



## Editorial

### **The conservation of a discipline: Traditional taxonomic skills in insect conservation**

Many concerned biologists have emphasised the vital underpinning role of classical taxonomy in conservation assessment. However, recently, attempts to replace 'morphological' species level taxonomy of invertebrates with cost-saving alternatives (such as use of higher taxonomic categories as surrogates for species, and other approaches to 'rapid biodiversity assessment'), and emphasising innovative molecular techniques to reflect diversity have proliferated. These approaches have been regarded as more expedient and, in some cases, 'more glamorous' options attractive to granting agencies and employers. The widespread decline in morphologically trained taxonomists, perhaps especially of specialists in invertebrates, has been addressed thoughtfully by Lee (2000). He has emphasised, correctly, that persistent scholarship and long-accumulated experience of morphological variety are the vital factors involved, and that the time needed to gain this expertise is commonly unavailable in the present climate of short term employment contracts and uncertainty, in which acquiring short term transferable skills is a better investment. A major problem is that of communicating the values of such classical approaches and, hence, the values of longer term investment in taxonomic expertise, in the 'real world'.

Many classically trained insect taxonomists pursue their studies well beyond normal retirement age, as the publications lists of many leading institutions demonstrate. Indeed, many taxonomists find it possible to produce their most important syntheses and monographs only once freed from the constraints of regular employment. Many such works are of lasting value, in contexts well beyond the simple documentation of biota. The central importance of alpha-taxonomy in much invertebrate conservation assessment demands that the discipline itself be conserved, through assuring the succession of expertise and increased appreciation of its relevance to practical problems.

In noting the decline of traditional taxonomy, Lee (2000) noted the need for traditional taxonomists to become more effective at self-promotion. Few would query this need, but the question then arises as to how

this promotion is to be best achieved. Many institutional employers are concerned more with 'innovation' and 'novelty' than with what they perceive as 'pedestrian' science or 'more of the same'. A training morphological taxonomist seeking to establish a career in the systematics of beetles, wasps, caddisflies (etc.) is likely to be already distracted from 'straight' morphology by the end of his/her doctoral study, not least because a 'solid' Ph.D. thesis on any insect group will generally be expected to contain original sections on cladistics or molecular phylogeny. Few would disapprove of this, but the practical consequence is that these latter facets are likely to be those more attractive to employers than the solid morphological scholarship acquired over the same period. Many universities, for example, are far more concerned about the fund-raising potential of their staff than the scientific and practical worth of what those staff do; 'inputs' which can help alleviate highly stressed budgets are understandably important. Selection committees are likely to be made up of 'successful' (that is, grant-getting, politically responsive) members, whose sympathies for fostering narrow non-transferable skills may be minimal – especially if those skills are unaccompanied by dollars!

In most taxonomic institutions, planning for succession is limited or impossible. Simply that a worker on a particular group or groups of insects (or others) retires does not guarantee that any replacement will be in any similar field. And, in the few cases in which taxonomic mentors persist to pass on their knowledge to younger workers, there is no assurance that those skills will be deemed of value to any future employer, who – if any replacement is made for a retiree – may opt for one with a greater variety or a different range of skills.

All of this brings us back to Lee's point about need for effective advocacy. In addition to self-advocacy from taxonomists (which is all too often disregarded as simple self-interest), sympathies for conventional taxonomy must be seen to come from 'users'. However, the reality is that many excellent taxonomic monographs have little or no use outside the small circle of specialists at whom they are primarily directed, and do not rank highly in citation indices; taxonomists have traditionally tended to write for other taxonomists! In addition, many syntheses (such as handbooks and the



like) written for less informed users are viewed as 'secondary activity', rather than being recognised for the large amount of original research they almost invariably involve. They are thus demoted even more in the eyes of employers (New 1999).

Advocacy for traditional taxonomic skills cannot come simply from providing monographs of favourite groups, however high the quality of the science involved, but must be fostered through more effective liaison with the people who use our work. Users need morphological taxonomy, as it is the only practical option for consistent use in many insect groups, but effective cooperation and agreements between taxonomists and ecologists (see agenda suggested by New 1996) may be necessary to bring this message home. Idealised advocacy for taxonomy (Schram & Los 1996) must be accompanied by pragmatism and focus, fostering the production of monographic treatments on the key groups of value as indicators, natural enemies, of pest complexes, members of significant evolutionary radiations, and so on. Within the insects, there is some broad agreement as to what some of these groups may be, but the picture tends to become confused through almost universal individual advocacy for the broader values of each worker's 'pet group' (Andersen 1999; New 2000).

A path to career stability for a morphological taxonomist may well entail selecting a focal order with a variety of values, including some of applied significance (and, inevitably, with major academic interest as well). For example, only, Coleoptera have a vast range of ecological roles and economic impacts ranging from established values as ecological indicators in terrestrial and freshwater ecosystems, and tools in zoogeographical interpretation, to pests in agriculture, forestry, and stored products, and positive values as natural enemies, and so on. A sustainable research approach might involve studies on several groups of different relevance to users, necessitating somewhat different levels of approach. Thus, a handbook to a relatively well known group of pests or natural enemies may have considerable local value, and can be tailored for particular regions or particular crops. It could be compiled in parallel with more long term study of other groups, field surveys of others, and so on. Taxonomists have often been accused of being narrow-minded, and some traditional fables of us hunched over microscopes studying groups of no interest to the wider community have, in the past, not been far from reality! This image is emphatically outdated. Morphological taxonomy is relevant, as it is the only template to which most

user groups can relate in practice, and its central role is assured in the study of the world's biota – as, again, emphasised by Lee (2000).

In terms of selecting focal groups, many initiatives for traditional taxonomists are available from a close study of the mission statements, annual reports and similar documents of environmental and primary industry agencies. These often include priority rankings of problems and needs, commonly accompanied by expressions of commitment to overcoming these. Such statements can be potent baits for a versatile taxonomist, as initial points for approach and discussion, and in that offers to cooperate and undertake research already flagged as significant to users may be attractive to funding agencies and industries with vested interests in the products. In many instances, we have thus already been told by user groups of their priority taxonomic needs, in ways in which the research can be fitted into existing portfolios. The needs for traditional taxonomy may not always be obvious but, as examples, statements on needs to know about pollinators of a particular crop or the natural enemies of a given pest, or indicators of hydrological changes, have strong taxonomic components. Indeed, many such desiderata can be satisfied only by the predominant application of morphological taxonomy in forms that can be interpreted clearly by users and, thus, by morphological taxonomists willing to adapt their skills to meet targeted needs.

If self-promotion by taxonomists is required, and I am convinced that it is, this promotion can be directed most usefully to potential clients, with the prospect of forging cooperative links, rather than in terms of 'enumerating biodiversity' or 'describing all species of group X'. Handbooks or monographs on client interest groups of insects are then major advertisements for the skills base available. Recent examples, such as Matthews' (1999) monograph on Australian heliothine moths (in which a mass of information is presented in 'user-friendly' format with an accompanying CD of details of taxonomic evaluation of minimal interest to a more general readership), set impressive standards for emulation, and demonstrate the way in which much future morphological taxonomy on insects will be driven.

This is not to suggest that the future of taxonomy is solely or predominantly as a service provider (New 1999). It is simply expedient to increase the breadth and variety of those who appreciate the outcomes as fully as possible. It is important to appreciate the difference between willingness to cooperate with user needs and transferring financial control for taxonomy entirely



or largely to users, with taxonomists thereby becoming vulnerable to the vagaries of short term funding provisions.

If we are to counter the decline in classical systematics and assure the succession so vital to morphological taxonomy, the need is surely to increase perceived importance and relevance of the approach. We may well have to accept that not all the more 'exciting' perceptions of systematics are met, but the breadth of interest of an energetic practitioner can surely combine the various modern approaches with the more classical, as many recent studies show. A start on providing relevant information to potential users can be made by compilations such as that by Barnard (1999) on British insects and arachnids, bringing together all major references and sources of taxonomic information for regional faunas and indicating the gaps that need to be filled, and their relative importance. The next practicable step would be to rank the gaps in order of potential uses for the products likely to eventuate, incorporating the anticipated or stated needs of potential clients – including those involved in environmental assessments. Taxonomists have the opportunity to initiate, as providers, agendas of considerable practical worth. The advocates for traditional taxonomy of invertebrates have abundant opportunities to promote the worth of their skills and to seek endorsement of that worth from elsewhere.

Taxonomists must, indeed, 'seize the day' in order to guarantee the future of their discipline in a world in which calls for information on biodiversity have never been louder, and our abilities to respond – and to lead this endeavour – can be focused effectively because those very skills and experience decried by recent fashion can be applied so diversely to provide unam-

biguous and communicable answers to many practical problems.

## References

- Andersen, A.N. (1999) My bioindicator or yours? Making the selection. *J. Insect Conservation* **3**, 61–4.
- Barnard, P.C. (ed) (1999) *Identifying British insects and arachnids. An annotated bibliography of key works*. Cambridge: Cambridge University Press.
- Lee, M.S.Y. (2000) A worrying systematic decline. *Trends Ecol. Evol.* **15**, 346.
- Matthews, M. (1999) *Heliothine moths of Australia: a reference guide to pest bollworms and related noctuid groups*. Melbourne: CSIRO Publishing.
- New, T.R. (1996) Taxonomic focus and quality control in insect surveys for biodiversity conservation. *Australian J. Entomol.* **35**, 97–106.
- New, T.R. (1999) Descriptive taxonomy as a facilitating discipline in invertebrate conservation. In *The other 99%. The conservation and biodiversity of invertebrates* (W. Ponder and D. Lunney, eds), pp. 154–158. Mosman: Transactions of the Royal Zoological Society of New South Wales.
- New, T.R. (2000) How to conserve the 'meek inheritors'. *J. Insect Conservation* **4**, 151–152.
- Schram, F.R. and Los, W. (1996) Training systematists for the 21st century. In *Systematics agenda 2000: the challenge for Europe* (S. Blackmore and D. Cutler, eds), pp. 89–101. London: Linnean Society.

T.R. New  
Department of Zoology  
La Trobe University  
Bundoora, Victoria 3083  
Australia  
(e-mail: zootn@zoo.latrobe.edu.au)