

GUEST EDITORIAL: RESPONSE

Keeping entomology on the map: is molecular biology the solution? A reply to O'Brochta

In a recent guest editorial, O'Brochta (1990) argued that the development of gene transformation technology for non-drosophilid insects, and the application of molecular approaches, in general, 'would go a long way to helping put entomology back on the map'. He also bemoans the 'state of our discipline' and cites a recent article in *Science* (Holden, 1989) to support his case that entomology has somehow slipped from prominence as a science by not holding shares in the 'new biology'. That molecular biological approaches are, and will continue to be, important in all biological disciplines is clear. The 'new biology' has considerably advanced our understanding of processes at the molecular level. The tools of molecular biology have been instrumental in solving myriad problems in fundamental and applied biology. However, it is not at all clear that entomology, as a science, is in a state of decline, or that jumping on the biotechnological bandwagon will solve whatever problems exist.

The article in *Science* (Holden, 1989) that O'Brochta cites does, in fact, describe concerns regarding the state of entomology. These concerns were expressed by a number of prominent entomologists at a recent American meeting. The decreasing amount of funding available for entomological research, and a looming shortage of personnel trained in traditional disciplines, like taxonomy and systematics, were identified as current problems. Competition for research funding with molecular biology was cited as a threat to the future viability of traditional disciplines. No indication was given, however, that the use of traditional approaches to problems in the physiology, ecology, genetics, evolution, behaviour, taxonomy and development of insects was somehow bankrupt of scientific allure. In fact, the entomologists polled were alarmed that funding was being diverted from these vital areas.

In short, O'Brochta misrepresents the intent of Holden's article. Despite decreased levels of funding, considerable advances have been made in the past 25 years in our understanding of insect biology by using traditional approaches. (The word 'traditional' is, in itself, something of a misnomer, as it implies that subdisciplines of biology, other than molecular biology, are artefacts of another era.) Entomological science has not come to a standstill by withholding its embrace of the 'new biology'. No one would argue that molecular approaches to entomological problems will be fruitful, and

deserve support. However, the funding problems of traditional disciplines in entomology will not be solved by merely abandoning these approaches, and fitting our laboratories with biotechnology equipment.

O'Brochta also suggests that molecular biology holds the key to solving insect pest problems. He foresees difficulties with the release of genetically engineered insects for pest management purposes, but feels that public acceptance of such releases will accompany demonstrations of the success of this approach. However, the release of genetically engineered organisms into the environment will require substantial knowledge of the ecological and evolutionary impacts of these organisms. This was made clear in a recent statement from a committee of the Ecological Society of America (Tiedje *et al.*, 1989). The knowledge required to use genetically engineered organisms, in a responsible manner, will be drawn from traditional disciplines. No one's interests are served by neglecting these areas in deference to the 'new biology'.

In these days of limited funding, setting priorities for research are difficult, to say the least. A number of entomologists (Holden, 1989) harbour legitimate fears about the future viability of their discipline. O'Brochta offers a self-serving solution to current problems in entomology – a prescription for putting entomology 'back on the map'. His preoccupation with the pursuit of molecular approaches does not reveal the broad perspective that will be essential in resolving these problems.

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