Victoria Braithwaite, *Do Fish Feel Pain?* (Oxford: Oxford University Press, 2010). Pp. 194. £14.99 (hb). ISBN 978-0-19-955120-0.

The issue of fish pain should be of fundamental importance to those who participate in recreational and sports fishing, for if fish can suffer and feel pain then moral questions arise about the treatment of fish by anglers (treatment which concerns, for example, the ways in which they are handled) and about the methods of fishing used by anglers (such as the 'catch and release' method commonly employed by recreational and sports anglers). Indeed, if fish can suffer and feel pain then it may be that not only do current methods used by fishing enthusiasts pose ethical problems, but that participation in sports or recreational fishing is morally problematic in itself. Moreover if fish can suffer then welfare considerations that previously may have been thought to be largely irrelevant with respect to fish (in the light of general scepticism about fish suffering) will take on a new importance, and this will have wider ethical and financial implications for the recreational and sports fishing industry.

The question 'Do fish feel pain?' is one which seems to have been avoided for some time partly due to the difficulties involved in answering the question, not just in respect of providing empirical evidence but also in respect of the philosophical and ethical problems involved in attempting an answer. In this insightful book biologist Victoria Braithwaite shows awareness of these difficulties and examines the scientific research to tackle the question of whether fish feel pain. Of course in the UK fish are legally recognised as beings capable of experiencing pain and suffering, yet there is still much scepticism about fish pain. Braithwaite's aim is to present the evidence that already exists for whether fish can feel pain in an accessible way in order to foster informed judgments about fish pain (ch.1). She achieves this with a highly accessible

book that is suitable for all those interested in the fish pain debate and presents the ethical issues in a balanced way.

The research of Braithwaite and her colleagues is fairly integral to the book. Perhaps the last stage of her research is the most significant in respect of the fish pain debate as it addresses whether fish are sentient (ch.1, pp.7-8). Braithwaite explains the mechanics of pain using language that avoids a high level of technicality, distinguishing between nociception ('the… recognition by the nervous system that damage is occurring') and pain ('the emotional sensation that whatever is damaged is hurting') (ch.2, p.40). To answer the fish pain question one firstly needs to determine whether fish are capable of nociception. Only then is it logical to seek an answer to whether they can feel pain (ch.2, p.41).

In chapter three Braithwaite outlines how her research provided clear evidence that fish possess receptors which detect damage to the body and trigger activity in the nervous system and that fish behaviour was affected by this process (p.65). To further determine whether fish perceive or suffer from pain further experimentation was carried out which aimed to discover if complex behaviour was affected by pain stimuli: 'we needed to find a complex behaviour, something that requires a higher order cognitive process that could be reliably measured to see how it was affected by a noxious treatment' (ch.3, p.66). The complex behaviour observed is attention, which Braithwaite explains is a complex process. Trout were injected with a noxious substance and their attention levels were monitored after a novel object had been introduced to their tank:

> Trout are very sensitive to new things. If you place an object into a tank most show strong avoidance behaviour—at least initially… To detect that the object is novel and should be avoided requires that they

> pay attention to it. Attention is… a higher order cognitive process; the animal needs to focus on a single thing while ignoring other aspects of the environment. It needs to perceive that something is new. It requires some sense of awareness (ch.3, p.67).

Trout that had been given the noxious liquid did not show avoidance behaviour when confronted with the novel object, but when given pain relief the fish displayed the usual avoidance behaviour: 'Giving the fish an injection of a noxious substance distracted its attention, but when pain relief was given, the ability to focus its attention increased again' (ch.3, p.69). Braithwaite claims that

> For this to happen the fish must be cognitively aware and experiencing the negative experiences associated with pain. Being cognitively aware of tissue damage is what we mean when we talk about *feeling* pain (ch.3, p.69).

One can see from the above quote that chapter three explicitly states that the research revealed fish can experience or feel pain. After reading chapter three, the reader then will be justified in believing that it has so far been concluded that fish *can* experience pain. Quotes other than the one above confirm this conclusion. Consider some of the other statements, such as 'fish respond to noxious stimuli in ways that indicate they perceive pain' (ch.3, p.74) and 'This result was the most direct evidence yet that fish really perceive and experience pain' (ch.3, p.69).

The reader then may be surprised to find that the beginning of chapter four questions whether fish can experience feelings and feel pain. As Braithwaite questions, 'Do fish experience feelings…?', 'do they really *feel* the pain?' (ch.4, p.76). Indeed, in the light of the conclusions of chapter three, the reader is left wondering why Braithwaite now (in chapter four) questions 'whether fish experience

the negative sensation of pain—do they really *feel* the pain?' (ch.4, p.76). Of course, this question would be all well and good were it not for the statements of the previous chapter (consider the quotes in the above paragraph: 'For this to happen the fish must be… experiencing the negative experiences associated with pain'; 'This result was the most direct evidence yet that fish really perceive and experience pain' (ch.3, p.69); 'fish respond to noxious stimuli in ways that indicate they perceive pain' (ch.3, p.74)).

Admittedly, at the beginning of chapter four Braithwaite appears interested in whether fish can *suffer* (p.77). But since it is stated at the beginning of chapter four that 'suffering is a negative form of emotion' (p.76) that can presumably by caused by a painful experience or feeling pain—as Braithwaite says, 'Feeling pain *is* an emotional experience' (ch.4, p.76)—then it seems reasonable to suppose that since fish can feel pain and have negative experiences (as stated in ch.3) then it is likely that they can also have an emotional experience and can suffer from a negative emotion. Indeed, at the beginning of chapter four Braithwaite states that 'Feeling pain *is* an emotional experience' (p.76), and so the reader would expect it to follow—in the light of the conclusions of chapter three ('that fish really perceive and experience pain' (ch.3, p.69))—that fish can have an emotional experience. However, that this follows from the conclusions of chapter three is not mentioned at the beginning of chapter four. And even accepting that suffering and pain may be different, this still does not explain why there is such focus (in chapter four) on whether 'they really *feel* the pain' (ch.4, p.76), or 'whether fish experience the negative sensation of pain' (ch.4, p.76) when it has been explicitly stated previously (ch.3) that they do. From a philosophical perspective, perhaps some conceptual clarity is called for in respect of the various terms used.

As one reads on one finds that the primary purpose of chapter four is to determine whether fish are conscious by looking at the empirical evidence. But it has already be found that fish are 'cognitively aware' and can experience 'negative experiences associated with pain' (ch.3, p.69), and it seems that a certain level of consciousness would be required for such experiences. As such there seems to be an implicit suggestion in chapter three that fish *are* conscious, so the reader may again be surprised that consciousness in fish is questioned in chapter four (p.77).

However, chapter four is overall well-written and presents some extremely interesting research about the fish brain and fish consciousness. It is suggested that not only are fish conscious, but that some fish may possess the capacity for self-consciousness (as defined by Ned Block) (ch.4, pp.106-12). Contrary to what some scientists have argued (ch.4, p.97), Braithwaite claims that the evidence suggests that fish have a brain structure that enables them to 'have some form of phenomenal consciousness' (ch.4, p.112). Braithwaite draws on her research with the trout to support the claim that fish have 'subjective feelings' (ch.4, p.103), and other research suggests that they have 'the capacity for subjective emotions' (ch.4, p.106). In the light of the evidence of sentience in fish, Braithwaite plausibly concludes that fish should be included as beings deserving of welfare concerns (ch.4, p.113).

The final chapters of the book discuss the ethical issues arising from such a conclusion. If we include fish in our welfare considerations, where do we draw the line? It is clear that Braithwaite draws the line for moral concern at sentience: 'Suffering… is an emotional feeling that involves awareness and sentience. Logically then, we should only care about sentient creatures that have the capacity to experience feelings such as suffering' (ch.5, p.121). However, it does not follow that since suffering is an emotional feeling that we should draw the line for moral concern under

sentient beings. Indeed, it is reasonable to suppose that nonsentient beings have interests that are deserving of moral consideration. Despite this contention, Braithwaite is sensitive to the fact that we do not have sufficient knowledge to say whether some beings are sentient and recognises that 'the absence of evidence does not necessarily mean the absence of sentience' (ch.5, p.134). So Braithwaite is aware that some other beings not usually thought of as sentient may qualify as beings to which we should show moral concern, and her inclusion of fish as beings worthy of welfare considerations certainly challenges the established view of fish and other so-called 'lower' animals as beings of little moral importance.

The reasons why the fish pain question has been avoided for some time are effectively addressed in chapter six. The ethical implications of answering the fish pain question play a role in its avoidance: 'It is possible that we haven't really wanted to know the answer… if fish feel pain, what does this mean for our current practices' such as angling and sports fishing? (ch.6, p.145) As Braithwaite says, 'many anglers… don't want to know whether fish feel pain because finding out that they do may require them to justify their sport' (ch.6, p.146). Whilst this may be the case, Braithwaite is aware that many anglers want to minimise the suffering endured by the fish they catch and are keen to use methods that enable them to do so (ch.6, p.146).

Whilst the treatment of fish by anglers is certainly an important issue in the light of the conclusions of this book, and the panel of scientists judging Braithwaite's research grant application were clearly interested in how her research (outlined in ch.3) might apply to recreational fishing rather than fish farming (ch.3, p.52), Braithwaite is aware that many other interactions with fish give cause for concern. She suggests that some sea-fishing methods cause considerable stress, pain and suffering to fish (ch.7, p.178). Her description of trawling is eye-opening, and many people will

be shocked at the treatment fish are made to endure when caught by this method. The treatment of fish in the aquaculture industry gives cause for further concern, particularly in respect of slaughtering methods which appear to cause a great deal of stress and suffering (ch.7, pp.180-82). Other issues arise from the conclusion that fish can feel pain: 'there is almost nothing known about the effects of captivity and how the fish cope with brightly lit areas crowded, noisy, and bustling with activity' (ch.7, p.173). Braithwaite points out that some fish species display behaviour indicative of frustration and stress when kept in public aquaria (ch.7, p.173).

While Braithwaite is aware of ethical questions arising from our interactions with fish, she is intentionally cautious not to draw ethical conclusions but suggests that our interactions with fish should be more humane. However, in the light of Braithwaite's description of some of the ways in which we treat fish, the reader would not be unreasonable in supposing that some sea-fishing and aquaculture methods cause more suffering to fish than angling, nor would it be unreasonable to suppose that the affects of captivity in some circumstances are more harmful to fish than angling methods. So whilst the conclusions of this book should encourage some anglers to revise the way they catch fish, the conclusions could have far more significant implications for the fishing industry, the aquaculture industry and for the ways in which fish are kept in public aquaria.

Overall, in spite of some contentions, this book presents a well-informed answer to the question 'Do fish feel pain?' and Braithwaite's claim that we should extend our welfare concerns beyond mammals and birds to fish is well-supported. Fish have long been thought of as insentient beings with a limited cognitive capacity, but this book effectively reveals why this view of fish is a mistaken one.

This book is unusual in that it thoroughly addresses the science of fish pain using language that is accessible and at the same time presents the ethical questions arising from the fish pain question. The science and the ethical issues are presented side-by-side in an informative and unbiased way. As such, this book is an important addition to the literature on fish pain, and provides excellent reading for all those interested in animal ethics. References are to high-quality texts that provide the reader with further reading from both sides of the debate.

In its explanation of the physical processes of pain this book may be of use to philosophy students and scholars with a general interest in the 'mechanics' of pain and the relationship between the physical capacity for pain and pain as an emotional phenomenon. Further, this book would be extremely beneficial for students who are studying ethics courses which involve discussion of the use of animals for sport, and it would be useful for scholars interested in researching the use of animals for sport or researching the welfare of fish used for sports and recreational fishing. Indeed, *Do Fish Feel Pain?* would be a valuable read for anyone whose work or hobbies involve coming into contact with live fish or anyone who is interested in making ethical decisions in respect of their treatment, use or consumption of fish.