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HOW WE SEE THE PROCESS AND PROBLEMS OF SCIENCE COMMUNICATION--
A RESEARCH SCIENTIST

Alex L. Shigo

IF IT AIN'T BROKE, DON'T FIX IT

Do we really have information indicating that we have a problem with science communication? Who has the information? Where did it come from? And, if we do have a problem, do we have information about the nature of the problem? Maybe we should start this discussion by considering the old, wise saying of the Appalachian mountain folk, "If it ain't broke, don't fix it!"

We must be careful not to run quickly with the assumption that something is wrong with our science communication system and that it must be corrected. Indeed, it may be that the existing science communication system is operating at peak efficiency now. And, if it is, we should not try to "fix it."

WOULD YOU BUY A BETTER MOUSETRAP?

We hear constantly that "more research is needed," "more information is needed," or "we need more information and research action now." Our habit for asking for more of everything is second only to that for telling everybody how busy we are. We believe that more of everything will always be better. We believe that being busy indicates productivity.

Because a person asks for something does not necessarily mean that they want it, or will use it if you give it to them. The old proverb about building a better mousetrap and having the world beat a path to your door is extremely naive, based on the half-truth that the world indeed wants a better mousetrap. We must remember that understanding mice is science, while building mousetraps is technology. People bothered by mice do want, and probably will use a better mousetrap.

Do the lay people really want to know more about everything that is happening in science? Do they really care? Are they interested only in technology? How much do you know about this?

SEXUAL INTERCOURSE

Now that I have your attention, you may be surprised to learn that an archaic meaning of the word communication was sexual intercourse (see Webster's Third New International Dictionary, page 460). In another dictionary, communication is defined as intercourse by words, letters, or messages; interchange of thoughts and opinions. The key word is interchange. Communication is an interchange of messages.

Webster's Third New International Dictionary goes on to define communications as an ART that deals with expressing and exchanging ideas effectively in speech and writing or through graphics or dramatic arts. Art is the key word. Art is doing. Art is skill, Science is knowing. Science is systematized knowledge.

Science communication is the art or skill of effectively exchanging messages gained from a systematized search for truth. It is an art and a science. An effective science communicator must be a rare art/science hybrid. Most scientists are poor artists.

DO WE NEED MORE BOB HOPES, OR BENNY GOODMAN'S?

Bob Hope and Benny Goodman are examples of master communicators. Their timing and delivery are almost perfect. Applause is the feedback they use to build their presentations. They are unique.

It may be that those who can communicate very well in science have surfaced and are doing the job now. Do we need more Bob Hopes and Benny Goodmans? Do we need more science communicators?

Consider for a moment the number of people needed to effectively support communicators such as Hope and Goodman. Without support it would be impossible for them to communicate or reach people. I wonder if our science communication act is not similar. It does take a great amount of support--unseen, and often not recognized by lay people--to put one person in the limelight.

WHO'S ON FIRST?

But, to be fair, we should look at both sides of the support subject. It may be that we have too many support people skilled in the mechanics or profession of communication, but not enough scientists who can or will work with them. Do we have answers in search of questions?

Enough of this! My only point is to make certain we have our subject well thought out or defined before we go round and round on discussions and jump to conclusions. Remember Abbott and Costello and their discussions on who's on first?

LET'S GET ORGANIZED

Science is a method of acquiring and recording knowledge. Science is systematized knowledge. Science depends on systematic procedures to understand and to record order. Order is what repeats or can be repeated. Order is truth. Truth can be beautiful. Truth can be frightening.

Let us look at science communications in a systematic way, and maybe some order will become obvious.

There are four possible combinations to consider:

1. A good science/art hybrid is at work. All is well. Leave alone.
2. A good science/poor art hybrid is trying to do the job. Few problems. Minor adjustments needed. Work with them.
3. A good science/very poor art hybrid. Many problems. Major adjustments needed.
4. Poor science/no art. Everything is bad. Abandon, and try again.

The strong temptation is to start by saying that numbers one and four are extremes and not worth discussing here. But, we have already considered number one. And, what about number four? There is a time when more patches are not the answer, and a clean sweep is the best way to go. But before we do anything, we must define the areas of science communication that need our attention. A problem well defined is on the way to being solved.

I'm sure that as the science communication system is studied, some parts will clearly need minor adjustments, and some will need major adjustments. So much depends on the science communicator and his or her mix of science and the art of communication.

SCIENCE/ART HYBRIDS

Some people have a combination of abilities and feelings, and some people do not. Before the professional support person in communications sets out to work with a scientist, the type of science/art hybrid the scientist is must be known. But, before we get into this too deeply, it might be wise to first consider some background material.

SOCIETY OF SCIENTISTS

Scientists are considered strange by some people. Most people picture a scientist as a person in a white coat working in a laboratory that has something blue bubbling in the background. It must be blue! The scientist is a mysterious person. It is difficult to break through this image. Some people do not feel comfortable around a scientist. And of course, some scientists do not feel comfortable around lay people.

Scientists belong to a society that has achieved its unique status over a very long period. The society has its own language, which can be cryptic and full of jargon at times. The science society has its own system of rewards--recognition, and its own system of punishment--isolation. The science society has a long history of conflict with the church as an organized power dealing with dogma. Evolution is still a problem. Many lay people still do not trust scientists because the lay people think that scientists believe that man came from monkeys. Some lay people could never trust a scientist because they think that scientists do not believe in God. The science society has never been able to make a strong impact on politics.

The society must change, but it is doubtful that it will change much. If it does, then we no longer have science.

PEER PRESSURE

Most scientists still do not approve of those in the group who begin to reach out to lay people in the outside world. The purists do not believe this is proper. It is against the society rules. I know because I have been told that "a good researcher just doesn't do such things." So, therefore I must be a poor researcher. Any science communicator must be a poor researcher by this rule. Regardless of what is said, this feeling is the predominant one within the society of scientists. Many scientists give lip service to communication, but they really want nothing to do with it. Why? I believe the answer is very obvious. They are afraid that someone will get close enough to begin noticing that they are not producing much. Science communication brings many people close to

you and your work. It could be good news or very bad news. Indeed, the society has its share of internal problems.

IF IT FEELS GOOD, DO IT!

This is a common statement made by our younger generation--and by some "oldies." But why do some scientists dare to communicate with lay people when their security exists within the society? When they reach beyond these limits they take a high risk. But some scientists, like mountain climbers, apparently enjoy the thrill or adventure associated with risk and challenge. Or could it be that the excitement of moving information out to other people just makes them feel good--and that is why they do it. Then again, some scientists are noting the handwriting on the wall that makes it clear that public support and accountability are not to be taken lightly. It may mean survival!

ENTHUSIASM

It is very difficult to measure excitement and enthusiasm. Some people have it for their work and life. Some people do not. Some scientists want everybody to know what they are doing. They find excitement in their life and their work. Their work is their life. They are curious. In a sense, some scientists have become addicted to this feeling of excitement, and they are willing to risk going beyond the limit of the peer group. People who have never been excited or enthused about their work will never understand this. The sad part of this is that too many times the not-so-enthusiastic person is the one who blocks the enthusiastic person because the not-so-enthusiastic person has the supervisory power. You may not agree, but think about it.

A BALANCING ACT

To go beyond the peer group, a scientist must perform a delicate balancing act. A strong research program must be maintained, while at the same time research results must be interpreted for different audiences.

The scientist who communicates effectively must maintain his or her standing within the society. This becomes increasingly difficult when pressure to generalize comes to the scientist from lay groups. The effective science communicator must understand art forms, and people.

RISKS

If a scientist begins to be recognized by user groups and lay people, it is not too long before he or she may no longer be considered a part of the scientific group. The punishment from peers is that they no longer listen to the scientist. They no longer accept his or her publications, and no longer invite the scientist to speak. The punishment is centered in isolation. The scientist who has "gone astray" is slowly cut off from the group.

REWARDS

First the dark side. For all of the work in science communications there is often little reward to look forward to, especially from the agency or group that the scientists work for. In fact, it almost appears that the struggle for survival only gets worse for the scientists. So, maybe the purists in the society are right.

It does take time to do the basic and applied research. The trick is to do the communicating while not letting your research slide. When the time you spend talking is more than the time you spend researching, you are in trouble. Back to the balancing act.

The review board for scientists' promotion look dimly on that "popular stuff." (I know, I have a good grapevine.) Often the supervisor who is saying "get out and communicate" is the same one who will be critical of your doing just that when he or she is behind closed doors. We really suffer from mixed signals. We need to get our act together.

There is a bright side. Recognition is the highest type of reward. To see your research reach the real world or user groups, and to be used is the highest reward. Indeed, it is the most beautiful reward. Of course, promotion and proper support of your program are also rewards. These things are coming, but slowly.

THE MEDIA

The media are always after something that has quick public appeal. Something that will sell. Now. Some media people never seem to understand how a scientific message can be distorted by the misuse of a single word. I am sure you know this. It is dangerous. Yet, it is often very difficult for the scientist to check final copy. But, the problem may rest with the scientist who is not giving the message clearly to the reporter.

DEVELOPING MESSAGES

Most scientists desperately need to learn how to develop messages that resist misinterpretation. Here is where scientists need the help of professional communications people. We need you. What can you do for us? To do the job for everybody is impossible, but we can work to reduce the errors, I am sure.

I think that seminars or workshops on this subject would be very beneficial. But, before this can be done, we need a good set of guidelines.

LIMITATION

In the end, we cannot save the world. Or do all things for all people. But, we may begin to save the scientific society that exists primarily because of public support. I do feel that more and more scientists are beginning to realize this.

SEVERAL SYSTEMS

There are some scientists who can perform the balancing act very well--basic research, applied research, and communication. To do this effectively they require a great amount of strong, well-organized support from other people. Again it is not so different from the comedian or the musician who requires many people to make all the necessary arrangements for the act. The effective communicators--musician, comedian, scientist--know how to take charge themselves, and to work with support people. What we must learn to do is to identify scientists who can perform in such a way, and help them. Support them. Too many times the system blocks rather than encourages such people. How can we change this?

The second part of the system deals with scientists who have sound messages from research, but either they cannot perform the balancing act or they do not have the necessary abilities to communicate with wide audiences. This is no sin! What must be done here is to help these people move their research results and messages out to lay people and user groups.

The important point is to realize that we need several systems, several ways to get the job done.

When we have a person who is moving rapidly and effectively with the balancing act, that person should be supported throughout the act. This is difficult. Too many times when support does come, it comes to start a program, but it is very difficult to get support to continue a program. For those who need help to continue to get research messages out, special kinds of support are needed.

One way to do this effectively is to have the scientist get closely associated with the key professional communications people, and hope that the combined effort will pay off. If it does, the scientist must not forget to recognize the help of the professional.

People sell products. People sell ideas. People sell research messages. But when you come right down to it, effective communication depends on people interacting with people. Anonymity is deadly. Yes, the books, posters, slide-tapes, and video tapes all help, but there is no substitute for eyeball-to-eyeball contact. In some ways, all the materials only serve to introduce the communication. Before any message is moved to a user group, the group will demand a meeting with the person. This is the point when the message or product is "sold" or not.

Some people can sell and some cannot. It is not so different from music. Two musicians can play the exact same notes, but one will leave you cold, while the other makes you feel good all over. Why? Some people just know how to reach other people. I do not think this is a learned ability. But, as already stated, we can learn to recognize those who can do it. Maybe one answer is to train supervisors in recognizing such traits early on in people new to the organization.

MADISON AVENUE

I was recently told that our agency is not in the fine arts business. It is amazing, but true, that many people who say they are in favor of communication in science know very little or nothing about the basics of communication. This is a major problem. As we move to wider audiences, we must use many different ways to get their attention. Many agencies and people do not understand attention-getting methods and devices. Agreed, we are not in the fine arts business, but we do need fine art as one way to get the attention of a wide audience. We cannot continue to use small black-and-white photographs crowded on cheap white paper, and expect to get our message out to a wide audience. Or posters that look like third-grade art projects. We also need many other devices to get audience attention. We in science are in stiff competition with many professionals from other fields who are trying to sell their products and messages. If we are going to do it, we had better do it properly. How can we make this point clear to our supervisors? It is very difficult.

DESIRE FOR SCIENTIFIC INFORMATION

Many lay people are truly interested in scientific information. This is one reason why science fiction books have sold so well in the last decade. Lay people really want to know about the world we live in and about outer space. They want to know about diseases. They want to know about the ocean. About the unseen micro world that is all around us. If we, the scientists, do not give them the best information available, they will get a distortion or fiction from any number of writers who know little or nothing about the true story. The really sad part of this is that many times the true story from science is much more exciting than fiction. But we must be careful here not to overplay the story or message. If we overplay, we are no better off than the fiction writer. Too often the fabric we see is woven closely with threads of truth and fiction. Scientists need help from professionals in developing exciting true messages. Teamwork is the name of the game.

RESPONSIBILITIES OF COMMUNICATING

If you know the cure for the common cold but cannot tell somebody about it, the information is of no value. Having the information is not enough. Having it published in some technical journal is not enough. Indeed, it is the responsibility of the scientist to move the message out to the people who want it and need it. The scientist must start the ball rolling. This is so important, that I repeat: it is the scientist's responsibility to start the ball rolling.

PUBLIC RESPONSE TO SCIENTIFIC COMMUNICATION

We do run a risk by getting information out. To get it to the lay person, it is often necessary to speak in generalities. The limitations of a subject never seem to get out to the public. When you generalize in science you will ALWAYS get into trouble. So a paradox begins to develop.

If you want to communicate to the lay person, you must generalize, and when you generalize you will surely be "hit" by your peers because they will know the limitations of the message. You do become a larger target as you communicate more. And now your peers say, "See, we told you he was a poor researcher; here is the proof." But, like turtles, we only make progress when we stick out our necks. We can only hope that we can keep moving the messages out so that even with the problems, we are still getting some information across. Too many scientists are afraid of being hit. But, a person is measured by how fast he can recover. An Indian proverb states that to ride well is not enough. The person must also learn to fall.

As accountability for public funds becomes more of an issue, the risk of a hit comes not only from peers, but from the public.

EMOTIONS AND DISCUSSIONS

We live in a world where many decisions are made on the basis of emotion rather than on fact. Here again the finger can be pointed at the lack of communication or unclear messages that come from science. Yet even when the scientist does come up with the information, sometimes the public may not accept it. A perfect example of this is smoking. Science

has spent a great amount of time and money on verifying the dangers of smoking. Yet many people ignore them. It does make one wonder.

TAXPAYERS AND PRESSURE

The taxpayer is getting closer and closer to many tax-supported people. More tax groups want answers from the political leaders about how their money is being spent. Accountability is the name of the game. Yes, scientists can hide deeper in the society, but sooner or later the taxpayer will seek them out and ask, "What have you done with my money recently?" If we are not prepared to answer this question, the entire scientific society may suffer because of the lack of interest of a few. Maybe it is time to make some changes within the scientific society. I think so.

A LOOK ACROSS THE FENCE

The scientist is not the only one with some problems about communications. I think some media communicators also have problems. Just as many scientists do not take the time to understand media communicators, the media does not take the time to understand the scientists and their work. The media communicators may be too set in the way they think the job should be done. Maybe the scientist also has some good ideas on ways to get the message out. We are too quick to start with the premise that here is a group of scientists that have all the problems, and here is a group of media communicators who have all the answers. In some cases the scientist may know more about moving a message than the professional communicator. My only point here is that we should not be too quick to point the finger only at the scientists. We need to find better ways to work together.

POINTS THAT NEED DISCUSSION

First, consider the four categories given earlier. We must identify:

1. Scientists who are doing the communication job well now, and continue to support them.
2. Scientists who need a little help with communication, and work with them.
3. Scientists who need a great amount of help, and work for them.
4. Scientists who will resist communication, and leave them alone.

Identification of the problem is extremely important.

In the end we must understand that people communicate. Communication problems are people problems. All the perfect messages, perfect rules, regulation, support, and know-how will not work if you do not have the right people involved.

We must be careful not to discuss this subject to death. There does come a time when talk must stop and action must begin. That time is now.