

## Preface



**Prof. Monroe Wechsler**

The Wechsler Symposium on Radiation Effects, Deformation and Phase Transformations in Metals and Ceramics was organized in honor of Prof. Monroe S. Wechsler for his outstanding research contributions to understanding of radiation effects, deformation, and phase transformations in metals and alloys. During the TMS annual meeting in March, 2006 in San Antonio, Texas, a total of six sessions were held: (1) Irradiation effects, (2) irradiation microstructure/microchemistry, (3) dislocations/obstacles/channeling, (4) irradiation pressure vessel, (5) irradiation facilities and techniques, and (6) shape memory alloys; some of the papers presented at the conference are published in this special issue of the Journal of Nuclear Materials.

Prof. Monroe Wechsler is currently an adjunct professor in the Department of Nuclear Engineering at North Carolina State University, Raleigh, NC, USA and lives in Chapel Hill. Monroe was born in 1923 and grew up in the Bronx, New York. He obtained bachelor's degree in physics from the City College of New York in 1944 following which he served in the US Army Signal Corps from 1944 to 1947. In late 1945 he was sent to Germany to serve in the occupation, and in 1947 he returned to the States, left active service and joined the Reserves. After working as an engineer at the US Naval Air Magnetics Laboratory in Lakehurst, NJ for a year, he enrolled in Columbia University where he obtained the Master's degree in Physics in 1950. That year he married Lorraine who received master's degrees from Columbia University in Journalism and English literature. Monroe received the doctoral degree in Physics from Columbia University in 1953, and his dissertation on the formation of martensite was citation classic of the 1950s.

In 1954, he joined the Solid State Division of the Oak Ridge National Laboratory and worked there until 1969 when he joined Iowa State University as a Professor and Chairman of the Department of Materials Science and Engineering (known at that time as Department of Metallurgy). During his association with ORNL, he was an adjunct professor in the Department of Chemical and Metallurgical Engineering at the University of Tennessee. While in Oak Ridge, he left the Reserves with the rank of Captain. The Wechslers enjoyed their 16-year stay in Oak Ridge so immensely that they say that 'Oak Ridge still feels like home'. In fact, Prof. Wechsler has been a visiting scientist in the Metals and Ceramics Division at ORNL until

recently, where he worked on particle transport calculations for the Spallation Neutron Source (SNS). Two of their three children were born in Oak Ridge.

At Iowa State, both Prof. Wechsler and his wife taught and retired (he in 1993 and she in 1990) as full professors emeriti. While Prof. Wechsler was in MSE (1970–1993) and jointly in NE (1976–1993) at Iowa State, Lorraine was in Journalism. During those years, they spent 17 summers and two sabbaticals in Los Alamos, where Lorraine worked for the lab newspaper and for the lab's information service and Monroe did radiation damage research at the LAMPF 800-MeV proton accelerator. In addition, Prof. Wechsler was a visiting professor at UC-Berkeley in 1977 and at EPFL in Lausanne, Switzerland in 1985. Prof. Wechsler joined NCStU as an adjunct professor in the Nuclear Engineering department in 1993 and has been actively guiding students and carrying out research. He guided more than 22 graduate students five of whom were at NCSU. Prof. Wechsler was a guest scientist at Max-Planck-Institute für Metallforschung, Stuttgart, Germany in 1977 and at Battelle Memorial Institute in Geneva, Switzerland in 1966–1967. He taught many courses in Materials Science as well as in Nuclear Materials. He is a Fellow of the American Physical Society, American Society for Metals and Iowa Academy of Science, and he received Outstanding Achievement Award from MSTD of ANS and Distinguished Service Award from Nuclear Materials Committee of ASM and TMS. He was a recipient of two patents in 1992 and 1994.

Prof. Wechsler's contributions span a wide range of subject areas in materials science as well as nuclear engineering. His work in the 1950s on martensite and phase transformations is well recognized in the materials community which later on led to his contributions to shape memory alloys and low-temperature shape-memory heat engines. His research on fundamental aspects of deformation was recognized early on. He made seminal contributions to radiation effects on materials and soon after joining ORNL he started working on radiation damage and effects in Cu alloys, C (graphite), Fe, Nb, V alloys, nuclear pressure vessel steels, etc. His work on radiation effects in bcc metals and radiation-anneal hardening received international recognition. He was one of the first to study annealing kinetics in irradiated pressure vessel steels. Early on he recognized the synergistic effects of radiation induced defects and interstitial impurities that find significance in the radiation embrittlement and dynamic strain aging of ferritic steels. In mid-1980s he got interested in spallation neutrons while being a guest scientist at Los Alamos. He continued this work even after retirement from Iowa State and in collaboration with students at NC State and scientists at ORNL in support of the liquid metal target design at the Spallation Neutron Source (SNS) in Oak Ridge. While working on nuclear materials he was always interested in shape memory alloys.

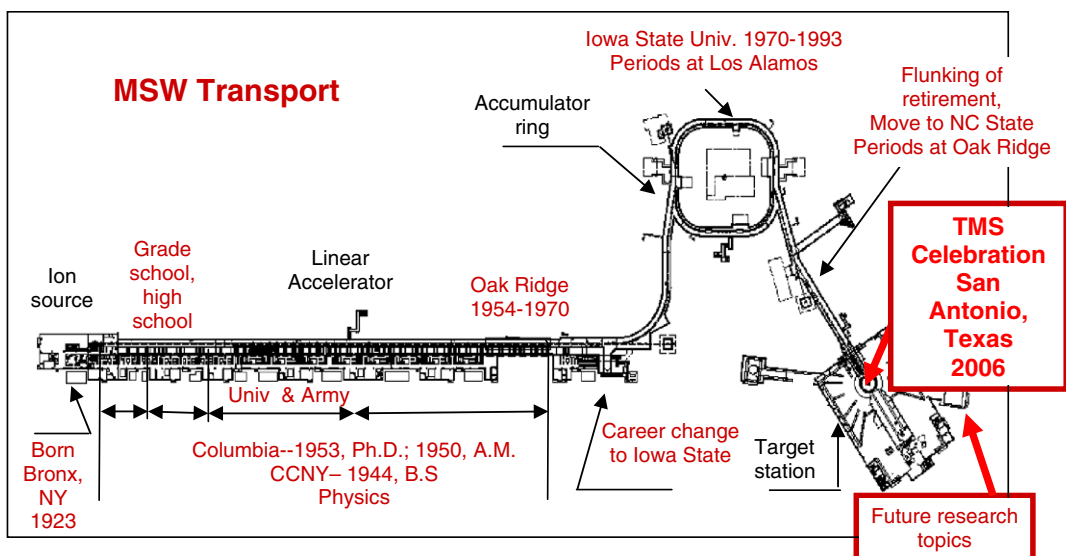


Fig. 1. MSW transport.

His varied associations and his everlasting zeal for research were pictorially (see Fig. 1) described by one of the symposium organizers, Dr. Lou Mansur using the schematic of the SNS below.

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