

Forward towards the machine guns, lads! — A reply to E. I. Newman

Recently Dr Newman reviewed my book, *Competition*, in *Journal of Ecology* (Vol. 78: 548). His principal criticism appears to be that I spent too much time on the 'nature of scientific investigations and the way they are carried out' and that most of the book was therefore not about competition. It was (and is) my contention that this organisation of the book was essential.

The difference between our positions is not trivial. It strikes at the very heart of the matter: do we, or do we not, need to reconsider fundamentally research strategies? Consider. Why are there so many studies of pairwise competition of plants in pots and so few studies of competition intensity gradients in the field? Why is resource partitioning continually interpreted as evidence for competition and niche overlap treated as a measure of its intensity when clear, logical, counter-positions exist? Why are there so many studies of competition in birds and so few in decomposers? Why are there so many studies of species and so few of traits? Unless we can answer such questions, we are bound to continue repeating past errors. Yet the causes of these and other issues arise not out of logic, but out of history and the psychology of scientists.

Let me illustrate the fundamental difference between Dr Newman's position and mine with an historical example. By sheer coincidence, when Newman's review arrived, I had just finished reading *The Social History of the Machine Gun* (Ellis, 1975). One of the most stimulating parts of the book addresses the question of why British generals were permitted to slaughter nearly an entire generation of young men by forcing them to march against entrenched machine guns. After all, the American civil war, more than 50 years earlier, had amply demonstrated that the advantages lay with defenders in trench warfare, and that tactics like Pickett's charge at Gettysburg (Gatton, 1971), while a gallant reminder of the past, were anachronisms. By the early 1900's machine guns had shifted the advantage to defenders even further. So why were outmoded tactics not re-evaluated? Lewis observes that the machine gun arose out of the social need for a small number of white people to be able to control large numbers of coloured people (British colonialists against blacks in Africa, American soldiers against Indians in North America). Therefore, British generals were convinced that while machine guns could stop 'savages', they could not stop white people. All the troops needed was more 'spirit' and they would succeed. Outmoded tactics and strategies were therefore not re-evaluated, and a generation perished in the belief that 'spirit' could overcome entrenched machine guns.

British Ecological Society Bulletin Vol. XXI: 1
p. 15-17 (1991)

There are clear parallels with current research on competition. What we need, I have argued, is not more examples of it, but a fundamental re-evaluation of research strategies to find new methods that will lead to real progress. But some generals would apparently deny this and insist that if we keep plugging away with the same tactics but more spirit we will get progress. The cost might be a generation of young minds told to use the same approaches to try to solve the same problems. Given that a generation of young people were killed by generals sending them against machine guns, the costs of sending a generation out to do more of the same thesis studies of competition will probably be socially acceptable. But it is wasteful.

The difference in our positions can also be illustrated by a more contemporary example. At a recent conference, a student presented a study on competition between a pair of lizards. There is a long history of such studies in the literature, so I was naturally curious to know why we needed another one. So I asked the student why he had undertaken the study. A colleague took me aside afterwards and admonished me for attempting to 'demolish' the student. His point was that it was acceptable to discuss whether the sample sizes were adequate, whether the experimental design was appropriate, whether the statistical analysis was correct, and a wide range of other questions, but it was a *faux pas* to ask why the study had been undertaken. I disagreed with him, but even if he was right that that was the wrong question for the circumstances, surely an author of a book is compelled to ask exactly this sort of question.

To return to trenches and machine guns, there were of course suggestions between 1914 and 1918 that new tactics were needed. Therefore, a special group of soldiers were needed — to go down the trenches and shoot their own men when they refused to go 'over the top' and make yet another futile run at machine guns. Similarly, firing squads executed deserters who (quite reasonably) concluded that the process was pointless and wouldn't participate. I am therefore glad that it is now 1990 and I simply wrote about a need to change an ecological research strategy. That way, those who contend that the philosophy and history of science are incompatible with the study of competition have only reviews rather than firing squads at their disposal. I still won't send young scientists over the top, and I hope that at least some readers of *Competition* won't go!

References

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