As the Presidents See It ...

A Fledgling Year

King-Ning Tu, 1981 MRS President

When I think back to the early 80s and my involvement with MRS, I feel a special sense of pride in the Society, particularly toward the people with whom I worked at that time. In 1981, Clyde Northrup was vice president, Kathy Taylor was treasurer, and Harry Leamy and Woody White were program co-chairs. Other capable and dedicated people also contributed their talents to MRS; for example, Elton Kaufmann chaired the Corporate Participation Committee. I single out the above people because they all later became MRS presidents! In 1981, the future leadership of MRS was already in place. And it was from this group of people that I enjoyed the best support—they made things happen.

1981 was one of MRS's early formative years. The Society was still very young, but showed all the signs of potential rapid growth. Behind that aspect of growth, however, there was no formal organization, no headquarters, and no logo. Ernest Hawk of Penn State University served as a part-time secretary, and Aram Tarpinian of the Army Materials and Mechanics Research Center (Watertown, Massachusetts) was our part-time financial officer. Aram's main job was taking care of the logistics of the Fall Meeting in Boston. This effort was a more-or-less one-man show.

As president, I was in charge of almost everything else and, from time to time, was required to be an entrepreneur. MRS was my "business." I could produce as much as I wanted, but with no budget! I recall that in mid-1981 we were in the red, and had to wait for the Fall Meeting registration fees to come in to balance our books. On the other hand, our 1981 registration attendance broke the 1,000 mark, due to the outstanding effort of the program and symposium chairs.

Several things that occurred in 1981 deserve special mention. MRS proceedings were launched with the signing of a contract with Elsevier North Holland. I clearly remember my meeting in New York City with Charles Ellis, president of Elsevier North Holland—he was more enthusiastic about the deal than I was. Although our program co-chairs were confident about the high quality of the proceedings and were sure that they would sell well, I was a bit wary about committing MRS to buy a minimum number of copies from Elsevier. There was no reserved fund for it. It is now history that our contract with Elsevier was for three years only and that the MRS Proceedings program has been successful, the number of volumes having quickly reached three digits.

In 1981, MRS also initiated the Corporate Sponsors (now Corporate Affiliates) group. This group was formed to ensure a close technical liaison with leading industrial research and development centers and to broaden support for expanding MRS activities. Rudie Voorhoeve and Elton Kaufmann led the Corporate Sponsors drive, with the emphatic support of W.O. Baker of AT&T Bell Laboratories. Baker sent me a long letter to assist our effort in soliciting members. Since that time, Corporate Affiliates have been a major provider of funding support and an invaluable source of personnel for MRS voluntary service. The group now numbers about 300.

1981 was a great year for "firsts"—it was so easy at that time to get things started. I recall Kathy Taylor promoting her Graduate Student Awards program so it would become a regular event at the Meeting; Rustum Roy proposing his rather different lunchtime symposia that cut across subject matter covered by the topical symposia; and Alfred Yue establishing the first MRS university chapter at UCLA.

In retrospect, the dramatic growth of MRS during 1981 was not accidental. MRS at that time was a small and nimble organization that deftly straddled the rising wave of electronic materials. The MRS Meeting acquired a progressive image and its interdisciplinary symposia attracted a broad spectrum of attendees, including significant numbers of overseas scientists and professionals. But MRS was also experiencing "growing pains." The Society needed to be run in a more businesslike manner and needed the support of a regular staff. By the end of my term, the undercurrents of our transition to a fully organized and staffed society was being felt.

I am fortunate to have been closely associated with MRS during its fledgling years and to have worked with so many truly outstanding people. It has been one of my most rewarding experiences. Today I am still excited about organizing an MRS symposium and attending the MRS Meetings.

K.N. Tu, formerly a research staff member at the IBM T.J. Watson Research Center, recently accepted a position as full professor in the Department of Materials Science and Engineering at the University of California–Los Angeles.

Early MRS Success Stimulated by Integrated Circuit Industry

J.M. Poate, 1980 MRS President

One positive aspect of this series of articles is that it demonstrates that we MRS veterans are still alive and kicking. This attests either to the perennial youthfulness of MRS and its officers or to the fact that wiser, older heads have never bothered to take over the reins of the Society—I prefer the first explanation.

The comments of my fellow former presidents make good reading for MRS devotees, but I will take a different tack and try not to spend too long reminiscing. Rather, I would like to address some scientific and technological issues which have shaped the Society. I wish to discuss two related issues: Why has the Society been so phenomenally successful during its first 20 years? and, What does the future hold?

I believe that the success of MRS has hinged on two issues. First, the enormous growth of the Si integrated circuit industry in the 1970s and 1980s provided an unprecedented stimulus for the study of electronic materials at the submicron and atomic levels. But why did MRS—and not one of the more established societies such as the American Physical Society or the Electrochemical Society—capture this field? The answer probably lies in the simple fact that the older and large societies could not respond quickly

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enough to the demands of this rapidly moving but focused community. Secondly, the specific area of electronic materials that provided the catalyst for the Society's growth was laser annealing. As I describe my early involvement with the Society, I will highlight the role that laser annealing played.

The 1976 MRS Meeting, which was held at the Hyatt Regency in Cambridge, Massachusetts, was my first introduction to MRS. That small meeting was a lot of fun and gave me some idea of the scientific spirit of such people as Harry Gatos, Ken Jackson, and Rustum Roy, who started the Society. There was not much on electronic materials at that meeting. The laser annealing bonanza started the following year (1977) at a July meeting of U.S.-U.S.S.R. scientists on ion implantation, where we learned from our Russian colleagues and from Nuccio Foti and Emanuele Rimini that pulsed laser irradiation could be used to anneal ion implantation damage in Si. This meeting immediately caused many laboratories in the United States to start investigating the phenomenon.

In the fall of that year, Ken Jackson, who was planning the 1978 MRS Meeting, asked me what the hot topics were for symposia—I told him that laser annealing looked like a winner. Ken was enthusiastic, so in 1978 I organized the Laser-Solid Interaction and Laser Processing Symposium with Harry Leamy at the Sheraton Hotel. Poised, as it was, at the frontiers of electronic materials research, this meeting was a remarkable success and attracted a sizable portion of the U.S. and international community. With the help of Steve Ferris, we published the proceedings in the American Institute of Physics conference series.

I asked Paul Peercy and Woody White to run the 1979 symposium, which was moved from the H to the A slot—where its offspring are still assigned today. The scientists who have been involved with Symposium A have been the backbone of the Society; indeed, our current president, Tom Picraux, was on the 1979 program committee. Laser annealing has been important not only for its role in making the Society the premium forum for electronic materials research, but also for its many scientific and technological ramifications. New regimes of Si crystal growth, phase transitions, and dopant segregation were discovered. I suspect one of the biggest impacts laser annealing had was that some of us were introduced to the beautiful subject of crystal growth, a subject conspicuously absent from the physics departments where many of us were trained. This field led to the development of rapid thermal processing, which is now used in Si integrated circuit fabrication; moreover, there is a good chance that pulsed laser irradiation will be used commercially to recrystallize amorphous Si for flat panel displays.

During my tenure as president (1980), we held the Fall Meeting in the elegant Copley Plaza Hotel. Clyde Northrup and King Tu were the program chairs that year. The Society was remarkably free-wheeling—an enduring characteristic that still makes MRS unique—and we simply went ahead and did things without hindrance from committees. We could not have existed, however, without the logistical support of Ernie Hawk and Aram Tarpinian.

The specific area of electronic materials that provided the catalyst for the Society's growth was laser annealing.

An inspection of the old meeting program shows how firmly we had established our position in electronic materials with Symposia A, B, and C. Symposium A, run by Jim Gibbons, Vern Hess, and Tom Sigmon, was a great success. Jim Van Vechten kept the laser annealing pot boiling by claiming that the phenomena we observed were not due to simple melting but, rather, could be explained by an electron plasma. He was wrong, but did a great job of goading us on. Symposium B, Defects in Semiconductors, was run by Jagdish Narayan and Teh Tan, and Symposium C, Semiconductor Interfaces, by Wei-Kan Chu and Jim Mayer.

Several other things stick in my mind about that meeting. Conyers Herring gave a remarkable and original Von Hippel address where he analyzed what was right (and wrong) with scientific publishing. I also have some interesting memories of the Copley Plaza. The bell hop who showed me to the complimentary MRS suite was plainly disappointed with my looks as he discussed the lavish lifestyles of the previous occupants—I seem to remember Frank Sinatra being one of them.

Views on MRS and materials research from former MRS presidents.

What next for MRS? My belief is that the Society's evolution has always been intimately linked with the semiconductor industry. In addition, the rapid growth of MRS occurred at a time when funds were freely available for research. All that has changed. The electronics industry has matured and is dominated by manufacturing issues, but more importantly, the whole structure of our research enterprise has changed dramatically in the past 10 years. One underlying cause of the change is the poor state of the U.S. economy. Moreover, since the end of World War II, the U.S. physical and materials research enterprise has been based on a troika of universities, industrial laboratories, and national laboratories. Industrial laboratories are now on the endangered list and the national laboratories, with the collapse of the U.S.S.R., are searching for new identities. All this might look pretty grim, but this confluence of events provides some marvelous opportunities and challenges for MRS and its members.

As materials, processing, and manufacturing issues become crucial for economic survival, materials scientists will move to the center of the scientific stage. Over the past 20 years, the members of MRS have demonstrated a real commitment to these applied, interdisciplinary activities and, through them, have gained much credibility. MRS is demonstrating that it can meet some of these challenges; the Spring Meeting, for example, is becoming a focus for semiconductor processing issues.

Big challenges confront us. Life was easy when we lived in an expanding universe. It is now contracting and we must make hard choices in terms of directions and use of resources. We must exert a leadership role not only in determining scientific and technological directions, but also in confronting the immediate issues affecting us all. One of the most painful of these immediate issues is the shrinking number of jobs and the existence, simultaneously, of an oversupply of PhD students. The solution to one of these problems is obvious, and we should start acting like a professional society to effect change. The challenges are many, but I believe MRS can and will respond to them. The next 20 years are going to be critical ones for MRS.

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