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Global links will breed more dangerous parasites

Science

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Increased global traffic of humans and goods is helping to disperse parasites - driving evolution

Scientists studying why parasites are not more harmful to their hosts have discovered that as the world becomes more connected so natural selection will favour more dangerous parasites.

The team, from Oxford University, looked at why, in mathematical and computer models, parasites reduce their harmfulness to the host (virulence) so as not to run out of hosts to infect: a phenomenon termed 'self-shading' that some have suggested can only be explained by 'group selection' as opposed to conventional evolutionary theory.

A report of their research is published in this week's *Nature*.

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Professor Stuart West

'Some people believe that this phenomenon of reduced virulence means that evolution is operating for 'the good of the group' rather than for 'the good of the individual', said Professor Stuart West of Oxford University's Department of Zoology who led the research. 'What we have shown is that there is no need to invoke adaptation at the group level to explain this. Parasites reduce their virulence because this increases

the transmission of their genes to future generations – something explained by conventional evolutionary theory.'

As well as giving a solution to this evolutionary puzzle the work also suggests that natural selection will favour parasites that are more harmful (virulent) as they become increasingly dispersed throughout the world – a phenomena driven by increased global traffic of human beings, livestock and goods.

'In such a connected world, where parasites are more geographically dispersed, it becomes an advantage for them to become 'nastier' as they are less likely to be competing with genetically related rivals or denying their offspring a supply of suitable hosts,' said Professor West. 'All this can be explained by looking at the 'selfish' genetic interests of the individual organism.'

Their analysis shows that, whilst the interests of the group can come to the fore in extreme situations – where there is no conflict of interests between individuals within a group – this does nothing to change the fact that individuals will always evolve in a way that is best for them, their relatives, and their genes.