The Care and Nurturing of Biological Engineering

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Biological engineering is so delicate right now. I'm talking about the broad, science-based biological engineering for which IBE was founded. That concept of biological engineering has yet to be accepted by the rest of the world. Sometimes, it seems, it even gets lost within IBE.

AIChE has been dealing with a crisis of mammoth proportions over the last year. Membership was down, and finances were overwhelming. It was possible that the society would close its doors; it was that serious. Grasping for solutions, chemical engineering and chemical engineering departments have seriously begun to look at their relationships with biology (see http:/bio.aiche/org). Many have decided that Biological Engineering is the panacea that they need. So, look for many departments to change their names to Chemical and Biological Engineering over the next few years. Note when this happens, however, that there will be little, if any, corresponding curriculum changes. Sounds like agricultural engineering and ASAE a dozen years ago, doesn't it?

ASAE is in the midst of a campaign to change its name to include Biological Engineering. Whether that is appropriate for ASAE is up to its members, but we can at least ask if ASAE is talking about the same broad and fundamental Biological Engineering that is the purpose of IBE.

Do all IBE members agree on the Biological Engineering of its founders? That is hard to answer, because, looking at the pronouncement and programs of IBE, it is difficult to discern what we stand for. Several years ago, President Norm Scott worked hard to get us to agree on a definition of Biological Engineering. It's not readily apparent that we continue to agree with it.

Then, let's look at programs from our last few meetings. We have tried very hard to include a breadth of possible applications. But, in trying to think outside the box, have we not replaced the big box with a lot of little boxes? Where is the unity in our programs?

When IBE was founded, there was a suggestion that specialty groups be allowed to form within IBE. That suggestion was rejected because we could not afford to fragment the unity of purpose of IBE.

I have written before about the tendency of IBE to look outside its ranks for experts in Biological Engineering. When it comes to keynote speakers, we look for those with established reputations in other fields to come and tell us about our own field. There must be someone in IBE who could qualify as an expert in Biological Engineering. And, if having this someone

speak to us about Biological Engineering is monotonous to us old-timers, perhaps the message is needed for those who weren't around at the founding of IBE.

I strongly believe that IBE should be the bastion for broad, fundamental, Biological Engineering. We need to decide among ourselves what that really means: what are the technical areas covered and what methods are to characterize the entire field. If we are to foster different specialized applications areas, we need to focus on the common themes among them. That is, a requirement for each paper given to and each article published by, IBE should be a consideration of how this technical information relates to the entire broad and fundamental field of Biological Engineering.

Then, with that commonality of purpose, we need to sell this concept to others. We need to show chemical engineering that they have a legitimate part of Biological Engineering, but only a part. We need to remind ASAE that the Biological Engineering talked about there still appears to be applications-based. We need to take advantage of liaisons with AIMBE, ABET, and other groups to spread the news that what they need is what we have spent so much time developing. IBE may never develop into a huge society convolving all engineers interested in biology with all biologists interested in engineering, but at least it could serve an extremely important purpose. That purpose is a vision of what Biological Engineering is and can be. We must keep that vision alive and not take it for granted.