Pain, Life, and God: Theodicy Informed by Biology and Evolutionary Medicine

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Abstract: Pain is a ubiquitous phenomenon. Since the beginnings of philosophical thought, the question of the nature and origin of pain has developed. However, it also raises the question of how an omnipotent and morally perfect God can allow so much pain and suffering in the world. In this paper, we analyze the findings of biology and evolutionary medicine to better understand the phenomenon of pain. Based on these insights, we then seek to enrich theological and theodicean reflections on the relationship between pain, humans, and God.

Keywords: pain; theodicy; evolutionary medicine; evil; animal sentience

> "Pain always seems like a problem, but usually, it is part of the solution"
>
> (Nesse and Schulkin 2019, p. 1)

1. Introduction

The experience of pain and suffering is familiar to almost all members of humanity. Pain overwhelms our bodies, overwhelms our consciousness, changes our mood and the way we are in the world, and the way we treat ourselves and others. It also changes our relationship with God: pain and suffering often motivate people to pray, hoping for healing and deliverance from pain (Platovnjak 2022; Roszak and Seryczyńska 2020); but it can also arouse anger toward the "indifferent" God (Exline 2020).

Theological and philosophical reflections on the nature of evil are influenced by the understanding of the phenomena of pain and suffering but often we find authors reflecting only on suffering. Pain hurts, and it is almost as if we are in a state we should not be in. It is as if we are in a state of punishment, even though we may not be guilty. As if we do not deserve to be so fragile. Pinsent puts it beautifully: "We are not what we should be" (Pinsent 2018, p. 134). On the other hand, there is a well-known attitude, expressed also by St. Thomas Aquinas, that physical pain can lead to the strengthening of the soul and the virtues, even if pain is more palpable and obvious to human reason than the joy of virtue.

We opened the article with the words of the American physician Randolph Nesse, the founder of evolutionary medicine, who announced a different view of the phenomenon of pain. If pain is shaped by the evolutionary development of living beings, in what way can this insight inform theodicy?

After a short theological and theodicean reflection and an introduction to evolutionary medicine, we will attempt to provide a definition of pain, how pain is triggered in the human body, and how pain is studied in animals. This will give us an evolutionary insight into the development of pain in living beings. Then, we will try to see how theology and theodicy can benefit from insights from biology and evolutionary medicine into the dimension of pain.

2. Short Theological and Theodicean Prelude

The tradition of theological reflection on the human condition, which inevitably includes pain, suffering, and death, abounds with attempts to make sense of these conditions (Bourke 2014, p. 91). Together with the degree of suffering (and the context of the concrete

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situation), the severity of pain is the fundamental moment by which we evaluate the gravity of the evil, the injustice, the crime, the injury that a living being endures. The phenomenon of pain is therefore inseparable from theological and theodicean reflections on the human condition, God, and evil.

We cannot go into detail about the theological foundations of these concepts here. However, we can point out some important moments of these foundations. Challenged by human frailty and the inevitability of pain and suffering, Christian theological reflection turns to Jesus, who experienced great physical pain (but also emotional pain—"Eli, Eli, lama sabahtani?") and death on the cross. At the same time, those under the cross experienced emotional suffering and pain, like his mother Mary and Mary Magdalene (*Biblija* n.d., Mark 15:33–42). Jesus was the Lamb of God who took away the sin of the world through his pain and death (*Biblija* n.d., John 1:29). However, why sin, pain, and death in the world? According to the Book of Genesis, Adam and Eve chose to disobey God and were expelled from Eden, from that perfect state that we intuitively believe was without pain and suffering. Since St. Paul and the fifth chapter of Romans (*Biblija* n.d., Rom. 5:14; 8:20), Adam is the one through whom mortality and sin became part of the human condition. His free choice caused the Fall; that is, a rupture and alienation, both from the painless state they were in and, more importantly, from God. Theology seeks to understand this alienation after the Fall (Rosenberg 2018), which undoubtedly includes pain, as well as the relationship to pain—the meaning, the understanding, and the way to bear it.

From a theological point of view, perhaps we could say that pain is an important factor in a dynamic relationship between: (a) *the past state* of integrity and original holiness characterized by initially pain-free creation (Van der Brink 2018, p. 117); (b) *the present state* of sin, pain, and suffering; and (c) *the future state* of the new heaven without pain that the faithful invoke every time they pray the "Our Father".

Theological reflections confronted with the modern findings of genetics and evolutionary theory reflect these moments and try to understand the pain and suffering of living beings before the appearance of human beings, but also the palpable evil that has existed with the appearance of human beings until today (Lloyd 2018, pp. 210–11; Aguti 2017). In the abundance of views and given the close relationship between pain and suffering, it is understandable to encounter views that proclaim pain and human frailty as a kind of punishment, abandonment by God, especially if they believe that God takes revenge. For some, pain is the inheritance of Adam's disobedience. However, is this the right category for the phenomenon of pain? Is pain, as part of human mortality and imperfection, a punishment?

Theodicy, a term coined by Leibniz (1710), is a discipline that grew out of the human desire to argue for an omnipotent and morally perfect God in the face of natural and moral evil in the world. That humans (and some other animals) feel pain is prima facie seen as a bad thing that raises the problem of evil (Stump 2010, pp. 4–5). However, there are cases where enduring pain is voluntary and therefore not bad per se, such as strenuous and painful training by professional athletes. Stump therefore points out that "pain is not necessary for something to be an evil which human beings suffer" (Stump 2010, p. 6). Also, Southgate eliminates pain in nonhuman creatures as a problem for theodicy (Southgate 2022). It seems that the emphasis is on the moment of suffering, while physical pain is primarily placed in the realm of a biomedical phenomenon that can be eliminated to some degree. Benedict XVI writes how "great progress has been made in the battle against physical pain; yet the sufferings of the innocent and mental suffering have, if anything, increased in recent decades. Indeed, we must do all we can to overcome suffering…" (Benedict XVI 2007, nu. 36). So, are we talking about a wrong phenomenon? Perhaps we should be talking about suffering.

Nevertheless, in the next chapters, we will attempt to provide insights that point to the mind/body dualism that causes this unclear and often oversimplistic division between pain (physiological sensation) and suffering (psychological response to pain) (Denny 2018, pp. 125–40). Studies have shown that unwanted break-ups with partners cause emotional

pain or suffering that activate the same neural architecture as when we feel physical pain (Kross et al. 2011), showing just how connected the two phenomena are. Furthermore, could it be that pain is a fundamental phenomenon of the human condition and a basis for most kinds of suffering experiences? Or are we perhaps dealing with the paradox of the inseparability of pain and suffering? Pain is, in most cases, the first and immediate sign of a possible evil (moral or natural) suffered by a living being. The human face opens the otherwise closed world of others and inevitably points to the pain that dominates the organism. Perhaps we can say that *without pain there would be no need for theodicy*.

Pain and suffering are two terms that are often synonymously used in the literature, and their distinction is anything but clear, if possible at all. This paper is not about distinguishing between them, nor is it the aim of this paper to delve deeper into the layering of the phenomenon of suffering as such (Mijatović 2021). The goal is a better understanding of the phenomenon of pain, which is usually considered prima facie bad (and evil), with consequences for theodicy considerations. Given the multidimensional nature of pain, we need an interdisciplinary approach for a better understanding of pain and its role in the human condition (Roszak and Horvat 2022). In the spirit of the movement of *science-engaged theology* (Perry and Leidenhag 2021), which seeks to answer certain theological questions with the help of science, the following chapters aim to shed light on some insights from the perspective of biology and evolutionary medicine on the topic of pain, and to consider how these insights can contribute to the mentioned theological-philosophical questions.

3. Evolutionary Medicine and Pain

Evolutionary theory, like a "universal acid", spills over into and alters all fields (Dennett 1995, p. 63), including medicine and religion (Horvat and Roszak 2020; McLeish 2020). Evolutionary medicine is the field that uses the principles of evolutionary biology to better combat disease.

One of the topics in the field of evolutionary medicine is pain, which is viewed in the context of the evolution of life. Building on the biological perspective on pain, researchers have looked at "the mechanisms and functions of pain from an evolutionary perspective" (Walters and Williams 2019, p. 1). This approach leads to questions such as: how and by what mechanisms the sensation of pain arises in living things; which species are able to feel pain; how the ability to feel pain leads to selective benefits, etc. (Nesse and Schulkin 2019). Another important question is: why does pain hurt (Kolodny et al. 2021)? Namely, why do we need to feel the unpleasant toothache, why is it not enough *just to know* that our tooth is decayed?

Today, we have "a rich body of knowledge that describes the mechanisms that mediate and regulate pain at levels from genes to molecules to tissues and organs" (Nesse and Schulkin 2019, p. 1). Yet the question of which areas of the brain are responsible for pain is still a hotly debated topic. In the evolutionary framework, scientists are gaining more and more information about the evolution of mechanisms and behaviors related to pain, but they are still far from a decisive answer (Walters and Williams 2019, p. 1).

In the following sections, we will briefly discuss the definition of pain and then look at pain in humans and other living things.

4. Definitions of Pain

The definition of pain is an ancient aporia that arose from the ancient Greeks' dualistic view of the human being as a unity consisting of a soul and a body. Hence, the definition had its many twists and turns between pain as an emotion and pain as a sensation (Craig and MacKenzie 2021, p. 108; Boddice 2017). We now look at a more recent definition of pain by the International Association for the Study of Pain (IASP), which defines pain as: "An unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage" (Raja et al. 2020, p. 1976).

It is clear from the definition that it is recognized that pain has two sides, a physical sensation and an emotional experience (which may precede pain, as an intrinsic feature or

as a consequence (Craig and MacKenzie 2021, p. 108)). The definition is further clarified by the addition of six key points. It is stated that pain is a personal experience and that other factors (biological, psychological, and social) contribute to this phenomenon. In addition, pain is distinguished from nociception in order to avoid reducing it to sensory perception. Nevertheless, the activity of nociception is usually the trigger for pain, while its amplification increases pain (Walters and Williams 2019, p. 3). As it is a personal experience, pain is something that is learned through experience, and subjective experience should be respected when talking about pain. From an evolutionary perspective, it is considered an adaptation, but in certain cases it can be maladaptive (have a negative impact on wellbeing). Although people can usually give verbal feedback, this is only one way of describing it. This means that there are other behaviors that can indicate the experience of pain in living organisms, including other creatures (Walters and Williams 2019, p. 3).

Although the definition seems broad, there are additional warnings that pain is still not well defined because the focus is mostly on sensory and emotional features, while important cognitive and social features are not emphasized enough (Craig and MacKenzie 2021). Another problem is that the language of pain is still shaped by the dualistic anthropology that divides pain into the realms of body and mind.

5. Pain in Body

We have seen that pain is a multidimensional phenomenon, but also noted that "the experience of pain is characterized by tremendous interindividual variability, which is driven by multiple biopsychosocial factors" (Fillingim 2017, p. S11). Biopsychosocial factors are emphasized in the biopsychosocial model of pain, where social factors also play a role, not just brain and mind (Boddice 2017). People understand themselves as members of a society and may also experience pain when, for example, they lose status or receive stigma, have their hearts broken, are exploited, or experience social trauma (Craig and MacKenzie 2021, pp. 107–8). The experience of pain also changes at different levels as people develop from birth to adulthood (Craig and MacKenzie 2021, p. 108), and the management or control of pain varies between people.

Leaving the subjective and social dimensions of pain aside as much as possible, we are now interested in how the sensation of pain is triggered in the human body. We are now in the realm of the biomedical model, where pain is an "expressions of a discoverable disease process and that there is a reliable connection between pathological changes and clinical features" (Quintner et al. 2008, p. 825). Receptors in the body perceive, transmit, and encode information from our body and the external environment. This ability is called sensation. A large part of the brain is responsible for these functions. The perception of painful stimuli based on specific receptors and pathways is called nociception (Latin *nocere*—to harm). The neuronal endings that trigger the sensation of pain are called nociceptors.

For example, the receptors on the surface of the skin perceive impacts from various possible sources: something sharp touches and cuts the skin; our fingers touch a hot oven; a strong hand presses on our hand; any kind of stimulus that at least slightly physically or chemically damages the tissue. Certain substances leak out of the damaged cells, causing an electric current, which is then conducted further to the back of the spinal cord. From there, simply put, the signal rises to the thalamus in the central part of the brain, and from the thalamus to the cerebral cortex.

The signal causes different brain centers to be activated, which can cause the sensation or feeling of pain. Because the brain contains maps of the entire body, we can quickly find out where damage is occurring—where it hurts. There are people with pain deficiency (congenital insensitivity) who cannot feel pain, causing them to accumulate more and more tissue damage. Unfortunately, these people have a much shorter life expectancy.

Although often unpleasant, pain warns us that our bodies are in danger, and can thus save our lives. At the same time, we learn and remember dangerous and painful situations, we can adjust our motivation and avoid these situations in the future. Our past experiences

of pain can also influence the way we will experience and respond to similar pain stimuli. You could say that pain is the survival tool of life.

6. Pain in Animals

We have seen the problem of defining pain. It seems that the emphasis on subjective experience is homocentric because subjective experience causally leads to the notions of selfhood and individuality that are reserved for the species Homo. Moreover, subjective experience is primarily verbally mediated, and all other animals cannot verbally express their painful states. Of course, it is pointed out that there are other expressions of pain, but it is obvious that additional effort is needed to define pain in terms of all living organisms. Because, the emphasis on the subjective dimension to some extent "eclipses the motivational functions of pain that are key to an evolutionary understanding" (Walters and Williams 2019, p. 2).

Given that most humans can give (in)direct information about the pain they feel, the question arises as to how pain is defined in relation to non-verbal animals? Walters and Williams claim that there are two approaches: (a) one that assumes the conscious experience of pain as in humans and then looks for strong evidence or strong analogies to humans, e.g., that animals with large brains are likely to feel pain; (b) a second that looks for analogous functional properties (protective and motivational), e.g., in invertebrates (Walters and Williams 2019, p. 2).

So how is pain studied in animals? To find out whether animals feel pain, scientists conduct comparative studies at different levels (anatomical, chemical, behavioral, and motivational). The question of pain in animals is important because it affects how we treat them. Jeremy Bentham (1789) addresses the question of our treatment of animals in these words: "The question is not, Can they *reason*? nor, Can they *talk*? but, Can they *suffer*?"

Today we know that mammals "process the neuroanatomic and neuropharmacologic components involved in transduction, transmission, and perception of noxious stimuli" (Allweiler 2022). Therefore, it can be assumed that they can feel pain.

Furthermore, certain fish species (e.g., rainbow trout) possess a nociceptive system, the biology of which is "strikingly similar to that found in mammals" (Sneddon 2019, p. 1). Rainbow trout physiologically and behaviorally responded to noxious stimuli, leading some scientists to recognize this as sufficient evidence for the experience of pain in fish (Jones 2013; Sneddon et al. 2014; for a review of studies, see Proctor 2012). From an evolutionary perspective, fish are interesting because "phylogenetically, fishes are the closest vertebrate group to invertebrates and gave rise to vertebrate tetrapods" (Sneddon 2019, p. 1), and therefore, studies from this field "might discover the extent of evolutionary conservation or differences in the underlying mechanisms through to whole animal behavioral responses to pain" (Sneddon 2019, p. 1). However, other scientists argue that the prerequisite for feeling pain is phenomenal consciousness. Unlike mammals and birds, fish do not have the neural architecture for phenomenal consciousness, and therefore, do not feel pain (e.g., Key 2015; Brown and Key 2021). To avoid contemporary tendencies to reduce almost all aspects of living beings to the brain (Muzur and Rinčić 2013) and against the type of the "no cortex, no cry" argument, various counter-arguments have been developed, such as the *multiple realization argument*—which claims that pain might be differently realized in humans and other creatures (Michel 2019).

In invertebrates, subjective issues are set aside and pain is defined on the basis of functional properties. Elwood (2019) points out that the greatest insights can be gained from observing the organism's behavior when confronted with noxious stimuli that might indicate the experience of pain. For example, the focus is on cephalopods (especially octopuses), decapods (such as crabs, lobsters, etc.) and insects (such as Drosophila—"fruit fly"; bees, etc.). The results of studies conducted with octopuses led to the conclusion that they have sentience, are likely to feel pain, and have the ability to suffer (Elwood 2019; Sneddon et al. 2014; Sneddon 2019). There are also other parallels regarding similar or identical nociceptive mechanisms in living things going far back into the evolutionary

past (Walters and Williams 2019, p. 3). In addition, these studies may also point to the realization that pain in animals may be perceived in ways that we humans are not aware of and elicit behaviors that are not similar to ours. One example: Paramecium is a single-celled organism. It has no central nervous system, but in the face of danger it can exhibit behaviors associated with pain, such as a defense or avoidance response—which is why it is sometimes called a "swimming neuron" (Brette 2021). Following the multiple realization argument, Michel makes a good point that "*it could be* that paramecia realize pain in a (yet) unknown way" (Michel 2019, p. 2418).

The important study of pain in animals (or the animal sentience) is gaining momentum with many unanswered questions and influencing various fields, from science to ethical questions on the moral status of animals (Browning and Birch 2022). This also has implications for theodicy, which not only thinks about human pain and suffering, but now also includes animals (Gasser 2021) and plants (Strickland 2021).

7. Pain as *an Old System* of the Living Organisms

The above studies are only a small part of the growing body of evidence indicating "increased complexity in the nature of pain experience as species evolved" (Craig and MacKenzie 2021, p. 107). Given the complexity of the social context of the human condition and the multidimensionality of human existence, pain experience has clearly peaked in the human species.

According to Broom, pain is *an old system* and its evolutionary path "must have involved cell sensitivity and localized responses but substantial changes in efficacy could occur once efficient communication within the individual and sophisticated brain analysis could occur. Changes in the pain system, once there was a moderately complex brain may well have been slight" (Broom 2001, p. 1). Pain offered several evolutionary advantages: If a particular situation is harmful to the organism, it can take action to avoid it, and the organism can learn to avoid future similar situations.

The pain system in all vertebrates, which includes humans, has more similarities than differences, but, according to Broom, they differ in behavioral responses to pain, "which vary adaptively according to way of life" (Broom 2001, p. 10).

8. Physical Pain, Theology, and Theodicy

What use can theology and theodicy have from the biological and evolutionary medicine perspective on pain?

We had a brief glimpse of the evolutionary path of pain, from the single-celled organism that avoids potentially dangerous substances to the complex human pain system. So, humans are not the only ones among living things that feel pain. Pain is evolutionarily older than humans themselves. Pain is an important part of life because it contributes to the survival of living beings. So, from this point of view, pain did not come into the world with Adam and Eve; nor is it a consequence of their misbehavior in Eden.

Given a lack of expertise in theological considerations, allow here a simple example of a possible integration of the previously stated insights with the thought of Thomas Aquinas. We emphasize that we are not developing Aquinas' thought in depth here, but only trying to provide an example. According to Thomas Aquinas, Adam's body in Eden—in this state of innocence (*status innocentiae*)—was ontologically the same as the body of contemporary humans. The nature of Adam and the nature of contemporary humans are the same (Roszak 2022, pp. 280–81). For example, Adam slept in Eden because sleep is a natural need of the body (Roszak 2020, p. 71).

This raises the question: Was Adam able to feel the pain in Eden? What would happen if God overrode the sensation of pain? The entire human body is in some way sensitive to noxious stimuli—from the skin to the various brain centers involved and cognitive features activated. Therefore, perhaps a more likely solution for those thinking about the "pain-free state" of Eden would be an environmental condition in Eden that posed no risk of major physical injury. According to Roszak, Aquinas would also support the idea that the external

environment would not have caused Adam pain or suffering (Roszak 2020, p. 78). The abolition of nociception and the feeling of pain would affect the functioning and the whole nature of the human body—if we can call it human at all. Of course, anything is possible to omnipotent God; but why would He create human nature as it is, and then suspend it to such a great extent?

One could argue that God could suspend the sensation of pain, but that at the same time He would not also suspend nociception. However, this would again mean the suspension of many, e.g., brain structures, which could lead to collateral damage, since the same brain areas perform different tasks and functions (Northoff and Horvat 2022). Therefore, it might be more reasonable to follow Aquinas and consider Adam and Eve to be of the same nature as us, while the environment in Eden poses no threat to their bodily integrity and saves them from the feeling of pain that might diminish the joy and love caused by the presence of God.

If we now turn to our present state, we can ask the question: can *the groaning of the whole creation in pains* (Rom. 8:22) be seen as punishment for sin or in the category of natural evil? We think not, for we have seen that pain is "part of the solution" of living things; an evolutionary adaptation in an attempt to survive and ensure the next generation. Physical pain as such has nothing glorious or tragic about it and therefore cannot be placed under the concept of natural evil. As if we would say that our vestibular senses are part of natural evil.

We could say that pain has value from a biological point of view. It has a positive value because it is necessary for survival. On the other hand, it has a negative value when it has a negative impact on the body or social and psychological wellbeing, for example in chronic pain.

Pain is not just a matter of sensation. It is a biological, psychological, and socially conditioned phenomenon. The attempt to draw a clear line between pain and suffering goes back to Greek dualism. It is still a feature of reflection in the field of theodicy that one avoids speaking of pain as a fundamental issue. As if it is downplayed because it is only a physical reaction. Given the difficult task and the fragility of theodicy, including its new evolutionary considerations and the inclusion of animals and plants, a theodicy that takes pain into account in its fullness will certainly be able to give a better answer to the question of pain, suffering and evil that accompany life from the beginning.

9. Conclusions

Although the absence of pain is by no means the main goal of life after death, we believe that thanks to the evolutionary perspective of pain, we can better understand the intuitive longing of humanity and its hope for the final state when God will wipe all tears from our eyes. A pain-free state after death stands in supreme contrast to all the frictions of life that tries to avoid pain—from single-celled organisms to humans.

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