cies of liverworts, lycopods, psilopsids, and ferns live epiphytic lives.

Though the conservation issue is implicit in Doyle's presentation, this reviewer would have welcomed a section of the book given to it. As surviving species in habitats that supply marginal living conditions for plants, these bryophytes and vascular cryptogams, almost entirely rhizomatous, spread rapidly as ground covers. Anyone who has observed *Equisetum arvense*, the common horsetail, cover acres in a very few years, or *Lycopodium complanatum* and *L. obscurum*, two common lycopsids of New England, spread across bordering forest floors after a road-building episode through the middle of the forested area cannot help being impressed by the capacity of these plants to extend themselves by vegetative reproduction. A slightly more open portion of an American tropical jungle with an extensive pure stand of *Selaginella hematodes*, with its "gun-barrel bluish" foliage, and the lush fern growth of both temperate and tropical forested areas ought also to move the most practical lumberman who would like to clean-cut a forest. One can hope that the author still contemplates at least an article such as he could write on "The Higher Cryptogams in Conservation."

However the reviewer may react in his wishes for this book, he is convinced that the author wrote it primarily for the morphogeneticist. In sharing with others his conviction of the merits of higher cryptogams for any aspect of developmental or evolutionary research Doyle has done his colleagues a commendable service.

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Appraisal of a Field

Materials Science and Engineering in the United States. Proceedings of the National Colloquy on the Field of Materials, University Park, Pa., April 1969. RUSTUM ROY, Ed. Pennsylvania State University Press, University Park, 1970. xvi, 180 pp., illus. $9.50.

The title of this work is somewhat misleading. The book is not a technical survey of materials science and engineering, but consists of a collection of conference speeches and opinions on the subject of how materials research should be organized. Also discussed is the amount of materials research and its financing in the United States during recent years, with some data on the situations in Britain and France. Most of the speakers are distinguished materials investigators whose thoughts on these topics are worth reading. One imagines that by nature of the subject matter the book will be of interest mainly to those who are concerned with research administration, rather than to the beginning student of materials.

One of the useful features of the book is an appraisal, by several contributors, of the effectiveness of the Interdisciplinary Research Laboratories (IDL's) set up in various universities during the past decade by the Advanced Research Projects Agency. The U.S. government was motivated to establish these laboratories by its advanced materials needs in defense and space projects, by the success of interdisciplinary research in many industrial laboratories, and, not insignificantly, on the advice of William O. Baker of the Bell Telephone Laboratories. It is interesting, therefore, that Baker's colleague Bruce Hannay, after praising the IDL's for their increased output of Ph.D.'s, admits that they have not been an unqualified success. He cites, for example, a lack of collaboration between senior IDL scientists from different disciplines and a distinct lack of research coupling with industry. This section will be of interest to anyone concerned with the interplay between basic research and technology.

The future prospects of materials research are also discussed by several contributors, in relation to declining federal R & D support. There is fairly general agreement that materials work will have to be made more relevant to new national priorities, that is, to finding solutions to social and urban problems. In a particularly clear analysis of this subject, Harvey Brooks discerns one of the serious difficulties to be a communication gap between materials scientists and those active in attacking these problems. He is pessimistic about closing this gap in the near future, and suggests that basic research may be entering a prolonged period of disfavor because of its inability to provide ready solutions to social problems. He notes, philosophically, that this has occurred many times in the past, and quotes some devastating 18th-century comments by Sprat before the Royal Society pleading for support for basic research as well as applied research.

Since many major industrial laboratories are active contributors to and users of materials research, it is perhaps unfortunate that more industrial representatives were not chosen as main speakers at the conference. Hints of some nonconformist opinions on the part of such people appear in some of the brief reports of discussions. It is also a pity, as regards the homogeneity of the text, that all contributors were not asked to address themselves to the main conference theme. In a few cases much space is devoted to comment on specific items of materials research, which is essentially irrelevant to the main topic. Finally, it seems inexplicable that the 50 pages of answers to questionnaires printed as appendixes to the book were not analyzed and condensed into a few tables or graphs instead of being presented as raw data.

Despite these drawbacks, this book contains many interesting ideas from leading materials researchers on all organizational and teaching aspects of this type of work.

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(Continued on page 365)