Tekst 5

A dog's life

1 NATURAL selection is blind to the future. So it is possible, in theory, for a species to evolve itself merrily to extinction by adopting a strategy that works in the short term, but not in the long. That has never been observed in practice. But a study published in this week's *Science*, by Blaire Van Valkenburgh, of the University of California, Los Angeles, and her colleagues, suggests it is true. Dr Van Valkenburgh has studied the fossil history of one group of mammals, and found a repeated pattern of evolution that seems to lead to extinction.

2 The mammals concerned are the dog family, a group of carnivores known to zoologists as the Canidae. This family is divided into three. Living dogs, wolves, jackals and foxes, together with their ancestors, are dubbed the Caninae. And there are also two extinct groups, the Hesperocyoninae and the Borophaginae. The past 50m years have seen a repeated pattern of particular carnivore lines proliferating, diversifying and then declining to extinction for no very apparent reason. Dr Van Valkenburgh's hypothesis was that there was indeed a reason, common to all of these cases, and that it was connected with an old idea called Cope's rule.

3 The rule in question is that small animals evolve into large ones, but not vice versa. This makes sense. Size brings security from predation, success in competition for mates (at least if you are male) and a lower surface area to volume ratio (which reduces heat loss). The downside is that big animals have to eat more than small ones.

4 Dr Van Valkenburgh took this line of reasoning a stage further. If you are a carnivore, the easiest way to eat more is to specialise in large prey. And that, in turn, gives you a further reason to grow big. But the problem with this is that large prey are rarer than small ones, so specialising in them leaves you vulnerable to relatively small ecological changes. If your preferred food supply vanishes you may not, as a smaller species would, have any suitable alternatives. Extinction thus beckons.

5 To test this idea, the researchers turned to the fossil record – in particular to the animals' teeth, which often survive when bone disintegrates. They were able to work out the likely average sizes of a range of fossil species from the well-established relationship between tooth size and body size in living canids. Then, by examining the anatomy of the teeth themselves, and of fossil jaws, when available, they were able to get a good idea of the type of prey the animals were eating.

6 The same trend was apparent in both the Hesperocyoninae and the Borophaginae. The number of large species with adaptations suggesting specialisation on large prey increased with time. Small omnivores became rarer (their place being taken by members of the newly evolved Caninae). And, crucially, the large beasts did not hang around as long as the small. The average lifetime of such "hypercarnivorous" species was 6m years. Smaller, less specialised species averaged 11m years. It thus appears that evolution really can lead to extinction.

The Economist

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3p **10** Geef van elk van de onderstaande beweringen aan of deze wel of niet in overeenstemming is met de inhoud van de alinea's 1 tot en met 3.

1 Recent research has demonstrated that due to flaws in their genetic make-up certain species are destined to exist for a limited time only.
2 The disappearance of a species might be related to the animals' increased size.
3 In evolutionary terms, the dog family has turned out to be one of the most successful species of mammal.
4 Until recently the disappearance of the Hesperocyoninae and the Borophaginae had not been accounted for.
5 Cope's rule is a formula for calculating the ratio of small to large animals.
6 Larger animal species can only survive at the expense of smaller species.

Noteer het nummer van elke bewering, gevolgd door "wel" of "niet".

"But the problem with this…" (paragraph 4)

1p **11** What does "this" refer to?

A being a carnivore
B eating more
C growing big
D specialising in large prey

"the researchers turned to the fossil record - in particular to the animals' teeth" (alinea 5).

2p **12** Welke twee soorten gegevens ontleenden de onderzoekers hieraan?

1p **13** How can paragraph 6 be characterised?

A It describes the findings of Dr Van Valkenburgh's research.
B It presents new arguments in order to support Dr Van Valkenburgh's theory.
C It puts forward counterarguments to Dr Van Valkenburgh's line of reasoning.