

Foreword

It is fitting for the proceedings of this symposium on radiation effects, deformation, and phase transformations to give dedication to the memory of some of our departed colleagues who have contributed to these fields of inquiry, in particular to T.A. Read, R.H. Kernohan, R.P. Tucker, and S.M. Ohr. Professor Read was my major professor at Columbia University and a friendly source of inspiration and knowledge for his graduate students. He was the driving force behind the development of the matrix-algebraic WLR theory for the calculation of the crystallographic features of the formation of martensite. Around 1954, Professor Read went to the University of Illinois to become chairman of the Department of Metallurgy. He died in 1966 at the age of 53.

R.H. Kernohan was a long-term physicist at ORNL, having worked there from 1951 to 1979. He died in 2006 at the age of 93. At ORNL, he became exceedingly adept in experimental work at research reactors and was one of first experimenters to make in situ measurements of electrical resistivity during irradiation. He played a key role in research on the effect of neutron irradiation on copper-base alloys.

Richard Tucker was my first graduate research student. He started with me in 1965, when, by the good graces of a Ford Foundation program, some researchers at ORNL were given the opportunity to serve as part-time professors at the University of Tennessee in Knoxville. The TEM photomicrograph that adorns the cover of these proceedings is an example of Richard's careful and competent work at the electron microscope. The photomicrograph illustrates for neutron-irradiated niobium the fascinating and important phenomenon of dislocation channeling, a phenomenon that may be central to the decrease in uniform elongation observed in irradiated metals. Richard's promising career in metallurgical research was cut short by sickness not very many years after he received his doctorate. This was a tragic loss to the metallurgical research community and to Richard's family and friends.

Mike Ohr came to ORNL in 1963 after doing a doctorate at Columbia University with Dan Beshers. As the reference to the cover figure indicates, Mike participated in the research on dislocation channeling in niobium. In addition, Mike made primary contributions to the work on radiation hardening, radiation-anneal hardening, stress relaxation, and dislocation dynamics in niobium and iron. Fracture in solids was also a major interest of Mike's, and he continued this work when he left ORNL in 1985 to head the Department of Material Sciences and Engineering at SUNY-Stonybrook. We lost a good friend and colleague when Mike died in 1988 at the age of 55.

Professors, particularly those in research, seem to measure their careers in terms of their students. My most recent student, very much among the living, is Wei Lu, who is now working on the SNS project at ORNL, and his paper is included in these proceedings. Between Richard Tucker (then) and Wei Lu (now), there were about 20 other research students. From then to now, they are a marvelous group, different in many ways, yet uniform in the privilege it has been to work with them and to regard them as my friends and fellow researchers. Moreover, the same is true for all the other friends and colleagues with whom I have shared this wonderful experience of doing research on radiation effects, deformation, and phase transformations or more generally on the nature of materials and radiation.

It was a special pleasure to meet with old and new investigators in the three fields in this symposium and to see the vigorous efforts that continue to gain better understandings. I also want to express my special thanks to the organizers and to the participants.

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