

SEA GRANT
COMMUNICATIONS:

THE WASHINGTON CONNECTION

MAKING AND BREAKING SEA GRANT NEWS

PROCEEDINGS
OF THE ANNUAL
CONFERENCE OF
SEA GRANT
COMMUNICATORS
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MAKING AND BREAKING SEA GRANT NEWS

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Edited by
Halcyon Ahearn and Jack Greer
University of Maryland Sea Grant Program

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Introduction

On April 23 to 25, Sea Grant communicators from across the country met for "The Washington Connection," a conference cosponsored by the National Sea Grant Office and the University of Maryland Sea Grant Program. The conference, an annual professional development workshop, featured three areas of concentration: the new computer-based information technology, media relations, and governmental relations. Speakers included specialists in information storage and retrieval, science writers, television and radio reporters and staff members from ocean-related government agencies and congressional committees. The principal audience was writers, publications editors, and public information specialists from Sea Grant programs around the country.

In the proceedings that follow, the first section provides a layman's introduction to the basic technology of computer-based data bases available to Sea Grant personnel, and the procedures for using these systems. Data bases discussed include government systems such as Environmental Data Information Service, the National Technical Information Service, the Outer Continental Shelf Referral Center, Regional Coastal Information Centers, and the Sea Grant Depository. Also included are several private services such as the Capital Systems and the Smithsonian Science Information Exchange. These sessions were designed to help Sea Grant communicators improve the flow of information to their researchers, writers, teachers, and advisory agents and specialists.

In the sessions on print and electronic media, science writers and reporters explained how Sea Grant communicators can prepare and place material for these specialized media and for the audiences they address.

The congressional relations sessions featured staff from key congressional committees explaining the need for concise and timely reporting of Sea Grant activities to concerned members of congress, their offices and committees.

These speakers, the question-and-answer periods that follow each session, and Virginia Carter's explanation of the services offered by CASE comprise the conference as presented here. The proceedings are edited lightly in an effort to retain a sense of personal contact with the speakers. At the back is an index listing names and addresses of the speakers and the information and services they offer.

The National Sea Grant Communications Committee arranged the conference program with practical goals in mind, and the result is solid information--hard facts, how-to methods and approaches, and workable tips for making and breaking news to Sea Grant's several audiences. There is a message: Make contact. And from nearly all the speakers there were invitations, exhortations, to do so. As Tom Burroughs put it, "Call me, write me, come knock at my door."

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Computers are coming down in size, and price, and are available on most university campuses. In this conference session Sea Grant communicators were exposed to the reality of the computer's presence, and its potential as a workhorse, or tool for the imagination.

The computer-related sessions of the conference informed Sea Grant communicators about the governmental and private computer data base services available to Sea Grant personnel and gave lessons in how to use these services. Communicators also learned how computers can help us manage information, organize it according to subject, not format, and provide not only references but whole documents together with visual information such as charts or graphs. The computer can now transmit voice and image in digital form over the same channel, opening possibilities for teaching, programming or visual telephone calls. Other possibilities include word processing, computer-linked photo-composition and even computer conferences that produce their own proceedings.

INFORMATION MANAGEMENT AND COMPUTER-BASED RESOURCES

TOM AUSTIN, DIRECTOR
ENVIRONMENTAL DATA AND INFORMATION SERVICE
NOAA

I want to tell you about some of the data and technology services available as part of the National Oceanic and Atmospheric Administration.

The National Oceanographic Data Center, which is one of the five spenders with whom you can communicate to respond to both coastal and IC's needs, probably carries 85 percent of the world's oceanographic data. This chart illustrates the distribution of the stations in the North and South Atlantic. The data comes in from a variety of sources. This illustrates a series of platforms operated by an oil company off the northern Gulf of Mexico. Data were reported at one minute intervals for the period of one year. These data are available now on magnetic tape and can be manipulated to meet your needs. The red line running through this line shows the path of hurricane Camille, one of the very serious hurricanes of the decade, and fortunately for the data-collectors and users, it passed very nearly over the top of one of the stations.

Satellite technology is opening up a whole new means to respond to user needs. On this particular slide you'll note the East Coast. The darker shade of grey is the warp of the lip of the satellite. This is infrared, and shows the cold water coming down from upper Labrador moving inshore up the Gulf Stream which is the warmer band offshore. The eddies that form from that cold band break loose, and go from the surface to the bottom. A recent development is that these eddies sweep up the lobster pots, causing a

considerable economic loss to lobster fishermen. Through a satellite inventory such as this the eddies are now tracked and the instant that information comes over, the number and new location of the eddies is presented to the fishermen. This is one among many other oceanographic cooperatives for which we have the data in the coastal zone as well as in the deep ocean area and among the bottom sediments.

Atmospheric data is gathered at our National Climatic Center in Asheville. These data come from a scattering of first order stations throughout the United States. The data from these stations are what are used every evening on your TV weather forecast. Hurricane data is becoming increasingly important, and we can present the user with the probability of the impact of hurricanes. What is the probability of a hurricane striking a coastal zone of interest to you and your constituents? What is the probability of its striking in excess of whatever speeds or velocity over a ten-year period, or a two-year period, or even a hundred-year period? Again, satellite technology is playing a major role.

Pretropical disturbances out in the mid-Pacific: The one on the right caused tremendous damage and loss of life in Mexico, the other dissipated. We have a very complete set of ocean data resulting from data submitted from ships, and those airplanes that fly along the coastal areas.

Solid Earth, the National Geophysical and Solar Terrestrial Data Center in Mobile: Earthquake data are becoming increasingly important as development in the coastal zones continues. An earthquake can cause tremendous damage to offshore structures. It can cause slumping and sliding of the sediments down the continental shelf. The earthquake data comes from an international seismic network, each of the stations shown here. Tsunamis: This shows the damage after a major tsunami. A tsunami alert

network has been developed in the upper Pacific and is available for people in coastal areas where tsunamis may strike.

Manganese nodules off the quake plateau: The coastal zones of the deep ocean are becoming of increasing importance both nationally and internationally--particularly internationally as a result of the law of the sea, the doctrines and the question of whether or not these resources, international waters on the bottom of the ocean, are the property of those who can collect them or are the property of all mankind.

The Center for Environmental and Atmospheric Assessment: This shows the diversity of platforms of operation FIGGY. The meteorological and oceanographic data from all these platforms are made available from the NCC, the National Climatics Center in Asheville, and the National Oceanographic Data Center here in Washington. This shows an interest in the coastal zone primarily related to the fisheries. Dr. Schlesinger has ordered a several billion barrel national petroleum reserve stored in leach stock salt domes in the northern regions of the Gulf of Mexico. The leaching, the brine, the high salinity of the effluent from this effort was not ambient to waters of the Gulf. How quickly does it reach ambient? How far from the diffuser does it travel before the level is below any possible toxicity to eggs, to larvae, to the bratted shrimp?

The Environmental Science Information Center is a fifth center in EDIS. This group is responsible for the editing, printing, and distribution of NOAA scientific and technical publications for a large series of on-line systems, allowing you, through computer network, to gain access to the oceanic and atmospheric science information service, to the NASA recon, to the thirty-three libraries of NOAA throughout the United States. This interactive

network, fully automated for NOAA or libraries, is laid out in a five-year plan. At the end of a five-year period, the network is scheduled for completion. These are examples of information sources made available through this interactive network. NOAA users of OASIS, through the Lockheed Corporation on the West Coast, alone totaled more than 5,000 inquiries for oceanic and atmospheric information last year. We have now broken the 100,000-a-year request barrier, having run about 130,000 requests since last year.

This is a breakdown of our user community. You'll notice the top bar is the general public. This is becoming a major user community. It's a new community, as of the last two to five years. The users, as far as the Environmental Data and Information Service is concerned, have shifted in number from industry, the media and other federal agencies to the general public. Now the general public includes a host of users: the fishermen, legislators, the informed public, civic associations--the group of people we provide data and products to.

This series of slides speaks to some of the projects with which EDIS is concerned, along with other elements in NOAA. For instance, NOAA has the responsibility by law to prepare charts showing the distribution of objects in the bottom water of the coastal zones that will cause damage to fishing gear. We are responsible for the data, and increasingly for the information, for the ocean thermal energy conversion systems, the first one to be off the coast of Hawaii. It is becoming increasingly important that we understand the distribution of ice, both land-fast and sea ice, but particularly in the coastal zones, because it has an impact on both the national and the global climate, and certainly it has an impact on transportation and offshore structures. Rigs that are in an area that has potential drifting ice have to be designed to sufficiently withstand the impact

of ice. Fish resources are considered in potential oil lease assessments, because when exploration, drilling and production start, we want to monitor whether or not the activities on the leases are having an impact on this resource.

The RCIC, Regional Coastal Information Center, will be mentioned again a little later. It is here that we have again noticed the amazing changes in the user community, those that seek information from RCIC. The northeastern RCIC had over 2,000 requests last year. You can see that the new users at the top represent nearly half of the total user community. We've got to learn to communicate and respond to a new type of user--not as scientists to the scientist or to the engineer or researcher, but to this new community, young people who are concerned. Need I be concerned about this big collection of CO₂ in the atmosphere? Need I be concerned about propyl and methyl mercury in the sea? The number of questions that the concerned public asks is the result of media exposure. They are beginning to ask the kind of questions they have never asked in the past.

The concept of data centers, of information centers, is a little like this particular slide. I can use this slide with freedom because I have legally lived with a librarian for thirty-seven years, and if I want to cause her blood pressure to elevate a bit, I say that as far as I'm concerned a librarian's aim in life is to bring the books in, lock the doors, and protect. It seems, though, that she is not a librarian; there are no librarians. There are now only media specialists. OK, there is a media specialist.

We have gone to computers extensively. This is the first picture of the new computers at NCC that I will be involved in dedicating tomorrow. It is a double A-frame Univac; it's a beautiful computer. That particular computer will be linked to

mini-computers in each of the five centers. Mini-computers will serve as the dedicated file clerks, trapping physical and climatic data, or information that each of you are interested in. These will also serve as remote job entries to a fully automated network so that you as users, as communicators, may go to any one of the five centers, or to the NCC, and your answer will come back, multi-disciplinary as is appropriate. You will not know whether the individual to whom you addressed your question has gone to one, two, or all five of our centers to get the information. Without computers, without on-line capability, and without the increasing capability for you to have access to our data and information files, the mounds of data and information at your fingertips to respond to your users would be severely limited. Computer terminals, mini-computers into large computers, and your having access to the files is the coming way of life.

BERNARD DENNIS, PROJECT LEADER
INFORMATION MANAGEMENT
OFFICE OF BIOLOGICAL SERVICES
U.S. FISH AND WILDLIFE SERVICE

There are three objectives I would like to address in this presentation. First, is your interest in Washington, D.C. sources of information relevant to the needs of your users? Second, I hope to present a broader view of the concept "information transfer" than perhaps you are accustomed to. Then, I will attempt to indicate how that broader definition impacts on our roles as information transfer professionals.

Simply stated, the mission of the U.S. Fish and Wildlife Service is to save the nation's fish and wildlife for the benefit of the American people now and in the future. This mission is addressed in a number of ways including:

- .management of the National Wildlife Refuge system
- .conducting fish and wildlife research
- .stocking streams and lakes
- .law enforcement
- .protecting and recovering endangered species
- .migrating bird management
- *serving as a primary federal source for ecological information needed for better understanding the ecological consequences of resource development alternatives (i.e., environmental impact assessment and prediction).

It is this last responsibility that probably is most relevant to your needs and the area with which we are primarily concerned in the Biological Services Program. We are a primary federal source of ecological information and technology.

Through an integrated national system of applied research, resource inventories such as the national wetlands inventory and coastal ecosystem characterization studies, development of field and planning methods, and information and technology transfer, the Biological Services Program provides ecological information and technology needed particularly for more precise environmental impact assessments and predictions.

The Program provides information related to development activities such as:

- coal, minerals and oil extraction
- power plant siting and operation and transmission corridor location and management
- dredging and filling operations and other alterations to streams
- coastal developments including onshore impacts of OCS oil development
- instream flow requirements for fish and wildlife
- other

The information and technology supplied by Biological Services is intended primarily for use by development planners, policy people, field operators, regulating agencies, power utilities, legislative and legal audiences, and others making or influencing decisions that impact on fish and wildlife and their habitats. The Program strives to package and communicate its information in ways most suitable for the intended users.

The second objective of this presentation is to

give a broader definition to the concept of "information transfer."

Over a two-year period, the Biological Services Program has made an intensive study of how it should do business to ensure that its R&D is relevant to high priority habitat preservation issues and that the results will, indeed, be applied by the intended users. We have come to the understanding that R&D and information transfer are inseparable processes which, when integrated consistently, form a new, holistic process we call "Information Technology Management" (ITM).

Further, we concluded that even though Biological Services is an R&D organization, its primary mission is to get information used by others. To accomplish this, we understood that we need to function as a user-needs-driven national ITM system, and that we need to conduct our work in five functional areas or steps. To provide a framework for consistently performing our R&D and transfer functions we saw that a set of procedures is needed to indicate who does what in each of the five steps. The five steps of the ITM process are:

Identification of user needs: identifying the issues relevant to the Fish and Wildlife Service and to our users. Continued interaction with the users helps to specify the content and format of the information and technology needed.

Communication of needs: introducing identified needs into the Service's planning and budgeting system to external suppliers. Needs documented by various organizational units of the Program are ranked according to priority of the issue involved and potential benefits from the R&D results. Top ranked needs are recommended for funding.

Development of information and technology:
matching the right suppliers with the requirements, monitoring R&D progress, and developing dissemination strategies and plans to get the results into use.

Dissemination of information and technology:
packaging and transmitting information in products and services best suited for specific user groups. May require a variety of communications methods including publications, maps, on-line data systems, exhibits, workshops, etc.

Evaluation of information and technology:
analyzing user feedback and using case studies to determine the influence of different products on the outcome of natural resource development and management decisions. Findings guide future R&D and product planning and dissemination.

We concluded that this ITM system is comprised of three types of organizational units each emphasizing a specific role:

- Headquarters in Washington, D.C.: general management of the Program and system, program planning and budgeting, interagency coordination at the national level, and identification of emerging national issues.
- National Teams: centers of interdisciplinary ecological expertise in issue areas with which the Program is concerned such as power plants, coal development, and coastal ecosystem activities. The National Teams are concerned with national and multi-regional issues within their areas of expertise and function as primary suppliers of ecological information and technology.

Regional Teams: located in the Fish and Wildlife Service Regions throughout the country. Regional Teams also are centers of ecological expertise appropriate for their respective regions, but, they function as information and technology brokers. They identify the issues, users, and needs in their regions, communicate priority needs to the suppliers, guide the development and dissemination of the responses, and provide technical assistance and evaluation.

On each of the National and Regional Teams is an Information Transfer Specialist (ITS) from the field of information science. The ITS functions as an information manager providing through staff and contacts needed information and communication science capabilities to support the Team in all five steps of the ITM process. The objective is to facilitate consistent application of appropriate information and communication science and technology in the supplier and broker functions of the National and Regional Teams.

The Information Management Project at Headquarters plans and coordinates development, implementation, and evaluation of the Program's ITM capabilities, including ITS staff, information transfer services, identification of the Fish and Wildlife Service as a primary federal source of ecological information and technology needed to address habitat preservation issues, and training.

Traditionally, formal education, training and activities in these fields have focused primarily on the handling and dissemination of information--after it has been developed in other fields. But, the information transfer process begins in step one of the five-step ITM process--not step four. Information transfer process expertise is required in all five steps.

The developers of information are primarily concerned with the transfer process itself and with getting information put to use. The two processes--development and dissemination--must be integrated to improve the relevance of the content and the efficiency with which information is transferred and applied. Thus, the role of the information transfer specialist is both facilitative, ensuring that content is effectively transferred, and supportive, providing the knowledge, skills and services needed in each of the five steps.

People who fill the role of the information transfer specialist must be information science generalists and managers. They must develop an understanding of the R&D process and determine what and when particular information transfer process methods and services are needed in each of the five steps--and have them applied effectively. Simply being a good information retrieval specialist, writer, or computer systems analyst is not enough. The job requires a broad combination of such knowledge.

The role of the information manager is receiving increasing attention in professional publications, but an emphasis on communicating methods (step four) is apparent throughout the discussions. I suggest that you Sea Grant communicators have the opportunity to broaden the perspectives of your respective communities regarding the management of information and technology and your role in that holistic process.

MICHELE TETLEY, PROGRAM COORDINATOR
OUTER CONTINENTAL SHELF REFERRAL CENTER
DEPARTMENT OF THE INTERIOR

I must admit that this is the first time I have appeared in a session entitled "Alphabet Soup." It's a bit disconcerting to realize that being a portion of that soup also means that I am part of the problem. Today we've had EDIS, OBS, and now we have OCS. It can be a little confusing. Now that I think about it, I'm at the OCS office; I work with the assistant secretary of PBA, in DOI, to coordinate BLM's and USGS's activities. Now I know where I work and what I do, but I'm sure it's a little bit confusing to you.

According to the letter I received last week, I'm supposed to speak on four topics in about ten minutes. Each of those could probably take about an hour-- Washington's acronyms could probably take weeks! I was also told that Tommy Austin was going to hit you over the head, and I was supposed to pull you by the ears. It seemed quite reasonable at the time, since those are roles that aren't new to either one of us. Well, let me get back to what I'm supposed to talk about.

To be quite frank, I don't think in the time we have here today that I can begin to help you cope with the city's acronyms. I can show you, however, that there are people behind those acronyms and they are fairly easy to reach, if you have a little imagination. I've always found it useful, when I started a new job, or started in a new discipline, to make a list of the acronyms that I ran across. Thinking back on it, NOAA is probably one of the worst agencies for acronyms--Tom Austin mentioned FIGGY. NOAA has not only

first generation acronyms, but as I discovered when I went to work there and started my collection, they have second generation acronyms. As I was telling Dr. Austin before the meeting, I couldn't remember what some of the acronyms meant, but I knew that there was a GATE and a GARP and a FIGGY. Some of those acronyms have initials which stand for the whole acronym of the other ones. So you really have to be in the business to understand what they all mean.

I simply want to run through a few of those whom I consider to be major contacts in town. I probably could have just brought my Rolodex and read it to you, but I have chosen a few people that I can recommend as starters in this town. They are outside of NOAA, since you've heard today about a number of resources within NOAA and since you are after all affiliated via the grant process with NOAA. For standard contacts, OTA, which is the Office of Technology Assessment, has an oceans section headed by a man named Bob Niblock who is a very good contact. The CRS, which is the Congressional Research Service in the Library of Congress, has a natural resource policy division, and Jeff Zinn is a good contact there. NOPS, the National Ocean Policy Study--although not as active as it used to be--is run by Deb Sterling, who you'll be hearing from later on. The only non-federal name is the CF, which is the Conservation Foundation. John Clark is an excellent contact when he's in town.

Those four are what I would call my starter collection. If they don't know about an issue, it probably doesn't exist. They are generalists, and if you are trying to find out the background on an issue, or find out what's going to be happening, these are the people to contact. If you want their phone numbers, call me at 201-343-9314.

You're probably wondering why I am stressing people. It's because I feel very strongly that people are a most crucial information resource. I

was trained in library science--as you can tell by my hairdo--but I have catalogued more people on three-by-five cards in the last eleven years than I have books. The reason is simple. I've always worked in disciplines where the discipline moved faster than the documentation. So the only source of information that I frequently had was the people themselves. In the political arena, it's who you know that carries clout, and I can guarantee that the same is true for the information business. For example, I am sure most of you are familiar with Nautilus Press newsletters, such as Ocean Science News and Coastal Zone Management Newsletter. In my opinion, those newsletters are probably the most useful current-awareness publications for the marine community there are. The reason is that Jack Botzum, who is the editor, and his staff, know most of the major marine community individuals, and they contact them regularly. I'd hate to see his phone bills, but look at their product.

This brings me to another favorite topic--your phone. Your phone is a very useful information tool. I remember, lo those many years ago when I first started in the information business, I dutifully wrote out my information requests, and my secretary typed them up and filed the carbons away. Two months later we would write the second request and about three months later we might get some of those documents. Now it was all very organized, but it was a great big waste of time. Once I started using the phone instead of the post office, a whole new world opened up to me. Not only did I get the documents in days rather than months, but more importantly, I met the people behind the information and the policies. And, as side benefits, I didn't have to have so many files, and my secretarial staff could work on more important topics.

The first thing that a nonfederal employee is

going to say is that those of us who work for the government have access to the FTS (another acronym)-- the Federal Telecommunications System. It is rather magic. You pick up the phone and nobody seems to charge you. But there are ways of cutting down on telephone costs when you don't work for the federal government. For example, when you are calling somebody in the federal government, ask them to call you back if you think it's going to be a lengthy conversation. I do that for callers all the time. I also will call around town, or the regional offices, asking people to call back the individual who requested something from me. That way the individual can sit back and start receiving calls. I must admit, it works better if you know the people you ask this of. For that reason I would recommend cultivating a couple of contacts in each of the federal agencies who are both knowledgeable and accomodating.

In this regard, I think I should point out that most public information offices in agencies aren't all that good as major contacts because they are once-removed from the action. They write their press releases from material submitted to them from the offices. If you are after a particular subject, you may find that they do not have detailed information.

I probably don't need to say this to this particular group, but hold on to those phone numbers once you get them. They are worth their weight in gold. I am continually amazed by the number of people who don't maintain phone files and who continue to ask me for the same phone numbers. You can save yourself hours of work, and certainly extra phone calls, if you write those numbers down when you get them.

At this point, I'm sure you're wondering why I get so excited about people and phones. No, I don't have any stock in Ma Bell. For the past eleven years, I have developed natural resource information services based primarily on people and telephones. To

be sure, I have left a number of libraries in my wake too, but my basic element has always been people. In my current job I don't even have a document collection. I have three giant Rolodexes and a pile of phone directories.

I run the Outer Continental Shelf Referral Center, which was established at the request of coastal-state governments. As I'm sure you know, OCS oil and gas drilling is a very sensitive topic for most of these states, so they wanted a way to find data and information concerning the Department of Interior's OCS leasing and management activities. This is a wide-ranging and pretty complex program which is divided between four assistant secretaries and innumerable field offices. There are also about half a dozen other federal agencies that are closely involved in the process, as you learned from Dr. Austin's presentation. He mentioned several things that are tied in with the OCS program. Anyway, it's very confusing when you are trying to find an answer to something. You don't know where to start. I was hired to be the magical number that the states, the public, industry, and other federal agencies--including, interestingly enough, the Department of Interior--could call when they wanted to know where to go for OCS information and data.

I work in the OCS program coordination office for the Assistant Secretary for Policy, Budget and Administration. We coordinate all of the OCS activities in the Department of Interior, handle all the state and federal liaison activities, and run the OCS advisory board. Because we have overview responsibilities for the OCS program, the program coordination office is a very logical place to put the referral center. I'm also involved in a number of other OCS activities which certainly adds to my knowledge, and thus to my ability to help the people who call in. For example, we're wrestling now with

implementing the OCS Lands Act amendments, which call for about twenty-six sets of regulations. As a result of these amendments, I will be charged with trying to figure out a way to coordinate all the federal agencies' OCS activities and to develop a record that will give us an overview of them, and then allow the states access to that. All the regulations generated that have anything to do with OCS will have to be collected.

I can't begin to unravel the OCS program for you today, but the one thing you should remember is that basically all the pre-leasing activities, from the call for nominations through the actual sale, are handled by the Bureau of Land Management. The post-leasing activities, from monitoring to management, to environmental review of the exploration and development plans submitted by the industry, are handled by USGS. Things aren't quite that simple, but that's a good rule of thumb. It's amazing how many people think that BLM is the only group that handles OCS activities. The bulk of the action is in USGS. Also, you should be aware that the RALI program in USGS-- RALI is Resources and Land Investigations--is developing a series of regional OCS indices and summary reports. These will list the documentation that is generated during the OCS leasing process. The summary reports will summarize the known data and information for a particular leasing area. These are being put together for the coastal-state governments, but they will be available for everybody. As these get on line--they're still in the development stage--you might be interested in them as a resource, for those of you who are in regions with very strong OCS activity and a lot of public interest.

Prior to joining the Department of the Interior, I worked for NOAA's Office of Coastal Zone Management. There I developed the Coastal Zone Information Center, and I used Sea Grant personnel and documentation a

great deal. Much of Sea Grant research, as you know, relates to efforts concerning management problems; consequently, OCZM's staff frequently reviews Sea Grant proposals. For this reason, I think it is probably not a bad idea to query both your state coastal-zone people and OCZM's regional folk to find out what they think are the pressing problems in your region. Certainly you would want to stress the fact that you are only interested in ideas, and couldn't make promises. I remember years ago this created some misunderstandings. It's a good idea to keep your finger on what's going on in Coastal Zone, to see where things are leading so that you can be there first.

Throughout all these jobs I have concentrated on putting people together with people. I guess my library science teachers would be a little disturbed by the fact that somewhere along the line I passed over the books and went directly to people. For the last three jobs I've had, I have, at base, been paid to be a window on the federal decision-making process. This is a great city for information, as you can see today from the lineup that Susan Bonsall has put together for you. You wouldn't be able to get such a cast of characters so easily in any other city in the country.

This afternoon you are going to be learning about a number of data systems that can provide you with useful and time-saving services. Some of you may want to dismiss some of these systems because you don't think you can afford to purchase the equipment or the package. What you should remember is that a little computer system can go a long way. So get on that trusty old phone and call around your campus and locate some of those terminals and word-processing equipment and negotiate. A lot of these systems need heavy use to justify them, so you'll probably be welcomed. The most important thing, I think, is to determine what is time effective. If something is time

effective, chances are it's going to be cost effective too. Just compare your hourly wage to five minutes of computer time well-spent and you'll see what I mean. There is a wealth of tools available, and I think you are cheating yourself if you don't use everything you can get your hands on.

TOM AUSTIN AND BERNARD DENNIS RESPOND TO MICHELE'S
CONCEPT OF THE INFORMATION USER.

Tom Austin: Both Michele and Bernie mentioned the decision-makers. I want you to put those two words in your mind and keep them there, because first, I don't think users know what they want. I don't think they know what they want until they have talked with you and spelled out what they think they need and then heard you discuss with them what they think they need, and convince them of what they really need. I can't repeat that, but let me give you an example-- that slide I showed of all the white spots in the Atlantic. When people call in and say I want all the oceanographic data on the North Atlantic, you know they don't know what they need. They know they've got a problem; they know the answer to that problem is to get a lot of data. So when you begin discussing with them what they really need, you can provide them with a limited supply of data, or you can even provide them with access to the products, or you can provide them with a source of literature made out by somebody who has used the data and has answered the question.

We are faced with a technological capability for meeting our user needs which is totally new in the history of our nation. A superb example of our national problems, and one we live with every day involves climate and technological developments, climate and food. Climate is a limiting factor in the availability of food, not only in our nation

but throughout the world. There have to be significant technological breakthroughs in fertilizer, hybrids, or other techniques to increase the production of wheat. Climate and housing: people are just beginning to realize that you don't build a house and shove in air conditioning and heating. You design a house around the climate in the area in which the house is built. Climate and transportation or climate and health: go down the various aspects of your lifestyle and you'll find that climate has become a living, limiting factor because our technology development has become so sophisticated. Young users understand that, but you'll find many users over fifty who don't understand that. That's where many of your user problems arise. They know they need a lot of information in order to do the proper decision-making, but they're not sure what information.

Bernard Dennis: I couldn't agree with you more. A very important aspect of a full response is to help the user find what he needs. If you can define that, you're halfway to the solution.

Michele Tetley: I've always felt that we are really playing doctor. The patient says, "I don't feel good," but can't tell the doctor any more. That's basically the way most of the users come in. They need help, but they don't know what kind of help, and you spend half an hour focusing them on their problem, or diagnosing their information ailment.

BRIGITTE HUYBRECHTS
CAPITAL SYSTEMS

What I want to talk about here is searches on computer data bases which have come on the scene in the last few years, and are a really good aid to finding information. Computers are not totally dehumanized, of course; there are people involved, and there are telephone numbers you can call. When you have completely fouled up your search on the computer, you can always call and ask, "Please help me."

What are these computer data bases? Today, we are going to talk mainly about the bibliographic data bases that consist of files of citations such as you have in printed indexes. I'm sure you are all familiar with biological abstracts and chemical abstracts. Well, these are filed on the computer and you can access them through a terminal from any place in the country that you want.

When is it most appropriate to do a search? Whenever you want to find information that is contained in a general article or a book or a conference proceeding, it is much more economical, and much quicker, to do a computer search. And, you can search in a more flexible manner on a computer than you can when you do a manual search. If you think of having to go to a library and find information, find a general article or several general articles on a topic, the time you spend going through printed indexes to find the citations is quite substantial. With a computer search it only takes a few minutes.

I would like to go now to an example of how to search because I think that is the best way to show you how it is done. Suppose you are interested in

literature or research that has been done on shellfish diseases in hatcheries. The first thing to do is to find the components of your search question, a job that is not always this easy, and to divide those up into several parts. So you have "Shellfish Diseases in Hatcheries," and in each of the components you try to find synonyms or inclusive terms. The documents are indexed under a large number of index terms and these files consist of hundreds of thousands of documents. In order to find those documents we are interested in, we go into the computer and we use logic to combine these search components with each other.

We use the logic that deals with sets and their relationships. There are three pull-in operators that we use to do the search on computer. The first one is what we call "Or" and it is used to find documents that are indexed either under shellfish, or under oysters, or under clams, or under two or three of those. So if we access the computer and ask it for documents that have shellfish or oysters or clams, we will get all of the documents that have those. The second pull-in operator is "And," and "And" shows the intersect. If we ask the computer for shellfish and disease, we will get only those documents that name both shellfish and disease as their index terms. So we will get only documents that deal with shellfish diseases. And then the third pull-in operator is "And Not," and it negates a part of what we want. In this case we want to find documents that are indexed under shellfish and disease, but not, since we do not speak the German language, the ones that are in German. So we say "and not German," and that is what we will not retrieve.

So, just by using those three pull-in operators, we will, from a file of hundreds of thousands of documents, retrieve only those that we want, and the search statement that we get at the end is like this:

We have "Shellfish" or "Oysters" or "Clams," and "Diseases" or "Pathology," and "Hatchery" or "Hatcheries."

All we need to do the search now is a terminal, a telephone to call up the computer. We need to have dialogue. We need to be in an area that has dialogue access to the computer, and that is not available in all areas of the country. But significant parts of the country do have local access--you just call by a local phone into the communications network which will then connect you with the computer and you are then on line. You have accessed the files. Of course, the other thing you need is an account number with the release date of the sender. After you have called up by telephone and signed on, and hooked the telephone into the computer terminal, you can begin interactions with the computer.

For example, the computer will tell you, "Hello, FTC. You are now connected to the ORBIT data base," which is the FTC data base. You then ask for the file, because each datum that is handled has a large number of different files. You ask for the particular file that you are interested in. We are interested in oceanic abstracts, so you call for file Oceanic. The program will come back and tell you that you are now connected to the Oceanic Abstracts, and it will ask you, "Is this one for search statement?" You say, "All shellfish or all oysters." You will receive Oyster and Oysters or Oystering, or anything that starts with Oyster and all Clam. The program comes back and it says that in your first search statement you have 1,265 postings. There are 1,265 documents indexed with those search terms. You then put in a second search statement, "All pathology or all disease." The program comes back and says there are 249 postings like that. You then use the pull-in operators one and two, and find there are 39 documents indexed under Oyster, Shellfish,

or Clam, and Pathology or Disease. As I said, that number indexed with Hatcheries. So now you know how many documents there are in the file that deal with this subject.

You can then ask the computer to print, on line, the citations. So you have the accession number, as well as the author's source, the language, and indexing terms for all of those. Or, you could ask the computer to create off line. Command, "Print off line," and it will print it open. The computer center will send it to you by mail and you'll receive it the next day, which is, of course, much cheaper, especially if you have a large number of citations that you want in print. So this whole search has taken about six minutes to do, and if we have retrieved figures which are what we want, we've really saved some time. That's really all there is to it. It's really very simple.

CHERYL ALEXANDER, COORDINATOR
ENVIRONMENTAL SCIENCE INFORMATION CENTER
ENVIRONMENTAL DATA AND INFORMATION SERVICE, NOAA

The Regional Coastal Information Center Program is a system, not a data base. Paraphrasing Michele Tetley, this is an information-doctor program helping you the patient, or so we hope by the end of this discussion.

The RCIC Program is sponsored by three NOAA agencies: the Environmental Data and Information Service, the Office of Coastal Zone Management, and the Sea Grant Program. There are two other NOAA agencies that participate with us: the Office of Ocean Engineering and the National Marine Fisheries Service.

Development of this program began approximately three years ago. NOAA had been given several mandates as the result of federal legislation concerning coastal zone management, OCS, and fisheries. Some of this legislation mandated that the federal programs incorporate state participation in their development. That meant the states needed information and data, but in many cases the mechanisms for obtaining this information were not available. So the RCIC program was formed to provide one-point or one-stop shopping for the information needed from any agency.

Regional Coastal Information Centers are located at universities and, more specifically, within the Marine Advisory Service of Sea Grant Programs. There is considerable expertise available at the universities already familiar with ocean-marine coastal issues. An information activity is

strengthened if it can utilize this expertise. In turn, the Sea Grant Programs can benefit from information sources and expertise provided by the RCIC's.

The goal of the RCIC Program is to provide improved access to coastal information. Coastal information is broadly defined to include scientific, technical, social, and economic aspects. Why so broad? Because there are multiple uses of the coastal zone which involve all of these aspects.

To date we have three pilot centers. The first one is the Northeast Coastal Information Center located at the University of Rhode Island. The second is the Northwest Coastal Information Center which is operated jointly by Oregon State University and the University of Washington. The third is Great Lakes Information which is located jointly at the University of Michigan in Ann Arbor and the Great Lakes Basin Commission.

We have had over 4,000 requests since the program began in June 1977. The requests come in from a broad spectrum of user groups including coastal planners, legislators and decision-makers, federal, state and local government, commercial concerns, citizen interest groups, researchers, and the general public.

The RCIC centers are not libraries; they are not primarily concerned with establishing collections. Instead, the centers tap the resources already available within a region, and coordinate them to lessen duplication of effort. The RCIC centers provide access to published and unpublished information, maps, and data; referral to appropriate agencies and experts in the field; and they inform the public through newsletters, information syntheses, and workshops. They also provide access to national information and bibliographic data systems.

The program eventually will form a network of nine centers. The three pilot centers in the

Northeast, Northwest, and Great Lakes will be joined by those in the Mid-Atlantic, the South Atlantic, the Gulf, California, Hawaii, and Alaska.

The three pilot centers and the RCIC Management Council communicate with each other using a computer conference system call CIAO (Coastal Information Access Organization)--our acronym for "hello." When an RCIC has received an information request and does not know where to find the information, it puts a message on CIAO asking for help. Almost always one of the other CIAO participants can provide a lead. Each RCIC has been provided with a computer terminal to participate in CIAO.

The best way to get a feeling for what an RCIC actually does is to hear some of the requests and their responses. So I will present six sample requests, the first three from Marine Advisory people.

One Marine Advisory specialist wanted information on how to plan and develop travel tours, especially drive-it-yourself tours, boating tours, and bike trails using existing roads. The RCIC contacted the Heritage Conservation and Recreation Service and local agencies. They developed a list of publications and agencies to contact for information on planning such trails.

A Marine Advisory specialist in New England wanted information on marine recreation in New England. What information sources could they go to--not published information, but what agencies and who was doing work on the topic? The RCIC contacted various New England research directors and state and local agencies. Using this information, a list of contacts was developed for the Marine Advisory agent.

A Marine Advisory agent in the Northwest wanted to know what the latest developments in fishing gear were. I'm sure your work keeps you familiar with this topic. In this case, Sea Grant publications

and the most relevant newsletters in the fishing industry were used to develop a short synopsis of the recent developments in fishing gear.

The boating industry was interested in establishing a plant along the East Coast to build a 33-foot sports angling boat. It wanted to know where the best location was, and where the highest demand for such a boat would be. They contacted a regional coastal information center. The RCIC got together information on transportation routes, taxes, skilled labor, financial incentives, and the market demand. As a result of this information, a plant was established and is now in operation.

A commercial developer needed information about an aeration system which the manufacturer claimed would prevent silt from clogging his marina basin. We call this our example of technology transfer in reverse because in this case a new instrument was being utilized and someone needed to know if, indeed, he should apply it. But use of the system in a similar marine environment had not prevented silting, and discontinuing its use was being considered. As a result, the marine operator saved a lot of time and money by deciding not to operate such a system.

In the final example, a coastal town engineer needed to know if a map existed that showed the rivers and streams in his state that had been used to generate power. The state's Department of Environmental Management and the Governor's Energy Office were contacted. Two projects were underway to update a survey that had been made in the 1950's. In this case, the coastal engineer was able to contact both agencies and get up-to-date information without going to very much trouble on his own.

Each RCIC receives about 20 percent of their requests from users outside of their region. We're hoping you will use the RCIC from your region, and

will feel as free to contact ones that are not from your region. Don't hesitate to call. The RCIC's are there to serve you and they are more than happy to do so. (See index for contacts and telephone numbers of the three established centers.)

TED RYERSON, SPECIAL ASSISTANT TO THE DIRECTOR
NATIONAL TECHNICAL INFORMATION SERVICE

Today's information revolution challenges the world's ability to organize information and to retrieve and manipulate it to solve problems. As the quantity of information--in the form of books, reports, journal articles, papers, manuals, guides, statistical data, and magnetic tapes--grows at a staggering rate, the world tries to keep pace by using an array of sophisticated equipment.

The National Technical Information Service is in the forefront of those leading this revolution. As an agency of the Department of Commerce, it is the most important single source for public access to government-funded research, development, planning, and analytical analyses.

The organization originated in 1946 as the U.S. Government's mechanism for channeling captured records of research and technology to U.S. business. As U.S. government-funded R&D grew in the 1950s and 60s, the Clearinghouse for Federal Scientific and Technical Information was established to provide central public access for the resultant technical reports. As the data base grew in the late 1960's, the scope of the acquisitioned material expanded to include the soft sciences as well as the physical sciences. It was at this point that the National Technical Information Service was established.

Today, NTIS operates the central information system for government-funded periodicals, technical reports, computer software, data files on magnetic tape, and government-owned patents.

Approximately 270 new reports and other items

of information are processed into the central information system daily. Bibliographic citations are created for each by information specialists. Report-flow into the system is controlled by traditional procedures for cataloging, subject classification, subject indexing and abstracting.

Machine-readable citations are created by key-boarding worksheets through a minicomputer system. The system provides on-line data entry and data edit for input processing and data selection for production of its various announcement media. A clean, merged tape of all segments of the file is then generated from the NTIS in-house computer. The master tape is used for the linotron photocomposition of NTIS journals and abstract newsletters and for lease to on-line vendors.

New reports are added to the system at increasing annual rates, with growth progressing from 59,000 reports in 1974 to over 70,000 in 1978. The total data base, dating back to 1946, now includes some 1 million items--with over 700,000 in machine-readable form (1964 to present). The reports describe the results of most of the U.S. Government's research, development, testing, and evaluation programs.

From the 270 new items collected and processed daily and from the record we make of them, a number of current awareness periodicals are created. Abstract newsletters are created in 26 different subject areas such as chemistry, physics, energy, civil engineering, computers, industrial and mechanical engineering, biomedical technology and human-factors engineering. A comprehensive journal called Government Reports Announcement and Index (GRA&I) is published biweekly for librarians, technical information specialists and others requiring all the summaries in a single volume. A cumulative index is produced at the end of each year to assist those using the journals to sort out specific categories of

information.

Many federal agencies and some nonprofit organizations utilize NTIS as the public promoter and sales agent for many of their periodicals. More than 20,000 subscribers buy copies of over seventy different periodicals sold by NTIS. These subscriptions range in subject matter from fossil energy to heat pipe technology to the EPA's quarterly bibliography.

As a result of the many awareness services, NTIS fills orders for about 12,000 reports daily in addition to 7,000 standing orders for periodicals. Each year it supplies customers with about 4 million research reports which are generally available in both paper copy and microfiche. Microfiche are 4 x 6 inch film sheets with spaces for ninety-eight pages, each one twenty-fourth the size of the original paper copy. One hundred and fifty sheets of film are about one inch thick, so you may easily carry the equivalent of fifty 300-page books in one pocket. An average file cabinet can hold 10,000 reports or the equivalent of a small technical information center. NTIS also has a specialized packaging service called Selected Research in Microfiche (SRIM) which automatically provides subscribers with full-text microfiche copies of research reports in special subject areas they select.

NTIS analysts help subscribers choose from among 500 different subject categories and 200,000 unique descriptive terms. For example, if a subscriber's area of interest is biological oceanography, he would receive about 228 complete report texts over a 12-month period at about one fourth the cost if purchased individually. The reports are sorted automatically and distributed to subscribers every two weeks as a standing order service.

For retrospective information retrieval, the major information processing systems, Lockheed, SDC, and BRS, supply the NTIS bibliographic data base

and many others to a computer network serving three or four thousand subscribers who make over 500 searches of the NTIS file daily. The data base is leased by at least twenty-five additional information organizations who perform about 7,000 SDI or awareness searches each updated at their operating units.

NTIS also provides customized on-line search services of its own. So when a researcher--an engineer, biologist, economist, communications expert, or student--comes to NTIS for information, an NTIS analyst can develop a search strategy to find it quickly and precisely. He can also tell if NTIS does not have what the researcher is looking for and, perhaps, refer him to other sources of technical information, such as the Engineering Science Data Unit, Machinability Data Center, or Electromagnetic Compatibility Analysis Center.

NTIS also produces published searches from its own data base, and of several closely related files such as Engineering Index and American Petroleum Institute. These are on-line subject searches performed by NTIS analysts in anticipation of customer's needs. Each search includes citations for documents and other types of specialized packages of information included in the NTIS collection. Over 1,000 published searches have been developed and are updated every year. The obvious advantage is that published searches are stocked and, therefore, can be offered quickly and at a lower cost.

Information about licensable technology is also acquisitioned and made available. NTIS obtains foreign patent protection on selected government inventions and negotiates directly for licenses utilizing these inventions. The availability of licensable government technology is brought to customer's attention by a special abstract newsletter, Government Inventions for Licensing.

Another major developmental area for NTIS is

computer-based data files produced by federal agencies and the computer programs for manipulating the files. These files, which are listed in directories and newsletters, represent a large part of the nation's computer-based data inventory available for public use. Special reports from some of these files are produced and made available.

In addition, the General Services Administration selected NTIS to organize and manage a federal software exchange center. Federal property management regulations require all agencies, other than DoD, to report common-use software to the exchange. Although the primary GSA market is other federal agencies, NTIS will also sell copies of the software to the public, with GSA's permission.

The value of NTIS for information practitioners is impossible to exaggerate. For the researcher or scientist it is the source of information that greatly reduces the possibility of reinventing the wheel; for the manager it can go a long way in helping to solve the problems of funding and autonomy; for the librarian it is a source of verification and guide to unpublished government reports.

I have highlighted some of the major NTIS products and services available for your use. If you are interested in additional information, copies of the NTIS information services catalog are available from me or can be obtained by writing NTIS.

ANNA MAY TENSAW, ON-LINE SERVICES
SMITHSONIAN SCIENCE INFORMATION EXCHANGE

I will refer to the Smithsonian Science Information Exchange as SSIE from here on out. Exactly what is SSIE? SSIE is the national single, central source for information on research in progress in all the fields of science. In other words, we are a data base, and we have on our data base summaries of ongoing research work. This is prepublication information. Some of the other speakers will touch on bibliographic data bases, but SSIE differs from these in that we are a prepublication data base. We have summaries of ongoing, and I might add, recently completed research work, because we keep information on the file for at least the twenty-four most recent months. For instance, if there is a project that was started four years ago and ended last year, of course it's not any longer ongoing. It's recently completed. You can still access us, rather than a bibliographic file, for that information, simply because it's still considered prepublication information.

We cover all the disciplines in the field of science at SSIE, life sciences as well as physical sciences. I'm not going to go into detail because of our time allotment. I'm just going to give you an overview.

We register approximately 100,000 notices of research projects each year from 1,300 different sources, mainly in the federal government. But we do get input from state governments, foundations, non-profit organizations, and so on. We have input from foreign organizations, mostly by contract, in the areas of dentistry, energy, and cancer. This is just

to give you an overview of the projects that come into SSIE.

In the federal government in the fiscal year '77 input from the Department of Commerce numbered 1,700 projects. Out of those 1,700 there were 1,025 that were NOAA projects, and out of the NOAA projects, probably 600 were from Sea Grant. This year, fiscal year '78, we have registered, or expect to register, approximately 2,500 projects from Commerce, and from NOAA alone approximately 1,700 projects, the total number we had from Commerce in fiscal year '77. So you can see just how much more input we're getting, and how many more programs from the various agencies we are receiving. From the Sea Grant Program we are expecting 1,000 projects. These thousand projects are not all on the data base yet because we are still in the process of registering them.

The notices of research projects are one-page documents with enough information to give you an idea of the purpose of the research. In the upper right-hand corner there is a unique number which we assign as the project comes in. If it is continued, we add a dash one (-1) or a dash two (-2), depending upon the particular year. The name of the supporting organization is given in a standardized format, from the top level down to the most descriptive unit. For example, we have Commerce, NOAA, and Sea Grant Office, so you know exactly what type of project it is. The notice gives you the exact address with the zip code, and also lists the project, the title, the investigator, his department specialty, and sometimes the rest of his staff. The performing agency's address is listed. This information is helpful if you want more information on a particular summary. What you can do is write the investigator, tell him that you have seen the abstract of his work, and ask for a little more detail. Most investigators are cooperative. The research notice shows the period of performance for

this particular record, then the summary itself-- usually 200 words or less--and funding, if given. The NOAA projects, which of course include Sea Grant's, do have their funding listed.

We cover all disciplines. I am showing you a project listing from New York because the people who organized this meeting are from that area. For example, we don't only list hard biology; we also mention policy, economic evaluations and the like.

We have a staff of twenty-five scientists who cover the various disciplines. Our scientists index these projects as they come in, and they also retrieve the information--a very good feature. I don't have an exact breakdown on oceanography, but I want to give you an example of the indexes themselves. We have over 300 indexes which are aligned in a hierarchical format. For example, if you look under "Engineering," you have "Waste Water Treatment and Disposal." I'm going to take that "Waste Water..." entry and show you exactly how that particular index is broken down, and how the analysts can retrieve at the highest level, or at the lowest level. Under "Waste Water Treatment and Disposal" you see "Characteristics of Waste Water." You can search the data base very broadly on that level and get all the projects that would apply, or you can search much more specifically on "Grease Content." All the indexes that have been set up are arranged in this kind of hierarchical format.

There are many uses of our data base. If you are a librarian, your prime interest might be to supplement a literature search from a bibliographic data base with ongoing research work. I'm not going to detail all of the products that we have because not all may suit your need. The custom search would probably be the best for you. If you wanted, for instance, to find all of the ongoing projects in the Sea Grant Program from the State of New York, you could call us or write us and we would do the search

for you. A custom search is ordinarily \$60, and I'm not hard-selling anything here, but that is the price. You can do an on-line custom search through Lockheed as well as SDC. If any of you have any problems accessing us on either of those, or you don't exactly know which terms to use since we have a hierarchical indexing system, you can always call the Exchange and ask me or anyone else in Search Service. We also have research information packages, already set up, that we think are of interest to people in various disciplines. These are offered at a cheaper rate.

The SSIE newsletter gives you a brief account of the Exchange--just about what I've covered up to this point--some examples of our information packages, and questions that can be asked of the data base. One additional point I want to make is that we are the NOAA marine pollution data base. Also, NOAA has a large order for search services with us, which may be available to you if you are specifically authorized individuals. If you want any information on that, you would have to call Millington Lockwood at the NOAA headquarters in Rockville, Maryland: 301 443-8964.

The point to remember is that SSIE differs from other data bases in that we are a registry of ongoing research work. We have on the file what is going on now.

JOHN PRICE, ASSISTANT CHIEF FOR REFERENCE AND
REFERRAL SERVICES
SCIENCE AND TECHNOLOGY DIVISION, LIBRARY OF CONGRESS

The National Referral Center was established at the Library of Congress in August of 1962 with the support of the National Science Foundation, and began operations early in 1963. The Center is designed to provide a single place which anyone with an interest primarily in science and technology, but covering virtually all subject areas including the arts and humanities, may turn to for advice on where and how to obtain information on specific topics. Functioning as an intermediary, it directs those who have a question concerning a particular subject to organizations, or in some cases to individuals, with specialized knowledge of that subject. It does not provide the information sought, but only tells the inquirer where the information may be found.

The Center is concerned with all fields of knowledge; similarly, it is concerned with all kinds of information resources, wherever they exist in government, in industry, in the academic and professional worlds. The concept of an "information resource" which the Center has adopted is an extremely broad one. It extends to any organization, institution, group, or unique individual with specialized knowledge in a particular field and a willingness to share this knowledge with others. This includes not only traditional sources of information such as technical libraries, information and documentation centers, and abstracting and indexing services, but also such sources as professional societies, university research bureaus and institutes, federal and

state agencies, industrial laboratories, museums, testing stations, hobby groups, and grass-roots citizens organizations. The criterion for registering an organization is not its size, but its ability and willingness to provide information to others on a reasonable basis.

Through a continuing survey the Center seeks to identify all significant information sources, not only throughout the United States, but around the world as well. Its efforts to date have resulted in the registration of over 12 thousand information resources into an on-line data file. This file, NRCM, is one of several available through the Library of Congress SCORPIO system. It's also available on the Department of Energy Recon System out of Oak Ridge, Tennessee.

The information given for an organization usually includes the name of the resource, its mailing address and location, its phone number, the areas of interest, the holdings, the publications and information services provided. A two-year cyclical review program was recently initiated to insure the currency of the file. This means that approximately 6,000 organizations need to be contacted each year for update purposes.

In response to requests for assistance in locating specific information, the Center provides the inquirer, free of charge, a printout of four to six appropriate information resources. For each inquiry the response is individually tailored to the inquirer's special interest. The Center's referral specialists, of which there are five working full time answering requests--each of whom has competence in some subject area--make a special effort to establish the most direct contact possible between the persons seeking the information, and the places and/or people who can provide it. The Center has established a goal of answering all referral requests

within five working days of their receipt. Some, of course, can be answered in minutes, particularly if the request, or one closely related, has been asked previously.

The most identifiable users of our service are librarians. They generate approximately one out of every four requests that we receive. Additional heavy users include engineers, scientists, administrators, other professionals, and students at the graduate and undergraduate levels.

One very unique feature of our service is that our referral specialists do not rely entirely on our on-line file. For every formal resource registered with the National Referral Center, we are aware of at least ten others.

The formal publications program of the National Referral Center has been inactive since the fall of 1974. However, there is in press the fourth edition of the Directory of Federally Supported Information Analysis Centers, which will be available this fall through the U.S. Government Printing Office. Also this fall, we will publish the first in a series of new directories aimed at exploiting those subject areas for which the Center has comprehensive coverage. This directory will cover the geological sciences and oceanography. Future directories will cover such subjects as psychology or possibly education.

The services of the National Referral Center are offered without charge to anyone. Many of those who have turned to the Center for guidance have, at the same time, reported specialized information activities within their own organizations. This mutually beneficial interchange is what the Center is striving for, and anyone engaged in an information activity is encouraged to list that activity and have a referral point with the Referral Center. The phone number for the National Referral Center is

(201) 287-5670, but I would like to give you two names to contact. In the area of physical science, contact John Feulner; in the area of biological science, contact Ed Green. These people have been with the Referral Service for over 12 years, and they are experts in the referral business.

BETTY EDEL, DIRECTOR
NATIONAL SEA GRANT DEPOSITORY

I know most of you, and I think you know me, and I think you know what we do at the National Sea Grant Depository. We are a facility established by the Sea Grant Program to collect and house all the publications generated by the Sea Grant Program. We receive three copies of all these publications. You send them to us, and we make sure that they are available for loan. You sell the publications and we loan them. Most of the publications have been done with Sea Grant funding.

The mainstay of the Sea Grant Depository is our loan copies. We loan some 3,000 a year. We have to keep track of some 16,500 documents. From conception it was seen as a necessity to have some sort of control over the mass of documents that were to be housed in the depository, and a system was developed by our staff in 1971 which we continually update. The 1968 to 1978 data base has some 13,000 citations in it, and from this there are some 5,500 separate items. The 7,500 additional entries are derived from larger publications such as conference proceedings that have more than one document, more than one paper given. So we do a little in-depth research to make these entries.

We type the publications in thirty or more categories. The data base now--from the 5,500 main entries--is 20 percent technical reports, 40 percent reprints, and 40 percent in the other 28 categories, which would include conference proceedings, advisory bulletins, brochures, annual reports, minutes, newsletters, and so on. Access to this data base is

through the several publications generated by the Sea Grant Depository. There is the monthly listing, there is the packaged literature search, and the yearly index. The 1978 index will be available next week when it comes from the printer.

Our listing from '78 information is in alpha-numerical order. We assign the numbers to it by institution, by type, by year published, and by the accession number that we add--and then we add the title, author, any important numbers, any notes. We derive a quick index from the document listing. The quick index takes the key words out of the title and lists them, and then gives the document number. Still another listing gives the title, the author's name and the document number. And there is a corporate index by institution. Finally, we have an NTIS number index, which lists the NTIS numbers and our document number.

We hope that this 13,000-entry data base will be available to you on microfiche sometime later this year, but microfiche is not for everyone. I think most of you have the paper copy of the index covering the past ten years, which consists of some seven separate indexes. The microfiche copy of the data base would put all this information in one place so we can use it. If you do want a copy of it, please contact me and I'll see that you get a copy. We're only going to make up about 200 of them and see what happens to them. Another important thing I want you to remember is that we have not only citations for these publications, but we have the publications themselves, and you can borrow them.

GARY ADAMS, LIBRARIAN
USER SERVICES BRANCH, LIBRARY AND INFORMATION
SERVICES DIVISION
NOAA

I am a librarian with the National Oceanic and Atmospheric Administration (NOAA), and I am going to talk briefly about some of the computerized data bases which are currently available on commercial information systems and which relate primarily to marine science and technology. For those of you not familiar with computerized information systems and data bases, the "system" is the mechanism (software) that is utilized to access the "data base" which is a structured file of information.

The following data bases are ones which relate exclusively to marine science and technology.

Aquaculture: This data base is currently available through NOAA on an in-house system, but it will be available on the Lockheed DIALOG system by September, 1979. This data base contains references with abstracts from all types of literature on the subject of the growing or husbandry of marine, brackish, and freshwater organisms including life history, water quality control, economics, nutritional requirements, and disease control. The data base contains about 4,300 records from 1970 to the present.

Aquatic Sciences and Fisheries Abstracts (AFSA): This data base is currently available as a test data base on the Lockheed DIALOG system. The test data base contains six months of information from January through June, 1975. NOAA is currently supporting a project to load and maintain a current data base

which will be available around the end of 1979 and which will contain information from January, 1978, to the present. ASFA is a comprehensive data base on the science, technology, and management of marine, brackish, and freshwater environments. It is international in scope, with subject coverage that includes aquatic biology, oceanography (biological, chemical, geological, physical), fisheries (harvesting, processing, marketing), ocean resources (chemicals, minerals, natural gas, oil, ocean energy, potable water), pollution control and effects, and other related areas.

Maritime Research Information Service (MRIS):

This data base is available on the Lockheed DIALOG system and contains information on all aspects of the maritime industry such as vessel design, cargo-handling and stowage, experimental ships, marine engineering, maritime law, navigation, and trade. The data base covers from 1970 to the present.

Oceanic Abstracts: This data base is available on the Lockheed DIALOG and System Development Corporation ORBIT systems. It contains information on all aspects of the ocean sciences including biology, engineering, fisheries, oceanography, international law, ocean and coastal zone management, and pollution. The data base covers the years 1964 to 1977, and it will be updated by both systems in the future.

The Library and Information Service Division of NOAA provides computerized literature search services on these and other marine-related data bases to NOAA and non-NOAA personnel. Other services include selective dissemination of information (SDI), our monthly updates of retrospective literature searches, and subject bibliographies and current issue outlines, overviews of marine issues with bibliographies and referrals. All our services, and procedures for obtaining them and contact points are described in Guide to NOAA's Computerized Information Retrieval Services.

JOHN STRAWHORN, INFORMATION MANAGER
CAPITAL SYSTEMS

I was told I should be careful, that this audience would not represent a hotbed of enthusiasm for high communications technology, and that if we could get through all the presentations without mentioning things like computers, or data bases, or processes, it would be all to the good. But I notice from the preceding presentations that the computer is here to stay.

There are many areas of communications technology that we could talk about today; obviously, we cannot possibly, even if we had the time, go into all of them. I have selected three particular kinds of technology that might interest you, and that I think should interest you for their potential benefit to the kinds of things that you do. They are: computer conferences, photocomposition, and word processing.

The computer conference is a genuinely new mode of communication. There has never been anything quite like it before. In certain of its aspects it compares to the telephone. Some content analysis studies of what goes on at a computer conference, however, have suggested that it produces an altered state of consciousness. But a computer conference is not exactly a conference in the way that this conference is. Its closest analog is a conference telephone call, except you don't have to worry about whether the other people are there when you are talking. You can enter, leave, and re-enter the conference without any concern for where the other people are or whether they are trying to talk or listen.

A computer conference operates on a special system that operates on a network of the type used to access bibliographic data bases--a system that manages the communications exchanged among a group of people. Many group computer conferences have involved hundreds of people all doing something at the same time.

The physical location of the conference doesn't matter, so long as the participants have access to the computer network. They need to have local dial-up access. Unlike conventional conferences, or even conference telephone calls, the beginning and ending of the conference can be very fuzzy. It can just lumber into motion and fizzle out at the end.

When you are participating in a computer conference, you sit down at your little computer terminal (like the portable terminal you see against the wall), dial the telecommunications network on the telephone, stick the telephone into the back of the terminal, and sign on to the conference system. You have a password to make sure that you're really authorized to be in there and spend somebody's money. When the computer recognizes you, it automatically lists the names of all the people who are authorized participants, and if you wish it to, it prints out all the messages that have been exchanged since you were last on the system. It recognizes when you get onto the system and when you get off it. You may just monitor what's going on, or if you want to send a message, sit at the terminal, compose and edit your message (there are composing and editing commands so that you can get rid of your misspelled words and typos) and send the message to as few or as many of the conferees as you wish. Then, sit back to see whether anybody responds, or exit and wait for people to have a chance to react to what you've said.

The computer stores the message for those who are not on line at the moment, and sends it to anyone

who is. It identifies each message by source, date, and time, and by a message number, which is assigned according to the sequence in which the messages have been sent. With a system like this everybody can talk at once, but only one person has to be active at any given moment for the conference to move forward. There is the option of sending messages privately to particular individuals, or anonymously, if you don't want your name associated with whatever you saw fit to say. That feature is very useful in certain kinds of settings. A couple of years ago the Canadian government did a large delphi-type study concerning drug abuse. Since the questions as to the legality of using certain drugs were considered sensitive, and the participants were people who worked for the Canadian government, they chose to do this anonymously in order to reserve the option of free speech.

The computer conference eliminates the need for travel, so that can save time, energy, and money. Another advantage is that participants stay close to their own sources of information. At a conventional conference you have to physically leave your office--all the files you have--and carry whatever you can manage in your suitcase and your head. If you're dealing with a highly complex technical subject that has a very large knowledge base, that can be a real disadvantage. The computer conference provides an instantaneous record of what is said to all the participants; the proceedings and the conference are exactly the same thing. As I mentioned, perhaps the most important feature of the computer conference is that it is asynchronous--you don't have to have participants' schedules coordinated.

There are of course some limitations or drawbacks. Some of us don't operate keyboards too well; some of us don't like computers on principle, and others for empirical reasons. I hear Brigitte say

at least five times a week that she can't stand computers. The asynchronism of the computer conference is both a blessing and a drawback--since you don't have to have people there communicating, things can get a bit lethargic. Someone said that computer conferences, to be successful, have to have what is called an "envelope of urgency." There has to be a need to get something done. And because of all the preceding things, extensive and rapid dialogue can be somewhat difficult.

Computer conferences, in one rudimentary form or another, are in fact being developed as simple add-ons to many network systems. If you have a computer system in a university environment that links several departments, the chances are you'll find some people in those departments using the computer system as a form of electronic mail, very much like the computer conference I described.

The second technology is photocomposition, a technology for publishing. Photocomposition is simply the use of a photographic process to arrange copy for the preparation of printing plates, as distinct from hot metal or strike-on composition.

Any photocomposer has four components. It has a light source, some kind of mechanism for storing and calling forth characters, a system of lenses, and a photosensitive recording medium, either film or paper. The systems differ primarily with respect to the way material is put into them, and to the mechanism used to store and generate characters. One system operates under the control of a small computer. When the proper character, etched on the periphery of a glass disc, is in line with the light source, the light flashes and the image is recorded on the film or paper. The most sophisticated systems don't use anything so crude. They have something that looks very much like a television screen, called a cathode-ray tube, which stores the

coordinates of the characters digitally in a computer. The characters are then painted on the TV screen, and photographed. That sounds laborious, but it is amazingly fast. These machines can set thousands of lines of type in a minute. There are also very simple photocomposers that sell for a few thousand dollars that can be used in a small in-plant typesetting operation.

There are just a couple of reasons why you should be familiar with this technology. First, the technology itself is becoming more powerful, more compact, and cheaper all at once, so it is becoming much more widely used. Second, it is converging with several other technologies toward manipulating and processing text. This brings us to the last technology, which is word processing.

A word processor is nothing more than a smart typewriter with a memory, sometimes with the ability to talk to another machine. It has five components: a keyboard, a processing unit (or CPU for Central Processing Unit), a work area, storage--some sort of external storage which can be a magnetic card, a disc or a magnetic tape--and finally, a printer. On a stand-alone system, which is a self-contained unit, you have one keyboard, one processor. More sophisticated versions include what we call a "shared logic system" which has several of these keyboards operating off one mini-computer. This gives this version much more power.

The question then is, what is this technology good for? Because it's a burgeoning technology, the question really is, why is it growing so rapidly? What it is basically good for is revising copy. According to some analyses, 40 to 60 percent of the typing done in revising a document is unnecessary in that it involves re-keyboarding characters that have already been typed at least once before. If you eliminate that, you drastically raise the rate

at which copy can be processed. Because of its memory, and its intelligence, the word processor records everything keyed into it. In revising, using the various editing commands, you keep only the new material. It also has the capacity to read formats very flexibly and automatically.

Word processing is also used in connection with other technologies, such as photocomposition. There are systems which prepare the material on a word processing system, producing a magnetic tape that can be used to rectify the composer, so that after the manuscript is originally typed, no further keyboarding is required to put it into publishable form. The general trend in modern publishing is toward reducing the number of times copy has to be keyed. In traditional newspaper technology, one article might be keyboarded sixty-eight times. With this kind of technology it is keyed once; only the alterations are re-keyed. The responsibility for the total keyboarding of the document is being steadily pushed back from the publisher or printer to the person who originates the document. When you are using this kind of technology in conjunction with photocomposition, the office's own record can be used to produce typeset copy.

JOHN MURDOCH
INFORMATICS

The point I want to make about today's technology is that it's not being used to the extent nearly that it could be, partly because most people haven't yet learned to move from a specific application of a piece of equipment to its more general uses. On two occasions recently I found terminals installed for one project within an organization which the staff thought could be used only for that project. Since they didn't require frequent use, the terminals were stored away in some forgotten corner of the office,

Just last Friday I was in a bank which had a multiple listings real estate terminal, probably familiar to many of you. I asked a staff member what other uses the terminal was put to. "Oh, that's part of the multiple listings program," was the answer. The bank's staff had failed to realize that the terminal could be used for other programs, not only for that specific program.

So, as Michele has pointed out, look at the equipment you already have available to you; find out what equipment the university or the organization you are associated with may have and start to learn the potential uses of that equipment. I believe Michele has also pointed out that most organizations justify their budgets by services rendered. Normally they are very glad to see you--at least in the early stages, or until their systems get overloaded. Consequently it behooves you to get in on new systems early so that your needs become a part of the established pattern.

When successfully applied, high technology will

force changes in many office work procedures. Consider, for example, the typical flow of documents in most organizations as illustrated in Figure 1. Think of your own office and the stack of papers on your desk. For each item you have several choices. A reasonable probability exists that, over a long period of time, you are not consistent in your choice. You may or may not send a document to the central file within your organization. You may think "Joe" should see this and off it goes. "Joe" has the same set of choices, including sending the document back to you.

Each organization has one to n persons who exercise the same choice. Copying devices make it easy for many copies of a single document to get into an office paper complex. Multiple copies compound the problem of finding what is needed because no one person really assumes responsibility for the total archival requirements. This paper deluge is stimulating a considerable number of studies and hardware developments.

In addition to being reproduced and routed by individuals, information tends to drive toward an organization of its own. As illustrated by the current Three-Mile Island episode, valves are critically important to many technologies. Information on valves within an organization probably will be organized more or less as shown in Figure 2 because of the different relationships that several groups have to valves. Therefore, another information practice that needs to be looked at is how to circumvent the tendency for information to organize itself according to its format or its use by the organization. New information technologies and practices brought about by recent improvements in computers and microimage systems offer possibilities for change.

The dramatic reductions in cost, physical size and power requirements of microprocessors and minicomputers now permit the implementation of concepts undreamed of

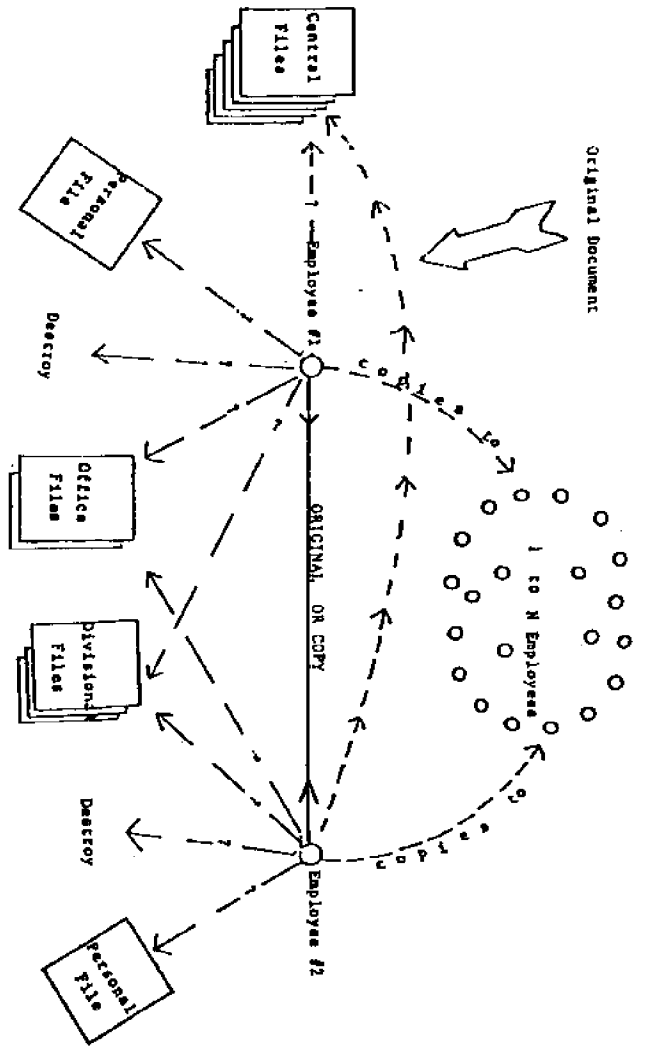


Figure 1. Dissemination choices.

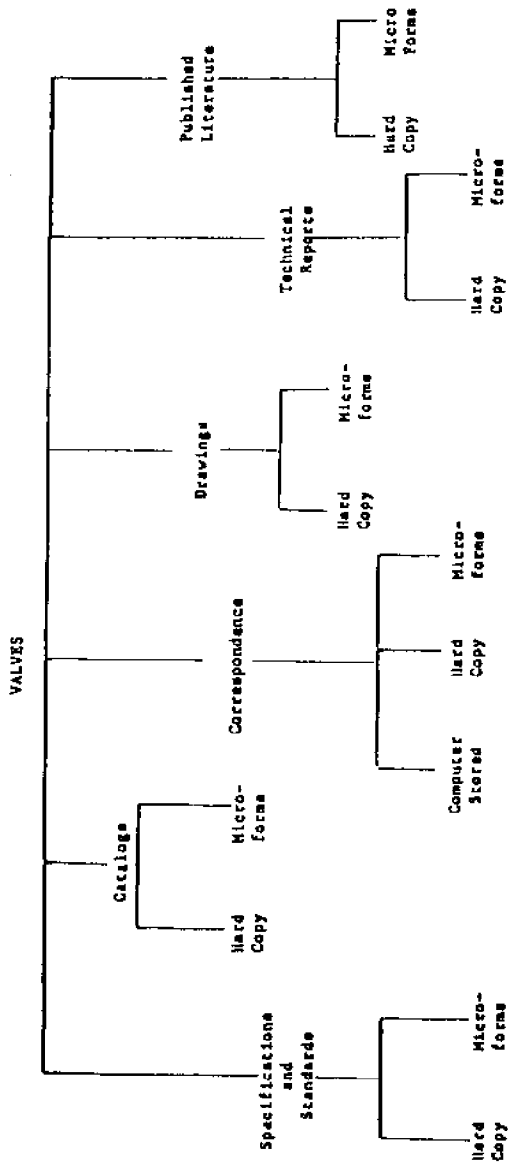


Figure 2. Information organization by document type.

just a few years ago. Combine this increased computing capability with the 200 to 1 reduction now available in micrographics and you can have computer control of over 100,000 pages of information in an integrated system not much bigger than a TV set. A document request in this system leads to full text and pictures--not merely a reference. Thus document delivery systems are beginning to replace bibliographic delivery systems.

Perhaps in five or ten years a video disk, which will store 50,000 to 100,000 images on ultra micrographics will replace repositories--not to save space or the cost of storage as in the past, but to improve rapid access to the information. One current application of this technology is to assist telephone operators in looking up telephone numbers. When you call Information for a number, the operator may be using an ultrafiche image of the phone book. As you start to speak the operator starts entering the name. Images of pages of the telephone book are tracking so fast you can barely see the movement on the screen. Often, by the time you have finished speaking, the operator gives you the number.

The computer terminal was demonstrated earlier; current microimage terminals look much the same. Another technology that is rapidly developing is digital communications and digital image systems which make it possible to print copies from micrographic files over any distance. With digital technology, facsimile, voice, and TV can all be integrated. In other words, if you wanted to show a TV image (or slides, or a micrographic image) and discuss it with persons at other locations, you could do so. The important thing, however, is not the technology, but how to use it. That is the big learning curve that we have.

An additional technology just developing is artificial intelligence. One application is a system

called ROBOT. ROBOT refers to language--not machines that run around. ROBOT frees you from the structured English language now required in computer search systems. Currently you have to decide how you are going to structure a Boolean search. In the ROBOT system you type whatever comes to mind. For example: "I think I want to see something on fisheries. No, make that diseases...or give me both." ROBOT accepts your way of saying things and starts giving you answers.

The major breakthrough occurring in high technology is its transparency, as evidenced by telephone circuitry. You do not have to think about the big switching systems which may route your voice to California, to Texas or to Chicago even when your call is just across the state. All that is invisible. The same thing is happening in the information sciences. Take advantage of technological changes and encourage their use in your organization.

One parting comment on technological trends. An organization that makes chips and add-on memories for computer systems just bought a software organization that distributes an on-line interactive system. Probably large-scale software systems are going into chips, and chips are going into small-scale devices. With memories increasing in size and costs coming down, the day is not far off when each of you can have this chip-oriented device with data collection software built in, so that you can type normal English into the system, or even speak to it and get information--not references--delivered immediately.

Technological advances are taking place more and more rapidly. Learn to use them.

BRIGITTE HUYBRECHTS
CAPITAL SYSTEMS

If I talk about everything else you will get what is called information overload, so I will not. I feel like Grover in one of my children's Sesame Street books who opens the door that says, "Everything else in the whole wide world," and then closes the door to outside. So there are a large number of data bases available other than the ones you have heard about here. There are several dozen bibliographic data bases, or more; and if you talk about source data bases, those that contain hard data, then there are several hundred. So all I will do here is tell you about guides to the data bases if you need them. Bowker has just published one called The Informational Marketplace, 1978-79, which lists data bases and vendors and also information companies that will do searches for you. The other source is a directory that I have been working on--it's cheaper but not as comprehensive--called A Directory of On-Line Information Resources. It is available from Capital Systems.

This is not as difficult as it seems because most of the bibliographic data bases are available through a few major vendors. You have heard the names given here. The first one is Lockheed Information Systems, the second one is Systems Development Corporation (SDC), both in California, and the third one is Bibliographic Retrieval Services (BRS) in New York.

There are just four more data bases, bibliographic ones, that I thought might be of interest to you. The first one is Biosis, available on Lockheed,

SDC and BRS, and it's just biological abstracts that are available--an enormously large file. The second one is Agricola, the agricultural data system that's available for the Department of Agriculture, but I thought it might be of interest to you. Again, it is a very large file. The third one is Maritime Research Information Service (MRIS), available from Lockheed. One thing to remember about on-line data bases is that since they are fairly recent, data you will find in them do not go very far back in time. Very few go back beyond the sixties, so they are really for recent information. The fourth one is Aquatic Science Fisheries Abstracts, which is the data base MIFAO.

I just wanted to say a little bit more about the costs of these data bases. They vary from one data base to the other, from \$25 an hour to about \$50 an hour, and then you have to add \$80 an hour of communications cost. But as I said before, it doesn't take very long to do a search, and people find that the typical search costs about \$15. It might be worthwhile, if you are associated with a university library, to talk with the librarian. The library may already have this system, and might be willing to do the searches for free. Otherwise, you will have to set up an account with one of the data-base vendors. Lockheed and SDC do not charge any starting fees; you just have an account and you access the system as little or as much as you want. At the end of the month they bill you according to how many minutes you had access to the system. The systems are available a large part of the time--six days a week from early in the morning to very late at night because they also provide access to Europe in a different time zone. It makes for a very long day.

There are a large number of data bases available to you. Talk to them about your information needs.

SHIRLEY HUDGINS, COMMUNICATOR
UNIVERSITY OF SOUTHERN CALIFORNIA SEA GRANT

SCIENCE WRITING
AND
THE
ELECTRONIC
MEDIA

The "Science Writing and the Electronic Media" session of the conference was put together in recognition of the power and effectiveness of radio and television as vehicles for delivering information to a number of audiences.

The invited panelists, representing both public and commercial radio and television, provided Sea Grant communicators with information and ideas, primarily in response to two specific questions:

What kinds of stories, news, events do you look for as sources of programming for your audiences?

Given the nature of Sea Grant research-- multi-disciplinary and ocean-problem-oriented-- what formats would be most useful to you?

We weren't looking for easy answers and we didn't get them. Our desire was to learn how we could be a resource for these media, as professionals who have something worthwhile to contribute...and communicate.

HARRY HEINTZEN, DEPUTY CHIEF
AFRICAN DIVISION, VOICE OF AMERICA

The distinguishing thing about VOA is that it is broadcasting to a foreign, not an American audience. That means we handle stories quite differently than we would if we were broadcasting here. The thing to remember about the audience is that it is largely in developing countries, where just about everyone is primarily concerned with things we take for granted: finding a job, getting an education, having health facilities and so on. So the appetite for news and information is considerably different from that in Western Europe or in the United States.

To most people in developing countries, science is a magic word, seen by many as the panacea, as the magic key that will change their lifestyle to one that more approximates ours, and meets the people's basic needs. So when we program to Africa, to Asia, to Latin America, we are very conscious of any story in the field of science that is translatable to the way of life in those particular areas. If we can relate any kind of a scientific development in terms of the people living in Africa or Asia or Latin America, we will use it.

We can use material of perhaps greater length and of less news import than can the American media, because there is a receptivity and considerable patience on the part of the audience to listen in great detail. As an example of this interest, the African Division sent a man to Africa last summer to collect interviews with African scientists who worked in conjunction with scientific institutions in this country. We plotted out the most interesting people

to talk to in a number of African countries. We are now in the process of turning these into half-hour documentaries, one scientist for each documentary. In this case, we are personalizing the work so that the individual African can relate to the subject matter through a human being.

VOA has its origins in World War I, and there are many conceptions of what it is. It has gone through a lot of changes since then. It exists today as something of an international public radio. VOA and BBC, for many people in the world, constitute the main source of information not only in terms of news, but in trying to explain what is happening in the world today; not only in the political arena, but also in terms of the environment, in energy, agriculture, nutrition and so forth.

VOA does have a science editor. He is the person to whom you can address general scripts, general tapes. But let me tell you a little bit about how VOA is structured, and you will be able to see that there are many placement opportunities for you beyond the science editor. The science editor works for a central service which supplies scripts in thirty-eight languages broadcast around the world 24 hours a day. However, these individual services also produce their own material targeted to their own areas. So while the science editor does most of the broadscale, basic stories, the individual services in individual geographic areas, such as the African Division, do the kind of targeted material I described. For instance, in the African Division we have services that broadcast in Swahili, Hausa, French, Portuguese, and English. And within those services there are individual editors who do particular shows, all of whom are interested in a good science story. One step further in the domain of VOA interest in science stories is that we not only broadcast them, but we mail them in the form of

tapes, to radio stations in developing countries which in turn put them on the air.

Of all the subjects that we offer to third-world radio stations, science is probably the most appealing, most universally sought, and therefore the easiest for you to place on VOA. If, for example, there is an African scientist working in your program, you could phone the African Division or write to the African Division with a synopsis of what the project is, or who the individual is. We could tell you immediately if we are interested. In sum, we are in the market for tapes, scripts and news releases that deal more with the human side of research rather than facts and figures. And we're also interested in knowing who is articulate on what subjects, because we could also do the interviewing ourselves. So if you can think in terms of a foreign audience, rather than a domestic audience, VOA offers a wide scope for placement. The sky is the limit because we cannot get enough good scientific material.

TOM BURROUGHS, RADIO PRODUCER
"MAN AND MOLECULES"
AMERICAN CHEMICAL SOCIETY

I want to make a plea and throw out a challenge. My plea is that I need public information people-- you are where I get my stories. The challenge is that you know your business before I come to you, or before you come to me.

The "Man and Molecules" program is sponsored by the American Chemical Society. It's a fifteen-minute weekly science radio program, and has a very wide national, indeed international, audience. It is on about 500 radio stations around the country; it's on half-a-dozen stations in Australia, half-a-dozen in Canada, and it goes over Radio Free Europe and occasionally over Voice of America. It is also subscribed to by several hundred high schools, colleges, university systems, and we sell cassettes, thousands each year, for educational purposes. So we do have a wide audience, and can make your information reach a goodly number of people.

We need good, solid, ongoing science research in areas that are of interest to a general audience-- that is good science, that's meaty, important, that's worth fifteen minutes of national exposure. If you have these kinds of stories, if you can offer those kinds of things, I will accept them with open arms, and before too much longer your people will be on the show. My plea is for you to offer me ideas, but my challenge is that I am sort of a tough customer to sell. I don't like suggestions like "Well, we have someone that is working with proteins," or, "doing ocean engineering." I want to know what they are

doing, what stage it is in. I want to know how well they speak. It is a radio audience; we need people who sparkle. We really need background information. We need you to go out there and do your homework: find out how well these people speak, be able to have facts and figures about what they are going to say--before you come to me and try to interest me in the story. Once you do sell me the story, we will certainly come on and do it. That is where I get very excited. But, I'm giving you the bad news part because you have to do your work first, and pass the challenge. Once we get past that point, then I take off. And that is where we get our stories from.

I'll get more specific in a moment. First, I want to give you a word about my sponsor. The American Chemical Society is a non-profit scientific and educational association. It is chartered by Congress; in fact, it is the only scientific and educational organization chartered by Congress. It has 110 thousand members--chemists, chemical engineers and the like. It is the largest society devoted to a single scientific discipline. Under its Congressional charter it has a public information responsibility. It has a news service; it does planetarium shows; it also sponsors the "Man and Molecules" program. It has sponsored this program now for eighteen years--one of the longest-running radio programs around, if not the longest one. The stations include, for example, everything from large stations in New York City, to little stations in Arkansas, Texas and California. As an example, just in the last several months we have added two stations in the Washington area, one of them the local disco station, one of them the local country-and-western station. In addition to reaching a wide audience, we reach a very diverse audience.

Coming back to the kinds of stories I am looking for. I am not looking for news-release kinds of

items in which something has been done and is being announced. They are low on my list. What I am looking for is science in progress. Science in the works. What kinds of things are going on now, what are we going to become involved with in the next year or so? Solid, ongoing--that's the key--science research. We cover most areas of science, but our first choices are always those that have something to do, in most any way, with chemistry, chemical engineering, biochemistry, ocean chemistry, environmental chemistry, and then into nutrition, health, medicine. We do everything from earthquake predictions to noise pollution. Again, the first choices are those that have to do remotely with chemistry, so we can justify the money that we spend on the program. But we will take other stories as well, as long as they are good stories. We do hard science stories--fundamental, basic research; we do applied research; we do fun stories. What kinds of things are people doing? We just did one on folk medicine among the Pennsylvania Germans, looking at some of the folk remedies, bioactive products which might be translated into drugs. So we do most anything, if it's a good story. If you would be interested in it, if you think your community would be interested in it, there is a good chance that we would be interested in it. If you can come up with a good news package that will fill fifteen minutes with useful information--not just fill in fifteen minutes--that's what we are looking for.

Again, we are looking for scientists who can sparkle. Not everybody can do that, and certainly not all the people we end up using on the program do. But there are some people you know just from your experience are not going to communicate well in a radio situation. They just can't explain their work to a lay audience. That, again, is one of the key things we are shooting for--a radio audience, a general audience. The scientists have to be able to

define their technical terms, to say where their work is going, to say what questions they still have on their minds; to give some feel of what it is like to be doing science. They have to be able just to communicate on a good level. I will ruin some of the interviews by doing bad interviews. But public information people have also doomed interviews by having interviews arranged that never should have been arranged in the first place. And I take your word on potential interviews. If I arrange a long trip, say, to talk to ten or fifteen scientists, it isn't possible, generally, for me to call all the scientists individually and talk with them for an hour or a half-hour beforehand. I really depend upon your assessment that this person is going to do a good job. And we probably use perhaps only 50 percent of the interviews we do. It's embarrassing for me, it's embarrassing for the scientist, and I would think it would be embarrassing for you as well, to go back and tell the scientist, "Well, for one reason or another, we are not going to use you in the program." So again, the ones that work out, truly work out well. I think that you would be proud of having the people on the show. It reaches a wide audience, and the scientists generally tell us that they are happy to be participating. But at the other end of the spectrum, disasters are easy without sufficient planning.

The kinds of topics we would be looking at are a wide range of things. Thinking quickly, I would love to do a show on ocean upwelling--nutrients coming up from the cold ocean waters along the coastal zone. Why is it important and how can we understand it? What kinds of projects are going on, what kinds of organisms depend on this phenomenon and how does the world depend on the organisms that live in the ocean's upwelling zones? Or, chemical communications in the ocean: How do all the critters down in the

deeps communicate? We did a show recently on bioluminescence in the oceans. It seems that once you get down below 200 meters or so, nearly every organism glows, blinks, flashes, or lights. That's sort of a fun story, but it also has important implications in producing biochemical information about how the luminescence systems work, in understanding the flow of energy within the cells, and in any number of kinds of scientific applications. Here we have a fun topic and a good, solid scientific application. Drugs from the sea, ocean mixing, the GEOSECS program, ocean and deep-sea-drilling projects--all of these kinds of things touch on the oceans, or on the coastal zones; all are areas that we would be interested in looking at. We get some information, certainly, from reading the magazines, the journals and whatnot, about what is generally going on, but now we need names; we need to be able to find out who we should talk to, who is doing a good job.

Even if I happen to mention a topic that you are not working on, you might be able to suggest someone you know in the field who is working on that topic. Ocean thermal energy development--any number of things come to mind. But again, it also has to be a big enough story to be of interest to a national audience. We can't always focus on a project that is only going to have an impact on one city or a small state area, although we do those stories too. There are exceptions to almost everything I am telling you, I guess, but what I'm asking is that you start in the broad areas I would be interested in, and then bring in the nice little things through the side door.

I go to a lot of meetings, I read a lot of journals, read the newspapers, watch television, any number of things to come up with general ideas. Or watch press releases. Send me press releases. I do read them. I read every one that comes in. And I follow up on those that look promising. Then my next

step, if I decide I'm going to go somewhere to do a particular story, is to call the public information people at the university, (mostly universities, or government agencies), and say, "What's going on?" The general response, when I say that I need good, solid stories offering scientific research in areas interesting to a general audience, is, "Well, what kinds of stories do you want?" Since I don't know what you are doing, you have to tell me what you're doing. I can't tell you what kinds of stories I want to do out of your organization, because I don't know. What I am looking for is the input from you folks. It's fine to tell me, "Well, I don't know now, but I can get back to you in two or three days." But in the two or three days I would like you to go off and spend a lot of time finding out the background for these stories, so that you can come back and give me a good comprehensive presentation on who is going to be a good speaker on this, personally. So you can put me on your news release list; you can call me, if you think you have good stories. Chances are, within the next six months or so, if it is a good story, we will come out and do the interviews on site.

The other challenge that I usually mention is that we would certainly accept long interview tapes-- broadcast quality reel-to-reel quarter-inch tapes done in a room away from typewriters and airconditioning noises, someplace where it's going to be a good quality tape, where the person is asked good questions and gives good answers. You can send me the tape and we will certainly make use of that. We will even turn it into a program; write the narration that goes with the program, allow fifteen minutes for the story, so you have roughly half narration, half scientist's voice. You could use those interview tapes. I have suggested this a number of times, and I've never received an interview tape yet, to be used like that. In point of fact, I would use a final

show, if someone was interested in taking a look at the kinds of shows that we do. I can provide script samples. If you think that you would like to take a shot at writing the complete program, beginning to end, and send me the final product, I would take a look at that. If it suited our needs, we would be perfectly happy to use it. I've never received one of those either.

We check all the scripts back for technical accuracy, scientific accuracy, with the scientists involved. We more or less guarantee their technical accuracy along that line. Again, I expect the same kind of cooperation from faculty. If we're sent a script, or a tape--an interview tape--we certainly check it back with our sources and with the scientists as well. We really conceive of this as a quality control measure. But feel free to send me stuff.

My message is, I depend upon you people. And when the system works well, we work well together. I've done a lot of shows, not many out of Sea Grant. Unfortunately, when we call most universities, they don't mention Sea Grant. Maybe you have to work more closely with your university public information people on that, so that when someone comes calling for general kinds of information, they are sure to mention your projects.

So you have, I guess, the job of selling on your end as well. But do contact me. If you want summaries of some of the past shows we've done, to give you a feel for the kinds of topics we look at, or if you want a description of the program, call, write, send me letters, come knock at my door!

RICH ADAMS, PRODUCER

"AGRONSKY AND COMPANY," WDVM-TV, WASHINGTON

Briefly, I will describe "Agronsky and Company," which is somewhat limited in terms of your access, but then as long as I am representing a local TV station, maybe I can share some ideas with you about how to approach local TV, particularly in this part of the country, where, with our proximity to the Chesapeake Bay, we do have a considerable interest in things which you might be able to help us with.

"Agronsky and Company" is a syndicated public affairs program in which Washington journalists discuss matters of very immediate interest from week to week. That show, quite frankly, does not use outside information other than that which is channeled to me or to the other people on the program who might want to bring it up. The discussions on the program are limited to exactly what is happening in the news that week. I will tell you who the people are, and if you would like to deal directly with them, or me, in terms of information, that is fine. The show airs on twenty public stations on the East Coast, plus the Post-Newsweek stations in Miami, Florida; Jacksonville, Florida; Hartford, Connecticut; Detroit; and one educational station out in Columbia, Missouri--a fairly limited audience. But just so you know, the participants are: Carl Rowan, syndicated columnist; James J. Kilpatrick, syndicated columnist; George Will; Elizabeth Drew; and Hugh Sidey, Washington bureau chief for Time Magazine.

The show is of somewhat limited value, from your perspective, but I would like to share with you how

you could approach local commercial television in the Chesapeake area. Primarily, our region includes the Washington, D.C. area--Virginia, say down to Richmond, all of Maryland including the Eastern Shore, and the Bay area with the exception of the little niche cut off by Baltimore, which is covered very actively by the Baltimore TV stations. There is no one here from Baltimore, but for your reference, those stations are very much concerned with this entire East Coast coastal area and the Chesapeake Bay. If there is something going on that would affect the Bay, or the estuary in this area, make sure that you deal too with the Baltimore commercial stations. They do take a very active interest and will participate.

In terms of types of information that we might want; anything that would have to do with the ecology of the Bay, any immediate things that might be of interest to us, some development that you might discover, some condition which might be prevalent in the Bay area. I know we have been very active on one issue--offshore dumping of sewage in New Jersey which immediately affects the Bay area. That is a matter of some legal concern, but it might be that some of you might have some riparian rights information and legal information that might be useful to us. In other words, we could use you as a resource, as well as your using us as a contact. It's a two-way thing. If we knew whom to call to get an expert, or to get some data confirmed, it would be useful to us too. We might not always show up at your office or at your place of operation with cameras, but we might use your information and the result would be a more accurate story, and a story that would be better respected. So it does work both ways.

We have access to the Bay. We have a helicopter which we use very often, so we can actually take

a camera team down to a waterfront area, which we do on a regular basis. We have been using it to follow up on the nuclear problem in Pennsylvania; we have used it on a number of other things. The commercial stations in Washington do have access to the Bay--ready and immediate access--if there is something going on that is of interest. Also consider the Baltimore stations with that in mind.

In terms of people to contact at our stations, we have a science reporter, as does, I believe, every other commercial station in Washington. (I cannot speak for Baltimore, since I am not familiar with what their staff situation is.) Our science reporter's entire area is science--all aspects of science. He has considerable connections throughout the scientific community, as do the science reporters of the other commercial stations here in Washington. They are knowledgeable; they are not sensationalists; they are looking for good information. Our person happens to be a gentleman named Steve Gendel. But just to make things easier for you, if you have any information that you want to address to the commercial stations here, you may address it to the science reporter, or to the assignment editor. The assignment editor obviously knows what is going on within the station and can channel it to the proper person. Basically, that would be how you would gain access to our operation.

The kinds of stories we would want would be stories that would affect the environmental concerns in our area, the water-supply concerns in our area. Those of you who are not from Washington may not know that we have a difficult water-supply situation here because of conflicting jurisdictions, because of overlapping jurisdictions, because of the federal presence here, and because of the fact that the Potomac River--which is our primary source of drinking water--is in some cases under federal jurisdiction,

in other cases in multi-state jurisdiction. Water supply developments, new advances in rational uses of water supply--those are the kinds of things that interest us, as well as the ecology of the East Coast generally, both in the Bay and in the Atlantic. We were involved in the offshore oil exploration arguments for the East Coast; we have been involved in the LNG tanker and its effects on the Bay and its tributaries. Information related to such issues is valuable to us.

Our viewership consists of people ranging from the Pennsylvania area, which gets us on cable--and most of the western and central counties of Pennsylvania do get us on cable even though we can't legally claim them as our audience--to the Eastern Shore, where we are also on cable. The Baltimore stations reach the Eastern Shore directly with their signals, which sweep right down that peninsula, all the way down to the tidewater area. Our viewership also consists of the Shenandoah Mountain valley all the way over to Winchester, Virginia, south to Roanoke and back up across the valley to Fredricksburg and then back to Washington. It's a rather large sweep, both on our primary signal, and on our cable signal. So we do reach a very, very large audience.

The type of audience we reach of course is determined by the makeup of our city here. We reach a very urban audience, obviously. We also reach the opinion-makers. And I have to say that our station and the other stations in Washington probably have more influence over national policy, in terms of the commercial stations, than any others in the country. That is because the people who watch us are the people who make the decisions. We are watched in the White House; we are watched on Capitol Hill. Consequently, our reports reach the people who affect the rest of the country. So you should keep us in mind--all the area stations. I won't be parochial about

this, because we all serve the same audience. All the stations in Washington have particular significance in terms of reporting issues of interest, since we do reach the people who make the decisions, from the President through the bureaucracy. You want to keep that in mind, particularly when you are dealing with policy-oriented issues. And we are an outlet. National news is local news here. We are the only stations in the country for whom the White House is a local beat. Consequently, we have that responsibility. Again, it can work both ways. We have an obligation, as any journalists do, to be accurate, but even more so here in Washington because what we do and what we say can influence policy.

We would like to be able to call upon you for accurate information. It's often frustrating, as a journalist, to try to do an accurate and fair analysis, particularly in the area of science where there are so many fine nuances and so many differences of opinion. And it's often frustrating to try to reach someone in the scientific community and have them say "No comment," or, "I won't talk to you because you'll only sensationalize it." Well, it's a self-defeating thing. If we can't get the information, we have to go on what we have; and if it's limited information, the story will suffer. So we need you, as you need us. It's a mutually sharing relationship. It is our intention, at least I can speak for our station, to continue this relationship. Our science reporter, as I mentioned, is concerned about that and welcomes any contact that you might want to make with him.

We are available. The Washington stations and the Baltimore stations offer primary access to the East Coast and to the opinion-makers, both national and local. We stand ready to help you, and we hope that you can help us too.

WILLIAM AYLWARD, REPORTER
NBC TELEVISION

First the bad news. The chances of your initiating a network story are two: slim and none. This is primarily because the network has its own investigative procedures, so if there is a series or direction--for example "60 Minutes" on CBS--then the network will spend its own time, its own efforts, its own personnel on that story. They might call upon you for information, but that too is probably a very slim chance.

But there is some good news. NBC, just like every other network, does not exist as an entity. NBC is 235 stations, here and in Europe through the VIZ news network, that are mostly owned by other people. We are, in actual fact, limited by law to only five VHF television stations, seven if we have UHF as well, and a total of seven radio stations. So NBC has only five television stations. They are referred to as the O and O--the owned and operated stations. They might be important to you, in terms of your local community, because the O and O, like every other local station, is concerned with local issues. However, an O and O station, such as WRC here in Washington, has access to the networks, because we are indeed owned by the National Broadcasting Company. So you have some other options. I'll briefly mention these to you, and then I'll give you some ideas about how to utilize them.

We have a system known as NPS, which nobody has ever heard of unless he owns a television station. NPS is our Network Program Service. It feeds out every day from 5 until 5:30. It's composed of a

number of stories that are complete within themselves, with somebody signing them up by saying, for example, "Bill Aylward, NBC Washington." These are not on the network per se; they are not on the nightly news. The same thing applies to CBS and ABC with the DEF service. These are sent to the local stations around the country, whether they be owned by the network or not (and in most cases they are not); for utilization in their own local newscasts. So on the ten o'clock news in San Francisco, the local anchor man might say "There's a story about the snail darter, and with that report, here's Joe Klutz, CBS News, Washington." And they utilize that package. Now it is generally easier, considerably easier, to get on the NPS line than it is to get on network. Forget network, really. You have to deal with your local affiliates, which can feed back into the network again by precisely the same lines of communication that we have into them. Each day they have access to us, just as we have access to them.

Now I won't stress story coverage, first of all because Rich expressed pretty well the kind of thing we are interested in, both locally and nationally, and secondly because most stories are self-evident, and there is only one rule that should really apply. If you are in love with the story, then you will lose sight of it. You should be very tough with yourself. Is this story a solid, good story that has universal appeal? If it doesn't, forget it, because you're going to waste a lot of time trying to push the story, when the story should probably push itself.

Video tape film, the wire services, and still pictures--I'll start with the last one because most of us think that still pictures aren't utilized in television, and that is not correct. There are two ways that they are utilized, outside of just full-frame, in other words putting a camera on the picture; the RP and the chroma-key. Now you don't need to

remember these things necessarily, because they both apply to the same function. That is, if I am the anchor man here with a screen behind me, and a picture appears on that screen, it is from one of two processes: either it is chroma-key, which means that the picture does not exist at all behind me, it's a sheet of blue felt, and it's electronically put on the screen, or it is RP, which is nothing more than a projector from the back of the screen showing it from the front. And when you take a picture from the front, there is the President right behind you. You might consider the possibility of a short story item, perhaps 20 or 30 seconds long with the use of an RP or a chroma-key. A lot of local stations need these stories for fillers.

The wire services: UPI and AP. There are a couple of others, Reuters and others, but we'll deal with those two because they are going to affect you the most. What is a guy from NBC doing up here talking about the wire services? Well, the fact is, we get the wire services just like everyone else does. I'm not taking anything away from Rich. I have to give you a little bit of the local station attitude too, because we are oriented to local stations. Both the UPI and AP have a thing called the "day book." If you call them up--just call the United Press International number--ask for the day book editor. Tell him that tomorrow at such and such a time there will be a news conference, or there will be an event; give a time and a place. He will put it on the wires. The following day, every television station, every radio station, every newspaper will have a copy of your event. If it's worth covering, they will be there. If it isn't, they won't. This goes back again to the story idea. What is important? What isn't? You can be sure that if AP and UPI say, "That's the dumbest thing I ever heard," it won't even get on the day book. But it

is something to consider, because that will save your going around to every one of the stations or calling them all up on the telephone--because everybody reads the day book.

About still pictures--I'll go back to them for just a moment because there is one thing that is rather remarkable. Every once in a while, I'll receive a package up there at NBC (most of the time, as I said, we don't use them except for file purposes), and it will be a picture of Mr. Jim Elliott receiving an award from the President of the United States. You'll have to imagine this...Here is the President, and he and Jim are shaking hands. Now it's a great picture and a great idea, except television sets are made like this (horizontally). That's a typical example of a lot of wasted time and money, because the pictures arrived in the wrong format.

Do not initiate lengthy information packages. Everybody likes to be proud of their work, like those copies that arrive special delivery that are this thick and have got reports and fancy folders. The fact is, though, that most newsmen--locally and nationally--are lazy. They are very busy and they really don't have much time to spend. So the normal procedure is to kick these thick packages out.

Follow up on your UPI. Say the story is going to happen today. Two days ago you should have sent out a one-page release to local stations. Yesterday you should have called UPI or AP and told them the story is going to happen. And today you just hope somebody turns up to cover it.

I think that most of the value of a session like this comes from the question and answer period, but I'm just trying to give you a few quick pointers on how you can get better coverage. I don't want to discourage you and say that NBC or CBS or ABC isn't interested in your story. I'm merely saying to you that most of your effort should be directed to local

television and radio and newspaper. Every once in a while we will call you. But if we do, we'll normally call somebody like Jim Elliott, because we know he never tells the truth...!

JIM SLADE, SCIENCE CORRESPONDENT
WMAL RADIO

I'm representing what may be a minority group here--commercial radio stations--so I will attempt to talk about all of them. As a science writer with some seventeen or eighteen years of experience, I deal mostly with science in an analytical way--a "feature-oriented" way, if you will. These features can be only about 3½ minutes long because of the format used where I work. But time is not necessarily a restricting element, since everyone handles a presentation differently.

For example, almost all of us in commercial radio like to add an occasional science fiction flavor to our stories, and I'll tell you why. Science fiction is not only fun to hear in the telling, it is fun to write and re-tell. More importantly, it affects the listener, which is how it gets its message across. The point here is: make it interesting. I'm not suggesting that everyone study the techniques of Jules Verne, but I am suggesting a cognizance of the human element in whatever story you have to tell. Be aware of the circumstances in which the job you are describing is being done, and be aware of the desired effect of that job. These are aspects which enhance the story, and the tools I need to write it. This can't be done every time of course. Not every story allows that. But I can assure you that as a storyteller--and that's essentially what I am--I look for those elements first in choosing the material with which to work. The question remains: How do you translate a story, in what form do you mold it so that it will get a message

across, so that the listener will listen all the way through and not get bored half way and drop out? These are very important considerations.

The material I need is tape, augmented by written background. Don't assume I know every subject. I do not, fill me in. Surprise me. The effect on the listener is everything in radio. Everything. I don't have a picture to work with. I can't let that help me tell the story. I'm looking for words that tell the story, that conjure images. Lifeless recitation of goals and purposes, idle numbers, discussion of projects in a way that indicates the researcher assumes the audience is thoroughly familiar with the subject, or worse, one who believes the audience knows nothing at all--these just don't work. Forget about it. If I am to use a tape, the speaker has to give me a clear, interesting picture of his or her subject. Now I want very much to use your subject's voice in whatever I write. In radio, tape-recorded comments by the authority on the subject are like a picture in the newspaper. They lend credibility and they underwrite what the reporter is saying. That's very important. They fill in details and they spice up the proceedings. Make your tape colorful, so the listener can feel the subject's excitement and interest. Describe how things look, how they smell, what the working conditions are like for this person. Don't take him in a room and shut the door. Take him out there where he is working and let me hear it. This is the flavor, this is the spice.

If you can, get the speaker to dream a little. I know most scientists don't want to postulate about what might happen. They say, "That is terrible, I haven't published on it and I am not going to say that." But if you can get them to dream a little around their subject, that's interesting. Most of all, try to get them to say these things, and not

you. If that's a tall order, it's what we try to do every time.

Now you are also going to have to consider working with two modes of broadcasting in mind. At a big radio station like mine, with all its researchers and writers and staff people falling all over each other--it's a very big station--time is very precious and very limited. So we have to be able to gulp the story down and make it fit the format. But you are also going to have to deal with the small stations in the smaller communities.

The best of all worlds for me, and what I try to do 99 percent of the time, is to come to the subject and do my own interview, with you as the go-between. And, by the way, if I do come there, please do not stay in the room, because you're a distraction to the interview subject. Sorry about that, but you are. He or she looks at you as the agency ear, and may be stiff with you there. And I have to make them comfortable with me before I can get a conversation instead of an interview. You make that harder if you are in the room. If I've done my homework properly, this conversation shouldn't last more than forty-five minutes or an hour. You can help me do my homework by sending me background papers when I set up the interview. I won't be insulted because I can't possibly know everything that's going on; you've got to set me up and fill me in before I can do a sensible job.

Out of this interview I'll later lift whole taped sentences or paragraphs to illustrate what I write. Most of what I write, I assure you, will be based on that interview itself--on what the person tells me, on your background material, or on whatever other interviews I do on the subject, if there are any others. If you do a package tape and mail it to me, I'll listen to it, read your material, and--if I'm interested--I'll lift out the subject's voice.

But if I do, I won't use your voice, ninety-nine times out of a hundred. Not because you aren't a thoroughly interesting person--I can tell you are from the way you've sat through all this--but because too many voices clutter the story and distract the listener's attention.

Regarding small stations with limited staffs, there is little chance of their ever using your material in a news format, in which a writer would have to take it apart and deal with it and then write a story of his own. More likely, he will run the whole package on a Saturday or a Sunday, as is.

But in the end, no matter who is to get the material, first make sure it is correct, and then keep it lively and interesting to many people. You needn't cheapen the story or put in a laugh track. But too many people dealing with science believe that it's a stuffy subject and that you have to deal with it with some inflated sense of dignity. This is not true. Scientists are people who are doing a job, and we want to talk about them in common, human terms. We are talking about things that affect people's lives, about food, fuel, economics, education, engineering, diplomacy--all very lively subjects directly affecting the average person or his or her pocket-book. Self-interest is still the greatest motivator. Bring the subject to the public. Make it live. Have fun with it. Sugarcoat the pill and they will get what's inside. And maybe you ought to read some Jules Verne. I do.

IRA FLATOW, SCIENCE CORRESPONDENT
NATIONAL PUBLIC RADIO

Ditto to everything Tom Burroughs said.

NPR has 218 stations situated in almost every state around the country. We also are heard on Voice of America and BBC radio, so they acquire lots of our stuff. Our stations are uniquely suited to what you people are doing because so many of them are on college and university campuses, which is where the research is happening. There are two ways to reach NPR: one is to reach us through the local station, the other is to call us in Washington or in our bureaus. We have a bureau in San Francisco, a bureau in Los Angeles; we have one in New York and Chicago, and of course the main bureau is now here in Washington.

So if you have a story idea, you can go to our local station in your city. I know some Sea Grant Colleges, like Wisconsin and Ohio, have stations right there. Once in a while we do get a Sea Grant story from our local stations. So the best way to handle it is locally. I would have to agree with that suggestion which was given here before. Go to them and say, "We have a story idea. There is an interesting story going on here on campus." They will then call the network and say, "We have a story idea," and OK it through them. Even if the network does not want it, that does not mean the story is dead. The local station may take it and produce it locally. So you can go that route. NPR stations do lots of public affairs programming, so your chances are very good that if the story is worthwhile, it will get aired, at least on a local level. If we

like the story, then we may pick it up and do it on a national level.

To get us to like a story more, as Tom said, we like to hear good speakers. And we like to hear sound. If you have a story idea, and you just take your tape recorder to interview someone in his laboratory across a table, we are not going to like that very much. We would rather have this gentleman around where he works, or outside, or someplace where we would get some ambiance, and a feel for what he is doing, if possible. If it's a story about migrating sea turtles, take us out to where the turtles are nesting, or where this person is doing his research, outside by the water--wherever we can get some sounds of what is going on. That will help us a lot and increase your chances of getting a good piece produced. Come up with that idea. Don't make us have to think of a way of making it sound better for you, and that way you will help us a little more, and you'll help yourselves in that sense.

Just in passing, I have a list of NPR stations that I can send to you if you are wondering where they are. You can contact me at my office, or our public information people will send you the stations.

As far as story ideas--we take hard news, we take soft news. I consider science news to be news that people are generally not aware of--probably most of science. I like the ongoing research story; I also like the story of the person behind the research. If you've got an interesting scientist who has been working on a problem for five, ten, fifteen years, and he's having trouble coming up with an answer, or just having difficulty doing the topic, I like that story too, because it's a struggle in itself.

We are considering doing a weekly science magazine program. We are in the process of getting an NSF grant to do a half-hour radio program each week,

to be distributed through the network. We would be depending on member stations for a lot of our material, and on people like you for story ideas. Not only will we be doing this program, but NPR will be expanding other programs too. We are considering a morning program; we are expanding our midday news program. Right now our main product is a program called "All Things Considered." It runs for an hour and a half in the afternoon, mostly from 5 to 6:30, or from 4:30 to 6 o'clock, depending on which part of the country it is running in. That program uses sixteen pieces a day, and runs seven days a week. The weekend version is only an hour long. We are looking for good quality material for that program. We will be expanding our programming to a two-hour morning news program which will eat up a lot of material also. We'll need stories and pieces for that program. In addition, this half-hour-long weekly science program will use the story I've used for material. We also have newscasts that run from seven in the morning until noon every day, that are five minutes long on the hour.

I'm also looking now for commentators, scientists who have good ideas about anything they would like to talk about--if they don't like public policy on the Sea Grant Program, if they don't like what's going on with funding, if they don't like the direction that science is going in one area. I'm looking for good talkers who can speak for about two or three minutes--we'll decide how long when we hear what this person has to say and how well he says it. This is something that we have been doing with other kinds of disciplines, but not with science. I'm sort of getting together these ideas, so if you know of a scientist on your campus, or wherever, who is a good speaker and who has something good to say, maybe once every three weeks, let me know. Or, you could have five or ten of them. We are not looking for

any one person, necessarily, to do the whole string of commentaries.

As far as feeding us material, as I said before, I think your best chance to get something on the air is to come up with a good idea, come up with some sound for the idea--how it can be produced--and then write me a letter suggesting it, unless you are going through your local station. If you just call me on the phone, many times you will not be able to reach me--we are all working on deadlines--even if you leave a message. The best idea is to write me a one-page letter with your idea saying, "Hey, we have this going on, how about it?" That will get results. We do return phone calls, we are interested, and we do research the material that you send us. We will check it out with other people to see what kind of research they think it is--if it is really worthwhile, or if your researcher is just looking for an NSF grant, or for some good publicity. We are getting pretty tough on that kind of stuff.

Our audience for "All Things Considered" is estimated at between 4 and 8 million, and lots of those people are scientists, so your stories will be heard by other academicians. They are an important part of our audience, and when we make a mistake on something, we certainly hear from them. So there is another aspect of our audience. Our audience is very diversified. The main program now is in a dry-time format, so it is a magazine, listened to mostly by people in their cars, or people at home cooking dinner, who have one ear cocked toward the radio. The car-traffic audience, sitting there in traffic, really listens intensely. Sometimes people will sit in the garage waiting for the story to be over.

Our stories run anywhere from three to eight minutes, if they're very good, at a running. If a story's not very good, it won't run at all. The average length is usually between 3½ and 4 minutes,

and then about ten minutes before air time they'll say, "Cut it in two."

We are looking for lots of ideas and lots of material. If we get enough material, enough ideas, we will sift through them ourselves. Don't be afraid to suggest something. We are not trying to limit your ideas or limit the type of story you send us. Just send it to us. Send it to us with some concrete ideas behind it, and I think you'll have a good chance, because we're actually looking for ideas; we're not looking to send them away.

SUSAN BURKS, CURRENT AFFAIRS ASSOCIATE
THE PUBLIC BROADCASTING SYSTEM, WASHINGTON

At PBS, we don't produce programs. Everything we do depends a great deal on our stations--about 151 across the country--and on independent producers, to break in our wares and what we put on the air and distribute nationally. In terms of helping them out (and I think they would be very open to information you might have, studies you might have completed), there are two mechanisms that you can make use of. The form you use depends a great deal on the individual stations and what they request.

First, there is the daily exchange feed which comes out of our WGBH station in Boston. This is very much like NBC's National Programs Service. It is fed for an hour every day, closed circuit, across the country. From the exchange feed, stations can pick up fifteen, twenty minutes of newscasts for their evening news, and just put in their own local news to make a half-hour news show every night. If you contact your local station with a press release or call them to let them know where they can get some footage, or any other suggestions you might have, they can make use of that information and put it on the satellite link which goes up to WGBH and through the daily exchange feed. This is used by, our last guess was, about 16 percent of our stations. So, it is a good idea for you to contact, and develop some relationship with, your local PBS station.

The other form is documentaries. I work in the area of news, public affairs, and documentaries. (We don't have a lot of money.) You can contact the local program manager or the local news director.

Communicate your idea on the phone, through a letter, but don't give him a big proposal, don't give him something with a lot of data. He can't use that right away. What you need to give the local guys is a treatment, in two pages, which explains very briefly what you have in mind, if it's for a documentary, and let them take it from there. If they are interested, they will call you. If they're not, they won't.

Not every local station has the facilities, has the personnel, has the money to produce a national program. We depend a great deal upon the ten top stations in the major cities: Boston, New York, Washington, Los Angeles, Chicago, San Francisco, Miami, Dallas...They are our major producers; they have the largest stations; they have the biggest underwriting and development departments so that they can go and find the money they need.

The final step, if you do get a station interested in a very newsworthy documentary, is to come to me. At that stage, I can let you know if I know where there are some endowments, foundations, that might be interested in funding your idea. Or, we can even approach the Corporation for Public Broadcasting for you. But we cannot do that unless we are assured that the production team you are working with is reputable, that they can pull off a major documentary, that they have the track record. If all of those major elements are there, then we will support you and we will go to a funder for you, and with you.

Other than that, I think the daily exchange feed, for breaking news, is your best bet. If you have problems in your local area, I encourage you to call me in Washington. Our offices are at L'Enfant Plaza. If you have problems reaching the local people, who perhaps cannot handle the story (because they are not all up to par like the NBC stations),

then you can call PBS and we will connect you to the local PBS station that can help you out.

The things that we are looking for now: We don't like to say we are just looking for nuclear stories, we are just looking for ecology stories. We are very open about the kinds of things that we are looking for, and the kinds of formats. One thing that we're trying to avoid is talking heads. A lot of people have told us that PBS has become the "talking-head network," and we are trying to get away from that. We are eliminating studio discussions and trying to deal much more with film, visuals; and if anyone is talking, to let it be in voice-overs. We would like our information to be given a much more graphic presentation. We are looking for hard-hitting documentaries. We want to go in behind the issues, as opposed to covering House hearings, meetings, seminars and those kinds of things. We are very much opposed to pulling much of that in, in the next seasons.

So, I welcome you to contact me if you cannot make any headway with your own local stations.

JACK GUTMAN, CHIEF OF RADIO
NOAA PUBLIC AFFAIRS

I don't find anything to disagree with very strongly on the present subject, but there are a few points on which I would like to elaborate. In my job as chief of radio services for NOAA, I work with both the network people and local people. This is probably the toughest market in the United States to crack with a phony story. You're just not going to sell it. I think the gentlemen at the table here would agree with that. I try not to contact them if I don't sincerely believe that I've got a story that is worth putting on the air.

I'm going to disagree just a little bit, however, with my distinguished colleague Mr. Aylward about the chances of putting a NOAA story on the air being "slim or none." They are maybe a little better. We have had a few stories on the networks--quite recently, for example, the Wichita Falls tornado. It was quite a big event. The spokesman on the networks was the director of the National Weather Service, Dr. Richard Hallgren. And there have been a number of other stories. The weather of course provides an everyday contact with the public. Much of this is handled too by my counterpart as chief of television at NOAA, Jeff Baker--we sit in for each other very often--and when a thing like the Texas tornado happens, or when something like the seal kills in Canada are confused with the American seal harvest, then we do get coverage. There are many other incidents of national interest. We are called on for spokesmen, for footage, and we are usually able to comply. I have

arranged a number of interviews on the local NBC station live. They have me holding the phone for a few minutes, waiting for them to talk to the person I have ready on the other end of the line. So we do crack--even NBC--every once in a while.

Mr. Burroughs, a few moments ago, was talking about the reel-to-reel show. That brought to mind what is available at NOAA. There are at least three sources of airing your story, when it is a good story. (If it's worthless, you know it's worthless.) First, we do a daily feed, out of the Department of Commerce, on a spotmaster system, to all the networks, to AP radio, to just about everybody who wants the information. Frequently, there are NOAA stories on that wire. I think the assignment editors usually check that number. The second source is the regional or local story. We probably get more use out of AP with their regional networks, for stories concerning Sea Grant, perhaps, than some other stories we've released. But as has been pointed out, your efforts, your individual efforts, are primarily local. Bill is right. Unless you have a big story, you are not going to crack the networks with it. As I said, the people in the news media in Washington are inundated with news releases, with tips. Sometimes the public information offices are staffed by professionals; sometimes they are not. I think that you people are well versed in what you are doing, but I would recommend, before you go to the networks, individually, that you contact Jim Elliott, who then calls Jeff Baker or me.

Then there is NOAA's fifteen minute radio show. The title of it is "The Sea and the Air," and it is distributed to about 250 radio stations throughout the country, in all fifty states. One particular recent interview was arranged with the help of Jim Elliott and the Coastal Zone Management in a cooperative effort. It deals with history on the

ocean floor, with the upcoming attempt to study the feasibility of raising the remains of the Civil War ironclad, the MONITOR. There will be a series of dives done in August. NOAA scientists, in conjunction with some of the universities, will take a good hard look at that hulk to see what they can bring up. Will they bring it up piece by piece? Can they bring it up in one piece? Certainly if this could be done, it would become a national monument. It would be a museum that would attract millions of visitors. We are going to see that this particular effort is on the daybooks of all the networks and wire services.

Now--since we are speaking about Sea Grant work--I would not have been aware of this story if Jim Elliott did not bring it to my attention. And this is not the only one. The story about Dr. Nemiroff out in Michigan, the man who literally brought a dead man back to life--the saving of cold-water drowning victims. This made Time magazine; it made all of the networks. We also did a fifteen minute interview for the "Sea and Air" feature with Dr. Nemiroff. So we do generate stories. It's my job to look for these stories too. But I don't think that with a local story you go to the network. These people just don't have time for local stories. As has been said, your chances are "slim or none" of putting a local story on national network. But test the water. Test it with Jim and with me, or with Jeff Baker.

There is another series in which your material could be used, a five minute feature put together by the Department of Commerce called "A Growing Nation." This is distributed weekly to about 500 stations. NOAA contributes about fifty percent of those programs, so we do about twenty-five of them each year. But, again, the story has to be of national interest. It can't be of interest only to

your local community.

I would like to recommend that if you don't communicate well with the program managers and station managers in your own community, you make an effort to do so. Go meet these people at their convenience. Don't just call them and think that you are going to walk in on them. In most small stations people are so darn busy they just don't have time to see you unless you set up a time convenient to them. You may be calling people who double as disc jockeys, newscasters, what-have-you. Don't call at five minutes of the hour, when he or she may be frantically trying to finish up a story. They don't have time to talk to you then. Call at quarter past, quarter of, when you'll have a chance to talk to the right person and get a few minutes of his or her time.

There is an announcement I can make that I think you might be interested in. A film on the work of Sea Grant is currently being filmed, and my colleague Jeff Baker will be going out to Wisconsin on the first of May to do a portion of that filming. He also will do some filming with Dr. Nemiroff, a news spot film clip on this cold water drowning. The target date for this Sea Grant film is early fall. This will give you a tool that you can use with numerous audiences. You also can communicate with local groups. I know that our subject is the electronic media, but don't overlook the local groups--the PTA's, the Garden Clubs, and so forth. They are all people, and they are all people to whom we want to send our message.

To sum up, if you have a Sea Grant story that you think is of national interest, I recommend that you get in touch with Jim Elliott. Jim will contact either Jeff Baker or me, and we'll take it from there, on a national basis.

QUESTION AND ANSWER PERIOD
SCIENCE WRITING AND THE ELECTRONIC MEDIA

Q: I've been impressed with the amount of effort that is applied to preparing programs for the media, but I'm wondering about the reverse flow. Certainly the communicators in Sea Grant have an obligation to try to get information back to their users--either the universities or the public--and except for Tom Burroughs, who mentioned the use of electronic cassette tapes, there is very little that is recoverable by ordinary means. How can that programming be recovered?

A: An interesting interview on manganese nodules, or something that does have some long-term historical information in it could be used by professors teaching a course in marine science, or whatever. But that stuff seems to disappear through the cracks.

A: On the cold-water drowning story, for example, a number of people requested copies. This could become very costly since each video cassette costs 25 bucks, and if you include production and transfer time, it gets to be about 150 bucks a crack. If a university makes a specific request for a particular dubbing, we will usually do it at cost. Write a letter to the network, radio or television, responsible for the production and request a copy. In most cases we try to provide it.

A: We also have here in town, as most large cities do, services which tape radio stations all day long, and they can go back by request and free a certain

piece, as long as they have some idea in what area it was broadcast. Government generally doesn't ask for this sort of thing because of the cost.

A: The Department of Commerce makes transcripts or reel-to-reel tapes available to the scientists who are interviewed, at no cost.

A: If you are associated with a university, you might want to contact that university's radio and TV production department. If your story appears on a local station, your own university may be able to tape it off the air, at no cost or at some minimal cost. Most local stations will also provide a tape, but you might want to pursue recording through your own institution. I'm sure that on most major campuses a tape recorder could be made available through the radio/TV or journalism departments.

A: PBS has a public television library which tapes most of its programs, and writes up most of our films to distribute out to their internationals. You can always contact them, here in Washington at L'Enfant Plaza.

A: It is my own personal policy to give out one free copy of a cassette to the person I interviewed or to the public information people. When we get requests from other people, we charge.

Q: You said most large urban stations have helicopter access?

A: No. It just so happens that in Washington most large urban stations have access. I don't know about the Baltimore stations. Check with your local stations to see what kind of facilities they have.

Q: Should we approach several people at once with a story?

A: You generally don't make any friends by contacting several people with the same talent at the same time, unless you are doing what we talked about, placing your story through a news column or something like that. But if you have a story that you think is good for me, and you spread it around to my competition, you are not going to get it on the air.

A: However, if it's a story of far-reaching effect, something that would affect a lot of people in your community, then it would hardly be professional for any one news organization to insist upon an exclusive story. But if it's a good public interest feature, then I think you should deal with the reporter who has given you access before. Is the cold-water revival thing only important enough for NBC to have? It's a judgement call. If you have a real slick little story that you want to get out, I'm not going to argue the point.

A: It works both ways. We have to look at it from your perspective, which is to get the story on the air. We're in competition, and if I don't want it, if Ira doesn't want it--in other words, use the marketplace. But don't play favorites on a regular basis. That's very dangerous. In an ongoing relationship you might want to make that story available to that particular person, but on a general basis, don't play favorites. It can end up hurting you more than it can help you.

Q: What you are saying about exclusives is a little confusing. When you say not to play favorites, are we supposed to take turns and go from one station to another?

A: Contact them all, I'd say. From our perspective, it would be nice if you only came to each of us, individually. But your perspective is to get it on the air. So I'd say, deal with it from your perspective. That is, actively expose it, and let the marketplace determine who gets the story.

A: But you're talking about a story as if it were a finite thing. It isn't necessarily. There might be a continuing story. When you are doing a follow-up story, you could deal with the same station. Nobody's going to get mad at that. But if it's a finite news-break--today the story happened--it isn't wise to say, "Only you can run it."

Q: With a good feature you should go to one station?

A: It's up to you. That's the way I personally want it, but I usually initiate most of my own contacts.

A: If he comes to you and says, "I'd like to do a story on such and such," and you say, "That's a great idea," and then release it to everybody else--then do you get the other side of the picture?

Q: So then you call everybody and say, "We're telling everybody?"

A: No. Don't confuse yourself. On one in a thousand stories you'd have to deal with that. If it's a hard news story that fits in with the daily flow of the news, nobody expects an exclusive. But if it's an interesting "did you know" science story that I come and ask you for, I don't expect you to tell everybody else that I am doing that story. If you do, I'm going to get angry, I'm not going to run it, and they're not going to run it either.

A: I frequently get calls from one network more than another. If we have a story breaking tomorrow, and I get a call from a reporter asking if he can interview a scientist mentioned in the story, I would ask him when he expected to release his story. If the release date is noon tomorrow and he gave me his word that he wouldn't run his story until noon tomorrow, then I would arrange the interview. But to break the story the night before is a disadvantage to everyone else, and I'm not going to do that.

SCIENCE WRITING AND THE GENERAL PUBLIC

Breaking stories outside of Sea Grant's internal network of publications calls for inside knowledge of preparing and placing science stories in the major news media. The science writers on this panel all look for science story ideas that will appeal to their readers. But they have different audiences, and for that reason they are looking for different angles.

Warren Leary, science writer for the Associated Press wire service, looks for events that will appeal to a national audience. He needs national news "with science in it somewhere," whether it be a tornado in Wichita or the saving of a cold water drowning victim in Michigan.

For Richard Kerr of Science magazine, the angle is science, but science with news in it somewhere. The news could be in a new discovery in astrophysics or a new idea about a more mundane matter like why onions make your eyes water. His audience is select but broad; most of them are scientists, but scientists from a broad range of disciplines who like to read about what is happening in fields other than their own.

William Furlong, as a free-lance writer, hones his stories to the specifications and interests of a particular publication, say a Sunday supplement or regional magazine. He generates his features from discoveries, research, possibilities and policies which affect a local area or region--science news of concern to a local audience.

All of these audiences are important to Sea Grant, and each of these writers knows how to fish for science stories. What follows are lessons for Sea Grant communicators in how to stock the national, local and Science waters.

WARREN LEARY, SCIENCE WRITER
THE ASSOCIATED PRESS, WASHINGTON

I'm unlike some of the other panelists in that I spend a great deal of time on spot news, running constantly and never getting a chance to stop. This running process is one of the things that distinguishes the services of the AP, and of our chief competitor, UPI, from those of magazines or newspapers. We are very current-event-oriented people, which is both helpful and harmful to us. We don't have a lot of time to linger and study a subject or to go into the depth that we might like; we're just moving constantly.

The AP covers science with a staff of four full-time science writers and two part-timers. We cover the whole nation, bringing in all the science news from medicine to geophysics to meteorology to you-name-it. If the subject has science in it somewhere, it ends up on our desks. We have two men in New York, which acts as a central bureau. They spend most of their time doing feature articles. There is another office in Washington, one in Los Angeles, and then we have two part-time men in Boston and Chicago. We informally divide up the country into regions. My region is the Southeast, since I'm farther south than any other AP science writer. The writer in Los Angeles handles everything on the West Coast and east to Omaha. It's a very informal designation, but we stay very busy just trying to cover all these regions.

In Washington I write essentially nationally-oriented stories. The story can be something out of Minnesota, something out of Michigan, but should

be something that reveals a trend, something that has implications somewhere else. There's really not much that I can do with what we call a "single-point" story--something that is happening in Iowa or Utah, and only there. It's out of my bailiwick. What I do here is cover a lot of agencies, in whole or in part. I have all of the National Science Foundation, a piece of NOAA, a piece of the National Academy of Sciences, the White House Science Advisors Office, NIH, part of NASA, National Geographic, U.S. Geological Survey; I also cover OSHA, HEW, EPA, NRC and the local universities.

In Washington I must also deal with special interest groups. Everyone has a banner to wave, and they wave it in my direction. There are lobbying offices here for the AMA, health associations, American Cancer Society, the Heart Disease Association--you name it. PR firms based here also have a lot of clients--everyone from the Calorie Control Council for saccharin to very obscure firms who manufacture machine guns or medical devices. I'm dealing with all of them.

Then I open my mail! In trying to sift through all of this material, including many medical and technical journals that I'm also responsible for examining for feature-story ideas--I read Science, JAMA and Journal of the National Podiatrist's Association, Military Medicine, and others--there is constant input coming at me from many directions. In dealing with all these people and all these forces, I do a lot of picking and choosing, and a lot of it is done very quickly. Perhaps I throw some things away that I shouldn't. I may find out later that the story I was looking for is in the third paragraph of a press release I never finished reading. In making quick decisions about what is news, someone frequently has to tell me, directly. That is why it is crucial, in your press releases and in your contacts

with the wire services, to get to the point, quickly.

I did an informal survey last summer when I was requesting help opening my mail. This may not seem like a big problem, but I get about 50 pieces of mail a day, and after a good weekend, about 150 pieces. I spend almost an hour a day opening mail, sorting through it. That's a lot of time in an eight-hour work day. The point is, the competition for a reporter's attention is fierce. I go through my mail quickly, and when something springs forth, it sparks a little light which says *this might be interesting*. I put that in a separate pile. The other stuff goes into my wastebasket, which is the largest one in the office.

I spend about 80 percent of my time on spot news--things that are happening now that I can go after, make some calls on, maybe do a quick interview, and push out. The other 20 percent of my time goes to features, long-range pieces that go into more depth.

In dealing with wire services, you have to understand how far we reach. The AP, for instance, has about 1,350 newspaper members in this country, including the Washington Post, the New York Times, and the Chicago Tribune right off the bat, and many small-circulation dailies from such places as Fargo, North Dakota. Our reports are put in broadcast style and sent to about 3,500 radio and TV stations in this country, and to 125 other countries, translated into many languages. So one 400- or 500-word story will hit a very large audience--100 to 150 million people, say--on just that one shot.

AP's structure is similar to UPI's. We have some very small bureaus in smaller cities called "correspondencies." They may be one- or two-person operations, though we move up to four-person correspondencies in some of the larger cities such as Pittsburgh. Then we have what we call "hub" bureaus,

regional bureaus that control the communications grid of several states. These bureaus also have people who deal with regional-interest stories and regional news. A hub bureau may have from 8 to 20 people on it--not a lot of people on duty at one time if you're working a 24-hour shift. And as busy as I am, some of these local bureaus get even busier. They have to do it all--writing news and doing radio splits while they handle all the aspects of running a business too.

So if you're going to approach the AP you have two courses: you can approach locally--which is the best course--or try to deal with a science writer on the national level. Rather than send a news release to go on top of other news releases from thousands of people, get to know someone in the local bureau. Personal contact is very important: you have a face to go with that voice on the telephone so he pays a little more attention. My advice, then, is to meet and deal with local correspondents. You might want to ask if there is anyone in that bureau or correspondency with a special interest in science or technical matters and deal with that particular news person because of his special interest. Again, you make personal contact: they know who you are, where you are, what kind of resources you have available. Another good idea is to introduce yourself to the local people by bringing in a story in person--not just a potential story or a wrap-up of what you do, but a firm idea that you can actually hand the newsperson. This demonstrates that you do have news, that you know what news is, that you can present something solid.

It is very important to evaluate your news. Everything that seems very important, say, to the Sea Grant Program is not necessarily that important outside of those four walls. You have to think about what the guy on the street is interested in, what kind of story someone not connected with your area

might want to read over breakfast. It's important to get out of your offices and your conferences with yourselves and find out what other people want to read.

The information that you give us should be as concise as possible, with as much information compacted as possible. We don't have the time to spend on volumes of background material. We like to have it accessible, though.

Another problem arises if you send in releases or stories and then go on vacation, or home at five o'clock, and no one can reach you. We may not get around to writing a story or we may be re-writing it when a question comes to mind. If we call your office only to get a recording that you'll be open at 8:30 the next morning, that's when your story gets thrown out. We don't have the luxury of keeping business hours. Also, should you be sending out story ideas or news releases that deal with a certain scientist or person at the university, you really should know where that person is at the time. Some stories, often on science topics from the journals, have several months' lag between submission and publication. When we call and find the author is in Brazil on a research project and no one can answer our questions, usually we can't use the story. So if you know you're going to send a hot release over a weekend or something, get an idea of where the principal people might be so that we can contact the them; or your people can contact them and you don't miss a good chance to get a story out.

As I said, unlike magazine people, we can't use everything, but we like you to have everything available in case we should need it. This puts a heavier burden on you, in dealing with a wire service like the AP, because you have to decide what's important and what we might use and give us precisely that information.

WILLIAM BARRY FURLONG, FREE-LANCE WRITER

I'm going to reverse the procedure just a little. Instead of telling you first what I do, I'll start out by suggesting what you might do to arrange your ideas, your material, for publications you don't work for. That can also perhaps serve as content for free-lance writers, because after all they don't work for a living either...As a matter of fact, the real function of a free-lance writer is to be able to live without income. The success of several people like this belies all of the economics of our times.

I'm going to give you four suggestions for presenting your ideas to publications for which you don't work--or for exposure to free-lance writers, when trying to get your stories into magazines or newspapers that are outside your normal context. The first of the four is that you have to study your market, your likely market. Pick your market, pick the place you want to be, and find out as much about it and about how it thinks as you can. Second, make sure that the editors of that publication are aware of your subject. Most editors do not want to be the first with a story or an idea. They are perfectly happy to have fifteen other people in noncompetitive fields have the idea or the story too, so they can be secure. Quite obviously I'm not talking about exposures of presidential corruption, but of the other 99 percent of the stories. The third idea is to develop a well-focused approach towards that single publication. Don't just have an idea that pleases you. Have an idea that compels an editor to want what you have to offer. And fourth, once you have sold your idea to a publication, do everything

you can to give the writer twenty to thirty times as much material as he can possibly use. Leave him in the position where if he picks the best 5 percent or the best 3 percent of the material and throws away 97 percent, he is really going to turn out with an immortal story, which is what he wants to do.

Now, let's take each of these things more carefully, in greater depth. I feel self-conscious in saying to people, "Read the magazines or the newspapers where you want to publish," because I think that's a given. Everybody does that or should do that. Maybe what I should say is, "Study them." Think about what they are doing from their points of view, not only your own point of view. Think about the market they are reaching or trying to reach, about how they are reaching that market, so that when you have an idea you can adjust that idea to their market, not just to your interests.

For example, if any of you are in agriculture, you can imagine that Parade magazine might have an interest these days in a story about the raising of lobsters, the breeding of lobsters commercially (not just the catching of them), or about the raising and breeding of any kind of fish as a substitute for meat--not just the synthetic development of meat, but the actual breeding, the new industry, a meat substitute, and so on. You must know that people are trying to do with lobsters what they have done with cattle, although obviously lobster isn't considered equal by the American palette. So Parade has that kind of a story. It's a story of "Boy, meat prices are high and here is somebody coming along with more and better fish, and falling into the same pattern as the meat and chicken producers did."

Now, Parade is a Sunday supplement; it is distributed through newspapers. The New York Times Magazine is also a Sunday supplement distributed through newspapers, but it would take an entirely

different story about the same subject: How much of this kind of food, or meat replacement, is there? How difficult is it to do the breeding, the raising of lobsters or shrimp or any other fish? How long does it take? How long will it take to be a full-fledged industry? How long do we have to wait in order to make it a meat substitute? The story comes out of the same center of ideas and facts, but the New York Times Magazine obviously has a different approach to it than Parade has.

What I'm saying is: study their approach, study their technique, study the markets they are looking for. It becomes reflexive. You will know almost automatically. You'll hear about a story and you'll say, "Oh, that's a story for so and so." You can do this not only with national magazines, but with local magazines. To a large extent, you can do it with newspapers--although some newspapers haven't thought through their end of the problem as completely as have the magazines.

Most areas of the country have very strong regional magazines. You can find not only an angle, but a way to approach a regional magazine with your story idea that will make them want to run it--as long as it's for them, and not only for you and a hundred other people. It has to be for them.

The second thing to do is to make certain that the editor is aware of the whole field in which you are working so that he doesn't feel naked before his enemies. As I said before, editors do not really want to be the first to run a story. They are not unhappy if it's on the AP wire, or if it's in Time or Newsweek. All you have to do is shape the story for them and say, "Hey look, this story is getting bigger and bigger, and it's for YOU. Why don't you do it in depth?" So you have to prepare the editor so that he feels comfortable with a story, so that he doesn't say, "I'm going to be the first one to

run this; what's going to happen?" He wants to be the first one in his area of the media; he doesn't want to be the first one in the world. So what you do, once you've targeted a particular magazine, is to send the editor what other people have written. Mark it up and send it to him so that it doesn't take him very long to read. Then, after a week or two, come in and tell him you've got a story. Or, you may have a writer who will go in and say he's got a story. The editor then knows what the story is about and that others whom he respects and is in contact with are running it. Not that story, but a story.

When you do go to an editor, make sure that you are not selling him a story. You are selling him an idea. Editors buy ideas, not stories. That idea has to be for his publication. You can't go in with a story and say, "Why don't you do a story on the law of the sea?" He would say, "What are you talking about?" No. You go in and say, "Did you realize that in the seabed off such and such a city there are umpteen amounts of minerals lying around in globules?" Or--and this turned up in one of the annual reports from Sea Grant--the success story of the person or the persons who thought of the new sea-trawling net. There were only five or ten lines in the annual report, but I thought it was interesting. Somebody thought of a new way to develop a sea-trawling net. The fishermen in that area are doing very, very well; they set spectacular rises in income. But who did it? How and why? How did this come about? These are all questions which you could take to an editor of, perhaps, a Sunday magazine of a fairly large local newspaper.

The whole idea is that you get the story that the editor wants. It may be a story that you want, but make sure, sure, that it's a story that he wants, that it is shaped and honed and you can give

him material that will make him say, "Boy, that's a story for our magazine," or, "That's a story for our newspaper."

The way that magazines approach ideas is different from the way that newspapers approach ideas. When a newspaper man writes a story, he has an angle. That angle usually survives for one or two paragraphs. As you continue reading the story, you find out eventually that the angle isn't there anymore. He's simply forgotten about it, and he's provided the copy editor with a way to make a headline and so on. When a good magazine writer writes a story, he picks an idea or a theme that will survive through the entire story. He does not simply give you two paragraphs of an angle and then forget about it. He gives you an idea, and if he's got any skill, he states the idea in the first paragraph (that's to make it easy on the editor or sometimes on the reader) and then carries it all the way through, all the way through. The good magazine editor is looking for that. If he realizes that you can do that, you've already solved half his problems.

Let me give you an example of how this hit me. A number of years ago the New York Times Magazine called me to do a story on what a small town in the Midwest is like on the 4th of July. Mood story, theme story. We picked Keocuk, Iowa, and I went out there and did the story. I researched it and developed the theme just exactly as the editor and I had agreed upon: what the small midwestern town was like in this year of our Lord whenever-it-was. Before I quite got to that, I wrote four of the most beautiful, evocative midwestern small-town paragraphs you could ever want to see. Sinclair Lewis would have cried. I loved it. Oh, what great material! But I started the story in the fifth paragraph. I mean, I put the idea of the story in the first sentence of the fifth paragraph. And as I sat there and analysed

it, I knew what I had done. But, oh, was that great writing--so I sent it in. The Times said, "Okay, Bill. Fantastic. Liked the whole thing. Only going to make one small change. Going to swallow the first four paragraphs." And swallow they did. They started with the very prosaic first line of the fifth paragraph. They made that the lead story and just let it run, because the theme could be observed in that first sentence and the theme carried all the way through.

There is a trick to doing this which you see in magazines of all sorts, and sometimes in newspapers. You'll hear newspaper people saying, "That's a magazine-style story." All they really mean is that some newspaper reporter has carried the angle all the way through the story, instead of dropping it after the second or third paragraph. The trick is this: You find yourself in the spot where you can't possibly carry the theme--if you're going to write, say, 5,000 words on the subject--all the way through (it's very, very difficult). So you carry it through as far as you can and then, perforce, move away from the theme. At the end, in the last few paragraphs, you then get back to the theme and restate it. You say, "See, it all worked; I just showed you." It is a parentheses, but it looks like it hangs together. That's the imperfect way of doing a story, but that's the way you quite often see it done.

When you take a theme, you have to be as selective as possible for the magazine. You could take almost any theme you wanted on the subject. I'll just take one at random. If you were going to do a story on the Rockefellers, it might take you 3 or 4 hundred thousand words to cover the subject adequately. Instead, you would do a story on the Rockefellers in terms of the old man as a business genius, or as a discoverer or exploiter of oil, or of Lawrence Rockefeller as a capitalist, or of Nelson Rockefeller as a governor or a Vice President or a lover. You

could have a whole set of different stories, but you wouldn't do them all. You wouldn't (nobody has recently) do a story on Nelson Rockefeller as either a governor or a Vice President. People are very selective. You have to be too.

By the way, if you are going to a writer, a free-lance writer, try to think of three or four ideas for him. (Presumably you know where the writer works or to whom he contributes articles.) Develop one or two paragraphs substantiating each idea. This allows the free-lance writer the chance to say, "Oh, gee, that will go in such and such a magazine." You already know that. You doped that out. You are just allowing him to discover genius for himself. Then he sees another idea that will go someplace else in the marketplace, and so on. So you work all of that out so that he says, "Gee, these are good ideas." You've got to remember that he is working for nothing. Nobody pays him. You get paid, presumably, for the ideas that you bring to him and for all the time that you put into development. He doesn't get paid anything. So he's going to be suspicious of anything that's going to take his time. Instead, you are going to come to him with things that are going to be easy to sell and easy to do. And give him a fairly good blank outline. He may say, "Hmmm, that person really understands."

We've talked about studying the markets, making the editor familiar with the general topic that you are involved with, developing a particular theme or idea that can carry the article all the way through, and making sure that the writer has twenty to thirty times as much material as he needs. The difference between what a magazine writer does and what a good writer for a newspaper does is this: The normal reporter on a newspaper is told by his editor to go out and cover that blast of the atomic bomb and write 300 words on the subject. So the reporter does

that. If he comes back and gives the editor 320 words, it's all over. The editor wanted 300 words. He's made his decision as to what the story is worth before he's seen it. This is the normal way newspapers operate. Fourteen people have just been shot down on St. Valentine's Day in a garage, give me 500 words. That's how they work. A magazine writer should be able to sit down, without trouble, and write 100,000 words on a subject. Without trouble. He should be able to write 100,000 words on a subject so that he can pick out the things which will make the best 5,000 words and make the editor say, "Boy, that's really strong." When you read a story like that, you sense the substance that is behind what is written. In a newspaper story, simply because of the speed at which the reporter has to work, you may get the feeling, "Gee, I don't know everything about this and it really doesn't follow through." But in a good magazine article you know that the writer knew a lot more than he said in the story.

How does it work in principle? Some years ago I did a story on the field of journalism for Harper's magazine about the Coles Brothers' newspapers. I went out and gathered everything I could. I finally sat down and, having a huge amount of material, started to write an index to my notes. I didn't write the notes, I didn't copy the notes, I just wanted to know where things were. So I went through the notes with a red pencil, indicating by page number and notebook number where they were. I typed that thing single-spaced. It ran ninety-nine pages. Now I had not written anything. I had not written any notes; I had written an index. I got to ninety-nine pages and I still wasn't finished and I began to think, "Geez, I'm becoming one hell of an indexer." At that point I stopped and started to write the story. The first draft ran thirty-nine pages

single-spaced; the final draft, the draft that was published, ran eighteen pages single-spaced. So you get an idea of what was behind the final published story, which came to probably 5,500 or 6,000 words. If you stop to think how much an index of ninety-nine pages runs you, you understand the contrast. So, when you work with a writer, give him everything. Obviously, give him the things that are going to sustain the idea and help shape the idea, but give him everything you have and don't be surprised if he keeps asking for more.

One of the things Ann asked me to talk about is how I work. Usually frantically! Basically, I work on assignment. I don't speculate in that I never write a story and then send it out to an editor. I do talk with editors almost every day on the telephone. They call up and they may have ideas or they may not. They just want to call up and say, "Hey, what's going on, what do you think?" (I mean, what you do in an office every day is what I do in an office every day--just shoot the bull with people, sometimes endlessly. And get very upset because it's only what comes out of the typewriter--not what comes out of the mouth--that counts.) Once I have an assignment, I go out and get everything that I can about the subject. I'm doing a subject now using eight library books and six magazines, just so I can ask questions in the article. I had them send every bit of published material they could so that I didn't have to go back looking for it. It takes days, hours, to do all this, to gather all of that information. That's what the writer should do. When the writer comes to you and says, "Give me everything," arrange to give him everything.

I'm going to go see a Senator this afternoon and I think I probably have 200 questions. I don't think I'll get more than 20 in, so I've arranged the questions in the order that I think is the most

worthwhile for this particular story. Then, when I have all the information, I go into the hardest part. I go back through the notes and read and read and read again, and make the indexes (which I now hate to do). In my own mind I keep thinking, "I have the story, I don't have to go through all the facts again."

My flaw as a writer is that I write too much. The editors like to know a lot, but they don't want to know that much. For example, about two weeks ago I didn't like the first draft I had written of a story and it was due the next day. I had no time. I sat down to revise it, a total revision, and that day before 5 o'clock in the afternoon I had written 9,000 words. But the next day the editor cut 9,000 words down to 5,000. Not an easy way to do it, and I don't necessarily recommend it, but that's the kind of pressure you sometimes face.

If your function is to help a writer, just help him get everything. Obviously, if he knows what his theme is going to be, help him get the materials for his theme. Each of you have become known in your various areas as part of a resource center for the whole phenomenon of the sea. Now obviously you don't all know everything about it, because you tend to specialize in singular areas--but you do know who does. The mere fact that you are together here at meetings means you do know who knows certain things. So when you get a call from a certain publication and they say, "Gee, we don't know anything about this; where can we start?" you can help them start.

A magazine called about a month ago and asked if I'd do a story on such and such subject. I said yes. The next day, somewhat soberer, I woke up and sat and looked at the notes--violently incoherent--that I taken and realized not only did I not know anything about that subject, but I didn't know anybody who did know anything about that subject. It

was absolutely and completely out of my realm. If I told you what it was you'd think I'm a nuthead because I'm sure that 50 to 90 percent of you know it. You just have different experiences than I have. I sat there and I said, "Where in the world do I start?" In Washington there has to be a trade association--in other words, a trade association! There was an information center so I called up the information center, but they were a lobbying group and wanted to inform public officials, not writers. But I found a guy who would spend an hour on the telephone telling me basic things; and he gave me the next guy to call, the next magazine to read, and so on. I went from there and wrote the story and the editor was phenomenally pleased. I never told him that I knew nothing, absolutely nothing, about the story. So be a resource center for people like myself, just to help them get started when they can't even begin to ask the first question.

RICHARD KERR, STAFF WRITER
RESEARCH NEWS SECTION, *SCIENCE* MAGAZINE

I'm a staff writer for the research news section. There are two news staffs which have recently been thrown under one editor. There is a news and comment staff made up of journalists who have developed an interest in science-policy writing and the political side of science, and our staff, made up of six or seven people who have advanced degrees in some field of science. We're hired with the expectation that we'll learn a bit about writing, enough to communicate our stories to our public. Our public is composed of about 100,000 association members. The magazine, of course, appears in libraries as well, so the readership is larger than that, but the readership is generally considered to be composed of people with science backgrounds. In that respect my stories are very different from a number that we might hear about here today.

I write for a reader with a degree in science, but in a field outside of the one in which I am writing. Most of my stories go through a number of hands, including other staff writers'. I generally write about my area of interest and training--in earth sciences--and I usually try to write the story so that a biochemist down the hall can get along with it and get from one end to the other.

My position also differs from Bill's in that I am paid a regular salary and I have time to sit back and watch what comes through. I may not be typical, but I am the recipient of a lot of shotgun material. A lot of what comes across my desk comes in the form of technical journals, popular magazines, news

releases, analytic reports and magazines. What I'm looking for are stories about developments in a field of research--not so much the activities of a particular researcher or institution.

We do have a few smaller pieces that can work with one or two labs or that sort of thing. One of our other writers kind of specializes in these items, such as why onions make your eyes water. He did an item on wonder water, a new development out of Russia which makes plants grow. You pour on the water and then actually watch the plants grow. So I'm really in the market primarily for broad, feature style stories, and secondarily for the newsier interest stories.

I do most of my research over the phone. I don't want to counter anything you've said, Bill, but I often feel overwhelmed with material. Researchers seem anxious to provide you with written material and have a great confidence and belief in communicating in writing. It's solid, it's reliable, it's down in hard print--but it's also overwhelming. Instead, my interest is, once I have the story idea, to make immediate contact with the people involved, who are actually doing the work. This is something I noticed in some instances of the Sea Grant material; there seems to be a tendency to highlight institutions over individuals. I'm looking for the subject, and then the person and how I can get ahold of that person. It just puts another step between me and my material if I have to take a less direct route than that.

What I'm looking for I guess is clearly stated story possibilities. I get discouraged very easily if I have to wade through any amount of material to find out why a particular subject is of interest. The news releases and Sea Grant 70s I find useful. The first time I saw an annual report was when Ann called me about coming here. Now an annual report

is an example of fairly dull material, in the sense that it is thick and seems to be interminable to read through page by page, but it gives me a chance to go through subject by subject--I'm not tuned in to every subject--and find out in very concise form some of the things that are going on. I found that I could read all of it.

So, in summary, what you are doing strikes me as reasonable for me as a writer. In particular, I want to emphasize getting story ideas to me and then helping me through to the person. Giving me visual material can be very helpful too, but it's the person I'm going to deal with and that I hope is my angle--that my technical background allows me greater access, or easier access, to the person who is doing the work.

QUESTION AND ANSWER PERIOD
SCIENCE WRITING AND THE GENERAL PUBLIC

Q: How much information do you discuss with the editor while the story is being written? Do you find that you can call the editor when you are trying to decide which way to go?

A: Well, I'd call him. This happened to me on a story outside the realm of science not too long ago. The story we thought we were going to go after at the start was turned around by events. The editor got on the phone and said, "We've got to go in this direction." Most editors, once they feel that they are going to get the story they want will rely on the writer to develop it to its fullest. Now that particular case was interesting because the top editor said, "Yes, we're going to have to change. You'll have to go in this direction but it still looks like a good story." Then one of the subeditors who was actually going to do the story called up on three successive days and changed his mind on three successive days. He didn't realize he was changing the story. He's a highly verbal editor who wanted to talk everything out, and in talking everything out he was changing the story. I just decided I was going to go the way I thought best, so I wrote the story that way and it was perfectly okay. Just use the best judgement you can. Talk it over with the editors, be honest and give them the best possible story you can.

Q: I wonder if Associated Press or any major wire services appreciate the problems of a small operation

with limited staff? Is the larger organization more able to provide specific expertise?

A: No, essentially the facts are pretty hard in these huge operations. Most operations don't have more than one science writer. We have constant plans to establish a larger staff, but we also have people who are in the outlying bureaus who have been out on science stories even though they're not officially science writers. Some of their feature stories are not as good as they might be, so we science writers spend part of our time screening stories from other bureaus to see that the conditions for accuracy and substance are met. But it's such a large network and there are so many people involved that it's hard keeping tabs on all of those people. Still, there are a number of them who aren't science writers who can appreciate certain subjects and who do write well. You just have to find out if they are in your region.

Q: I understand that there is some kind of a phone feed for reading news releases right into a wire service. How do you use that particular line?

A: There is no formal system for that. Some bureaus have telecopiers. Here in Washington, the bureau has dictationists who are able to take news releases. But there is no formal nationwide system for taking news releases.

Q: Much of your material is written broadcast style. I know UPI has a broadcast stylebook. Do you?

A: We have the same thing. Each newspaper story is translated by our broadcast team, so we have broadcast and print versions. AP stylebooks for both broadcast and print are available at most university bookstores.

Q: Considering the kind of information we might provide you with--perhaps engineering information or something concerning petroleum--what kind of criteria do you use to distinguish what is newsworthy and what isn't?

A: The basic idea is, does anyone else care, would anyone else read about this? You're dealing with the average person out there, not a select audience, not a group of scientists, but everybody. With a story about snails or clams you might try something to get this average person involved. An engineering-project-style story probably wouldn't sell. So it's just a matter of thinking, "Is anyone else interested the way we are?" Or, "Is there a way we can make this kind of sexy for the average guy?" We used to call him "The Milkman in St. Louis."

Q: Since you are aware of the commercial aspect, do you think there is a greater interest in science writing among the editors of broad audience publications?

A: Yes. But there is probably more communication between science sources today, than between science writers and their editors. By way of expanding the whole thing, if each of four guys got out a thousand-word feature each week for you (something you would probably like to be able to do), there are editors all over who would buy those stories. Look at the New York Times which now has one day a week devoted to what's new in science. How long is it going to be before other newspapers across the country begin to do the same thing? I'm presuming that other editors are watching. So I think that more editors are aware of science story possibilities, but there is an age gap. Editors of newspapers are not young; they're not close to what is going on that's new in

science. They grew up before science even came out. The guys behind them though--the ones who make you wait--are probably the guys who would show that interest in science writing.

A: AAAS is starting up a new popular science magazine. They have a small staff, largely freelance, mostly writing two-thousand-word articles. We'll do six or seven articles bimonthly with some short news items of 500 words or less. Al Hammond will be the editor of this magazine, called Science 80! Their offices are at the same address as Science.

Q: When we shackle you with releases from our local programs, do you ever file them, or try to keep track of what's going on?

A: Most of the releases end up in the circular file, but I do put some of them aside if they look interesting, or look like they might turn into something, or I'm just curious about the story. I make a file, and that file could show two or three items waiting for the proper time to become a story.

SEA GRANT'S CONGRESSIONAL AUDIENCE

Staff members from key ocean-related committees of the House and Senate were asked to respond to the question:

How can Sea Grant staff best provide and package information for Congressional audiences?

The answer was unanimous. Committee staff have to provide instant information to legislators, and to get that material, they have to sift through and assimilate a tremendous daily influx of publications. As a result, all of the panelists asked for information packages providing one-line synopses of research reports and publications or abbreviated lists of abstracts. From these, legislative staff can choose and send for documents relevant to upcoming legislation.

The panelists also stressed the importance of keeping legislators and staff of key committees informed about the work and accomplishments of Sea Grant Programs around the country.

DEBORAH STERLING, STAFF ASSISTANT
SENATE COMMERCE COMMITTEE
OFFICE OF SENATOR ERNEST HOLLINGS, DEMOCRAT
SOUTH CAROLINA

Next year, Senator Pell's Human Resources Committee will be preparing for reauthorization of the general Sea Grant law. Our committee has both reauthorization and oversight responsibility. Authorization merely sets the ceiling level up to which money can be appropriated. So if the ceiling level is 15 million dollars, for example, that means that the appropriation committee can appropriate anywhere between zero and 15 million. But that is the responsibility of another committee. Our committee, which deals with Sea Grant, deals with policy questions concerning the program in general.

The Congressional Research Service does something that is very, very helpful to us. They put together every other week a set of abstracts of reports that have recently come out of their research service in our areas of interest. They send them over and we have an opportunity to read through the abstracts, check off the ones that we think will be useful, and send back for the full reports to come in. I think some kind of organized way to deal with all of the information (a great deal of it very good) that comes out of the Sea Grant Program would be very helpful as far as our committee is concerned.

At the present time I can't even begin to tell you how many newsletters from individual Sea Grant Programs come into my office--off the top of my head, about eight. There is no way we can read all of those newsletters. We do skim them, to look for things that would be helpful to that aquaculture bill that's rolling. We look for aquaculture things, and

related information. The newsletters circulate throughout our office, through a staff of five. We also get reports sent to us. Lots of times these hit home and I by no means want to discourage you from sending these reports, because frequently they come rolling in at a very fortuitous moment and we can make very good use of them. At other times there's no way we have time to read them, so they end up on the side of the desk for months and months and we finally have to throw them out for lack of space.

If there were a more organized way for us to be made aware of the reports that are coming out of the Sea Grant Program--on a quarterly basis, or semi-annually--I think my office would find that very helpful. Then we could respond and go back to the Sea Grant Program and ask for specific kinds of reports. Sea Grant 70's has a lot of interesting information and contains general synopses of the kinds of things which give us an idea of what's going on. It also lists reports that are becoming available. But we are dealing with Sea Grant 70's kinds of publications and newsletters for practically every program that we have, and there are many of them. If we could have something packaged, if it wouldn't be too extensive, knowing I'm going to have to feed the kitty on Monday if I speak too ambitiously here, it would be a great help.

Most of your reports we can put to very good use at one point or another, but we do have space problems. Those reports which carry an executive summary are particularly helpful for review. We seldom have time to read through a 150-page report or even a 40-page report.

We think Sea Grant is a pretty important program, and has come a long way. There is a lot of support for it on the Hill, and a lot of recognition of how important the work that is going on in the field is.

We see uses of it everyday, whether we hear from local fishermen whose states we are particularly attuned to, or from the management offices of the schools with Sea Grant Programs. There is tremendous importance attached to the work that's going on. We just want to let you know that Congress is quite supportive of the Sea Grant Program.

RICHARD NORLING, STAFF DIRECTOR
SUBCOMMITTEE ON OCEANOGRAPHY
HOUSE COMMITTEE ON MERCHANT MARINE AND FISHERIES

I guess I will be very narrow-minded and discuss what needs I have, as a committee staffer, for information on Sea Grant. Our subcommittee is in charge of authorizing legislation each time the Sea Grant Program needs to be renewed on the House side, so we need to know the broad outline of what is happening in Sea Grant. We have a new chairman; we don't have a lot of background on what you people are doing across the country. We get annual visitors from MIT and Woods Hole who tell us what they are doing, and those are very important visits. You can try to visit your whole state delegation, but members of Congress who work on ocean matters are probably the ones most interested and therefore the easiest to contact.

Members of Congress go from one issue to another throughout the year, even from hour to hour during the day. They really don't have time to sit down and read books. I don't have time to sit down and read books, as a staffer. I have a stack in my office of things that I ought to read. Things I have to read I take home because that's the only time I can get to read. Regardless of what you've heard about the number of staff on the Hill, we are understaffed, since there are 435 members in the House and 100 members in the Senate, all of whom want to know about every single thing that is happening in the country, whether or not it is legislative. And of course they want their staffs to find out about anything to do with legislation. Well, that's impossible. As a staffer,

you end up working like this: an issue comes up and you remember some document which came across your desk within the last month or so that had something to do with that issue; you go back and try to find it in the files, or in the stacks of paper you put to the side that you wanted to read, and hope to do a quick crib.

Just as an example, my chairman is Mr. Studds of Massachusetts, who was the House author of the 200-mile-limit fishing bill. Probably the most frustrating kind of request he gets comes from undergraduates writing term papers. "Can you supply us with some of the kinds of research you did in developing that bill?" We did no research. We just didn't have time. We have to rely on research that other people do.

We know now that the Sea Grant authorization bill expires at the end of the next fiscal year, so next spring we'll have to be considering legislation to extend the program. That's probably the longest amount of time we ever have to know that an issue is coming up. Usually we have less than a week. If somebody is offering an amendment on the floor of the House or Senate, and you have to advise your boss whether to agree to it or not, you have almost no time to gather information.

On top of what Bill said about the kinds of communication which are going to help us, the only other thing I think would help is abstracts--not even abstracts, exactly, although those are helpful publications, but something closer to one-liners. In this format one could sift through very quickly to see what is going on in Sea Grant that is of interest to a specific committee. Perhaps other audiences could use this also, so this kind of index is what I would request from you.

WILLIAM YOUNG, LEGISLATIVE ASSISTANT
TO SENATOR CLAIBORNE PELL, DEMOCRAT, RHODE ISLAND

We do receive a number of publications from some of the Sea Grant institutions around the country. I am very impressed by the quality of them, by the professionalism of them, and in general they are very helpful. They have a lot of information that they don't name, but they are always interesting. And as I said, they are professionally done.

I'm sure you know that you are certainly dealing with a number of audiences in the publications you put out. You have the scientific community, you have the other Sea Grant institutions, other departments in your own institutions, government agencies, state agencies, local agencies, as well as other federal government agencies that you want to let know what you are doing; and you have your user groups: fishermen, marina operators, recreational industries, and the general public. Obviously, in no one publication, in no one form of communication, can you know what all these audiences need, and that is true of Congress too. I think we have sort of unique needs, and we are a very limited audience. It is very useful to us to get the kind of publication that you send to these other groups. I'm not sure that there is any need for a special kind of congressional newsletter. We like to know what you are doing. We like to know what you are telling fishermen; we like to know what communications you are having with other people. As far as Congress is concerned, the kind of thing that I like to find out about Sea Grant is what is generally going on with it, and a general publication is very helpful that way.

When you get more specific, I think it is helpful to know what is developing, what is happening in your Sea Grant Program, or what you are doing that may have some policy implications. There may be some individual program that started out because of a local need, in one institution, that has come up with findings that may show a need for a new national emphasis. That's the kind of thing that has policy implications, including the kinds of things that are not just interesting to us, but may spur us to do something. If you are able to spot those, to highlight them when you are communicating with your congressional offices, it is very helpful.

How do you do that? How do you communicate with your Congressman? The publications that we get provide a base for knowing what is going on out there, but if you want to get specific congressional interest for the Sea Grant Program, really a letter is best. A letter accomplishes two main purposes. It's a message to the user from somebody out there saying, "This is what we're doing, and it's of particular interest to you," or, "This is something I would like you to do." That's still the most effective form of communication to a member of Congress that I'm aware of.

One other suggestion, which would come under the heading "The Care and Feeding of Congress," is that a pretty effective form of communication with members of Congress is to let them know you exist--be nice, try to get them to come down to visit your program, have a picture taken on the way there. Publish the picture somewhere, preferably in a wide-circulation newspaper while the Congressman is getting an award. That's communication!

The guy has come down there, he has some knowledge of the Sea Grant Program and what you're doing. This is the life's blood of being served. Members of Congress can serve you better if they know your

program. You are going to make them happy and make a friend. And you can make them feel good about the visit. They need publicity. And if you have a real friend in your Congressman--who has helped out the Sea Grant Program, who wears white sweaters, who tries to persuade his fellow members of Congress to vote for the Program, particularly in this age when getting money from the federal government can be harder and harder--for heaven's sake, if you've got a member of Congress like that, take care of him. Treasure him. Mention his name in your publication. If he happens to be the guy who founded the Sea Grant Program with his legislation, then give him everything!

GREG DAHL, MINORITY STAFF
SENATE COMMERCE COMMITTEE

I'd like to place emphasis on our information needs from you. The key word is organization. I don't think we are getting as much use as we could from available Sea Grant publications because many times we don't know that they exist until after an issue has passed, until after they could have really been helpful. Some kind of a bibliography, or an index that tells us what's available, would be extremely helpful. A bibliography with a one- or two-sentence summary of what's in each report or document would be even better.

I want to underscore what all my friends have said about the function of time. Since I have come to work here--and I'm fairly new to the Hill--I have found that there is simply not enough time to handle all the issues that arise. In our office on the minority side there are two people to handle oceans affairs, not five. One thing that's important, and that I'd like to stress, is that when you deal with committees, remember that there are always two sides. There is a majority staff and a minority staff--and the minority likes to know what's going on too. When you send documents to us it would be very helpful if you sent more than one copy so that we get a look at them too.

I believe there is a good deal of support in the Congress for the kinds of things that the Sea Grant Program does. When I was a Sea Grant student, I wondered what sort of policies I could investigate, or what my professors might want to know about. We may not know what bills, or what specific parameters

of legislation are going to arise a year ahead of time, but we know pretty much what the issues are and would be happy to discuss what we see as upcoming issues in the oceans area. So if there are questions about the direction policy is taking, my office would be happy to respond to them.

QUESTION AND ANSWER PERIOD
SEA GRANT'S CONGRESSIONAL AUDIENCE

Q: Are you more interested in a bibliography or abstracts?

A: Greg and I are not going to quibble over whether it's a bibliography or abstracts. We need to have some idea of what is contained in the reports so we can find the information we need.

Q: A periodic list...?

A: What I'm saying is--and I want it to be constructive criticism--we know that there is an awful lot of good work being done in Sea Grant Programs all over the country because we get some of the material, but we don't get all of it. And we don't know, oftentimes, what's being done until after a bill has been passed or an issue resolved, at least as far as we're concerned.

Q: By subject matter...?

A: I don't even know if it's necessary to do it by subject matter. That depends on the gross number of projects you are reporting on. If it's a large number then it might be helpful to have some kind of gross categories. What we need is some way of gaining access to your stored information. We just don't know what's out there. NTIS, for example, sends us something with things broken up into such areas as ecology.

A: The other thing is turnaround time. We obviously can't stock in our offices all of the back reports done by Sea Grant on ocean issues. If we could have some means of access to what's being done, we could get something if we need it in a hurry.

A: I must say, we've had tremendous response from the agency. When I put in a call to a Sea Grant office, they respond really quickly, sometimes in a matter of hours.

A: In response to all this, it should be mentioned that there is a National Sea Grant Depository. Every document, report, newsletter, Marine Advisory Service bulletin that comes out of the Sea Grant Programs is archived in the Sea Grant Depository at the University of Rhode Island. They can do research for you if you want information on a specific policy, and get it to you. Only about ten or twelve copies of technical reports are printed, but on a general basis you can get them on loan.

Q: What's the lag between the time a report comes out and is available and the time that you can send it to us? Are we talking about months?

A: No. As soon as distribution of a publication is made, copies go directly to the archives at the University of Rhode Island. Also, the Depository does a monthly prospectus.

A: I think one of the quicker ways of picking up what's coming out of the program continually is through NTIS.

A: Sometimes we learn some of the most interesting things about Sea Grant from newspaper articles. Most Senators and Congressmen have a collection of newspaper

clippings from their home-state newspapers, and that's another way information can get into congressional offices. As Bill says, if we're working with aquaculture, getting the name of someone who is doing some important research may be just as important as getting that final report from some other research project.

A: We get NTIS publications, and circulate them throughout the office. There may be some extra costs involved in getting a list from you, but I think in the long run that might work better. As committees that have responsibility for oversight, for dealing with the long-term policy of these programs, we like to know specifically how the Sea Grant Program is doing. Our bosses want to know about Sea Grant. They will just ask an idle question: "What's Sea Grant up to?" You may know you've skimmed an NTIS publication, but you've done it more for subject matter than for where the publication came from. That's another reason it might be helpful to have some compilation--maybe an annual index would be sufficient--from Sea Grant. It's helpful to have, on one piece of paper, or on several attached, an idea of what's been happening in the program over any period of time. This would be particularly good next year, not just to see the sheer volume of studies, but for sampling for quality too.

A: I'd like to second that. The programs that seem to have the toughest time when the budget is being reviewed are the programs that you only hear about at budget time. If you hear about a program over and over again, they don't seem to be as quick with the scalpel when budgets are up for review.

Q: All of us put out newsletters. Do you read them?

A: We get some, and again we skim them. I was out for a week and I'm typical, I'm sure, of a committee staffer. I came back to three piles of paper on my desk, each one over four feet high. That's the kind of thing we have to deal with every day. We are involved in a whole lot of different issues, and we have blossomed into generalists who want to know everything that's going on. That is why I say we skim them. We look for things of current interest, but we can't possibly sit down and read them all. I may sit down and read something that is related to a current issue, but otherwise, it's very difficult to squeeze reading into the job we're dealing with.

A: If Senator Warner asks me what's happening at the Virginia Institute of Marine Studies, I better be able to find out in a hurry and tell him. So we need the influx of publications even if we do not go through them line by line.

A: The Sea Grant Program is not the only program we are dealing with. It's just very difficult, in the midst of all the reading, of drafting letters to other Senators, drafting legislation, correcting reports that are going on in one of the three arms of Congress involved in policy, dealing with problems that erupt in the legislation branch, to keep up with one particular program.

Q: Do you work for one particular member?

A: Our committee has members from all states, and the staff is organized in areas of expertise. We have people that handle oceans; we have people that handle railroad cars; we have people that handle airplanes; but it's not a "this person works for this Senator and someone else works for another Senator" situation. Their personal staffs handle

that.

A: We pretty much serve the entire committee on the majority side. The minority side serves the minority side. Of course, there are certain Senators who are more interested in ocean matters than others.

A: I work for Mr. Studds, since as chairman of the subcommittee he hired me, but I'm equally responsible to all of the other members of the subcommittee. If they want to ask me for some information, I should be able to respond.

A: If you keep up with Washington, you have to keep up with all of it. Their interest is quite national, in terms of working with the committee.

A: I got an inquiry not long ago from Senator Nancy Katzenbaum's office. She represents the state of Kansas. The inquiry was about seabed mining. We expect that our coastal-state Senators would be the most active on the committee on ocean systems. Sometimes it works that way and sometimes it doesn't.

Q: Sometimes scientists are concerned about getting word of their research out before they've actually gotten their results, and the SSIE has on line all of Sea Grant's ongoing projects. Do you use these resources to find out what Sea Grant is working on, to find out how useful it is? Is it a problem that the ongoing research hasn't reached the stage of completion yet?

A: I call up NOAA, Ned Ostenso's oval office, and say, "I need your help. Where do I find this stuff?" I don't know what they do to find it. He can be the one to say, "Well, this is ongoing research, and this is the state of it so far."

A: This information is passed along on the basis that we hear from people with certain concerns that certain kinds of research are going on. Basically though, you have got to be information synthesizers for us. We are dependent on you for information for policy analysis. Sea Grant is a special source, we know that we get a very fast response from the national office here, and from the Sea Grant Association. The whole system is reactive in terms of the kind of support we need when we're real frustrated because we don't have time to just sit down and find out what is actually occurring within Sea Grant, or even what extra special things you are doing lately. Whether we would take research that is not proven tends to be subjective. Since Sea Grant uses a peer review system, if someone is trying to go down a dark alley, usually it is nipped in the bud. On the other hand, we all have been around long enough to have had experience with scientific affairs with too little scientific background. If we smell a rat, we go to somebody and say, "What's the story on this?"

VIRGINIA CARTER, VICE PRESIDENT
COUNCIL FOR THE ADVANCEMENT AND SUPPORT OF EDUCATION

SPECIAL ADDRESS

I'm really glad to be here. I'm just back from running a conference for about 225 people, and as the people who are running this one know, this makes you a cross between a sort of chambermaid and Pearl Mesta. On the one hand you're emptying ashtrays, and on the other trying to be very gracious to all the people who've come.

I always feel a special kinship with editors and PR people because it seems to me that we're really different from other people--that's Different with a capital "D." And the way, it seems to me, that we're particularly different is that when a business executive or a college president makes a mistake in conversation or in a letter, it involves one other person or maybe four or five other people; but when we make a mistake in a news release or in a printed publication, we make it 7,000 or 25,000 times. It seems to me that this bond unites us: we've all been through that terrible experience of living with our editorial goofs.

In fact, I want to start out by telling you about a couple of my very worst goofs. I worked for a long time at a women's college in Roanoke, Virginia, named Hollins. Hollins was founded in 1832, and since that time it had had a dairy herd, because in the early days that was the only way for a rural campus to have fresh milk. Well, there's nothing more lasting than a college tradition. So year after year they kept having the dairy herd, right up to the late 1960s. At that point the business office did a study and found we were losing \$10,000 a year by having the herd

instead of buying the milk. So they decided to have a sale. And I felt, in my little college newsletter, that the alumni, who from the very beginning of time had seen these cows on the campus acres--in fact, my little girl's first word was neither Momma or Dada, but "cah" for cow--anyway, that we needed to tell the alumni about this. So we had some pictures made of these big holstein cows. I had a format I imagine you are all very familiar with--it's the two 8½ by 11 sheets put together. On the third page, very prominent when you opened it up, I had two column-and-a-half photographs of these big holstein cows. And I didn't really think, but the outline was set in nine point Garamond italic, which as you know is very light, explaining the sale and everything. Well, I didn't think about putting a rule under it or anything, and here came the three-column headline, "Faculty News from Around the Quadrangle." Well, that was bad enough, but hold your hats. The first item, honest and truly, was: "Dr. Alice L. Bull, Chairman of the Department of Biology..." The urge to die. You just never want to face anybody again.

The one thing that consoled me a little bit was that an even worse thing had happened at Hollins a few years before that, and that was when we got our chapter of Phi Beta Kappa, and the editor of the catalog had asked one of the members of the faculty committee what she should say the first year about Phi Beta Kappa. Now the man said, "Why don't you go look at the Vassar catalog, because they really have a good description." That year 17,000 copies of the Hollins catalog said, "Members of the Hollins Phi Beta Kappa chapter will be selected by the Vassar faculty."

I had a pretty bad one. In my second issue of CASE Currents--on the opening page we have a section called "Collage" that has news about CASE--I said, "Who to write for what at CASE." Well, of course

it should have been, "Whom to write for what at CASE." People wrote me about that. And then I decided to write a retraction, but I couldn't decide whether to say, "To who it may concern..." or, "Whom cares..."

Anyway, editing--even if you put the right word in the wrong place you're in trouble a lot. One of my first real paying journalism jobs--I'm not too sympathetic with students today who talk about work-study wages, because my first paying job was for the Richmond Times Dispatch and paid seventy-five cents an hour. At that point I was editing weddings, and writing feature stories for the women's page. One of my first stories was about a thrift shop at Fort Lee that sold used things. I started out with a series of questions, and one of them was, "Do you want to buy a pair of red children's shoes?" My journalism professor, who lived in Richmond and read the paper, wrote me saying, no, he didn't want to buy the shoes because because he didn't have a red child. Of course, I should have said, "...children's red shoes."

There is also the problem of typos. Also at the Times Dispatch I saw what was one of my favorite typos. I guess everybody has his or her own, but this is one which said, "The bride wore lace over satan..."

Well, I am really here to tell you a little bit about CASE, the Council for the Advancement and Support of Education. Although that's self-serving in some regards because I work there, I did spend twelve or fifteen years on three different campuses--Hollins, the University of Richmond and the University of Maryland--in jobs much like yours, although related to a general college information program. I myself am so sold on what CASE did for me that I feel with a very clear conscience I can tell you what it might do to help you. In fact, there are many things it might do whether or not you, yourself, become a member-representative.

CASE is a national association. It really goes

back to the 1920s, when two organizations were formed. One was the American College Public Relations Association, the other the American Alumni Council. The two merged in 1974 to form CASE. We now have programs and services for six different groups of college people: publications and periodicals people, information officers, alumni administrators, fund raisers, government relations people (that's a polite word for lobbyists), and what we call management, which is the management of these functions. Often vice presidents in the area of institutional management really spend more of their time managing and need help in that area, rather than in the specific area of fund raising or public information, for example.

I brought a brochure that describes CASE in rather general terms. In every case, I can say, the institutions that you represent are now members of CASE, so that you, through your public information, alumni, or development offices can have access to these services. You can attend any of our programs at the member rate, because we consider the institution a member, rather than the individual. But the one thing you may want to consider, after I get through my spiel, is whether you, yourself, want to become a member-representative, and get your own set of mailings from us.

CASE is organized in eight regions or districts, and each of your areas of the country will be having a district program. All of the district conferences, except the one in the Midwest held in December, are held in January, February, or March. They are very "how-to" oriented. They will have a complete program in publications, another one in information services...and you can pick and choose among them. The conference registration fees are usually pretty low, from \$35 to \$50 or \$60. Once a year we all get together for something called the Annual Assembly, which has programs in all of the six areas that I

mentioned to you.

Our monthly magazine, CASE Currents, which I've sent to all of you, is how-to oriented. In every issue we will have articles on public information and publications. February 1979, for example, has three related articles on dealing with crisis and controversy.

We also have conferences such as the ones described in the newsletter that I sent you. For example, there is a Creative Do-It-Yourself Design workshop. This is a great program if you have to do your own newsletter or tabloid design. It's going to be held in Chicago on June 2. There is an intermediate to advanced program in creative editing and writing in New Orleans right before our annual assembly. There will be a creative periodical design program in Washington on May 5th. These are intensive how-to programs to help you do a better job. Next fall we're having a news/information conference in Philadelphia. This will be very much like the conference here, but targeted right on media relations. It will cover how to get coverage without releases, how to get national coverage, how to work with television stations, and so on. You may want to send a person who works with you if you are already tooled up on these topics. In the fall of 1980 we will have a conference here in Washington on communicating science to the public. This will be for news people and editors of research publications. We hope to also involve alumni editors because we feel that alumni publications are controlled-circulation communications going to a well-educated, influential group of people.

CASE also has a number of how-to publications that are useful. I gave you a little folder called "Resources." It lists the different things we offer, including an extensive list of microfiche. We sometimes bring out special information in microfiche

when there isn't enough demand for a hard-copy publication. I did bring three or four samples of our publications, because sometimes it's easier to decide whether you want something after you've actually seen it. If you do special events--such as open houses, dedicating new marine science facilities, or whatever--you might want to take a look at our Special Events Survival Kit. This tells how to arrange budgets and how to set up schedules. It includes several checklists--the whole schmear on how to do special events.

I'm very sold on the fact that good publications and PR programs should be based on adequate research. We need to know what our publics are thinking; we need to know what the reaction of readers is to the publications we put out. So CASE published a little do-it-yourself guide, Attitude and Opinion Research: Why You Need It, and How You Do It. You might find it helpful.

From our conferences, we often try to develop handbooks so that people who can't come--who can't spend two or three hundred dollars for travel, lodging, and registration fees--can benefit from the material presented there. This handbook, Making Your News Service More Effective, came from a news bureau conference we had in Chapel Hill, North Carolina, a couple of years ago. We updated the handbook this year with new material. It's been very, very popular. It has a section on managing the news service; news service operation, including making the metropolitan media; big coverage from small shops; how to get coverage without releases; staging a news conference; developing a faculty news-contact directory; staging press conferences; how to target your news releases; writing news releases; feature writing; covering the arts; and science writing made easy. On into radio/TV: topics include basic broadcasting facts, writing broadcasting news, increasing radio coverage, working with television news, producing effective TV PSA's,

and on and on. So it's a really good, soup-to-nuts basic handbook in news bureau operation.

This year, as a kind of companion to it, we've brought out a handbook called Effective Publications for Colleges and Universities. It deals with the general things that one should take into consideration: editing, organizing, buying, printing, and so forth. Then it has special chapters on various types of publications: direct mail, newsletters, annual reports, and so on.

This summary should give you insight into the kinds of things CASE specializes in. We're very nitty-gritty, very how-to. We try our best to stay in touch with what our members want. One reason I'd like to see more of you get into CASE is that we're like every other association: We respond to membership pressure. There are several science people--Bill Kell at Minnesota; Paul Lowenberg at University of California San Diego; Earl Holland at Ohio State; Blanchard Hiatt of Michigan--who are pressuring us to do more programming in science. We're trying to be responsive. For example, we had a series of sessions on science communication at our Annual Assembly last July, and they were very well-attended. But the more science-oriented people we get into CASE, the more programming we are then going to be able to do.

I left for each of you a little yellow flyer about our critique service. That is especially useful if you do a newsletter, tabloid, or magazine and you want some outside, impartial advice on how your writing, photography, and graphics measure up. We select some of the very best people in publications work. They go off by themselves; they go over these publications in minute detail, fill out a long questionnaire, write comments on your publication. It's a very, very useful service.

We also have a Recognition Program in which we encourage colleges to enter their outstanding

publications, but also because we identify through that program the best in many, many categories--graphics, annual reports, newsletters, and so on. They then become models that can help you improve your work. When I was on college campuses, I would write for the winners, and I got really good examples to inspire me.

I hope you are absolutely convinced that CASE is for you! If you are, the way to join is through the membership representative on your campus. I included a list of those in the letter I sent you earlier. If you are not sure who that person is, tell me today or write to me, and I'll be glad to furnish that information. For each member-representative, the additional fee is \$50 a year.

Let me stop now and see if there is information about CASE that I haven't given you.

Question: Can you tell us about newsletter programs? We all put out newsletters.

If you'll open "Resources" and look on the first page, you'll see Creative Newsletter Graphics. This is a workbook in which we got twenty top designers to each design a newsletter format. These are formats in which you can put your own logo and then adopt as your own. If you had asked one designer to do a design just for you, believe me, that would cost about ten times fifty dollars. If you asked twenty designers to give you prototypes and then let you choose among them, that, in effect, would be what you get when you buy this book. You are then completely free to adapt or adopt these formats for your own use. Also, below that is listed Creative Tabloid Design, which actually contains twenty really good tabloids for you to look at--they are right there--plus a 48-page instructional book that tells why these tabloids are outstanding. It also discusses different approaches to grids, to use of photography, to use of typography and so on.

Index

Gary H. Adams
Librarian, User Services Branch
Library and Information Services Division
National Oceanic and Atmospheric Administration
6009 Executive Boulevard
Rockville, MD 20852

"All of our services, along with procedures for obtaining them and contact points, are described in Guide to NOAA's Computerized Information Retrieval Services, 1979, which is available free of charge from NOAA."

Rich Adams
Producer, Agronsky and Company
WDVM TV
4001 Brandywine Street, NW
Washington, DC 20016

"We could use you as a resource, as well as your using us as a contact. Anything to do with the (Chesapeake) Bay, or whom to call to get an expert to get data confirmed would help us. Our science reporter, Steve Gendel, welcomes contact."

Cheryl Alexander
Coordinator
Regional Coastal Information Centers
Environmental Data and Information Service
National Oceanic and Atmospheric Administration
6009 Executive Boulevard
Rockville, MD 20852

"We're hoping you will utilize the RCIC from your region and feel free to contact ones that aren't from your region." Contacts and telephone numbers are:

Candy Dunn
Northeast Coastal Information Center
Narragansett, RI
Phone: 401-792-6211

Nancy Huang
Great Lakes Coastal Information Center
Ann Arbor, MI
Phone: 313-668-2330

Bob Holton
Northwest Coastal Information Center
Corvallis, OR
Phone: 503-754-4172

Tom Austin
Director
Environmental Data and Information Service
National Oceanic and Atmospheric Administration
6009 Executive Boulevard
Rockville, MD 20852

EDIS is composed of five spenders with whom you can communicate to respond to user needs: The National Oceanographic Data Center, the National Climatic Center, the Center for Environmental and Atmospheric Assessment, the Environmental Science Information Center, the Regional Coastal Information Centers.

Bill Aylward
WRC-TV4
National Broadcasting Company, Inc.
4001 Nebraska Avenue, NW
Washington, DC 20016

"I don't want to discourage you and say that NBC or CBS or ABC isn't interested in your story. I'm merely saying to you that most of your effort should be directed to local television and radio and newspaper."

Susan Burks
Current Affairs Associate
Public Broadcasting System
475 L'Enfant Plaza
Washington, DC 20024

"I welcome you to contact me if you cannot make any headway with your own local (Public Broadcasting) stations."

Tom Burroughs
American Chemical Society
News Service
1155 Sixteenth Street, NW
Washington, DC 20036

Phone: 202-872-4446

"But do contact me. If you want summaries of some of the past shows we've done, to give you a feel for the kinds of topics we look at, or if you want a description of the program, call, write, send me letters, come knock at my door!"

Virginia Carter
Vice President
Council for Advancement and Support of Education
Suites 530/600, One Dupont Circle, NW
Washington, DC 20036

"I hope you are absolutely convinced that CASE is for you. If you are, the way to join is through the membership representative on your campus. If you are not sure who that person is, write to me, and I'll be glad to furnish that information."

Greg Dahl
Senate Commerce Committee
United States Senate
5202 Dirksen Senate Office Building
Washington, DC 20510

"If there are questions about the direction policy is taking, my office would be happy to respond to them."

Bernard Dennis
Office of Biological Services
U.S. Fish and Wildlife Service
Department of the Interior
Washington, DC 20240

"The Biological Services Program is a primary federal source of ecological information and technology."

Betty Edel
Manager
National Sea Grant Depository
Pell Library, Bay Campus
University of Rhode Island
Narragansett, RI 02882

"If you want a (microfiche) copy of the data base (of the National Sea Grant Depository), please contact me and I'll see that you get a copy. Another important thing I want you to remember is that we not only have the citations for these publications, but the publications themselves, and you can borrow them."

Ira Flatow
National Public Radio
2025 M Street, NW
Washington, DC 20036

"We are not trying to limit your ideas or limit the type of story you send us. Just send it to us. Send it to us with some concrete ideas behind it, and I think you'll have a good chance, because we're actually looking for ideas; we're not looking to send them away."

William Barry Furlong
1629 K Street, NW
Washington, DC

"Be a resource center for people like myself (a free-lance writer), just to help them get started when they can't even begin to ask the first question."

Jack Guinan
Public Affairs
National Oceanic and Atmospheric Administration
6009 Executive Boulevard
Rockville, MD 20852

"If you have a Sea Grant story that you think is of national interest, I recommend that you get in touch with Jim Elliott. Jim will contact either Jeff Baker or me and we'll take it from there, on a national basis."

Harry L. Heintzen
Deputy Chief, Africa Division
Voice of America
Washington, DC 20547

"We would welcome hearing from any Sea Grant communicators with story ideas along the lines set forth in my remarks."

Brigitte Huybrechts
Capital Systems Group, Inc.
6110 Executive Boulevard
Rockville, MD 20852

"Bowker has just published a data base guide called The Informational Marketplace 1978-79, which lists data bases and vendors and also information companies that will do searches for you. The other source is a directory that I have been working on--it's cheaper and not as comprehensive--called A Directory of On-Line Information Resources. It is available from Capital Systems."

Richard Kerr
Research News
Science Magazine
American Association for the Advancement of Science
1515 Massachusetts Avenue, NW
Washington, DC 20005

"In particular, I want to emphasize getting story ideas to me and then helping me through to the person. Giving me visual material can be very helpful too."

Warren E. Leary
Science Writer
The Associated Press
2021 K Street, NW
Washington, DC 20006

"You might want to ask if there is anyone in that bureau or correspondence with a special interest in science or technical matters and deal with that particular news person because of his special interest. You make personal contact..."

John Murdoch
Informatics Information Systems Company
6011 Executive Boulevard
Rockville, MD 20852

"The science is moving so fast that all you have to do is learn to use it. Take advantage of it as it occurs and get it out into the organization that you are with."

Richard D. Norling
Staff Director
Subcommittee on Oceanography
U.S. House of Representatives
Room 1334, Longworth House Office Building
Washington, DC 20515

"The thing I think would help us is abstracts--not even abstracts exactly...but something closer to one-liners. Perhaps other audiences could use this also, so this kind of index is what I would request from you."

John Price
Science and Technology Division
National Referral Center
The Library of Congress
Washington, DC 20540

"This mutually beneficial interchange is what the Center is striving for, and anyone engaged in an information activity is encouraged to list that activity and have a referral point with the Referral Center. In the area of physical sciences contact John Feulner; in the area of biological sciences contact Ed Green."

Ted Ryerson
Special Assistant to the Director
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161

"If you are interested in additional information, copies of the NTIS information services catalog are available from me or can be obtained by writing NTIS."

Jim Slade
Science Correspondent
WMAL Radio
4400 Jennifer Street, NW
Washington, DC

"The material I need is tape, augmented by written background. Don't assume I know every subject. I do not, fill me in. Surprise me."

Deborah Sterling
Staff Assistant
Senate Commerce Committee
United States Senate
5202 Dirksen Senate Office Building
Washington, DC 20510

"If there were a more organized way for us to be made aware of the reports that are coming out of the Sea Grant Program on a quarterly basis, or on a semiannual basis, I think my office in particular would find that very helpful."

John Strawhorn
Capital Systems, Inc.
6110 Executive Boulevard
Rockville, MD 20852

"I have selected three particular kinds of communications technology that might interest you, and that I think should interest you for their potential benefit to the kinds of things that you do."

Anna May Tensaw
On-Line Services
Smithsonian Science Information Exchange
1730 M Street, NW
Washington, DC 20036

"NOAA has a large order for search services with us, which may be available to you if you are specifically authorized individuals. If you want any information on that, you would have to call Millington Lockwood at the NOAA headquarters in Rockville, Maryland: 301-443-8964."

Michele Tetley
Office of OCS Program Coordination
United States Department of the Interior
Washington, DC 20240

"I simply want to run through a few of what I consider to be major contacts in town: Oceans Section, Office of Technology Assessment is run by Bob Niblock; the National Ocean Policy Study is run by Deb Sterling; Jeff Zinn is a good contact at the Natural Resource Policy Division of the Congressional Research Service; John Clark is an excellent contact at the Conservation Foundation. If you want their phone numbers, call me at 202-343-9314."

William Young
Legislative Assistant
Office of Senator Claiborne Pell
Senate Office Building
Washington, DC 20510

"If you want to get specific congressional interest for the Sea Grant Program, really a letter is best."

