Author's Commentary on "A pHish Tale"

Commentary On
A pHish Tale

The main purpose of this case is to discuss some of the dilemmas that many engineers and scientists may face when dealing with important scientific issues that directly affect the public interest. In this case, a large number of lakes in a region have been found to contain high acidity (low pH). Tom and Richard both believe that the pH changes are caused by pollution that originated at the regional power plants and traveled through the air to be deposited on the lakes. Their main reason for believing this explanation is that when such a large area is affected, the mechanism for the pollution is most likely air transport. However, no real scientific evidence has been gathered to link the pH changes to the electric plants, and Tom and Richard are launching a five-year study explicitly to determine the cause of the pollution.

In the case of some scientific or engineering studies, there would be no dilemma; Tom and Richard could perform the study and determine the cause of the pollution, and others could decide how best to deal with the problem when they were finished. But in this case, severe and irreversible damage may be done to the lakes, the fish and the communities that rely on the fish before their study has been completed.

Tom feels that he has a responsibility to try and keep the lakes from being destroyed, and he would like to take an active role in removing the cause of the problem. He has close ties to the local environmental community, and he wants to help them keep the lakes safe from harm.

Richard, the older and more experienced scientist, does not want to get involved with the environmental groups. He believes that as scientists, they should not take sides. The position of scientists and engineers in American society is somewhat precarious. They have a reputation for being objective, relying on facts and not being influenced by any particular political agenda. However, as more and more scientists have begun to take an active position in some issues, the public's attitude toward science has been changing. Richard is also concerned about his and Tom's standing in the scientific community if they make such a bold claim and discover

that they are wrong after further research.

Part 1

The dilemma rests with Tom. He has a few choices. He could agree with Richard and not take any active position on the pollution, or he could get involved with the environmental activists right away. Another option would be to wait until some preliminary results came from the study and hope that no further damage was done to the lakes by that time. Then he could use the research results to confirm or repudiate his theory and be more confident in his action (and somewhat more objective). Another option would be to mention the problem to his environmental friends but not take an active role himself.

His decision is a difficult one, and I believe that his choice must be rooted in the details of the situation. Tom must weigh the possible effects of continuing unabated pollution on the fish and lakeside communities against the short- and long-term effects of his action on his own career and on his discipline. He should also consider the effect that modifying or closing the power plants would have on the utilities and those who work for them. However, he does not want to turn his back on his friends. If he believes that the lakes will soon be irreparably damaged, he should act now; otherwise, he should probably wait until further information is gathered.

Part 2

Tom has weighed the information and has decided that the potential immediate harm to the environment and the communities that rely on it is more important than other concerns. He has allied himself with his friends in the local environmental group, but his friends want him to make statements that condemn the utilities and are much stronger than the evidence and his beliefs support. They claim that such statements are needed because the public does not understand the intricacies of scientific research and would not be motivated to act otherwise.

Here, Tom's dilemma is even more difficult. Most of the nonscientific public, including many individuals holding political office, do not have a good understanding of how science is done and the large uncertainties that it often involves. Thus, his environmentalist friends have a significant point when they say

that they must make their message simple in order to be understood and to galvanize support into action.

However, in many scientific circles, and probably in Tom's mind, brushing over the uncertainties to that extent is a lot like lying. Personal and scientific integrity would make it difficult to take such strong a stance on this issue. But, if you step back from it, that's really the only thing that has changed. Tom still believes that the lakes face imminent danger if nothing is done. Is keeping his personal integrity intact worth the destruction of the lakes?

Of course, the salvation of the lakes does not entirely rest with Tom. Whether he is involved or not may not make any difference, although the support of a scientist closely involved with the study will probably strengthen the case of the environmental group. Would making the statements really be tantamount to lying? Should he adamantly refuse to make the statements but still be involved with the groups' actions?

Another option would be to set up some community discussions where he could explain the details of the lakes' increased acidity without saying definitively that the pollution is coming from the power plants. Would this option satisfy his need to stop the pollution without harming his integrity? If such scientific discussions were commonplace in the community, would that make Tom's job and decision easier?

Regardless of Tom's decision, it must be a very personal one, informed by the facts and the likely effects of his actions. It is hoped that a discussion of this case will help better prepare scientists and engineers to face this type of decision. Perhaps it will even encourage them to take steps to educate the public on scientific matters before a problem like this one occurs.