

Alpha Chi Sigma Banquet
Madison, Wisconsin
December 11, 2002

Introduction by John Wright

I am delighted to introduce Professor Bassam Shakhshiri as the invited speaker for tonight. Bassam and I were assistant professors together back in the early 70's. Bassam was born in Lebanon and I believe he came to the United States in 1957. And he has really been one of THE leading advocates to our science in this country. He started off working on demonstrations and I think particularly in encouraging the rest of the faculty to take teaching as a real responsibility in the department. The department has always had a tradition of fine teaching and having the best researchers and the people that would teach our freshmen the elementary chemistry. I was trying to find out where that tradition started. I have a feeling that it started with the founder Mattie? But I don't know that for sure. But Bassam has certainly played a significant role in leading our chemistry department in the excellence of teaching that characterizes it.

I took a trip to Korea this last fall and as I talked to different faculty members in their offices there, I often looked over their shoulder at the book shelves and many times saw these four famous books that Bassam has created on chemical demonstrations. They really are the bible of chemical demonstrations and you find them all over the world. Bassam is really well know for developing these demonstrations and also for his advocacy of science. He is the founder of the Institute for Chemical Education, one of the real powers for advancing chemical education in the country. He went on to be come the Director of the Educational Directorate at the National Science Foundation. He brought science education to the forefront of the National Science Foundation. He returned back to Madison and continues to be very active. His most significant contributions were recognized recently by his award of the William T. Evjue Distinguished Chair for the Wisconsin Idea. It is a very prestigious chair that was given by the University to our best faculty members and Bassam was the person that was chosen for that. So I am really delighted to introduce you to Bassam tonight. He is going to speak to you about the future of Alpha Chi Sigma and the chemical sciences. Bassam.

Thank you very much John, for your very kind introduction. It is really an honor for me to be asked to speak at the centennial banquet of Alpha Chi Sigma. Many of you will be asked, I am sure, to be speakers at different banquets but I have the singular honor of being the centennial banquet speaker. That will not happen again in my lifetime and I suspect not in your lifetime. To every brother of our fraternity, I want to say, congratulations and happy anniversary and happy centennial. To everyone in the audience tonight, I to say the say the same thing that King Henry VIII said to each one of his wives, "I will not keep you long".

UW - Madison is just over 150 years old. Alpha Chi Sigma is exactly 100 years old. I have been a faculty member here for just over 30 years. That is about 20 percent of the life of the University. About one third of the life of Alpha Chi Sigma and about one half of my life. Now you know approximately how old I am.

I have been asked to speak about the future of Alpha Chi Sigma and the future of Chemistry. I must repeat the same thing that the others before me have said, but I want to put it a little bit more strongly. Only fools predict the future. Of course, in our society we have various collections of fools. We have weather forecasters, we have economists.

Chemistry has been so successful, so successful it is at high risk of losing its identity. You name me a field of human endeavor that is not affected by chemistry. We just concluded a chemical century. Yes, with all kinds of advances and all kinds of pollution. Just imagine, a little over one hundred years ago, the electron was discovered. You know what year it was discovered, right? 1899. Was it 1897? I stand corrected. Just checking to see if Frank was awake. Yet, we have enjoyed, before that discovery, electricity. Michael Faraday's famous experiments and other scientist, who knew a lot about technology greatly benefitted from alchemy and what eventually became chemistry. So, I would like to ask you a question, and this is not a rhetorical question, I would like you to tell me what is the one thing that differentiates our society now from all previous societies? Societies of one hundred years ago, five hundred years ago, a thousand years ago? What is the one thing that you can think of that differentiates our society now from all previous societies? As I said this is not a rhetorical question, so I want some response. "Rate of change" "Instant communication" "Electronics" "Democracy" "Quality

of Life” There are other responses that people could come up with, I will give you what my singular response is. “Science” and of course chemistry is the central science. Some people say it is a central science. I say it is THE central science. In the old days technology drove what happened in our society. Our ancestors built huge structures, pyramids, canals, the coliseum, big cities, invented the printing press without much knowledge about the science of the printing press. Electricity, I have already mentioned that. And what is happening now, especially in the second half of the immediate past century is that science has taken over and drives technology. So now we can build pyramids at the atomic level. Advances in microchip technology which is based on scientific research that was done enable us to do many things that could not be imagined by the founders of Alpha Chi Sigma or anyone else who lived in that era. It was only a year or so after the founding of Alpha Chi Sigma that the Wright brothers did their first flight. Every time I get on a big airplane, whether I am going overseas, or across the continent, I just close my eyes and try to think about their thoughts one hundred years ago. Could they have imagined that we can fly and go to far away places and do it safely. Could they have imagined that advances in technology based on advances in the chemical sciences will enable us not only to enjoy quick travel, instant communications, improvement in the quality of life? I don’t know if they could have imagined that they may have, but I don’t know. So it is very difficult for any of us to have imagined what could happen one hundred years from now. One thing for sure, I believe, strongly, that Alpha Chi Sigma helps promote enlightenment and that is a very important responsibility that members of Alpha Chi Sigma have. It is really an essential responsibility that I trust will continue. I don’t know what will happen in chemistry in the next 25 years. Whether because of our great success it will disappear as a discipline. And if that were to happen maybe the words professional chemistry society or professional chemistry fraternity will also disappear. I don’t know. There has been great coupling between chemistry and the chemistry fraternity in the past one hundred years. What happens to chemistry in the future will greatly influence what happens to the fraternity.

I’d like to take a moment now to say something to members of Alpha chapter. I have had the privilege of being on this campus now, this is my 33rd year. I became a member of Alpha Chi Sigma at the University of Illinois. Because a member of Alpha Chi Sigma from Alpha Chapter who was a teach assistant with me at Urbana invited me to become a member. So I think you

have a big responsibility to continue inviting people from chemistry and from outside of chemistry to come to the fraternity. People from the faculty, people from the graduate student population and of course, undergraduates. And as a memento of my being the centennial banquet speaker I'd like to present to the Alpha Chapter, a book. The book is Uncle Tungsten. How many have read this book, or are willing to admit to reading this book? Uncle Tungsten, Memories of a Chemical Boyhood, by Oliver Sacks. A very outstanding writer. So the MA, who is the MA this year? Come up here Nick. I would like to present this to you and I will tell you that from now on every pledge who comes to see me to sign their plaque, will not only get the usual questions that I ask but they will get questions about this book. So this should become required reading for the pledges. But, I hope that the active members will also take a look at it. I will tell you that it is available from Amazon.com for just under \$12.00. It is a very good book, the paper back edition that is, this one is the hard cover.

It would be difficult for me to stand before a group and not do a demonstration. All of these balloons are just sitting out there, and waiting for someone to walk over a pop them. Well, I did a lot of balloon popping this weekend when we did the 33rd annual of "Once Upon A Christmas Cheering in the Lab of Shakhashiri" program. So I am not going to do that but I am going to try another experiment. This experiment is a simple experiment where I take a match, some of you may have seen me do this before, and I hold this match up like this, this experiment demonstrates the difference between physics and chemistry. Hold this match like this and I let it go, it falls down to the table top, bounces a few times and comes to rest, that's physics. I take the same match and I strike it, that's chemistry. You see, chemistry is no match to physics. We get from this experiment, of course light energy, we get heat energy and I should also do something before something bad happens. Advances in the physical sciences now are so great that not only can we describe accurately, one hundred percent accurately, what will happen when I let go of the match, what will happen when I strike the match, we can even predict those with full accuracy. There is something that none of you can predict. None of you can predict whether or not I will let go of this match. Or when I will let go of this match. I hope that in the next one hundred years, research that is beginning to take place by neuro scientists, based on the understanding of how the chemistry of the brain works, perhaps, there will be a reasonable attempt to understand and explain how this very important concept that we hold so dearly in the

country, the concept of free will actually works. So we are all entitled to dream about such advances and that is part of my dream that we will be able to understand that. I doubt that it will happen in my lifetime but maybe it will happen in the next one hundred years.

Now when we strike the match, we of course see, what do you see? Light. You know that this match has in it, this flame, you can look at the candle flame that are in front of you. You see the same flame that our ancestors observed thousands of years ago - have in them, a substance that was not discovered by chemists until just about 15 to 17 years ago. You know what that substance is, allotrope carbon. Bucky balls. Imagine our ancestors, knowing about graphite, knowing about diamonds, yet there is this common allotrope right in front of their own eyes, that they did not know about. How did we get to know about it? We got to know about it because of great intellectual prowess. Of highly skilled and motivated and dedicated individuals who pursued questions that they were curious about. So, it is easy for me and anyone else to predict that curiosity will still remain in the next one hundred years but what the curiosity will lead to is difficult to talk about. And try to predict in any way what the curiosity will lead to is difficult. Maybe there are substances in the soot of a flame and maybe they aren't.

I believe strongly that as professional chemists we have an awesome responsibility not only to advance our discipline but to promote the public appreciation of what chemists do. And as was mentioned earlier, many people by that toxic chemicals is one word. And this is something that we need to try to work even harder than we have been able to do so far in order to communicate to the public at large not only true chemical dependency as also was mentioned before, but to celebrate the safe handling of chemicals. The benefits that accrue from using chemicals and to learn about the potential hazards of all chemicals. This is the responsibility I think all of us, individually, as professionals, have and we should be very very careful in implementing whatever ideas and thoughts might bubble up from a group of dedicated professionals such as members of Alpha Chi Sigma and others who are involved in communicating chemistry, not only in the classroom, but especially outside the classroom. There is one area that faces us now that I believe chemists have been a bit shy about dealing with. In fact some people say, why should I be concerned about it? And this is, the rapidly emerging plague, Aids. This is something that I think chemists can truly, through work in the life sciences, through social work, can really make

a difference, a big significant difference in terms of not only stopping the spread of Aids, especially in the other countries, but also in this country, but also helping to develop advanced cures for such a terrible ailment and disease that we have. I think it is really important to think about ways in which we can be creative and inventive to deal with this difficult issue, which is not only scientific in nature but also social in nature. That is why I say chemists can participate in stronger ways in dealing with that.

I believe that the gap is widening very rapidly between those of us in what I call the science rich sector of society and those who are in the science poor sector of society. We enjoy great knowledge of science, great knowledge of chemistry, but the rest of the population is deprived of that and I believe that this very rapid increase in this gap between those in the know and those who are ignorant about chemistry and about science is detrimental not only to our society in the next ten, twenty- five to fifty years but the next one hundred years. And so what we need to do as individuals is to not only contribute to the advancement of science but we need to contribute to closing that gap so that people in society will become science literate as distinguished from scientifically literate. Those of us who are practitioners of science are scientifically literate and those who are not practitioners of science should have a sense of appreciation of what science is without known intricate details of chemistry, physics, biology, or what have you. Just having a sense of appreciation of what this discipline is that we call chemistry.

I would like to give an analogy to try to make this point even clearer that I have made is so far. This analogy comes from sports. Just as we have professional hockey players, or basketball players, football players, and so on, we also have sports fans. Without those sports fans the entire professional sports enterprise would be nothing. And that is not an exaggeration. And that is what we need. We need chemists, we need scientists and we need science fans. We want those fans to be sitting in the stands, not as passive spectators but we want them to be following what the players are doing.

Now in some settings this analogy does not quite sit very well with some people. So let me offer another analogy to make this very important point we really are engaged in, what our

twin mission is. The twin mission to get more people to go into science, to belong to Alpha Chi Sigma, but also try to have those who opt not to do that to become appreciative of science. We need good orchestra players and we need audiences that appreciate what the performers are doing. That is the twin mission that we are embarked on. I go a concert as I am sure many of you do, and I know very little about the music theory, but I enjoy, if the performance is good, I enjoy what is going on. And that is something that I think we should really strive to do immediately in all chapters of Alpha Chi Sigma and of course do it with proper guidance and set expectations at the national level so that this effort will be successful.

I haven't said much about predictions, but I wanted to impress on everyone the importance of taking personal responsibility not only for ones own behavior and ones own activities but take personal responsibility for what the group that you belong to does. Take responsibility for what the Alpha chapter does in the next couple of years that you are going to be here as members, so that you can not only point with pride at what has been done, but you can look back 10-15 years and say to yourself and say, I helped start...whatever it is that you helped start, or I helped maintain...whatever it is that you are maintaining. View this as a relay race where you are handed a baton when you become initiated in Alpha Chi Sigma and you don't want to drop the baton along the way you may want to shape it a little bit and polish it to make sure that it is in proper condition before you hand it to the next group to come after you.

I'd like to close by making a very short presentation. This presentation is actually another demonstration. This is something that was not around when Alpha Chi Sigma was founded. -----researchers spend a lot of time, effort and money to develop this light stick which is a source of joy to a lot of people who don't understand how it works but they like it. This is an example of how Alpha Chi Sigma can be providing enlightening experiences for its members and so Sherry I'd like you to have this as a memento of coming to Madison and I want to thank those who have helped make this banquet a success, I know lots of people have worked hard on it. And I want to thank you again for your kind attention for inviting me to be the speaker tonight. Thank you very much.