

# reviews

## Energy crisis

John Chesshire

*Energy: The Continuing Crisis.* By Norman Metzger. Pp. 242. (Thomas Y. Crowell: New York, 1977.) \$12.95.

As if to anticipate the reviewer, the author commences his study by questioning the need for yet another book on the "energy crisis". The justification lies in his belief that since 1973, energy consumers have been lulled into a dangerous complacency: new finds of fossil fuels are reported daily, and the nuclear and non-conventional technology lobbies sing in high praise of the potential of their systems. This appearance of plenty allows consumers the luxury of using yet more fuel while putting up stern and vocal criticism to planning applications for new nuclear stations, oil refineries and coal mines. Meanwhile, their elected representatives, whether in the US Congress or in the British House of Commons, point to the political implications of tough conservation measures, especially any which might bring about the transition of fuel prices to the long-term marginal costs of replacements. Thus, the "continuing crisis", and the need for another book.

The author adopts the now-common, fuel-by-fuel approach in his analysis, and focuses on the US situation. He points to the steady demise of coal this century, and to the massive injection of funds now required to raise production by providing new capacity and efficient mining, conversion and utilisation technologies. He concludes by arguing that the scale of the resource requirement is such that the vast expansion of the coal industry is by no means the certainty it seems to be in current energy policy planning.

Critical to his review of the oil sector is an analysis of the likelihood of continued cohesion of the OPEC cartel (a fixation with many American commentators). The absence of any discussion of the role of the state in determining alternative depletion policies is a weakness here, as in the succeeding chapter on natural gas. His useful arm's-length account of the "Troubled Youth of Nuclear Power" includes an assessment of recent American action and reaction in the build-up of nuclear generating capacity, and a damning indictment of the lack of attention to waste disposal

and storage, and leads him to the whimsical (but incisive) view that "maybe the trouble with nuclear reactors is that they don't have belching smokestacks".

Of the unconventional technologies, he anticipates that the major contribution will come from the fusion, solar and geothermal routes, and he highlights the critical uncertainties regarding the cost, scale and timing of their contribution to future energy supplies.

On balance, the author is to be commended for his realistic evaluation of the many exaggerated claims that have

been made about both fossil and novel energy supplies, and for his sensitive analysis of the constraints on change imposed by the power and vested interests of the energy corporations and the regulatory functions of the state. It is unfortunate that he favours a supply—rather than a demand—orientated approach, thus neglecting conservation policies and technologies and that he adopts a relatively short-term US-centred view of the world. □

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## Tracing the history of life

*The Phylogeny of the Vertebrata.* By Søren Løvtrup. Pp. xii+330. (Wiley: London and New York, 1977.) £15; \$29.50.

COMPARATIVE BIOLOGY has been revitalised in recent years under the stimulating influence of Willi Hennig's *Phylogenetic Systematics*. No longer can it be regarded as the feeble survivor of a primitive descriptive phase of biology, for it is evidently central to evolutionary biology and gives meaning and direction to research in fields as diverse as embryology, population genetics, biogeography and behaviour. It is based on a belief in the objective existence of a true path of descent for all living organisms which may be reconstructed by the empirical testing of well formed hypotheses. Nevertheless, despite its already long life, comparative biology is not yet a mature science with well understood philosophical and theoretical foundations. Søren Løvtrup's book attempts to remedy this defect, using the *Vertebrata* to exemplify his ideas.

The book opens by setting out its Popperian research programme and then immediately takes up the "Logic of Phylogenetics". By excluding fossils and thereby avoiding argument about what is in any case a practical rather than a theoretical difficulty, Løvtrup is able to treat classification and phylogeny reconstruction as the same process. Thus, of the two levels of taxonomic activity differentiated by Gregg—taxonomy proper and method-

ological taxonomy—Løvtrup attacks the latter. Taxonomy at the higher level is a primitive science. As Gregg says, "Taxonomists engaged in methodological research are [thus] without adequate linguistic resources to support their investigations. They must rely almost entirely upon unsuitable prescientific idioms borrowed from everyday language". Gregg's own solution was the use of set theory, but this had no hope of acceptance in a pre-Hennigian intellectual climate that deliberately depressed rigour and allowed artifice and authority to flourish. Twenty-five years later, Løvtrup is in a more favourable position, though it is perhaps unfortunate that his "language" is a series of definitions, axioms and theories, rather than the symbolic logic of Gregg.

The heart of Løvtrup's book comprises two long chapters on the ancestry and divergence of vertebrates. These are more easily approached than other chapters and will no doubt readily attract attention because of their heterodox conclusions. However, Løvtrup has more important things to say elsewhere in this book, and as he deviates so disastrously from his professed deductive approach, I am disinclined to give much weight to his conclusions. The last section of the book deals with the mechanism of evolution. Comparative biology has not benefitted greatly at a practical level from work in this field, and Løvtrup tries to redress the balance with an axiomatised version of his "comprehensive" theory. This is