

## Sexual Selection: Badges and Signals

I was satisfied to read that Maynard Smith<sup>1</sup> agreed with me that when there is a conflict of interests between the sender of a signal and its receiver signals should be costly in order to increase their reliability. But Maynard Smith suggested that there is another set of signals, for which he coined the term 'notices', that function when there is no conflict between the communicating parties. Hence, there is no need to invest in the reliability of these signals. But it is now generally accepted that there is always a poten-

tial for conflicting interests between any two organisms<sup>2-6</sup>. Hence, a signaller may have the option to use the reaction of other individuals to its signals to its own advantage and to their disadvantage.

It is especially difficult to identify the cost in the set of signals that seem to provide a badge (notice) to a set of individuals (e.g. 'specific signals'). Elsewhere<sup>7</sup>, I suggested that the concept of 'specific signals' is an artifact created by the scientist and that these signals should be considered

as standards for comparison rather than as a badge of identification. For example, a line along the body of a fish may help the observer (mate, rival or predator) to appreciate the difference between the length of two very similar individuals.

Evidence that these patterns may be used to identify a conspecific is not necessarily evidence that these patterns have evolved as a consequence of that advantage. The definition of a signal should include only those characters whose advantage to the

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signaller is a consequence of the information they provide to other individuals. A kangaroo may be identified from a distance by its particular gait, but it would be wrong to suggest that the specific gait of the kangaroo has evolved for that reason. The search for the cost in all signals has generated interesting interpretations for long-standing problems<sup>8-12</sup>.

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