PREFACE

There is no separate world beneath our feet. In a karst area the interface between the geosphere and the atmosphere simply dips out of sight below the general lie of the land, much as it does when we gaze across a barren plain and fail to notice that it is riven by a narrow and deep canyon that is brimful with water, life, beauty and opportunity.

Hamilton-Smith, E., Kiernan, K. and Spate, A., 1998. *Karst management considerations for the Cape Range karst province, Western Australia.* A report prepared for the Department of Environmental Protection, March 1998.

Although Charles Chilton (1860-1929), based in New Zealand, was an early exponent of stygal biology in Australasia, the groundwater fauna of Australia — along with that of Africa — is particularly poorly known. Nonetheless, subterranean biology is gradually coming of age in Australia. The year 1992 saw the first meeting in Australia devoted to the biological setting of a single karst area, Cape Range. Since then, substantial work has been reported on the subterranean fauna of Tasmania, New South Wales, Queensland and Western Australia, both in terms of distribution, taxonomic affinities and ecology.

The focus of subterranean research has broadened considerably in the interim with substantive focus on non-karst systems (alluvial aquifers) and less commonly examined caves (sea caves) or karst systems (anchialine systems and novel groundwater calcrete aquifers in palaeodrainage channels). The advancing study of the processes associated with groundwater-surface water interactions provides a formal link between stygobiologists and limnologists from which both will benefit.

Groundwaters in palaeodrainage channels of the arid zone are proving to be major centres of stygal, especially crustacean, diversity and the anchialine faunas from the north-west of the continent have provided unexpected links with the tethyan fauna previously known from either side of the North Atlantic Ocean.

The important biodiversity represented within subterranean faunas, commonly comprising short range endemics as well as geographical and phyletic relictual species, is increasingly being recognised by management and regulatory agencies as worthy of assessment. Subterranean fauna was covered in some recently ratified Regional Forest Agreements and is commonly assessed in environmental review and management plans in Western Australia. Internationally, karsts and their living biotas have become important foci of attention for World Heritage listings, karst wetlands have been accepted under the terms of the Ramsar Convention, and the World Bank now recognises the protection of karstlands as of major importance.

An increasing numbers of both terrestrial and aquatic species restricted to underground habitats, and their communities, are being recognized by fauna authorities at both the state and federal levels—largely by dint of their restricted occurrence— as being endangered by landuse, water abstraction, pollution, dewatering, cavers, or by occupying a very restricted geographical range. There are very real pressures on subterranean fauna and their protection has largely been mitigated by lack of information about their existence, the processes and dynamics of subterranean ecosystems, and how they may respond to natural and anthropogenic disturbance.

In the bigger picture, subterranean faunas are increasingly being found associated with chemoautotrophic environments of the types suggested for the genesis of life, and they are a key part of the hypothesised global corridors—along mid-oceanic ridges and along alluvial corridors on land— that may have persisted through geological eras, providing links between regions remote in space and time.

These issues and world views are touched upon in papers presented here. While they represent but a small step globally, they mark a significant advance in Australian subterranean biology, not least because biospeleologists, systematists and others assembled in one place and forged future collaboration.

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