NO BRAIN, NO PAIN?

GRAHAM MOLE looks at the latest American research that claims fish are incapable of feeling pain

IT'S WHAT WE'VE all been waiting for...the answer to the question "Do fish feel pain?" That answer — according to an American professor — is "No".

For us, as anglers, that answer is crucial in robbing antis of one of their most persuasive arguments.

The research is by Professor James D. Rose, of the Department of Zoology and Physiology at the University of Wyoming. It was published in *Reviews in Fisheries Science* and referred to in *Trout News*, a publication of Britain's Centre for Environment, Fisheries and Aquaculture Science. So it's not some gin-soaked pronouncement by Colonel Farnsbarnes.

It's impressively official. In fact something that's entitled "The Neurobehavioral Nature of Fishes and the Question of Awareness and Pain" and runs to a full 38 pages has to be taken seriously.

The examination of our quandary isn't the easiest of reading for a layman, and Prof Rose certainly isn't the first scientist to tackle the subject — the proof being that the bibliography alone for his piece runs to five pages. However, he does seem to leave little room for dispute.

His central argument is summed up like this: "Awareness of pain in humans depends on functions of specific regions of cerebral cortex and fish lack these essential brain regions or any functional equivalent, making it untenable that they can experience pain". In other words fish just don't have the bit of the brain that transmits pain.

The professor writes, "People hold very differing beliefs about this question. Some would believe that if fish react to stimuli that would cause a person to feel pain that the fish must also be feeling pain." He goes on: "Reactions to injury are present in all forms of animal life, but these reactions do not mean that pain is experienced." For example, a starfish doesn't have a brain but, nevertheless, has automatic reactions via sensors which move it away from danger.

> **"Fish have the simplest types of brain of any vertebrates"**

But what is pain, anyway? He explains: "Pain is a physchological experience that is separate from behavioural reactions to injurious stimuli." At the dentist, for example, an anaesthetic stops nerves sending messages to the brain. Result? No pain. Rose says the term "pain" should be used only "to refer to the unpleasant psychological experience that can result from injurious stimuli". Apparently the difference between humans and fish — at least in this instance — is that in our case we have "massively developed cerebral hemispheres" but fish have only primitive ones and their existence, he says, "is dominated by brainstem functions".

Professor Rose goes on: "Fish have the simplest types of brain of any vertebrates while humans have the most complex brains of any species."

He says that if the cerebral hemispheres of a human are destroyed we go into a comatose, vegetable state. (Cerebral hemispheres are the bits that make us brighter than other mammals. We have the biggest ones on the planet).

He writes: "Fish, in contrast, have very small cerebral hemispheres that lack neocortex. If they are destroyed, the fish's behaviour is quite normal because the simple behaviours of which it is capable depend mainly on the brainstem and spinal cord. Thus a human's existence is dominated by the cerebral hemispheres, but a fish is a brainstem-dominated organism."

In practice this means that to both perceive and be aware of sensory stimuli — like painful bits going through to our skin — you need a complex brain. If the cortex of our brain is damaged we lose awareness of sensations, but other parts of us still work.

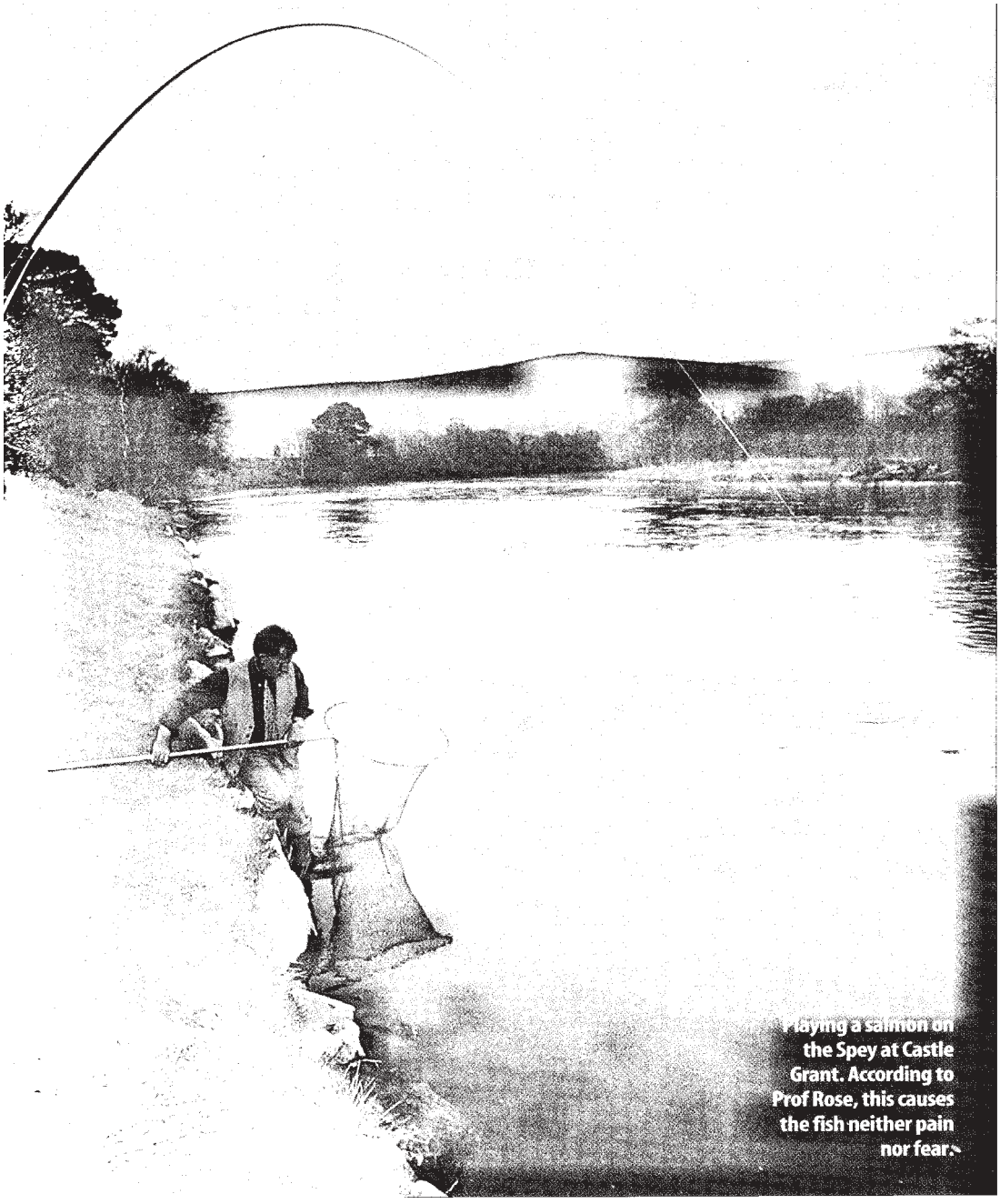
For both fish and humans large parts of the brain are simply like an automatic pilot.

The professor states, "Fish do not have the brain development that is necessary for the psychological experience of pain. These regions do not exist in a fish brain."

In fact, he says a fish brain is simple and efficient, but a bit like a 1949 Volkswagen car.

The human brain, the professor argues, is "more like a modern luxury car with all-wheel drive, climate control, emission controls, electronic fuel injection, anti-theft devices and computerised systems monitoring." That allows us to feel pain but stops fish doing the same.

All of this might be very reassuring for us anglers —



Playing a salmon on the Spey at Castle Grant. According to Prof Rose, this causes the fish neither pain nor fear.

after all, who hasn't been asked that cruelty question at a party?

But what about the fight a fish puts up when it's hooked?

Surely that shows intelligence. How else would a trout know instinctively that it needs to either fling itself in the air to throw the hook or dive into a weedbed or — like most I seem to hook — do both within a minute or two and with a few other tricks thrown in?

Professor Rose argues that the fish isn't consciously fighting at all...

He explains: "It should be clear that fish behaviour is a result of brainstem and spinal ::erns of activity that are automatically elicited by the stimulation of being ·ked, but that fish don't have the brain systems necessary to experience pain."

He adds: "It is very important to note that the flight responses of a hooked fish are essentially no different from responses of a fish being pursued by a visible predator or a fish that has been startled by a vibration in the water...these responses are a general reaction to many types of potentially threatening stimuli and can't be taken to represent a response to pain.

These responses are unlikely to reflect fear for fish because the brain regions known to be responsible for the experience of fear, which include some of the same regions necessary for the emotional aspect of pain, are not present in a fish brain.

Instead these responses are "simply protective reactions to a wide range of stimuli associated with predators or other threats to which a fish automatically and rapidly responds."

So we don't cause fish any pain, or even fear. But we can cause them stress — hardly surprising when you think of it.

The professor writes: "Although it's very unlikely that fish have the capacity to experience pain or suffering, their reactions to nociceptive stimuli (injury, basically) include the secretion of stress hormones. Those stress hormones can have undesirable health effects on fish if they are secreted in large amounts over a long period.

"So it's important when practising catch-and-release to observe the usually recommended procedures of landing a fish before it's exhausted and to return it to the water quickly."

In essence the man is saying that if we try to put the feelings of fish in the same category as our own we're barmy — the posh word is anthropomorphic. Would we compare our mental states with those of an amoeba or an earthworm?

You also need to realise that human brains cater for emotions, language, memory and a capacity for planning. Fish just can't do that.

And what about those who still bang on with remarks like "Well, you can't ask a fish if it feels pain, can you?"

The professor's answer is simple. "The fact that an indirect approach is needed is no ground for suspending judgment. The structural and functional conditions required for a living, viable brain are known. If diverse tests reveal that these conditions do not exist the diagnosis of brain death is made. Although it's impossible to talk to the victim to make a determination of brain death there is a high degree of certainty about the diagnosis."

Interestingly the research, for all its authority which, to me anyway, seems to be faultless in its logic, will probably not influence a single soul who thinks our sport is cruel. It's just something we're stuck with.

The last word

OK, so you're at a party and being accused of cruelty to fish. Here's how to crush your accuser. Quote this from Rose's research explaining how pain travels: "The spinothalamic tract connects directly to topographic somatosensory nuclei of the thalamus which project to the topographic thalamic nuclei. Nocieceptin-related activity from the nontopographic thalamic nuclei is projected to diverse nontopographic regions of the cortex." So there, smart-arse.