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The Unfinished Agenda

Author	Amory Lovins
Publisher	Thomas Y. Crowell Co.
Pages	184
Price	$3.95
Reviewer	Gerry Dampier

Small, Beautiful World, Can We Help You?

Once there were many small groups of people, each group concerning itself with solving some urgent problem. "This part of the system is out of balance; let's fix it this way," one group said. Another group heard the plan. "If you fix the system *that* way," the second group said, "it will come unglued over here." The first group responded, "If we don't solve this problem soon, the system will be permanently beyond repair. Can we fix our part of the system so that your part won't break?" The two groups conferred. "Maybe," they agreed, "if we rearranged things yonder, both this problem and that problem will be resolved." So they tried it. It's too soon to judge the results, but something very unexpected happened: The groups decided to get together with other small problem-solving groups to see if they could agree on some ways to solve *all* the problems each group had tried to solve separately. They found ways to think about the whole system.

Some people in the small groups call themselves "environmentalists." There are many other small groups; if others wish, they can join the game. Any number can play. It will be easier now; the environmentalists have "got their act together." In *The Unfinished Agenda*, the problems the small groups are trying to solve are defined and solutions are suggested. This is a very significant book. It will help if members of other groups read it and respond to it.

Those who consider themselves to be environmentalists have devoted decades of thoughtful concern to finding ways to implement survival on spaceship earth. Among those ardent earth-enthusiasts, some are wilderness hikers. It's a real challenge to plan a rough hike: One determines the destination first, then thinks backwards. Which path? How many days' supply of food and water to take? Can fellow hikers tolerate the rigors of this route or should an alternate trail be scouted? Many lawyers, engineers, and even nuclear scientists enjoy wilderness hikes. Given this way of thinking, one can appreciate "spaceship" logic. *The Unfinished Agenda* might be approached from this perspective.

Prior to the 1976 election, The Rockefeller Brothers Fund initiated "The Environmental Agenda Project" to find out what the so-called environmentalists in fact want. What are they *for*? (It is no secret what many are against.) Pooling their expertise, many visible, responsible spokespeople for the environmental movement helped to identify what the environmentalists perceive to be the crucial issues to be faced in the decade ahead and to recommend explicit actions that might be taken as steps along the path to survival. Short papers were submitted to be evaluated by many. A tentative draft was drawn up by Gerald Barney (PhD, physics), and a conference was held in New York. A task force, one representative from each of the 12 environmental organizations having the largest membership, aided Barney in rewriting his first draft into the published version of *The Unfinished Agenda*. It is a consensus document. The order in which the issues are addressed is significant. Remember, these are responsible survival strategists, from varied backgrounds and disciplines. They found they could agree on which issue is fundamental. It is first.

The third, and contingent, issue, is "Energy." The entire section on that topic was written by Amory Lovins. Well known to nuclear scientists as an "anti-nuke," Lovins deserves special attention: Barney confirms that Lovins indeed expresses the consensus opinion of the Task Force. Lovins is articulate; he proposes "orderly phasing-out over about ten years of existing (nuclear) facilities" (p. 66) and "repeal of the Price Anderson Act" (p. 66), leading to "termination of the fast breeder program and all other steps leading toward a plutonium economy" (p. 67). He has shown elsewhere how he believes that this could be done without major disruption to the fabric of society.[1]

It is the expressed hope of the Rockefeller Brothers Fund staff that *The Unfinished Agenda* will initiate dialog on the issues addressed. This volume has won wide readership in Washington and among those in favor of a non-nuclear future. A spokesman for President Carter has commented that the book will serve as a benchmark against which this Administration will be judged.

This book will not be enjoyable reading, but it is certainly important reading. Meaningful dialog is possible only when each party to the dialog has given thoughtful consideration to what the other party is saying. Viewing the book from the perspective of the wilderness hiker, consider Lovins' model of two divergent paths. Each path is an energy strategy: One strategy implements the "hard" technologies—including coal and nuclear; the other implements "soft" technologies, which rely on such renewable energy resources as solar energy. Lovins believes we have recently passed the fork in the path. He believes "soft" technologies are along the trail to survival. Backpackers know that divergent paths may lead to the same destination. Perhaps one is the high road, the other the low road—different hikes for different tykes. Can reconciliation be effected through meaningful dialog? What kind of future can we *all* accept?

Gerry Dampier (BA, physics, Vasser, 1951; Master's, natural science, Arizona State University, 1972) is currently the educational services coordinator with the Arizona Nuclear Power Project and is secretary of the Arizona Section of the American Nuclear Society. She has logged 55 miles backpacking in wilderness areas during the first six months of

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.