientist in the preparation of a paper for publication in a professional journal of the scientist's choice. We then required the scientist to reciprocate by helping the student prepare an article on the scientist's area of expertise for publication in newspapers or magazines read by the lay public. The aim was to increase the public's understanding of science: what scientists working in that area of expertise are doing, why they do it, and what's in it for all of us.

Normally, scientists do have grant funds that they can use to pay the students for assistance in publication. Most scientific and professional magazines will not re-edit or rewrite a scientist's paper. Some do send suggestions on what to do to make the paper acceptable. Usually, it's a matter of style or of presenting the material in a manner consistent with the journal's standards. And we teach the students how to handle such rejections.

Many public relations and advertising agencies call us for one shot project assignments. They usually need help with an assignment in aeronautics, or materials engineering, or pharmaceuticals or mechanics and have no technically trained individuals on their staff. Many of them need data sheets, catalogs, as well as feature articles on new technical developments. In these cases, we are able to extract our highest prices since the work not only requires the writing of the article but usually the know-how in

placing it in a magazine to give their clients maximum exposure to related markets of scientists and engineers. Since we also cover this topic in class, such projects are excellent practice as well as--again--serving as the base for an article for the public on the work of scientists or engineers at that particular company.

Up until now I have described techniques we utilize to enable the students to earn sufficient funds so that they are essentially "working their way through college." We also need to raise funds for the kinds of activities normally budgeted for by the university. We utilize two techniques:

1. We sponsor a Science in New England news service that distributes news stories and articles about science and technology to the daily newspapers throughout New England. We distribute Science in New England to newspapers without charge provided they credit Science in New England and give a byline to the student. We also cover special assignments on an exclusive basis for some newspapers. After a couple of years of operating this service on a free basis, we hope to market it and use the income to support the Science Communication program. We also hope to get government support since the NSF is interested in increasing the public's understanding of science. Because of the success and the acceptance we've had by the newspapers over the past year, we're hopeful that within a reasonable period of time 20 to 30 newspapers in the area will be willing to give us a monthly sum so that we can set up a non-profit news center. A $50.00 a month charge to about 20 or 30 newspapers should give us $1,000 to $1,500 a month of income--sufficient to run the service.

2. Perhaps the most successful mechanism for raising money in large amounts quickly is the seminars we hold for scientists and engineers. One seminar deals with "How to Write for Publication." It is aimed directly at scientists and engineers who need to know how to break into print or who have trouble doing so. We have charged $75.00 in the past and are considering raising it to $125.00 for a rather long day. We start at 9:00 in the morning and finish at 11:00 at night. The program I've passed out to you details the entire day.

Morning sessions are covered by four editors of national publications; they tell the attendees how to go about meeting the requirements of the magazines in which they want to be published. Attendees have lunch with the editor of their choice--all prearranged during the pre-registration period. In the afternoon they break up into groups headed by the editor of the publication in which they have an interest. Publication editors represent communications, computers, machine design, aeronautics, lasers and engineering production. All editors donate their time since they want papers from scientists and engineers submitted to them.

Again at dinner, the registrant chooses an editor's table and in the evening they can again choose private sessions with other editors if they came with a paper they want criticized.

The key to success in seminars of this type is the fact that the advertising is usually donated by the publications willing to send an editor for the day. Thus, the publicity costs us nothing and guarantees attendees interested in that magazine or newspaper. We normally restrict attendance to about 100 and at that level

have thrown off a profit of about $5,500 for the day. We have run these conferences twice a year.

Thought these conferences are normally organized for local scientists and engineers, we find that about 75% of the attendees come from the eastern seaboard and 25% from the rest of the country. Attendees come from Pacific coast states, as well as the Midwest and the South. The three seminars we've run to date lead me to believe that an organization such as one we are considering forming could jointly sponsor local seminars at our universities on "How to Write for Publication." Indeed, advertisements could be a joint advertisement in which we list the schools and list the dates on which the seminars would be held at your universities. Since the advertising costs you nothing, you hold the conference if you have enough attendees to guarantee you a profit; should not enough registrants sign up at a particular university, the conference could be cancelled with no loss to yourselves.

You need not use the editors from the local media in Boston, although I'm sure some would be very happy to travel to your universities. You can contact national publications headquartered in your regional areas. I'd be very happy to discuss the details on how to go about arranging for their cooperation.

Other types of seminars we've run that earn money for our division involve holding technology assessment or state-of-the-art seminars on engineering or technical subjects. Such conferences could be tied in with engineering professors at your universities or they could be held without their cooperation. Most magazine

editors are happy to consider sponsoring conferences on technical subjects at universities. Editors of these magazines will undertake the responsibility for organizing the speakers and covering the conference for publication in their magazines. Seminars can be for one to three days with the attendance charge based on the meeting length. We have run seminars on printed circuits, minicomputers, digital displays, servo-systems, and similar related engineering subjects. We have also cancelled several conferences when not enough registrants signed up. In most cases, of course, all you have lost is the time and energy you have put into preparing for the meeting--and that can be considerable. But that's the only risk you're taking. At the same time, it is an activity that can bring money into your program and give your students excellent experience.

I hope the projects I've described help you generate ideas for other projects we can run separately or sponsor jointly so that we can continue to meet yearly and help each other improve our programs and the quality of the students who pass through our universities.

Patterson: I might mention that it has been an interesting experience for me being in Washington. For example, I went to the Hill recently to sit in on appropriation hearings. And I wished that a choreographer had been there to make an arrangement of the "dance." Various people came to make their presentations, various Congressional committeemen raised their questions, the discussions went forward, sometimes backward, and occasionally sideways. It was an interesting study in the process of communication!

One quick question. Where are the women in technical communications? As I look out over this audience they seem conspicuously absent.

A. (from the audience) There are a great many women in the field. Sixty-five percent of my students are women.

As far as projects, I can offer just a few brief comments. (And please recognize that these are personal observations, based on short acquaintance with NSF policy and procedures.) It does seem clear, however, that fishing expeditions don't get very far. Agencies are looking for projects that are well conceived, well thought out, well planned. Ones where the investigator has a specific objective in mind, a project that they have designed rather carefully, and one where they know precisely what they want to do and how they intend to go about doing it. One other reminder. They would like to be sure that you're not re-inventing the wheel. That you do know the field, that you know where the project you're proposing fits with what has already been done, and what needs to be done, and that you are acquainted with what has already been done in the field, any previous related studies and the like. Perhaps another suggestion would be that NSF, and I think other agencies, are looking for original ideas. They are quite open to new ideas, new approaches, new techniques. Increasingly, too, we are hearing the word evaluation. They'd like to see some form of evaluation built into a project. You propose to spend "X" number of dollars. What will you have done by the time that money is spent? Some sort of built-in way of measuring results, some kind of monitoring process.

Public understanding of science is difficult to measure certainly. But they are interested in efforts to measure the degree of interest and concern about science and its activities, and I think they would be receptive

to receiving informal proposals that might relate to these matters. I should point out, however, that at NSF all the money has already been allocated for this year and so for any possibilities there you would be looking beyond the present year. But it doesn't mean that they are not interested in proposed new projects. They are, even in an informal way. If your proposal doesn't fit their guidelines, they might possibly have suggestions for you of other agencies or organizations with interests in those areas.

Money is tight, which you may have suspected. They don't know how much money is going to be available in next year's budget. The Public Understanding of Science budget is probably going to be slimmer than last year's.

I can give you some idea of the kinds of projects they have funded in the past. A number of symposia, e.g., which have brought together editors and scientists to examine communications problems of mutual concern. They have funded a number of museum projects, each a bit different in purpose and approach, and a variety of exhibits, also. They have funded a number of film projects, including the "Nova" series that you are familiar with, and a few small projects relating to communications research have received limited support. I think these examples will suggest to you the nature of the projects that have received funding over the past year or so. There is a concern with opening up communications between the scientific community and the general public to enhance understanding and the projects they select seem to offer the best hope for doing just that.

Robert F. Ellis
M.L. White
Richard E. Wiegand

THE ROLE OF THE SOCIETY FOR TECHNICAL COMMUNICATION

Ellis: Since most of you are aquainted with STC this will be very brief. The Society for Technical Communication is an organization of approximately 3200 members at this point. It is an international organization; we have 50 chapters in the U.S. and Canada, and some members at large in various foreign countries. Basically our membership consists of technical editors, technical writers, technical illustrators, and graphic specialists, publications managers, and educators. Our people come from industry, government, and the academic world. We operate through a Washington headquarters manned by two people. And administratively, we have a Board of Directors and some 50 operating committees.

We publish a quarterly journal, Technical Communication; we publish a bi-monthly newsletter for members, Intercom. They are developing a rather extensive publications program which I think we'll probably get into further into the discussion.

We have a number of professional programs that relate directly to this meeting, specifically those involving education and development. We have the publications program that I have mentioned, activities in intersociety liasion, and a standards council which formulates and publishes standards for the industry. Our major activity, of course, leads to an annual conference. This year our 22nd annual conference will be held at Annaheim, at the Disneyland Hotel next month. Other areas that I think touch directly on this meeting are an annual competition that the Society holds in publications and also in technical arts.

White: My topic is the matter of relationship between a group of this kind and the Society for Technical Communication. I thought to get the discussion started

it might be worthwhile to talk about some of the activities and potentials for activities that may have some relevance to a group of people involved in academic programs.

The first area would be the recruitment of students. I think the Society is involved in a number of things that generally are aimed at persuading young people that the field of Technical Communication would make a good career for them. STC has published a little booklet called College Majors in Technical Communication. There is a fair amount of demand for this from people around the country, demands registered largely at the Washington office. This gets sent out, but the difficulty with the publication is that the number of programs developing is increasing rapidly. Identifying them over the nation is difficult so that although the current booklet is not quite 3 years old, it is woefully out of date in terms of new programs. But it is something the Society is doing as a means of encouraging and identifying programs.

The Society has also published a little brochure, Is Technical Writing Your Career? which is made available to Chapters, 50 of them nation wide. It also gets mailed out in reply to inquires made at the Washington office. It is a general brochure discussing what careers in Technical Communication, particularly Technical Writing might be like. And we have made an effort in this brochure to list the programs we are aware of. This is the kind of thing that I would imagine you might use in advertising your own programs. There is also a brochure on technical illustration as a career put out by STC. Identifying programs in technical illustration is extremely difficult, and I do not believe that this brochure actually identifies any such programs.

Another area that the Society has gotten is to encourage local chapters to participate in activities directed at encouraging young people to enter the career of Technical Communication. The number of chapters that enter into

these activities is far from uniform, but there are chapters who are involved in taking part in high school and community college career days, again trying to encourage students to look to Technical Communication as a career. I would suspect that if your own program is located where there are one or more chapters you might very well, as a matter of fact, try this kind of activity.

Another activity some chapters of the Society undertake is promoting science writing contests. This is a means, of course, of interesting high school students, particularly, in the field.

I'm not sure whether this next comes under recruiting of students or not, but the Society has just completed its 4th annual scholarship awards program. I suspect everyone here, or most of you have, I hope, encountered some mailing from the STC concerning the program. Its a very modest one; the Society would hope that it could become less modest in the future. But we are for the 3rd time this year awarding two five-hundred dollar scholarships for upper division students or graduate students who will be next year regularly enrolled in a Technical Communication program.

There are some other areas in which the Society is involved where perhaps the chapters might very well be a help. This group was at its last meeting in Minnesota interested, for example, in practical work internships. Working with local STC chapters, members of this group might find an increased number of outlets for students who want work experience. I know that when Jim Souther and I started what is now a very modest little Technical Communication program at our University just this year, we talked to our local chapter about it. We haven't seen much in terms of recruiting students, but we have been pleasantly suprised by the cooperation of some organizations and members of the chapter in terms of work experience opportunities and a number of other things related to that.

Employment of students is an area in which the Society could give us some help, again on a chapter or regional level. Some chapters or collection of chapters in a region have gotten themselves involved in listing employment opportunities, primarily for their own members. Its possible, I would think, that through contact with chapters or with regional organizations opening up employment horizons for our students might very well be possible.

The 50 international chapters of STC could provide certain data gathering opportunities. Dick Wiegand will discuss this point. Potentially, I think, in the Society there is a great deal of interest in the development of Technical Communication programs. Many members of the Society are eager to see more programs of the kind represented here developed. Actually the committee of which I am chairman, and more directly the sub-committee of that committee, of which Tom Pearsall is chairman, has been involved in trying to identify and locate programs. As a matter of fact, I suspect one of the major reasons for the meeting this morning is actually work done under the auspices of the Society by Tom. What we have been looking towards is some kind of proposal for a grant in order to study in depth the kinds of programs represented here--to do so not with just academic personal, but with members of the profession. And perhaps out of such a indepth study we could come up with some suggested models for programs similar to ours which then could be made available out of the national office to the large number of persons who inquire weekly in that office. How do you teach a course in Technical Communication to engineers and scientists who are not perhaps so interested in that; but also how do you put together a program of this kind. Inquiries come in frequently and there would be some way in which to reasonably answer an inquiry as a result of an indepth study of this kind.

I would like to close with the note that Tom Pearsall suggested in introducing the topic itself. The kind of role STC can, would, or should play in

relationship to a group of this kind will depend, of course, on the kind of role this group wishes to play in relationship to STC.

Wiegand: We have several problems in industry when it comes to hiring technical communicators. We must first define to prospective technical communicators just what technical communication is. Next, we must train the person to do the job by filling in gaps in the person's training and experience. Finally, we must create and maintain a professional climate to sustain productivity, decrease turnover, and maintain interest in the field.

Let me give you a picture of one neophyte technical writer in his first job in industry. Armed with a journalism degree from the University of Illinois (there is one course in technical writing at the Champaign campus, but I didn't take it) and technical training in the United States Air Force, I applied for a job advertised in the newspaper as a "technical writer."

When I first talked to the people at Sundstrand, I tried to find out just what is a "technical writer." After they gave me a definition (writing maintenance instructions in support of hardware produced by Sundstrand), I thought the job sounded interesting. They hired me, and here I am today!

The first day I came to work, I was handed a pad of paper, a pencil, a set of blueprints, and a dictionary, and was then told, "Here are your resource materials--now write a technical manual." Since I really didn't know what to do, I stumbled around and asked questions I thought were "stupid." I did get my questions answered, and ended up somewhere on the "road to success" as a technical writer.

So what am I saying? In essence, what many new technical writers feel in their first jobs but may not be saying--inadequate training

prior to job entry causes many frustrations to employees as well as employers. Schools are failing to offer adequate training for such jobs, and industry often doesn't have the time, money, or expertise to implement an adequate training program.

After a few months on the job, I started talking to my superiors. I said we should start looking at training as a viable solution to problems of low productivity, turnover, and job dissatisfaction from some of our technical writers.

I said to myself, let's see if we can't zero in on our specific needs for technical writing at Sundstrand. The first thing I had to do was ask, just what specifically does a technical writer have to do? In our Technical Publications Department he has to write technical manuals, from start to finish, as a complete task: manager of a communication project, if you will.

There are other activities within the Communication Services Department that expand our scope of technical communication activities. Perhaps a brief explanation of our structure is in order.

I am in the Technical Publications Department, one of the three main sections in the Communication Services Department. My boss is the manager of our department, reporting to the manager of Communication Services. Other than Technical Publications, there is a Communication Design Department that creates technical advertising, public relations, trade exhibits, and so forth. We have complete production facilities in the Communication Production Department. We also have a group that prepares our product proposals.

A technical writer, as the name implies, works in the Technical Publications Department. But a communication designer works in the Communication Design Department. (Printers, photographers, platemakers, binders, etc., Communication Production.) But titles and/or job classifications can be misnomers. All of these people are technical communicators. They just work in different media.

Overlaps? Certainly we have an overlap in these technical communication areas. When a task comes up that requires different expertise, we pull together a team of persons representing each major department in Communication Services to best complete the task.

The training program I designed was catered to meet our needs by combining textbook training with "on-the-job" instruction. I will not give you a full report on our training program, since I will be presenting our program in a paper at the 22nd International Technical Communications Conference at Anaheim this year. (I have some copies with me today, should you want one.) I thoroughly believe, however, that this is the first of its kind in the country (at least the first program of its kind set to paper).

We have yet to have a person who has graduated from a technical communication program apply at Sundstrand for a job. We do, however, have a wide variety of persons right out of a four-year or graduate program who come in and say "I want to be a technical writer--I don't know what the job is, but I want to do it!" So, we have a number of applicants with widely diverse backgrounds who apply.

Many applicants come from journalism curricula--they can't find jobs on newspapers, magazines, or in public relations activities. But they also come from elementary education, psychology, philosophy--some even have Ph.D.s. Aside from an argument that these persons are over-educated for this job, we don't know how we can use any of these persons since they haven't the foggiest notion of what technical writing is. The training program we've established helps bridge this gap to provide capable workers for our technical writing tasks.

I feel that Sundstrand is not atypical in hiring problems when seeking competent technical writers. I feel the Society for Technical Communication (STC) and its membership can help your group in establishing a proper and adequate academic program to prepare technical communicators for jobs that exist (not in the imagination, but really exist) in industry.

A cross section of people that are members of STC in both education and industry (managers and professionals alike) could provide input to your group. My proposal to STC to accomplish this will also be presented at Anaheim this year. These are inputs I think we should be seeking:

1. What kind of experience and training do technical communication managers seek in a person applying for a technical communication position?
2. What do professionals think about their education and training, and what would they recommend for aspiring technical communicators who are planning their academic careers?

3. Data on the future of the field--jobs, salaries, promotions, etc.

The mechanism of data gathering included in my proposal is to have each STC chapter establish an education committee. Within that committee, the goal would be to gather inputs from their chapter membership. When all the data are collected, the STC National Education Committee would collate data and prepare a curriculum. This may be similar to the curricula you now have, or it may be significantly different.

It seems to me that colleges and universities could offer technical communication courses in addition to existing curricula with little adaptations. And this certainly should have some effect on filling jobs with qualified people in industry.

For example, the word I have from editors, publishers, and other media people is that journalism majors are having problems finding jobs. Perhaps schools that teach journalism, radio television, advertising, and public relations could offer an option in technical communication so that students can get jobs. Some of your schools have catered programs for these jobs, but we in industry are not getting enough products from them. So, what we have to do is either lead neophyte technical writers blindly, or develop training programs such as ours at Sundstrand.

It is costly to bring someone in and put him through a training program. We'd like very much to see a person walk in off the street and say, "I'm a technical communication graduate." I think we'd just

fall all over ourselves because we've never seen this person.

The basic skills of technical writing and communication that we try to cover in our training program are basic, yes, but they zero in on the more specific training needed in our industry. This training is much more specific than a person could receive in a technical communication curriculum. But, schools should be able to provide more training in the skills of basic technical communication that can be adapted in companies like Sundstrand, American Can, Boeing, Textron, and others. I'm not opting out of training as a part of a person's adaptation to any new job. What I'm calling for is to let us in industry do just that. By catering academic training and on-the-job training to the realities of technical communication, I think two elements are enhanced that have plagued publications managers for years--increasing productivity and decreasing turnover.

We have lost a lot of people because a person doesn't really know what he's getting himself into, and becomes frustrated because he feels he is not a part of the profession of technical communication. They work at a job for some time, then move on to something else. If a person isn't motivated to do a good job, he probably won't. And he'll probably go somewhere else for some other kind of job. We want our writers to be motivated and to be productive; but without the tools, frustration sets in and problems arise.

In addition to our training program, I've also been given the green light from our management to set up a training group--a pool of technical communicators that are trained on-the-job to perform the

various technical communication tasks of our Communication Services Department. Then, when openings arise in the various groups, a person would transfer to that group, knowing that he has the tools to perform the job effectively. The supervisor is also happier since he knows someone has been adequately trained.

An aspect of getting people into these jobs is to tell them about what jobs a technical communicator is likely to perform. Recruiting, then, becomes a necessity. We have done a little recruiting of our own in Rockford. We have talked some to high school counselors and students to give both an idea of what we do and why a student should choose a career in technical communication--if nothing more, the students learn that there are jobs for them if they are properly trained.

We try to explain what a technical communicator is. We offer tours of our plant, and particularly of our Communication Services Department, to any organization. We would certainly like to see more participation from high school groups.

Rockford industry, in cooperation with the area high schools, also offer a Careers Day. We invite all high schools within a 100-mile radius to come to Sundstrand and other industries to see what jobs are in these various companies: engineering, marketing, contract administration, and technical communication, to name a few. We hope to instill a spark in some students to want to make this field a career.

One of the problems our Communication Services Department has is informing the public just what Sundstrand is doing. Sundstrand is

the largest employer in the city of Rockford, whose metropolitan area comprises 200,000 people. The company has the reputation of being one of the foremost "military industrial complexes" (to coin an old phrase) in the area. What we try to do is not so much change the impression, but give a more realistic representation of what Sundstrand is and what it does. So we have the job of informing the public--public relations, if you will.

As far as cutbacks, I consider them a means of "getting rid of the chaff." True, some technical communication jobs are in overhead positions (not directly attributable to sales of hardware). But, people who are dedicated to their work, that are not"freeloading" can always expect to have a job.

We have the capability to serve not only our division and our corporation, but also to serve our community and really the whole part of northern Illinois. When divisional and corporate workloads go down, we go out and get business from other industries that either don't have the size group we have, or the expertise. As a result, in 196. while other aerospace industries suffered 15 to 20% layoffs in their technical communication areas, we didn't lose a person in Technical Publications.

There is a definite need for these people. We'd certainly like to see one of your graduates knocking at our door!

Further comments by Wiegand:

The first thing we do when we make an assignment is to define very carefully who the reader is. We find out as much as we can about the

reader or user of our technical data--and not just that he is a mechanic and works in a shop, but what kind of mechanic he is (experience level); what kind of shop he is working in (tools and machines he has available); and if he is involved in training others in his skill by using our manuals.

All of the techniques of journalism are applicable in technical writing: interviewing, research analysis, writing reports, verifying data, observing equipment function, observing hardware in the field. All of the elements of good journalism and communication are used.

We try to instill in our writers not only the application of writing skills, but also understanding the thought process--the ability to search out problems and ask questions. Before, emphasis was only placed on writing skills (rhetoric and other methods, if you will) in tackling a communication problem.

In our department, we ask groups within our company (engineering, manufacturing, quality control, field service, product support, etc.) to review the material for technical accuracy. But, when an engineer says to take something out or to change something, we don't make the change just because he says to. We weigh the comments and present the material as we feel most effective for the audience--and we let them make decisions about technical accuracy.

Another thing we've been able to do at Sundstrand, and in most cases industry as a whole, is to upgrade technical communicators in terms of salary and respect with scientists and engineers. It's been a long battle, but we're getting salary levels where they should be.

But that demands quality. Once quality is there, respect will follow. Therefore, we have a commitment from our management that says the technical communicator is important to the company and is worthwhile to the company's existence.

Surveys have been made and people have expressed strong comments on both sides of the question, do you hire a technical person and teach him to write, or do you hire someone who can write and train him in the technology? I say we should have both, because that's what we now have. It certainly would be nice to have a person trained in the basics of both at school. Then we train the person specifically in our tasks.

Jerome L. Nelson
Jan Robbins

COMMUNICATION THEORY AND TECHNICAL COMMUNICATION

Robbins: The habitual way of dealing with communication theory, research data, and research methods in technical communication programs and technical journalism, as well as in journalism schools and in a good many other areas, is to establish a course or two, or three or four, in communication theory and add it to other courses in writing, graphics and so forth. Then we automatically assume that transfer of learning takes place from one course to another. The fact is that this transfer doesn't occur. Part of this panel discussion is to find an answer to the question: "How do we establish an appropriate transfer of learning from the theory/research/data level to the practical field.

We confront the problem at RPI because we have both Master's students and PhD students in the same courses. Up to the present, we have not been able to separate these two groups; and they are two entirely different groups. The PhD students are primarily theory/research oriented and the Master's students are mostly professionally oriented. It's been fairly clear that some exposure to communication theory and research data has been beneficial to the students interested in practical communications problems; whatever use they have made of it, they have made largely on their own and not by planning on our part.

Let me be more explicit about what I mean by communication theory. Rather than give you a definition right off the bat, let me try to break the problem up into three separate components. There is a level of theory and research, the primary purpose of which is to explain how communication takes place. This involves not only the development of theory itself, but also

the ability to predict that what we thought was going to occur is going to occur, and then to find out if it does. How do we know public understanding of science is being improved? Certainly not just because we're putting out messages.

Secondly, theory and research are involved in describing what in fact does happen, a good deal of which we don't know. There's a huge body of undigested research data available, most of which we deal with in one way or another in communication theory courses. Some of it we deal with adequately in professional courses, but most we don't.

And at a third level there is the whole issue of methods of data collection--how to do research. Most of these methods have been designed primarily by physiologists, psycholigists, and people of that sort, with the validation and reliability criteria, methodological assumptions, and so forth, that are typical of these sciences. These tools are quite useful in trying to establish what a message has or has not done for an appropriate audience, and, in fact, what the characteristics of that audience are in the first place. But the tools are not designed to be sufficiently efficient in practical situations. Experimental design has been done primarily for people doing experiments in very carefully controlled academic laboratories. With slight modifications of assumptions of various kinds it is possible to design relatively easy, inexpensive, simplified, virtually experimenter-proof research methods that could be used, again relatively inexpensively and quickly, for pre-testing and post-testing documents.

These are the three separate issues that, to my mind, arise under the heading of communication theory. If we go one step farther and take just the word "theory," I've already given you a brief notion of what I mean

by it. The attempt to explain certain phenomena such as information exchange, dissonance reduction, information seeking, and so forth. I really have doubts myself that the sheer exposition of theoretical explanation, however well verified the theory may be, is of terribly great use to the technical communicator. But there is some substantial evidence to indicate that the implications of certain kinds of theories related to communication have immense practical importance.

Let me give you just one example. You're all familiar, I'm sure, with the traditional readability formulas. Most of them were developed during World War II or shortly thereafter, and most of them have not been significantly modified since. They all deal with what in current linguistic theory would be called surface characteristics of sentences. In particular, they deal with such things as word counts, syllable counts and so forth. I don't know if you're aware of test data on readability formulas, but they fall down rather drastically. They are of relatively little use in establishing the real readability of documents.

We now have something called the theory of generative transformational grammer. It provides a much deeper understanding of the structure of sentences. It has been used in numerous linguistic studies, not precisely yet to develop thoroughly elaborated readability formulas, but, that's in the works now in a number of places. But it has been used to point to such things as the fact that there are certain kinds of long sentences that are considerably easier to understand than short ones. If the sentence is short because it has many deletions in it, it is very hard to understand. My point is that you only find these things out when a theory exists that allows you to predict what you think is going to happen and what concepts are vital to this prediction. That you will hit on the right way of producing a read-

ability formula, or evaluating readability is virtually zero until you have a theoretical explanation that will let you choose the right way.

These are some of the kinds of things that I see as potentially important, but my trouble is in trying to teach a mixed bag of students, and doing essentially two things at the same time: dealing with purely research data, research methods and so forth for people who are going to go on in theory, gather research data and use research methods on one hand, and at the same time helping the professional communicator. I'm not sure how to bring these two goals together.

Comment: Could you give us a kind of classical application of communication theory?

Another comment: May I make a suggestion here. Let's talk about that segment of theory that has to do with organizational patterns of communication.

Robbins: Do you mean communication networks? That aspect of communication theory turns out to be important in a lot of ways. It might be of direct interest for your students. Two things go on in groups--accomplishment of tasks and the maintenance of emotional and social rapport. Compare the totally open communication patterns, when everyone has equal channel access to every other, strictly hiearchical communication patterns where messages go from one person to two below to X number below them and to strictly authoritarian communication patterns, one communicator going directly to everybody down the line, with very limited interaction among group members. Well, studies of such networks indicate that communication channel availability has a rather large impact on the success of task performance, the success of maintenance of social rapport, and the time it takes to accomplish either of those. Now those studies along are of primary interest within organizational settings such as research teams. But if we generalize a

little bit we go into the area which is now called information science. Information science is a much better term. More research has been done on audience information use behavior there than any other place and yet it is hard to find someone in technical communication who has been into that literature. For example, there is a publication called The Annual Review of Information Science and Technology. Like all annual reviews it has large sections that review research literature on selected topics so that you can get a nice neat summary of findings without going back and reading through all the details of the studies. In almost every issue of that review there is a substantial chunk, usually 80 to 100 pages, called "assessing audience information needs and wants," 95% of which is directed towards assessing needs and wants in engineering and science applications. Those studies allow you, for instance, to make a number of interesting generalizations, most of which don't come to mind at the moment. But I can tell you what they are about, in any case. Some concern the information seeking patterns of people in research teams or research and development teams, as opposed to implementation teams. Some deal with individuals working alone in the laboratory, as opposed to people working on group projects. Some deal with people working in hiearchically structured research laboratories as opposed to people working in so called democratic research structures. The information seeking and use patterns differ substantially in these settings, but differ predictably according to easily measured demographic and psychological characteristics of people.

Jerry Nelson: There are fads in communication theory too, like everywhere else. One is the concentration on attention to what audiences attend to. I think that the consensus now would be that this is no longer particularly interesting or important. Predispositional theory played a rather large

role in this. And there are some favorite hypotheses of 10 to 25 years ago, such as the selection hypotheses. One of the things that we found is that you can back away from the positions that were held before, for example, trying to predict people's attention to specific messages.

Lets take a Black person's reaction to the program "Julia," of 2 or 3 years ago, in which Diahann Carroll played the role of a Black Doris Day. You could go out and talk to Blacks and ask what they thought of it, and almost to a person they said they resented it, and it was an unrealistic portrayal of a Black person in society. O.K, well if we looked at that response we would predict that they wouldn't watch the program. This just wasn't the case; they watched it. So some other variable in a matrix of variables was overriding that one. It turned out to be race. That's common sense too. Incidentally this is something that I think we said, and that is a lot of what we do: we verify common sense.

Some other things, however, are not so obvious. Let's take programmed instruction. There is a way of preparing a message such that you can, with virtual certainty, assure that the person who receives the message will understand it. Now one of the ways you do this is by trial and error. Lots of us have done that. If you break the message down, however, and deliver it to the student and force him to read the article, to interact with the message, you can build the odds that he will comprehend it. Now in "comprehend," what do I mean? What I mean is that he could pass a test, I suppose. Are you prepared to find out whether he did in fact comprehend it? The test could be, does he do what you expect him to do? When you ask him if he knew the date of the Battle of Hastings, did he in fact know the date of the Battle of Hastings?

Robbins: Jerry, let me make one comment about that. There is a non-obvious implication in what Jerry is saying. The idea is, given what Jerry has said, that if you break a message down into pieces of various small chunks, to each of which a response of some sort is made--an overt response, maybe a verbal or written response--that this will automatically increase learning. There are two non-obvious outcomes I'd like to articulate. One is, it turns out that if you break the message down too far, and by too far I don't really mean very far, comprehension falls apart. Longer chunks can be responded to with higher accuracy [illegible] longer term learning than short ones that you see in most exisitng programmed texts. And, I'm saying this with some confidence, most of the existing programmed texts you see are not as efficient as they could be, based on knowledge that we now possess.

The other non-obvious implication here is that you ought to be able to keep adding short messages in a document so that the whole document shows high comprehension. It turns out that if the document takes longer than an hour to do, retention rates begin to fall off. So small packaging of documents is much more effective in learning and retention than l packaging of documents. At least one company that I'm familiar with on a consulting basis learned this much to its dissatisfaction. The company produced a 500-page programmed text and found that it was absolutely useless.

Comment: If we could digress for a moment and talk about the lecture system. One of the things that we tell our students is to avoid, if at all possible, the question lead, particularly if the reader can answer yes or no to it. Bell labs did some research, again in the attempt to get the

audience to interact with the message. They just plugged a few questions into text. Not questions that required an answer, as is done in programmed instruction where we tell the students if they're right or wrong, but just imbedded questions in the message that alluded to the material that the person had encountered in the pages or paragraphs preceeding. Then they ran a test of comprehension. This was obviously a control message with thought questions and a test message. On a specific point about which questions were raised, the test responses improved about 40%. That's pretty good! On the whole package of information they got about 25% improvement. So there is something going on here.

What would happen in your science news stories, or in material that was included in science text publications, if you could begin to imbed questions to make sure that your readers understand what you told them? Does this have any applicability? These are some things that we're trying to do.

Nelson: I have one other example that I might bring up. We were talking a moment ago about the current vogue in linguistics of generative transformational linguistic theory. Let me tie two things together, that one and the old so-called information theory which I think most of you are probably familar with.

We teach journalism students and a good many other writers to use low redundancy in the information theoretic sense. Efficient code, O.K.? Even information theorist's can tell you that an efficient code is terribly inefficient in the presense of any kind of noise. To tie this back to linguistic theory, many of the studies going on in psycho-linguistics are studies of just how much noise of what kinds influence messages in what

ways. It turns out that in certain kinds of situations you can actually reduce the information content of a message by about 50% and still get the point across. But it also turns out that some kinds of redundancy are highly positive, and some kinds aren't. It's possible to build a general theory of redundancy, for instance, and this is being done, which allows you to predict ahead of time the kinds of redundancy in expressions that need to be built in, in situations where you can anticipate certain kinds of psychological or physical noise.

Russell Briggs
Thomas L. Warren
John F. White

TECHNICAL COMMUNICATION AND THE COMMUNITY COLLEGE

White: Thank you for the opportunity to offer some observations on the status of Technical Communication study in the two-year or community college. I would like to offer some conjectural statements on the future of such endeavors, and bring some word on the problems and issues that attend the development of technical communication programs in the community college. But before I begin to offer any judgments I think it is necessary (given the predominant representation of four-year and graduate institutions at this meeting) to provide a capsule look at the major characteristics (mission, student population served, faculty typology, etc.) of a community college.

I represent a college that professes to be "comprehensive" in its mission to provide educational services to a population of 600,000. Our current enrollments surpass 20,000 students, and we project growth (ground is about to be broken for our branch campus) for the next 10 years. Educational programs are offered for those students in "transfer" sequences, i.e., bound for senior or receiving institutions, and for "career" sequences, i.e., electing any of 45 one-year or two-year terminal programs. These latter options are often referred to as vocational-technical programs, but this classification no longer does justice to the growing academic character of the programs.

Technical Communication in a community college means many things, some familiar, some unfamiliar to 4-year college/university representatives. An examination of a number of basic areas might cast more light, so I

offer consideration of a number of basics.

First, What are the courses? And who teaches them? Courses in Technical Communication in Community Colleges tend to be limited to the two standard and traditional items-- Report Writing and Business Writing. These courses typically provide a service basis to a wealth of programs in the Engineering, Science, Health Sciences, and Business areas. They are often offered as alternative steps or tracks to the usual Freshman English sequence. The more "advanced" community colleges have taken this core or base a bit further, and have added component courses to help form out a technical communication program, and such courses as Scientific Writing, Graphics Communication, Publications Management, etc., may well exist.

What about the faculty? Any examination of the English faculty (Business faculty at many 2-year institutions) is sure to be interesting. Those who hold tenured positions come from a variety of professional teaching experience backgrounds--elementary, junior and high school teaching, junior and community college experience, and senior college experience. In addition, many recent additions to community college English staffs have arrived fresh from graduate assistantship experience. All of this mix spells out not so much a diversity of approach as it does a standard or traditional English teaching viewpoint. This factor is important when one considers that the teaching assignment for report and business writing classes necessarily depend on faculty who teach basic composition classes--and usually in a traditional manner. As a division chairman of a large number of academic departments, I am

concerned with providing the best staffing available for the individual courses we offer. I share some of these problems with you, perhaps, in the way in which technical writing courses are staffed, and in the manner or style in which instruction develops. Even in the community college, there is a tendency to give "status" to the literature course, and to deem the bread and butter composition courses as an often burdensome and necessary chore. It is often a difficult task in staff development to get traditional faculty, trained in a philosophical/literary sphere, to concede that the teaching of technical writing or business writing (most faculty still refer to it as business letter writing) has any merit or status.

So my assessment of the faculty called upon to teach technical writing in the community college is that (with a few exceptions) they are "traditional" composition teachers "made over" with a new assignment. Perhaps, and not to lose sight of the purpose of this meeting, the combined efforts of the Society for Technical Communication could give attention to the need for faculty development and professional guidance in this area--namely the preparation of technical and business communications teachers.

Second, what are the features of a career (either one-year or two-year terminal) program? How can they be developed? A career program (the parlance owes to the abiding emphasis on the employment realities for community college programs) is one which may be one-year or two-years in length and one which combines educational and training experiences with an aim toward actual employment upon completion. Such

programs don't simply "appear," but are carefully planned by college and community personnel. A local advisory committee of working professionals must be able to identify manpower needs in the projected service area for a five to ten year period before any program can be inaugurated. In the case of technical communication at our institution, we discovered large support from a number of large corporations in the 200 square mile district, but found trouble in gaining final state agency approval. In the end, the program was re-titled Technical Reporting and consisted of three course alternatives for a one-year program. Our plans for a two-year degree program must necessarily wait upon an initial year of program success. Typically, community college students enrolling in technical writing or business writing courses are doing so because they are compiling "English" credits for any of a great number of career or job-oriented programs. The career program in technical communication envisioned at Harper College will build upon the well-established "service" idea, but extends it from other departments within the college to the community at large. Indeed, one of the unique features of Harper's program will be the projected target learning audience. We will be developing a program for people already possessing four-year degrees, but who desire to upgrade their professional potential in their current employment. They are engineers, scientists, and technical personnel in general, and will be (we conceive) markedly different from those students between 20 and 28 in age. This particular move on our part, i.e. to develop a non-baccalaureate degree which is neither upper-division nor lower-division in the usual sense, opens still another view of the community college--that of pro-

viding mid-career improvement possibilities for area professionals. In plain words, our action stymies many senior college personnel who fail to understand the community college (they continue to use the term "junior" college) as anything but an institution which provides freshman and sophomore courses for those students hoping to ransfer to senior colleges and universities. Community colleges (per se) lay heavy stress on the value of the externship experience in career programs. For example, if a student is enrolled in a career program, there is a requirement for on-the-job experience, whether the course is practical nursing, air conditioning and heating, or criminal justice study. In technical communication we look with high hope to the neighboring corporations which have volunteered assistance in externship experiences.

The development of a technical communication program usually falls to interested faculty and administrators and occasionally to local advisory personnel who recognize a need in the community. Several steps have to be taken: 1) A job-potential survey has to be taken in the area. 2) Formal application for a program has to follow prescribed internal and external steps. Internally the program must be seen as part of the goals of the institution and follow the curriculum committee route. Externally, the appropriate state agency or higher board must see fit to grant approval. 3) A coordinator (usually an able faculty member) is proposed and is normally granted released time from teaching. 4) Courses must be reviewed/projected. 5) Periodical evaluations of the program must be planned.

Thirdly, what are the curricular problems which develop between two-year and four-year institutions? What are some possible solutions? The relationship between junior and senior institutions has an impact on the development of technical communication programs. Those faculty members and administrators from community colleges know only too well the burden of the game of course review and approval. Two-year institutions simply cannot offer any courses which are deemed upper-division or junior/senior level by the senior institutions. This set of rules is highly criticized by community college teachers. Four-year institutions thus exert much influence on the "allowable" English (and technical communication) curricula in the two-year institution. Solutions will no doubt require bending by both parties. Perhaps the role of such associations as the 4C's and STC can be that of a mediator and reconciler in such academic boundary disputes.

In summary, I have tried to present an overview of certain characteristics of technical communication in community colleges. If I have presented too much of an administrative perspective, I apologize, and it is not intended to slight the necessary day-to-day basics of the classroom teacher. I would like to close by considering the way in which the Society for Technical Communication might be able to render developmental assistance to technical communication professionals in the community college. My remarks here might well have struck a number of cooperative chords, but I would specifically call attention to three areas--1) Consideration by the Society of the problems of transfer between institutions, and specifically to deal with issues of upper/

lower division significance. This cannot be done without taking a look at course make-up and expectations at all levels, including graduate courses, and also not without giving attention to the type of program I have outlined here. 2) Consideration by the Society of the ways in which courses could be encouraged, developed, and monitored in the community colleges, especially through the means of consultants and packets of descriptive as well as prescriptive information. 3) Consideration of the development of a research impulse and a data bank which could be utilized by all institutions. This would also assist in trying to lay out some direction for technical communication as a profession, or where technical writing employment possibilities would be developing.

Briggs: Michigan now has 29 community colleges and Kalamazoo Valley Community College, which has been operating for seven years, is one of the younger ones. KVCC with about 5500 students serves a population area of about 250,000. We are near Western Michigan University and Kalamazoo College. Michigan's larger community colleges serve about 15,000 students--the smaller ones, about 1000 students.

Regarding KVCC students, we notice that the average age has been increasing; it's now about 26. The ratio of part time to full time has tipped rapidly toward part time. About 65% of our students are taking less than 12 semester hours, usually 6 to 8 hours. Most students work 20 to 40 hours weekly.

Mid-career changes have been mentioned and I'm inclined to call it "early career" changes in respect to our students. Many students

have started in some line of work, or have been through a military enlistment with some technical training, and now are studying in the community college on an Associate Degree program. Others have worked at labor or assembly-line jobs and have decided they need more education. A relatively low percentage, less than 20%, come directly from high school with no experience at all.

KVCC offers vocational, technical, and liberal arts (transfer) programs. Our emphasis is on preparing students for specific occupations and helping them to obtain employment in that field. I understand that our batting average is good.

I'm a technical writing-business communications instructor rather than an administrator. (All faculty are "instructors.") I have degrees in English and Communications and 10-years experience as a technical writer and communications analyst in the automotive engineering and aerospace industries. Most of our faculty, incidentally, have Master degrees and career experience in their fields.

Regarding technical communication, KVCC has a larger area called "industrial production careers." This area comprises several industrial applications, one of which is called "technical industrial communications." This two-year program has two options: one leads to an Associate degree in technical illustration, the other in computer applications. Most students take the technical illustration route where they find employment in graphic arts firms or departments. Some move on to further studies in commercial art.

The computer applications program includes science and technology

courses, technical writing, speech, and a series of computer courses. Students are trained to be communicators or liaisons with both computer specialists and engineering people. Most students transfer to a four-year program in computer science. Others don't complete the KVCC program because they land jobs in the field and plan to pick up courses in the future.

We also have many vocational-technical programs which require our technical writing or business communication courses. And pre-requisite to these are freshman communication courses from our general studies area.

COMMENT: Tom Pearsall

It seems to me, then, that the junior college poses two possible programs: one in which you train for a career and quit at the end of two years; the other where you use a junior college as a stepping stone to a four-year college.

Briggs: There is a third: a person may use it for upgrading in his present line of work.

Pearsall: Well, for the sake of simplification, let's stick with those two. It seems to me that if a person came to me out of high school and said, "I want to go to junior college first and then come to the University of Minnesota and into your tech comm program, and I have the option of taking a tech comm major or a general education:" I would say to him, "By all means take a general education--don't take tech comm-and in your general education get as much science as you can possibly squeeze in. Then, come here and we'll take care of the tech comm in the

last two years." I say this because, that is what our 4-year students do. They take their general education for two years and concentrate in the major for the last two. This may be one of those boundary areas of dispute mentioned earlier by John White.

Warren: We are getting commitments from deans of programs in other state colleges. For example, we've got a commitment from Brookings on the pre-engineering. We know we're not going to get any pre-engineers at Springfield, but if we did, we've got the dean's written commitment that here is their curriculum for two years. Here is our curriculum, and the mesh is made, so that the kid can come to us for two years and then off he goes to Brookings for the final two years. Now I see South Dakota, Minnesota and Nebraska especially are entering into swapping agreements on out-of-state students. I agree with Tom Pearsall that we've had some real problems in meshing. I've had to identify that student immediately and then get on the phone to Tom and say look, I've got a kid that wants to do two years here and then he'll come up to you. Let's get together and look at the curriculum and see what we can do to mesh our two programs.

Briggs: Regarding the question: what do technical writers do? I would like to make a few comments from my own experiences in industry. Although I've been out of industry five years and would like to get a look inside again, I would say it's difficult to describe what technical

writers do. People with this title do such a wide range of things! And their training and backgrounds vary considerably.

We had a wide variety of people working as tech writers on the Atlas Missile program. I was on site in Nebraska with a "multiple effectivity" program where we were writing the manuals and procedures while they were still installing things trying to get operational with the first ICMB's. The job was called Manual Verification. We were looking over the shoulders of technicians and engineers writing and rewriting procedures while they were working them out. Back at Vandenberg AFB they were redesigning the systems and sending out mofification kits and partially written software.

I was a salaried General Dynamics employee supervising crews of "job shop" writers. We had all kinds; most had no English or college background. They had eased into the tech writer classification from technician jobs, graphic arts jobs, and a variety of support jobs associated with the industry. They were very resourceful people. So, this is one category of "tech writer," and you'll find these types everywhere. They came aboard one way or another and managed to learn by doing.

The most demanding kind of technical writing I've seen was at Hughes Aircraft Company where the writers were responsible for the technical content. We were writing progress and project reports on minicomputer radar and fire control systems. The engineers had written almot nothing yet. We worked from logic diagrams, system schematics, specifications, and discussions with designers. We also used resource

books to build understanding of the state of the art. All writers had degrees: some in engineering, some in science, some in English with a science or technical background.

Between these two examples, my experience in several publications departments leads me to say that about half of all technical writing is a rehashing of previously written or drafted material. This isn't very difficult to do and many people after some experience is gained can handle it. Proposals are a large part of the work and little really original writing goes into most of them--mostly rewriting to fit the need. Manual and Specification writing I haven't much experience with, but this is a large part of the tech writing field. Many of these writers gravitate here from other technically oriented jobs.

Warren: The University of South Dakota at Sprinfield offers three levels of technical communication courses: beginning, intermediate and advanced. The beginning course is essentially a techniques course: instruction writing, descriptions of mechanisms and processes, summary, analysis and so forth. The intermediate course brings the various techniques together into the writing of a formal report and used consultants from the technical area for accuracy of the technical content. Most of the technical students take these two courses.

Students who wish to major in Technical Communication take both the beginning and intermediate courses and then the advanced. The first assignment in Advanced Technical Writing I is to prepare a memo

in which they describe the kind of job they want to hold after graduation. Focus in the memo is on the extent and kinds of communication skills required. The job may be as a technical writer solely, or in combination with another technical specialty (for example, 60% of working time as an electronics technician and 40% as a technical writer). Each student's syllabus in Advanced I can then be structured to fit career goals.

Advanced Technical Writing II deals with specific areas of technical writing competence: parts catalogs, manuals of several varieties, brochures, industrial film and, if there is time, semantics and communications theory. The student is then ready to meet most technical writing situations.

The students are, as you can tell, thoroughly grounded in the basics of technical writing before they take the advanced courses. This is to insure that even students not planning to major in technical writing have a good grasp of technical communication skills. The success of this ambition rests with the textbooks used. The beginning class uses Ann Laster and Nell Pickett's Writing for Occupational Education. The intermediate students use Houp and Pearsall's Reporting Technical Information, a text, by the way, written for juniors and seniors, yet used at USD/S by second semester freshman. Mills and Walters' Technical Writing is used by the advanced classes. Our library has a very good collection of technical communication materials which we use a lot.

The students do not hesitate to try to make direct applications of their technical communication skills. One advanced student is currently rewriting the operator's manual on an oscilloscope used in the Electronics Department. Another student is working on a parts catalog.

We also have the problem of boundary disputes mentioned by John White. I think one of the things that's going to have to happen is conferences like this where 2-year and 4-year people discuss their programs so that sume mutual understanding is reached about transfers. The student comes in and he says he wants a two-year technical writing program. He wants to get out and make money. So he goes through the two-year program, and he gets out just as you described. After a couple of years he finds that perhaps his career is limited or his interest has expanded. For some reason or other he wants to go on to another degree but at a bachelor's level. What we are finding is that the other state colleges in South Dakota want to errect barriers around their programs. We are currently working on agreements among the State colleges so students can easily transfer and receive full credit for their two years of work. I am concerned that similar agreements be reached with schools outside South Dakota.

Clarence A. Andrews

STUDENT RECRUITMENT

Andrews: At Michigan Technological University we are trying to build a major program in Scientific and Technological Communication. It replaces an older program in Technical Writing which had only six courses--it could not be construed as a "major"-- and which attracted five or six students a year, mostly drop-outs from other programs.

The primary goal at MTU is to produce graduates who will work in science and technology. Our program is designed to produce the communications experts who would work alongside these people. Our students will take 45 quarter-hours in communication skills (chosen from a larger number), 45 quarter-hours in a science or technology, and 90 quarter hours in core studies.

The problem--where to recruit students? Journalism schools and programs in "Communication" are overflowing with students--the enrollment is up almost 500% in the last few years, and there are no jobs for most of these. But our program could use a hundred of these a year and we could place many of them in industrial and institutional situations.

Most people do not think of themselves as technical communicators. Most of us who are teaching in the area backed into it. We can't depend on high school counselors, secondary English teachers, and such. Our best recruiter is the secondary science teacher. We propose reaching these people through an occasional newsletter and through a mobile "Science Fair" which our school has developed, and which travels throughout Michigan.

We also propose reaching them through a summer workshop in technical communication. This workshop would bring 100 secondary students a summer

to MTU. It would give them an insight into what the technical communicator does. Most of the program would consist of hands-on experiences--writing, editing, publishing, producing a radio show to be broadcast over the MTU radio station, producing television tapes, movie shorts. Their subject material would be the laboratories and classrooms on campus.

We trust also that exposure to two weeks of the Upper Peninsula of Michigan in the summer--a most delightful place, cool, the purest air in the Universe, woods and water--would persuade them that MTU was the place to matriculate.

On a larger, longer-ranging scale, there should be an attempt to develop the image of the technical or scientific communicator. Perhaps the science writers' groups, the aviation writers' group, the STC, the heads of programs such as those at MTU, Minnesota and RPI, could get together and outline an image-building campaign on a national base. The image of the newspaper reporter has been developed--through plays such as Ben Hecht's Front Page, through innumerable motion pictures, through summer workshops and the like. Something similar needs to be done for our people.

Moreover, the STC, at least, worries itself too much about the image of professionalism. Such an image-building campaign would help produce that status as well.

James Connolly

NO[illegible]RITTEN TECHNICAL COMMUNICATION

Connolly: At the first conference of this organization, held in St. Paul, there was a marked tendency to use the terms "technical communication" and "technical writing" as synonyms. There is more to technical communication than technical writing. This paper is intended to identify some of the other areas of communication that should be, or at least might be, considered within the technical communication programs.

A mild disclaimer should be stated first. I have nothing against technical writing. I'm sure that there are many interesting and exciting things that could be learned from technical writing. Having read many technical documents in a number of industrial situations, I see a clear need to train people to write and edit technical material. I might even go so far as to allow that technical writing should serve as the foundation for an academic program in technical communication. My concern is that it not be considered the sole content of technical communication programs.

There is an historical warrant for the appeal for broader based programs. Having served as an industry consultant for 15 years in the area of technical communication, I have seen an incredible change in the nature of doing business in large corporations. Originally the marketeer or salesman stood as the buffer between the engineer and the consumer. The engineer was required to write only for the internal audience within his own corporation and ocasionally for fellow engineers within his own discipline. Audience factors were of minimal concern. Now I don't want to resurrect that old battle between speech and English as to whether technical communication is written to someone or not. Experience indicates that the receiver

of information should be the prime determiner of the content of the message. Industry is now acutely aware of this.

That one single change, among other changes is enough to justify the consideration of three areas of communication, in addition to, technical writing. They are 1) technical speaking, 2) technical meetings and 3) technical graphics. As widely divergent as they may see, they are all related to a refocusing of attention on the sender-receiver relationship.

Even if one were to teach technical writing from a strong orientation of audience awareness there would still remain two major differences between technical writing and technical speaking. The first is the question of language. As I am writing this, I'm following the general outline of my speech delivered in Boston. The transcript is an absurdity. My ego refuses to accept that it reflects accurately the communication event in Boston. I rather hope instead that it reflects the human dynamics and less formal style of the public speaker. A well-written paper, on the other hand, when read aloud sounds like someone reading aloud to an audience, not speaking to the audience. I think that these differences are important and further, should be taught to our students if they are to be equipped to do the job when they graduate.

The second area of difference is the immediacy of feedback. An article or paper might be written one month, edited the next, published three months later and letters of response start arriving the following month. In the speaking situation, a member of the audience who does not understand something that has been communicated will immediately raise a question. The speaker must be able to adjust or amplify on the spot if the communication event is to be successful. Along the same lines, if the reader of a technical

report has some trouble comprehending a particularly tricky technical process or interrelationship, he may slow down, read it again, think about it for awhile, look up a reference in a book and finally, in his own way and in his own good time grasp the information. The listener does not have that luxury. If the listener doesn't get it when it is said, he doesn't get it at all. This means that the language and the structure of the technical speech will be different than the same content delivered as a paper. The feedback potential will be enhanced by virture of the more immediate relationship between the sender and receiver.

The area of technical meetings may seem to be unrelated to the kinds of communication problems discussed at this conference, but I believe that there is a connection. When the student leaves the womb of the academic environment and is forced to exist in a power-structured industry or business environment, he should be aware of some of the problems of organizational communication. There are a number of very fine books written on organizational communication, but most of them are designed to introduce the student to the theoretical foundations of organizational research. They don't help the student understand the role that a technical communicator might have to play in establishing a conference or conducting a meeting to solve a technical problem. As a consultant I have many times been asked to assist in teaching people how to deal with other people in the one-on-one situation. Interpersonal communication might help but I've found that practical experience of designing, organizing, executing and critiquing problem solving meetings to be a very effective method for teaching students about human communication behavior in an organizational setting.

Why the technical communicator? The engineering types who are involved

in the nitty gritties of solving a problem become so data centered that they become incapable of generalizing about the problem. The technical communicator, trained in the structuring, simplifying and abstracting of technical concepts from technical data can serve as a focal point in helping the technologist to see where they are going. The very fact that they are not a part of the design team and do not represent a specific departmental bias can make their contribution invaluable. And industry executivies know it. More and more, they are asking outsiders to assist in both organizing and conducting technical meetings to minimize the biases and wasted time that are so common.

The final area of concern is that of technical graphics. Let me share a little background first. When I started as a consultant in 1961, the primary tool of graphic support for the technical speaker was the flip chart or hard chart. Most of the graphic support that I saw was extremely busy, detailed and complex. As an aid to the speaker they were not only not effective, they were distracting. Most of the graphics were copies of the kinds of things that appeared in technical documents--engineering drawings, detailed schematics, complex graphs and the like. After several years of working with engineering types, and by leading them toward the overhead and the 35mm slide, I have seen some improvement. The industries began to talk about graphic support personnel and budgets for graphic production. Today, most industries have graphics departments that employ artists, draftsmen, and illustrators and have invested hundreds of thousands of dollars in sophisticated equipment for the production of graphics. The only thing missing is a knowledge of what to do with these people and the equipment to produce graphic support that communicates a message.

This is the responsibility of the technical communicator. They don't have to know how to draw anything, they don't have to know how to operate the machinery. They don't have to know the skills of illustration. They do have to be graphically literate. I suppose some definition would be helpful. They should know the difference between a good visual and a bad visual. They should know the difference between a visual for support of an article and a visual for support of a speech. They should know when a visual is needed and what kind of a visual it should be. They should know what skills are needed to produce the art work for a good visual as well as the equipment and the processes.

Even if at this point you agree with everything that has been said there still remains the question of whether or not this is truly the concern of programs in technical communication. A great deal depends on your perception of the job market for which our majors are being prepared. My concern is that our graduates will be called upon to assist in setting up technical communication events, whether writing, meetings, or speaking, and will be expected to give knowledgeable advice and direction to the engineers and others that they will be hired to serve. They may be hired initially as writers or editors, but as their experience develops so will their scope of responsibility. I think we owe them the basic training and exposure that will give credit to our discipline title.

David G. Clark

A ROUNDTABLE LETTER

Clark: I know we've all talked about sharing things and I felt that one possible way to do this on a more regular basis than meeting once a year, is to begin some systematic correspondence. I've learned a lot about different kinds of programs and would now like to see all your curricula--what you require, course outlines, and reading lists. Once we get beyond that there is another step that would be fairly easy. That would be to have a round table letter, perhaps with an editor who would solicit problems or topics from us all, solicit and collate responses, and send the results to us all. Then we would have a storehouse of our concerns through the year. We might even do several of these in one year, and the way it works is pretty simple. You just say this is the problem, tell us what you do. And you sit down at the typewriter and in 10 or 15 minutes you describe your own personal or institutional experience and then send it in. These are collated and reproduced and sent back to us and we have what each school does.

We can be pretty specific about what we do. And then anyone may take this for whatever purpose, analyze it in any way, even present it to their deans or administration. One thing we could do soon is describe what we actually teach and get that in writing to the rest of us. What are some of the requirements for entry into the technical communication program for students? What do they have to have in GPA's or in courses or backgrounds? What kinds of tests do we give? We're thinking of instituting a writing test at our university and maybe some people have other kinds of requirements.

I'd like to know a good deal more about what you think are the require-

ments for teaching in the field. Somebody mentioned advisory committees. I'd like to know who has one and how it works. And how do you go about setting one up? What kinds of people do you get on it? I'd like to know what kinds of problems people face within their own institutions, and general ways of improving our own programs. I think this would be a good start. It's the cheapest one I can think of, because it would mean that we could do it with a minimum investment of our own time and paper and probably we could rotate the chore of mimeographing and distributing the results among us so that it wouldn't be a burden on anyone or any one department for more than a semester or a year.

There's one other thing that I thought we could do to benefit ourselves, and that is exchange a list of teachers available and teaching positions available and requirements for those positions. And maybe we could expand this to include some other things. If we worked with STC we could certainly begin to get a better relationship with STC and with the industry, however we define industry. Bob Ellis and I were talking a little earlier about trying to see if there isn't some way, at least for those of us who are stuck out 60 miles from the nearest water hole, to have visitors from industry quite often. The Newspaper Fund in connection with the Wall Street Journal has a Editor-in-Residence program. About 60 or 70 prominent U.S. newspaper editors have volunteered to visit journalism schools. All the school has to do is put them up while they're there. The newspaper pays the expense of transportation and underwrites the editor's time off. He comes for 2 or 3 days at a time. There are some fine things about that program and it could surely benefit our school if we had a list of technical editors and communicators who would be able to take off for a day or two

to come and see us so we could say to our students: Here are technical communicators: this is what they do and this is what they look like. It would be a good way of keeping schools up to date. We might also try sending professors back to industry periodically, through some kind of exchange. The ANPA has just started a program in which the editor and the professor change jobs for about 3 days or a week and go look at what the other does and talk to students or to the newspaper people.

I'm arguing strongly for some kind of systematic exchange of views because I think most of us could benefit from this. Probably everybody has thought of at least 20 other ideas.