

Why kindness is all part of being selfish

BY NIGEL HAWKES, SCIENCE EDITOR

PEOPLE who help others without expecting any reward are not as altruistic as they seem. According to a new theory, they perform acts of kindness to earn a respect which increases the chances of people behaving kindly towards them.

This may sound obvious. But explaining altruism within the canon of Darwin's theories of evolution has always been difficult. If the object is to ensure the survival of our own genes — as most modern evolutionary theorists believe — then why co-operate with anybody except family, who share those genes?

Now Martin Nowak, Professor of Mathematical Biology at the University of Oxford, and the mathematician Karl Sigmund, of the University of Vienna, have produced an explanation for co-operative behaviour which fits in with the selfish gene. They use mathematical models and game theory to show that being kind to somebody you may never meet again can be still be interpreted as self-seeking behaviour.

Until now, Professor Nowak says, altruism could only be understood within families, where genes are shared, or between people who meet regularly, in which case one good turn will earn another. But the new theory explains what he calls "indirect reciprocity" — where acts of kindness are done to strangers who will never get a chance to reciprocate.

In *Nature*, the two scientists describe a model in

which individuals can behave as co-operators or as defectors — that is, non-cooperators. The benefit of co-operation is to gain a respectful halo that encourages others to co-operate with you. But there is a cost — that of doing something that brings no direct benefit.

And if you co-operate blindly with everybody, that means that some defectors could exploit the system, relying on others to be nice to them without making any effort to be nice themselves. So even co-operators must sometimes defect, in order to punish persistent defectors. By doing so, they risk their halo slipping, as others see them behaving unco-operatively.

The mathematics of the theory are therefore not straightforward. The authors investigated it by creating a computer model of 100 people and running a succession of simulations to see which strategy emerged as the most stable. After 166 runs, the model stabilised as one of indirect reciprocity.

This, says Professor Nowak, is the first mathematical treatment to show that co-operation is a stable evolutionary strategy. Some degree of co-operation also exists in animal societies, but not to the same extent as in humans.

"I believe that the human species is characterised by having solved this problem" Professor Nowak says. "It was a decisive step in the evolution of human societies."