1977. Mrs. Dampier, a widow, has supported three children through university, and now enjoys tennis, hiking and community activities such as AAUW and technical societies. She is also very active in church work, having served as deacon, and presently serves on the Presbyterian Task Force for Hunger.

1. AMORY LOVINS, "Scale, Centralization, and Electrification in Energy Systems," *Proc. Future Strategy for Energy Development Conf.*, Oak Ridge, Tennessee (Oct. 1976).

Ion Plantation in Semiconductors

Authors	James W. Mayer, Lennart Eriksson, and John A. Davies
Publisher	Academic Press (1970)
Pages	280
Reviewer	James N. Fordemwalt

Ion Implantation in Semiconductors is a comprehensive overview of the field up to its publication date of 1970. There has been a considerable amount of progress since that date. Much that was laboratory experiment in 1970 is now in large volume production. However, the theory and fundamentals discussed in this book are as valid today as they were at the time of publication.

The book begins with a general discussion of ion implantation and very briefly goes into each of the subjects that are dealt with in detail in the subsequent chapters. This section, although very brief, is well written and gives the reader a good perspective of the overall subject.

The second chapter covers range and range distributions of implanted atoms. The subject is covered quite thoroughly, with both theoretical consideration and experimental methods and results discussed in detail. The following three chapters cover lattice disorder and radiation damage, lattice location of the implanted atoms, and the use of hall effect and sheet resistivity measurements in silicon to interpret the effects of the implanted ions. Again, the theory and experimental techniques are discussed in detail.

The last chapter, on device considerations and applications, was written by R. W. Bowers of the Semiconductor Division of Hughes Research Laboratory at Newport Beach, California. This group pioneered in ion implantation in semiconductors, but it had a genius for going down blind alleys. While the widest commercial integrated circuit application of ion implantation has been the setting of MOS threshold voltage, this is not even mentioned. The Hughes approach of using ion implantation to produce a self-aligned gate MOS structure, which has never found wide commercial use, is discussed in detail. Several other uses of ion implantation in semiconductor devices, i.e., varactor diodes, IMPATT diodes, and nuclear particle detectors, are discussed very briefly. This is the weakest chapter of the book.

Ion Implantation in Semiconductors, except for the last chapter, is a well-written and thorough review of the subject as of 1970. It is well referenced and reasonably complete. It is a recommended addition to the library of anyone interested in the subject.

James N. Fordemwalt (MS, analytical chemistry, University of Arizona, 1956; PhD, physical chemistry, State University of Iowa, 1960) directed research and development on silicon gate and ion implantation in MOS devices for American Micro-Systems in Santa Clara, California, until 1971. Dr. Fordemwalt is presently director of the Solid State Engineering Laboratory at the University of Arizona.