FortyTwo Talks: Animal Sentience – Part 1

Paul Fuller: Hello and welcome to *FortyTwo Talks*, the podcast which takes a deep dive into the legal world, led by the experienced members of 42BR Barristers.

My name is Paul Fuller. I'm a member of 42BR Barristers with a predominantly business and property practice, and I'm also a member of 42BRs Animal Welfare Group.

I'm joined by two other members today. Marcia Hyde, a practitioner predominantly practicing family law, and Edmund Walters a barrister with a regulatory and civil practice who also prosecutes for the RSPCA.

This is the first of two episodes in which Marcia, Ed and I will be discussing the concept of animal sentience, the legal recognition of animal sentience, and ultimately the implications of all of that.

Suffice to say that shoehorning a millennia of religious and philosophical thought and debate, a few centuries of scientific research and several decades of jurisprudence into two short podcasts is an impossible task. So, this will be very much a whistle stop tour, but it is one that we do hope you will find interesting and informative.

So, Marcia, assuming most of our listeners are human, we're all sentient beings, so probably have an idea of what it is to be sentient. If people ask they might talk about consciousness, awareness, and perhaps even spiritual - the soul, but for an easy opener. What do we really mean when we talk about sentience?

Marcia Hyde: Well, not such an easy opener Paul because what we mean by sentient is still open for debate. It's difficult to define. What we mean as a basic is an ability to experience feelings and sensations. Do we think that is also consciousness? Do animals have consciousness? Some people would say they do. Some people would say they don't.

There's not necessarily an agreement across the board as to what we mean when we say an animal is sentient. It's still open for debate. There's still a lot of

research on it. One of the ways of looking at it, and what I'm going to do is a quick whistle stop tour through religion and philosophy and just look at how humans have seen animals from those perspectives. And that will take us into the areas of animals in science and how science defines animal sentience. So, if you look at religion first, and the ancient religions valued animals, but saw man has the only living creature who could develop a relationship with the gods, and therefore sacrificed animals to appease the gods.

We then moved to ancient Greece and Rome where again, animals were used in rituals, but were also used as symbols for the gods. And they were seen as mediators between man and the gods. And some gods took on animal forms, so they were beginning to be revered.

In the more Eastern religions, say for example Hinduism. Hinduism sees the divine or God in all creatures, and therefore all animals are revered. Animals in Hinduism represent a different divine or demonic quality. So, for example, a cow who we all know is the most revered in Hinduism, that is seen as the divine mother. A swan is symbolic of wisdom, grace, purity, which is why most Hindus are vegetarian.

In Islam, all creatures are seen as conscious creations of Allah and therefore are to be respected and treated with care and compassion. Cruelty and torture are condemned. Animals are still seen, however, as created for human benefit, but must be treated ethically and humans must be seen to cause them as least suffering as possible.

But also in Islam, which is quite interesting, is animals are seen to be conscious of God and in their own way praise him, which I find a very interesting concept when we look at consciousness and belief, et cetera.

In Judaism, humanity again has dominion over animals, but cruelty is strictly forbidden.

Buddhism is the only religion that accepts that all animals are sentient beings. Also, the concept of rebirth - so that any animal can be reborn as a human, and any human can be reborn as an animal. And they're therefore interconnected. The taking of life is banned and applies to all sentient beings and also extends to the animal world and will come on to see the difficulties which science has with

trying to see where, for example, insects may be sentient, whereas they accepted on the Buddhism has being sentient.

And I think Ed, you had a view about Catholicism and stewardship, didn't you?

Edmund Walters: Yes, I was just going to mention, well, two religions and contrast them very, very briefly. I mean, there's the ancient, and you touched on the ancient Indian religions. I mean, Jainism, one of the oldest of all has this concept of Ahimsa, which is one of the main pillars of it, fundamental principle, forming very much the cornerstone of the ethics and doctrine of that particular ancient religion. It means really nonviolence or non-injury to any life form at all. And it seems that Jains have this concept that really, the life force, or rather the soul is present in every single animal and even plants.

And that this idea of Ahimsa, non-violence, is different from the concept perhaps found in other philosophies and religions. It's the idea that if you harm living beings, you actually are harming your own self or your own soul, which is in contrast to, and of course, they don't have the concept of an overall creator, you are in a cycle of birth and rebirth and reincarnation, and the idea is that by your behaviour and your ethics, you can escape the cycle of birth and rebirth.

In contrast in Catholicism, of course, where they have of course a concept of an overall creator. You have the seventh commandment in Catholicism is interpreted as being respects the integrity of creation and in the Catholic catechism, it very much, there's quite a lot of mentions, and I'll be very brief about this, for mentions of animals, and it's very clear that the use of vegetable and animal resources can't be divorced from the respect for moral imperatives and the man's dominion, which is a concept, man's dominion over the inanimate and other living creatures is granted by the creator. But it's not absolute. It's not, it's very much limited by the concern for your neighbour. But also it requires a religious respect for the integrity of creation, which of course, in relation to animals, which are all God's creatures, Catholics have very much have a duty of stewardship and providential care.

And that their mere existence means that men and women owe them kindness and also very much that's in the lives of the Saints, of course, St. Francis of Assisi being the patron saint of animals. And there's plenty of stories from his life about his contact with animals and his interaction with animals. For example, one example, I won't dwell on them, when he talked to the birds, the darted, the crows and other birds, and effectively preached to them and that they were able

to listen and take it in. So very different, but again, enormous respect for the animal kingdom in both those religions, but from a very different ethical perspective and religious perspective.

So, it's very interesting. And one last point is that it's a very ancient idea, the idea of animal sentience really. And even in ancient Rome, for example, you've got porphyry, the first perhaps treaties on vegetarianism, the abstinence from eating animals. Again, on the basis that because all animals are rational beings, he said that you should not eat animals for that reason. And he certainly directed that teaching towards philosophers, if not soldiers or athletes and asked them to adopt a vegetarian diet for that reason. So, it has an ancient history, this idea of animal sentience and also animal welfare.

Marcia Hyde: Yes, and then I mean that's reflected, some of that is reflected, in philosophy and the development of philosophy, and the idea still remains, I think, in philosophy, which is reflected in religion, which is man still has dominion over everything. So, if we start off with Aristotle again, exactly that, nature has made all animals for the sake of man.

So again, it's animals to be used, but usually always without cruelty and with care. Chinese philosophy is very different in the sense that - always a recognition that animals could suffer and should therefore be treated with care and compassion. So, it's slightly more towards the idea of animals as being sentient than Aristotle was, which was really animals were there for humans to use.

We then get to Descartes when human philosophy develops and Descartes early 17th century, so 1596 to 1650. His emphasis on reason as a way of understanding the world or explaining the world, and he saw reason and sentience as identical. He felt that animals had no reasoning, no thought, no consciousness or soul, and could not therefore be sentient.

How he did see them was something which I think when we look back on it now, we find very difficult. He saw animals as complex biological machines and he experimented on them. He did a lot of vivisection and a lot of quite vicious, cruel experiments on animals, and he considered they're, what we now know or accept are expressions of pain both the physical reactions and the screaming and the noise. He considered them simply to be automatic reflexes and not expressions of pain. So that was a very tropical era.

By the time we get to the 18th century, we get to utilitarianism and Jeremy Bentham and his introduction into principles of morals and legislation, and he very much looking at animals and humans and how to improve the human condition for one and all, as it were.

He directed us in respect of animals and said *don't ask whether or not animals can reason, don't ask if they can talk, but ask can they suffer?* And that was a real change, a very fundamental change, in the philosophical approach to animals during that century.

We then move on to behaviourism in the early 20th century, which originally was a psychological theory to understand human being but was also extended to animals, and that was in the works of Watson and Skinner. And that saw behaviour, both in humans and animals, as a reflex to stimulus from outside in the environment, and that led to concepts such as reinforcement of behaviours, punishment for behaviours, when applied to animals it led to a view that animals really had no innate capacity to experience pain, suffering, or pleasure, they were simply responding to stimulus.

And I think this is still reflected in some of the experiments, which now more modern philosophers and scientists do to try and establish sentience in different creatures. And it's central to an idea of balance, which I know Ed and Paul you are going to talk about in a moment.

And then lastly, bringing us up to date in the way humans think of being in the world is a phenomenological approach which looks at consciousness. By the time of the 20th century, early 20th century, people like Husserl, Heidegger and Sartre, they are looking at things very differently and emphasise the structures of subjective, conscious, individual experience.

So, Heidegger talks about an individual being in the world, and then the search for meaning within that context rather than for the scientific behaviourist, causation, explanation. And it comes very much a focus on understanding consciousness and subjective experience and that starts to bleed us into the work of the more modern philosophers looking at sentience.

Birch, Broom, and in fact, I think Browning and Viet, they recently in 2021, are coming to understand that trying to use a phenomenological approach might give us a different way of trying to understand animals' experiences. Although

we can't know what it is to be a bat or a bird, we can use different philosophical ways in which we try to find meaning in consciousness and being, which will help us better understand how to find out which animal is sentient, and actually what do we mean by it?

So that leads lastly into the animal liberation approach, philosophical approach, to someone like Peter Singer, who argues that equality is a basic moral principle, because there's always a overlap between sentience, morality, ethics, religion, philosophy, and what Singer would say is that equality should be applied to all animals because they have capacity to suffer.

So that was a very, very, very whistle stop tour of some of the ways that we can look at animal sentience and philosophy. But the main work is done on trying to uncover and unearth sentience in animals, and that's really through the scientific approch. So that takes us to Ed, because Ed, you, I think, were going to talk about the Cambridge Declaration of Consciousness.

Edmund Walters: Yes. I'll touch on that, one thing just whilst you are there with Peter Singer, he does say in his sentinel work, which of course in 1975, The Great Work Animal Liberation, he does refer to animal sentience and he refers to the fact that philosophers have attempted to use sentience as a way of drawing the line of moral worth, and you've touched on morality there.

It's morality, moral worth of an animal, I suppose, has been a central thing, central concept to the idea of if you're providing them with some welfare, rights or protection, then you have to determine which animals are covered. And he interestingly drew the line, a blind sentience if you like, somewhere between a shrimp and an oyster. But you have asked me to, to say something about the Cambridge Declaration of Consciousness. This was July 7th 2012, where there was a prominent group of scientists from all around the world, they came together to sign this declaration in which they affirmed really the evidence, that evidence indicates that many types of non-human animals have the capacity for consciousness and in the declaration, essentially they state this as follows, I can just say this, they state in this declaration, *conversion evidence indicates that non-human animals have the neuroanatomical neurochemical and neurophysiological substrates of conscious states, along with the capacity to exhibit intentional behaviours. Consequently, the weight of evidence indicates that humans are not unique in possessing the neurological substrates that generate consciousness. Non-human animals, including mammals and birds and many other creatures, including octopuses, also possess these neurological substrates.*

And what they mean by neurological substrates refers really to the foundational structures in a nervous system that makes it possible to generate consciousness. But there's no single substrate or structure that is necessary for consciousness across all types of animals and the structures that can give rise to consciousness are different in different animals.

So, this leaves a level of uncertainty still today. And the human-like brain structure is not required for consciousness and the are other structures, and there's a lot of detail. Research has gone on since then and before, before 2012 in this area. And we can move on then to Jonathan Birch, professor Jonathan Birch, who's very important in this.

And I don't know, Paul, if you are going to say something about Broom, first of the definition of Broom.

Paul Fuller: Yes. Thank you, Ed. Well, of course, the Cambridge definition of consciousness, might be said marks a real seismic shift in the academic approach to animal sentience. But as you alluded to there, it still really leaves open the question, how do we define animal from the scientific perspective, and I know that probably you're going to come on to talk about the precautionary principle which is highly relevant in that regard, but perhaps a not unreasonable starting point might be reference to the encyclopaedia of animal behaviour. And that sets out in its third edition various definitions, and as lawyers of course, we like definitions, and as an obvious starting place is the definition of sentience and the encyclopaedia says this about sentience - *it's having the capacity, the awareness, and cognitive ability necessary to have feelings.*

So just like a good lawyer would do, the next question we should ask ourselves is, well, what do we mean by those other terms, awareness, and feelings?

Well, the encyclopaedia tells us that feelings is a *brain construct involving at least perceptual awareness, which is associated with life regulating systems and is recognisable by the individual when it reoccurs and may change behaviour, or act as a reinforcer for learning.*

And lastly, awareness. The encyclopaedia says *is a state during which the concepts of environment and self and crucially of self in relation to environment result from complex brain analysis of sensory stimuli or constructs based on memory.*

And those definitions are cited in a 2012 paper by Professor Donald Broom, who was appointed as the world's first professor of Animal Welfare in 1986. He's a world leader. He's currently based at the University of Cambridge Veterinary School, and as you might imagine, has written extensively on the subject of animal sentience and Broom posits that a sentient being is one that has some ability to evaluate the actions of others in relation to itself and third parties.

So, there we have the idea of the animal having an idea of itself separate to everything that is not itself, to remember some of its own actions and their consequences.

So, there we've got the capacity for memory.

To assess risks and benefits.

To have some feelings. And to have some degree of awareness. So, lots of elements there. Ed, has the academic world tended towards favouring any of those elements over others when trying to really pin down what we mean when we talk about animal sentience?

Edmund Walters: Yes. Moving on then to perhaps, Professor Birch, Professor Jonathan Birch, he's the professor of philosophy at the London School of Economics, and he very much has been an important figure in the realm of animal sentience and indeed in relation to the Animal Welfare Sentience Act 2022, which we will come onto in our second part of this podcast, and Professor Birch has a definition of sentience, which he uses and has used in relation to the Sentient Act, which I'll call it, but also he's written a book quite recently, 2024, called The Age of Sentience. But sentience takes in a broad sense meaning the capacity to feel, in an narrow sense it refers to the capacity to have feeling for the positive or negative quality. And that's valence.

The idea of valence experience and as sentient being in the sense relevant to what he has devised a framework, framework of principles, using the definition of sentient being as being a system with a capacity to have valence experiences, such as experiences of pain and pleasure. So, it's not as simple as saying, a sentient being is sentient because it can feel pain or because it can feel pleasure, it's something more complex than that.

And we'll go on, in a moment to the definition, or rather the tests that he proposes to determine whether or not a particular animal or particular species can be regarded or could be regarded as a sentient.

And what he does is that he calls a particular system or particular animal, we're dealing with animals, a sentience candidate. If there is an evidence base and it's very much evidence base, that implies a realistic possibility of sentience in that particular animal and that it would be irresponsible to ignore that when making policy decisions that will affect that particular species of animal or particular animal, the evidence base then is strong enough, or rich enough, to allow the identification of welfare risk, and to design and assess some precautions that you would take to protect the welfare of that particular animal. So those are sentient candidates, of course, all vertebras really, and it is perhaps common sense.

And, and one thing I would say, from a personal point of view is that to me it's obvious that, in a lot of cases, that animals are are sentient, I don't need to be a philosopher or a scientist or a theologian to know personally that a dog or a cat is sentient. Everyone would probably agree with me there, but I would go further than that to say that Cephalopods, octopuses again, you would say, and you know, I've watched the program *Octopus My Teacher*, and a lot of people have, and they've come out, having watched that program will say, if they had any doubts, which I didn't have any way, that an octopus is plainly a sentient being that plainly they are. And not just that, of course they're highly intelligent beings, but that's not the test. And I think it's accepted across the board that intelligence is not the same as sentient, and that's a very important point.

But octopuses are plainly in my view, and most peoples view now, I think, are both sentient and intelligent, but that also applies perhaps to other creatures. And again, it's often a matter of personal awareness or rather assumption that other animals are plainly sentient, even smaller animals than that.

And of course that's the debate that's important from the point of view of law, of course. And what policies, what laws should be made to protect species of animals? And what species, which species do you protect? And this in his writings, and particularly the edge of sentience and other pieces of writing, Professor Birch and other philosophers and scientists have tried to come to a test, if you like, for determining whether or not an animal is sentient in the sense that you then must take precautions and identify welfare risks, and the government and the group should take steps to protect the welfare of such

animals. So the sentience candidates where there's good evidence really of sentience, but there's also, he identifies investigation priorities.

That's where an animal, a particular animal, might fall short of the requirements for sentient candidature, and it requires further investigation. And that might cover insects, fish, perhaps some smaller crustaceans, smaller shrimps, brine shrimps, for example. I don't know if you remember, they're called sea monkeys, but you know, are they sentient? When you get those as pets and you put them in water, there's a kind of cyst, I don't think they're eggs, they're cysts or something, and they come alive. But are they sentient?

And the same is true of course of gastropods. Are slugs and snails, are they truly sentient beings? Now, again, in my personal opinion, they do appear just as a lay person, not as a lawyer or theologian, they do appear to be sentient beings. They're certainly highly sensitive and they certainly appear to be sentient in the sense they react and appear like they might feel pain. There's a debate of course about that. But they're not like us, of course, they don't have brains. They have ganglia, which are collections of nerve endings or nociceptors.

Marcia Hyde: What I was going to ask you, Ed, was in the Birch framework, the precautionary framework, because as lawyers, we think about standard of proof and his standard of proof is bar an act. I mean, can we, as lawyers, can we see them as balance of probabilities? Beyond reasonable doubt?

Can we use those kind of terms or?

Edmund Walters: Well, I think he talks about precautionary, erring on the side of caution, in his works and in particular in this book, the Edge of Sentience, which is very good book. And I think this framework, and I haven't really mentioned the framework, I think I should say what the principles are in this framework.

There are three essential principles and the first principle is the duty to avoid causing gratuitous suffering. Now, that's again, past quite an obvious principle, and of course we've touched on that in all the world religions really have that principle or ethical starting point that you do have a duty to avoid gratuitous suffering at a minimum, really, to sentient beings, either intentionally or through recklessness or negligence. But of course, you've got to determine what are sentient beings first before you get to that point.

Of course, not all suffering is gratuitous and it might happen in the course of defensible activity, despite some proportionate attempts to prevent it.

And, and again, the issue of, or the principle of proportionality is very important within this framework. And the framework principle two that he has formulated is that sentience candidature can warrant precautions. So, if a particular animal was a sentient candidate, then it would be reckless or negligent to make decisions, that be policy decisions or any decisions, to create risks of suffering for that animal without considering, very importantly, the question of what precautions are proportionate to those risks.

So, if, for example, you determined that a particular animal, a gastropod for example, a snail or a slug, was a sentience candidate, what the question a government should ask is what precautions would be proportionate to risk to those particular animals?

And then the framework principle three is that assessments of proportionality, and this may go to your point, Marcia, of how do you do that, once you've determined that there's a sentience candidate and there's no certainty, there's an element of uncertainty, even with sentience candidates, and there's also disagreement between different groups, scientists, philosophers, even about sentient candidates, but there's certainly disagreement in animals which may be described as investigation priorities. That's gastropods, for example, slugs and snail, the garden snail

But the framework principle three, he's formulated is that assessments of proportionality should be informed, democratic and inclusive, that's the phrase. And that he recommends that the democratic process should be used to assess what proportional measures should be taken in a particular case. And he talks about the citizens panels or assemblies to assess the proportionality of possible responses. And he uses something called the PARNC test, permissibility and principle adequacy, reasonable necessity and consistency.

But there's a lot of detail in that book and in his thinking, which I can't cover In this short podcast. But, obviously this is all very interesting and perhaps I'll hand over to Paul to talk about the IME definitions.

Paul Fuller: Thank you, Ed. Yes, whilst Birch's framework model, his incorporation of the precautionary principle and as Marcia has touched upon,

his bar an act test, which is really an expansion as I understand it, of the precautionary principle where, so long as there is sufficient evidence, it doesn't have to be perfect evidence of sentience, then the threshold is met. Whether that's on the balance of probabilities or something else, I don't know. But if the threshold is met, then we must act, and that's a moral responsibility that we have. It's still very much a philosophical approach and it still leaves open this question. How does one go about assessing whether that threshold is met by reference to scientific criteria?

And I suppose early contributors to the science focused approach to establish sentience in animals was in a 1991 working paper of the Institute of Medical Ethics and that posited seven criteria which ocus very much on pain experience, and that's something that Ed has touched upon, the balance aspect.

And those seven criteria are possession of receptors sensitive to noxious stimuli, second possession of brain centres of a higher level which are analogous in some way to the human cerebral cortex. Number three, a possession of nervous pathways connecting the nociceptive system to the higher brain centres.

Fourthly, the existence of receptors for opioid substances, especially within the brain. Fifth, evidence that analgesics modify the animal's response to stimuli that would be painful to a human. Six, functional similarity to the human response to stimuli that would be painful. And lastly, persistence of an animal's behavioural response to a painful procedure, and I suppose that's incorporating the learning and the memory aspects that we touched on earlier.

Criticisms of the IME seven criteria include the fact that they are designed solely to assess vertebrates and not other invertebrate species that we've heard about, but also in significantly that they focus very much on pain response and behavioural criteria.

And it's being argued that, for example, just because an animal might recoil from a painful experience in much the same way that we will when if we were to touch a hot stove, it doesn't necessarily mean that that animal is experiencing pain or that that animal is experiencing the feeling of fear and anxiety that comes with the experience of pain.

When we recoil from touching a hot stove, for example, and we can all think about this, the pain comes later, the experience comes later. The actual act of

recoil is very much an automotive response and arguably not evidence of sentience, but rather just an automatic response. And Ed, I know you were going to talk about the efforts that have been gone to try to finesse and refine key indicators of animal sentient within the scientific community, following on from the IME seven criteria.

Edmund Walters: Yes, absolutely. You touched on one of the main problems with the IME criteria, which is this idea that a reflex in an animal is not necessarily convincing evidence of pain. And there's another problem that's been identified by Professor Birch and his team.

But Professor Birch says, well, there's an assumption in criterion four about the type of neurotransmitters that modulate aversive experiences. And that assumption may not be done for invertebrates. And there are other types of neurotransmitter that may potentially modulate aversive experience.

Paul Fuller: And that's receptors for opioid substances?

Edmund Walters: Yes, that's correct. So, it's the idea that, that it concentrates these criteria, the IME criteria, perhaps too narrow. Criterion four is the reference to opioids, which is perhaps too narrow. So, what he and his team did at the London School of Economics and Political Science, the LSC, they developed a new set of criteria, which they've called the LSE Criteria, or he's called the LSE Criteria. And the criteria one to three of these new criteria, they replace the emphasis on higher and lower brain regions with an emphasis on the integrative brain regions receiving input from multiple sensory sources. But, briefly, I think perhaps maybe the last thing we can do on this part of the podcast, the criteria which all still focus on the idea of pain, there's eight criteria there, nociceptors is number one. That's the animal possesses receptors, sensitive to noxious stimuli, nociceptive, if I pronounce that correctly. Number two, sensory integration. The animal possesses integrative brain regions is capable of integrating information from different sensory sources.

Number three, integrated nociception and the animal possesses neural pathways connecting the nociceptors to the integrative brain regions. Four analgesia, the animal's behavioural responses to noxious stimulus is modulated by chemical compounds affecting the nervous system in either or both of the following ways:

A - *the animal possesses endogenous neurotransmitter system that modulates in a way consistent with the experience of pain, distress, or harm, its responses to threatened or actual noxious stimuli.* So this idea of noxious stimuli and really a reaction to that is very essential to the, to these criteria as well.

B - *the other way in which the animal's behavioural response to noxious stimulus is modulated by chemical compounds could be putative, local anaesthetics, analgesic, such as opioids or antidepressants modify an animal's response to threat or actual noxious stimuli in a way consistent with the hypothesis of these compounds attenuate the experience of pain, the stress or harm.*

So, these criteria are very much focused on the idea of the evidence of pain, distress, or harm.

And five - motivational trade-offs. The animal shows motivational trade-offs in which, for example, the disvalue of noxious or threat stimulus is way or traded off against the value of an opportunity for reward leading to flexible decision making.

Six -flexible self-protection. The animal shows flexible self-protection behaviour, for example, wound tending, guarding, grooming, rubbing of a type likely to involve representing the bodily location noxious stimulus.

Seven - associative learning. The animal shows forms of associated learning in which noxious stimuli become associated neutral stimuli or in which novel ways of avoiding noxious stimuli alert through reinforcement. These forms of associated learn go beyond classical conditioning, which a single condition stimulus overlaps temporarily within conditioned stimulus.

And then eight - analgesia preference. The animal shows that it values a putative analgesic or anaesthetic when injured in one or more of the following ways:

A, the animal learns to self-administer putative analgesics, or anaesthetics when injured.

B, the animal learns to prefer when injured in location, which analgesics or anaesthetics can be accessed.

C, the animal prioritises obtaining these compounds over other needs, such as food when injured.

So those are the criteria, which again, they concentrate very much on the idea of pain, distress, or harm or evidence of those are indicators, really.

Paul Fuller: Thank you, Ed. So, that paper I think that you've been referring to is Jonathan Birch's 2021 Paper Review of the Evidence of Science in Cephalopod Molluscs and Decapod Crustaceans, and that paper was instrumental in amendments to the Animal Welfare Sentience Bill, which has now become the Animal Welfare Sentience Act 2022 at include decapod crustaceans and cephalopods within the scope of the Act and that really leads us nicely into the topic for the second instalment in this two podcast series where we are going to be looking at animal sentience, it's recognition in the law and the implications of that.

I suspect we've run woefully over time and we're going be in trouble with our PR lady here, but quite right too because as we said this is a broad subject and we've really only scratched the surface.

But we hope you've enjoyed this.

Thank you for tuning in to *FortyTwo* talks, to listen to other episodes, and of course, this episode and the next episode and you can find us on Apple Podcasts or wherever you else you get your podcast from.

Thank you for joining us. Bye-bye.