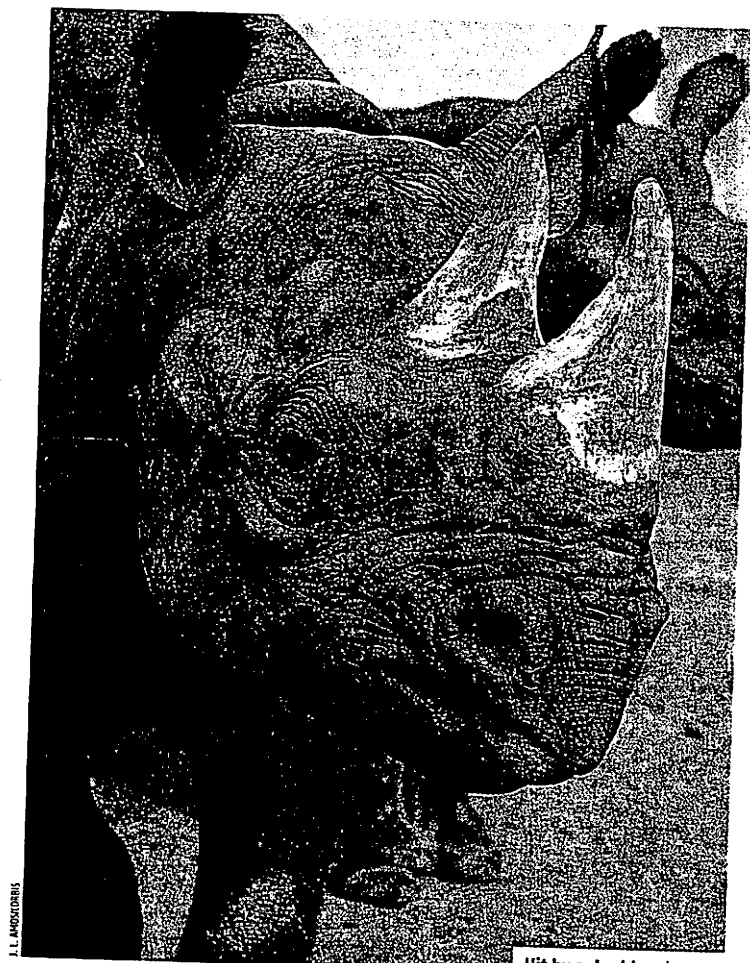


Captive rhinos killed by overdose of iron



Hit by a double whammy

VETERINARY surgeons have made a breakthrough in understanding why the endangered black rhino is so difficult to keep in captivity.

Although numbers are beginning to climb in the wild, rhinos are still rare, and animals in zoos are critical to safeguarding the future of the species. But over the past decade around half the black rhinos in American zoos have died prematurely of chronic anaemia.

Affected animals suffer from low blood cell counts, weakness and apathy and often pass blood in their urine shortly before they die. In humans, anaemia is caused by low levels of iron. But in rhinos, paradoxically, it may be caused by high iron levels, which catalyse the formation of oxygen free radicals that damage red blood cells.

Now a new study of the animals' strange blood chemistry has brought vets closer to understanding how to prevent these deaths. Eric Harley and colleagues at the University of Cape Town in South Africa were puzzled to find that black rhino blood cells contain 50 times as much tyrosine as human red blood cells. "You just don't usually find an amino acid at screamingly high levels in a cell," says Harley.

Tyrosine mops up oxygen free radicals, suggesting that it protects the rhinos against excess iron, the researchers will tell the International Conference of Comparative Physiology and Biochemistry in Africa at

Ithala Game Reserve in South Africa in August.

Harley believes that their findings may help explain why so many rhinos die in captivity. In the wild, rhinos browse on acacia, which contains relatively small amounts of available iron compared with plants such as grasses. No one can yet be sure, but the rhino's natural food may also contain higher levels of tyrosine. So captive rhinos fed an alternative diet such as grasses may be hit by a double whammy: getting more iron than they are used to as well as less of the tyrosine that counteracts its effects. "It is certainly another thing that we need to consider," says Ellen Dierenfield, nutrition advisor on the rhinoceros Taxon Advisory Group of the American Zoo and Aquarium Association, although she believes that chemicals other than tyrosine may also be involved.

Vets are now adding tannins to black rhino feed to try to mop up the excess iron directly. So far, the animals' health hasn't improved, but this could be because the right combination of chemicals has not yet been found. "With a chronic disease you cannot change the diet and then assess two weeks later whether it worked," says Marcus Clauss, an expert in rhino nutrition at the University of Munich in Germany. "With a species that can get to 30 years old, this is a long-term process." James Randerson ☉

Lawsuit could force limits on US carbon emissions

THE US is wrestling with its conscience over global warming. While the federal government continues to turn its back on the Kyoto treaty, eight states and a city are suing some of the world's largest power companies in an effort to limit carbon dioxide emissions. And the companies targeted are American. Observers say that the lawsuit

could herald a wider trend in the US to circumvent the federal government and take unilateral action to curb the effects of global warming.

California, Connecticut, Iowa, New Jersey, Rhode Island, Vermont, Wisconsin, New York and New York City claim that CO₂ churned out by the utility companies constitutes a public nuisance owing to its effects on climate change, and is in breach of a law designed to protect property owners from the actions of their neighbours. They want to force the companies to reduce their CO₂ emissions by at least 3 per cent each

year for 10 years. "If we do not act soon, the steps that we will need to take to prevent global warming will be much greater," New York attorney-general Eliot Spitzer said last week.

The five companies – the Ohio-based American Electric Power Company, the Tennessee Valley Authority, the Southern Company, Ohio-based Cinergy Corporation and Xcel Energy, serving the western and

"If we do not act soon, the steps we will need to prevent global warming will be much greater"

midwestern states – together produce 10 per cent of US CO₂ emissions, more than the whole UK, says Spitzer.

The states say they are launching the action in a bid to "fill a breach" left by the federal government, which has "abdicated responsibility" for tackling CO₂ emissions. A simple way to limit emissions, the states say, would be to list the gas as a pollutant under the Clean Air Act, alongside other gases such as sulphur dioxide, which causes acid rain. But the government has refused to do so, despite appeals. The utility companies say they will fight the legal action. Maggie McKee, Boston ☉