

productivity of forests and wildlife; river-basin schemes and irrigation/drainage; and problems of energy, mining, and industry, must all be combined with measures for the regular renewal of resources and the prevention of degradation and pollution. Forms of Action and Organization comprise the responsibility of national governmental and scientific organizations for selecting priorities and for concentrating limited resources on the most important problems. The success of regional and international cooperation enterprises in an economic and environmental sense is noted to be possible only if a nation has its own skilled manpower and appropriate governmental policies.

The objective of the SCOPE Secretariat is to disseminate this valuable information, through the book and booklet, to persons and organizations who are concerned with problems of the environment as it relates to the hazards of uncontrolled development planning at national and other levels in Africa, Asia, and Latin America. It is hoped that individual scientists will not miss this opportunity to enrich their knowledge of environmental issues as seen by native scientists in a global overview of the developing world.

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**More Water for Arid Lands: Promising Technologies and Research Opportunities.** National Academy of Sciences, Washington, D.C.: 153 pp., 77 figs, 73 × 15 × 0.8 cm, US \$2.50 (stiff paper covers), 1974.

This report was prepared for the Technical Assistance Agency for International Development, Washington, D.C., by an *ad hoc* advisory panel of 16 eminent scientists and other experts, and 9 additional contributors. It deals with the more promising technologies for the use and conservation of scarce water supplies in arid areas. The book consists of 16 chapters, each of which deals with a different technology that is presented under sub-headings introducing methods, advantages, limitations, stage of development, and needed research. A short list of selected readings, and a list of workers involved in relevant research, are given at the end of each chapter.

Chapters 1–6 of the book deal with technologies for increasing water supplies and cover the subjects of harvesting rain-water from hill-slopes and man-made catchments, run-off agriculture, irrigation with saline water, re-use of water through recycling and waste treatment, methods of tapping underground water, and other sources of water including desalting, solar distillation, use of satellites and aircraft for detecting water in arid lands, rainfall augmentation, and dew and fog harvesting.

Chapters 7–16 deal with the technologies for conservation of water and cover the subjects of reduction of evaporation from water and soil surfaces, reducing seepage and cropland percolation losses, use of trickle irrigation, reducing transpiration, selecting and managing crops to use water more efficiently, and other water conservation techniques such as controlled 'environmental agriculture' (in watertight transparent enclosures) and artificial recharging of underground aquifers.

The panel based its selection of technologies on their individual merit and potential for application—particularly in developing countries—but left it to experts in the countries concerned to weigh the technical prescriptions in the light of each country's resources and capabilities.

The conciseness of the book, with its clear and orderly presentation, provides the reader with a comprehensive and up-to-date technical overview of this important subject. As mentioned by the panel, the aim is not so much to give an

exhaustive treatise on each of the technologies, as 'to draw the attention of agricultural and community officials and research workers to opportunities for development projects with high social value'. This book should also prove to be a useful asset for public health engineers and environmentalists.

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**The Vanishing Lichens: Their History, Biology and Importance,** by D. H. S. RICHARDSON. David & Charles, Newton Abbot, Devonshire, England: 231 pp., 41 plates, 27 figs, 30 tables, 14 × 22 × 2 cm, £5.25, 1975.

One of the most encouraging developments in botany since the Second World War has been the remarkable revival of interest in lichens that has taken place. This revival is especially opportune in view of the current public concern for environmental matters, as lichens are now widely regarded as our foremost biological indicators. Unfortunately, environmental changes have had an adverse effect on the distribution of many lichen species, often wiping them out over large areas: hence the appropriate title to David Richardson's book, *The Vanishing Lichens*. The work, however, is not mainly concerned with distributional changes as the unsuspecting might infer from its title; rather does it deal with economic aspects of lichens.

Dr Richardson surveys the use of lichens in folklore, their use in the dating of rock surfaces, their physical and visual effects on the surfaces of stone buildings and monuments, and their use in dyeing, medicines, embalming, and perfumery, as well as their importance in relation to reindeer and caribou, birds, mites, insects, and gastropods. Other chapters deal with lichen symbiosis, pollution, habitat destruction, and conservation, and also the history of lichenology.

The information is conveyed in an interesting and indeed entertaining manner, and in a way which can be easily understood by persons with no prior knowledge of lichens. There is much information that is not readily available elsewhere—extracted, as it were, from the fringe of lichenology. In this way the views of religious fanatics are brought into the account of symbiosis, whilst that on pollution mentions the smoke restrictions imposed on Widnes for a visit of the Queen, and that on stone colonization brings in the umbrella of cow-dung over a grain-store on Romney Marsh—to give but three examples. In only one or two places does the author get carried away with his own enthusiasm. The distribution map of *Lecanora conizaeoides*, for example, shows a remarkable and disturbing westward advance of this toxitolerant lichen over the last twenty years for which there is in fact very little evidence, and the photograph of the cooling towers of Drax power-station rightly shows the disfiguring effects of lichen growth on white concrete, but cannot also emphasise the 'importance of moisture', as the towers in question had never been used when the photograph was taken.

The photographs form one of the most valuable aspects of the book—certainly the most interesting collection of lichen-related illustrations to appear in recent years. These range from hand-loom for making lichen-dyed tweed on the island of Harris to Henry Moore's reclining figure now blotched with unsightly lichens at Dartington Hall. Unfortunately the photographs are poorly produced: they are not printed on art paper, and many are lacking in contrast and detail. The photograph on the dust-jacket is of a West Indian bush cricket, included to show mimicry, but nevertheless a strange choice; photographs of lichens them-