

Energy past and energy present

Man, Energy, Society By Earl Cook. Pp. xi+478. (Freeman: San Francisco and Reading, May 1976.) Cloth £10.40; paper £4.50.

THE availability of energy is clearly a key element in the history of civilisations, the size, form and behaviour of societies and the choices open to them. Following in the steps of Fred Cottrell's remarkable *Energy and Society* (1955), the geologist and geographer Earl Cook here re-explores this fascinating set of connections. The result is a valuable, broad introduction to 'energy' in a historical, social, geographical and economic setting. The sweep is immense, ranging from the emergence of agriculture to future energy alternatives of varying socio-political stability. The approach is often refreshingly catholic: thus, a major section on the global distribution of energy resources starts with arable and pasture land; food (and its getting) commands as much attention as the major fossil fuels; the ethics of resource depletion and the sociology of control of energy use are discussed as thoroughly as the usual technical and economic topics. One consequence is to make the book a valuable source of inaccessible statistics and data, such as the efficiency of early machines; the total system energetics of transport, food production, mining and other industrial activities; and the rising energy and other costs of winning lower grade mineral and fuel resources.

Although useful up to a point, any uni-dimensional view of the world can all too easily be taken too far into empty truisms and gross overstatement. Cook all too often falls into these traps, walking dangerously close to a pure 'energy theory of value'. Statements such as "a doubling of living level requires approximately a doubling of available energy" (p190); that if energy use per capita is not increasing then economic development is reversing (p218); and that the gap between developed and underdeveloped regions in per capita energy use is widening (p18), underpin many of the book's theses, yet are demonstrably false. Nor is it exactly helpful, in the absence of any sustained discussion of overt political factors in the control of energy or of society, to come across remarks such as "high energy man seeks diversion in sports, business, drugs, sex, rioting, and crime" (p221), or that the Crusades could not have happened without the mobilisation of energy surpluses in Northern Europe "reflected in horses, armour and men"

(p195). Yet read with a wary eye and a few pinches of salt, this is nevertheless a valuable book as both a thought-provoker and source of information.

Energy Resources and Supply. By J. T. McMullan, R. Morgan and R. B. Murray. Pp. xii+508. (Wiley-Interscience: London and New York, March 1976.) £12.50; \$27.50.

FEW of the 'broad survey' books on energy that are now flooding the market focus with such admirable clarity, thoroughness and wide scope as does this on the hard-nosed physics and engineering of the subject. Aimed at university courses and the more numerate specialists, the emphasis is predominantly on techniques and their physicochemical basis—in many ways a refreshing change that helps fill an important gap. There is also a strong bias towards the 'mainstream' supply and conversion technologies, with about half the book devoted to resources, extraction, processing and characteristics of the fossil fuels and the nuclear fuel cycle, both fission and fusion. Opening chapters survey the energetics of the biosphere-atmosphere system and photosynthesis, whereas there are relatively sketchy chapters on solar energy, other renewable sources, storage, energy-in-use and (with proper enthusiasm) the heat pump.

Plant ecophysiology

Physiological Plant Ecology. By W. Larcher. Translated by M. A. Biederman-Thorson. Pp. xiv+252. (Springer: Berlin and New York, 1975.) DM 46; \$18.90.

IN revising and translating into English the original German text *Ökologie der Pflanzen*, the opportunity has been taken to adopt a more accurate title, which is supported in the Preface by an adequate description of the subject matter and aims of the book. Ecologists urgently seeking physiological information relevant to field situations for teaching and research purposes, invariably have to search a voluminous literature. Professor Larcher is to be congratulated on making this task so much lighter, by producing a concise account of many important aspects of plant ecophysiology.

Inevitably, the topics covered reflect the authors' own research interests and the limitations of space and cost. The approach adopted of portraying the development of the subject in the choice of illustrations and tables is ex-

The coverage and density of information is impressive. Yet there are curious gaps. For example, there is much about peat as a large 'fossil' resource but nothing about the vast annually renewed fuel sources in (tropical) estuarine biomass; in a long section on nuclear reactors there is the scantiest reference to comparative efficiencies of fuel use; the account of solar collectors bristles with algebra but there is hardly a word about overall system design or integration of solar with other ideas (including storage and heat pumps), the keys to success in this area. More seriously, there is such a determined avoidance of almost everything but physics and engineering that the real world sometimes seems light years away. There is almost no mention even of costs, and the broader economic and social aspects of energy are confined to a single chapter of six pages. The total misunderstanding of the energy situation, needs and constraints of the undeveloped world, revealed in the final pages, is no less than appalling in a book which in many ways deserves to become a basic text for undergraduate and graduate students in the physical, engineering and environmental sciences.

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tremely interesting. Much of the material is new and valuable syntheses have been made in a number of tables, yet in certain sections, especially those on nitrogen and mineral elements, the treatment is somewhat out-of-date. Under the heading 'Dry-matter Production' (p63) the section on growth analysis would greatly benefit by additional references to recent alternative articles and texts. There are very few obvious errors in the text: (cf p000) should be (cf p134) on p54 and (cf p000) following Id=direct solar radiation (p191) should be omitted from this revised translation. I would prefer to see Leguminosae used on pp94, 101, 115 and 119 instead of Fabaceae.

The book is a valuable source of reference to articles normally hidden away in the German literature and it is to be regretted that the current rates of exchange will put it beyond the pockets of most undergraduates.

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