A Philosophical, Scientific, and Theological Analysis of the Problem of Creaturely Suffering:

Towards a New Perception of God and Pain

A Thesis submitted to Middlesex University in partial fulfilment of the requirements for the degree of Doctor of Philosophy of Theology

by

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Abstract

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The processes of Neo-Darwinian evolution have been used to argue against the existence of the loving God portrayed in the Judeo-Christian Bible. Philosopher William Rowe presents this as the Evidential Problem of Natural Evil which claims 1) that there is unnecessary widespread suffering in nature, 2) that a benevolent and omnipotent God would not allow such suffering, and therefore 3) such a God does not exist. Paul Draper uses *inference to the best explanation* to conclude that the Hypothesis of Indifference (atheism) has more explanatory power regarding the character of the universe than does the Hypothesis of Theism (Judeo-Christian belief).

This study understands the complex problem of creaturely suffering as deeply interdisciplinary and analyzes it accordingly. First, theological responses to human and non-human suffering are reviewed and critiqued, including Greco-Roman influenced "Fall" interpretations of Genesis 1–3 which implicitly make the scientifically untenable claim that creaturely pain and biological death on Earth originated 6,000 years ago with Adam and Eve's sin.

Second, the scientific literature is 1) consulted to evaluate the accuracy of popular and academic views of unnecessary suffering in nature which undermine Judeo-Christian claims that God is loving, and 2) used to illustrate God's providential care through natural pain-mitigating processes.

Third, Martin Buber's "I-Thou" relational theology, the Book of Job, and the *brain opioid theory of social attachment* are employed to show that loving, empathetic relationships with God and others mitigate the experience of pain in both human and non-human sufferers. With research from varied academic fields, a theodicy emerges suggesting that God created the phenomenon of pain for both biological and relational purposes so that the children of God may be revealed (Rom 8:19–22).

Keywords: evolution; Genesis; pain; animal suffering; natural evil; theodicy; relational theology

Attestation

I understand the character of plagiarism and the University's policy on it.

I certify that this dissertation documents my own original research contribution at Middlesex University.

Victoria Lynn Campbell 5 August 2021

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Abbreviations

AAS	*Acta Anaesthesiologica Scandinavica*
AB	*Anchor Bible*
AGP	*Archives of General Psychiatry*
AJPEM	*American Journal of Physiology-Endocrinology and Metabolism*
AJT	*American Journal of Theology*
AMA	*American Medical Association*
AMN	*The American Midland Naturalist*
AmSci	*American Scientist*
AnB	*Animal Behaviour*
APM	*Analgesia and Pain Management*
APQ	*American Philosophical Quarterly*
APSc	*Acta Psychiatrica Scandinavica*
ARA	*Annual Review of Anthropology*
ARES	*Archivi Reali di Ebla Studi*
ARN	*Annual Review of Neuroscience*
ASR	*American Sociological Review*
ATR	*Anglican Theological Review*
BAR	*Biblical Archaeology Review*
BBS	*Behavioral and Brain Sciences*
BioLett	*Biology Letters*
BMCN	*BioMed Central Nursing*
BN	*Behavioral Neuroscience*
BOUTC	*British Ornithologists' Union Taxonomic Committee*
BioPsy	*Biological Psychiatry*
Boll	*Bollingen*
BR	*Brain Research*

BRB	*Brain Research Bulletin*
CB	*Current Biology*
CD	*Child Development*
CJFR	*Canadian Journal of Forest Research*
CJZ	*Canadian Journal of Zoology*
CurOr	*Current Ornithology*
CVJ	*Canadian Veterinary Journal*
DPsyBio	*Developmental Psychobiology*
EJNM	*European Journal of Nuclear Medicine*
EJP	*European Journal of Pharmacology*
EJSP	*European Journal of Social Psychology*
EMCNA	*Endocrinology Metabolism Clinics of North America*
ExpN	*Experimental Neurology*
ePSD	*Electronic Pennsylvania Sumerian Dictionary*
EPSL	*Earth and Planetary Science Letters*
EvoPsy	*Evolutionary Psychology*
EvQ	*Evangelical Quarterly*
FEco	*Fire Ecology*
FFish	*Fish and Fisheries*
FrZ	*Frontiers in Zoology*
FWeb	*Food Webs*
GEMDCOP	*Gastrointestinal/Endocrine and Metabolic Diseases, Current Opinion in Pharmacology*
HdOr	*Handbuch der Orientalistik*
HorB	*Hormones and Behavior*
HP	*Health Psychology*
HTR	*Harvard Theological Review*
IJESNR	*International Journal of Environmental Sciences and Natural Resources*

ILAJ	*Institute for Laboratory Animals Journal*
JAMA	*Journal of the American Medical Association*
JAP	*Journal of Applied Physiology*
JAS	*Journal of Archaeological Science*
JBA	*Journal of Behavioral Addictions*
JBM	*Journal of Behavioral Medicine*
JCBFM	*Journal of Cerebral Blood Flow and Metabolism*
JCI	*Journal of Clinical Investigation*
JCCP	*Journal of Consulting and Clinical Psychology*
JCN	*Journal of Cognitive Neuroscience*
JConS	*Journal of Consciousness Studies*
JCPP	*Journal of Comparative and Physiological Psychology*
JEA	*Journal of Egyptian Archaeology*
JESGE	*Journal of Earth Sciences and Geotechnical Engineering*
JGP	*Journal of Genetic Psychology*
JGSABSMS	*Journals of Gerontology - Series A, Biological Sciences and Medical Sciences*
JIM	*Journal of Internal Medicine*
JM	*Journal of Mammalogy*
JN	*Journal of Neurosurgery*
JNMD	*Journal of Nervous & Mental Disease*
JNSci	*Journal of Neuroscience*
JP	*The Journal of Pain*
JPET	*Journal of Pharmacology and Experimental Therapeutics*
JPSM	*Journal of Pain and Symptom Management*
JPTM	*Journal of Pharmacological and Toxicological Methods*
JSPR	*Journal of Social & Personal Relationships*
JSS	*Journal of Semitic Studies*

JTIICC	*Journal of Trauma-Injury Infection and Critical Care*
JZ	*Journal of Zoology*
LBS	*The Library of Biblical Studies*
LivB	*Living Bird*
LPN	*Laboratory Primate Newsletter*
LSci	*Life Sciences*
MHRC	*Mental Health, Religion and Culture*
MMS	*Marine Mammal Science*
MP	*Molecular Pain*
MPO	*Medical and Pediatric Oncology*
MTP	*Music Therapy Perspectives*
NAS	*National Academy of Sciences of the United States of America*
NBR	*Neuroscience and Behavioral Reviews*
NCBCOT	*New Collegeville Bible Commentary—Old Testament*
NEJM	*The New England Journal of Medicine*
NatGeo	*National Geographic*
NHGRI	*National Human Genome Research Institute*
NIV	*New International Version*
NN	*Nature Neuroscience*
NRN	*Nature Reviews Neuroscience*
NRSV	*New Revised Standard Version*
OrNS	*Orientalia, Nova Series*
PB	*Psychological Bulletin*
PBB	*Pharmacology Biochemistry and Behavior*
PCCOP	*Primary Care: Clinics in Office Practice*
PEC	*Patient Education and Counseling*
PM	*Psychosomatic Medicine*
PN	*Progress in Neurobiology*

PNASUSA	*Proceedings of the National Academy of Sciences of the United States of America*
PPJ	*Pain Physician Journal*
PRSBBS	*Proceedings of the Royal Society B: Biological Sciences*
PS	*Psychological Science*
PSCF	*Perspectives on Science and Christian Faith*
PSPB	*Personality and Social Psychology Bulletin*
PsyRev	*Psychological Review*
PTRSB	*Philosophical Transactions of the Royal Society B*
QuadSem	*Quaderni di Semitistica*
SCAN	*Social Cognitive & Affective Neuroscience*
SCB	*Science & Christian Belief*
SCN	*Supplements to Clinical Neurophysiology*
SPPS	*Social Psychological and Personality Science*
SR	*Scientific Reports*
SSCLCA	*Senate Standing Committee on Legal and Constitutional Affairs*
Strong's	*Strong's Exhaustive Concordance*
TAP	*The Arts in Psychotherapy*
TCS	*Trends in Cognitive Sciences*
TNTC	*Tyndale New Testament Commentaries*
TPS	*Trends in Pharmacological Sciences*
TD	*Today's Dietitian*
TN	*Trends in Neuroscience*
UF	*Ugarit-Forschungen*
USNPS	*United States National Park Service*
VR	*Veterinary Record*
VTSup	*Supplements to Vetus Testamentum*

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1. Introduction

Since Charles Darwin published *Origin of Species* in 1859, it has become increasingly clear that predation, pain, and death have not only preceded the existence of human beings, but have been woven into the very fabric of life.[1] With the acceptance of Neo-Darwinian evolution in mainline science and the accompanying recognition of extensive pain and death in nature, theistic belief (specifically Judeo-Christian belief) has been put under increasing pressure to explain the purpose of creaturely suffering in a world created by a loving God.[2] According to the Barna Group:[3]

- Significant numbers of Gen Z (41%) and Millennials (45%) in the U.S. think that science and the Bible are in conflict.
- One-in-five (20%) Gen Z and one-in-four (24%) Millennials believe that "science refutes too much of the Bible."
- Approximately one-in-three Gen Z (29%) and Millennials (30%) have "a hard time believing a good God would allow so much evil or suffering in the world."

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[1] Charles Darwin, *On the Origin of Species: By Means of Natural* Selection (Auckland, N.Z.: Floating Press, 2009 [6th edn]).

[2] Richard Dawkins, *The Blind Watchmaker* (New York: Norton, 1986). Richard Dawkins, *River Out of Eden* (New York: Basic Books, 2008). Daniel Dennett, *Darwin's Dangerous Idea* (New York: Simon and Shuster, 1995). Paul Draper, "Evolution and the Problem of Evil," in *Philosophy of Religion: An Anthology* (ed. L. Pojman and M. Rea; Belmont, Calif.: Thomson Wadsworth, 2011 [6th edn]), 315-326. Philip Kitcher, *Living with Darwin* (New York: Oxford University Press, 2007). Alvin Plantinga, *Where the Conflict Really Lies: Science, Religion, and Naturalism* (Oxford: Oxford University Press, 2011), 3-63. Michael J. Murray, *Nature Red in Tooth and Claw: Theism and the Problem of Animal Suffering* (Oxford: Oxford University Press, 2011). Christopher Southgate, *The Groaning of Creation: God, Evolution, and the Problem of Evil* (Louisville, Ky.: Westminster John Knox, 2008). Celia Deane-Drummond, *Christ and Evolution: Wonder and Wisdom* (Minneapolis, Minn.: Fortress, 2009). Nicola H. Creegan, *Animal Suffering and the Problem of Evil* (Oxford: Oxford University Press, 2013). Trent Dougherty, *The Problem of Animal Pain: A Theodicy for All Creatures Great and Small* (New York: Palgrave Macmillan, 2014). Bethany N. Sollereder, *God, Evolution, and Animal Suffering: Theodicy Without a Fall* (New York: Routledge, 2019). John R. Schneider, *Animal Suffering and the Darwinian Problem of Evil* (New York: Cambridge University Press, 2020). Ronald E. Osborn, *Death Before the Fall: Biblical Literalism and the Problem of Animal Suffering* (Downers Grove, Ill.: IVP Academic, 2014).

[3] Barna Group and Impact 360 Institute, *Gen Z: The Culture, Beliefs and Motivations Shaping the Next Generation* (Ventura, Calif.: Barna Group, 2018), 63-67, 112. Gen Z are defined as those born 1999-2015 and Millennials as those born 1984-1998.

In short, there is a growing perception that Judeo-Christian belief is incompatible with science and cannot explain the suffering associated with natural processes that cause creaturely pain and biological death, often referred to as *natural evil*.

Part of this presumed conflict with science has been due to the continued influence of St. Augustine's Genesis interpretation in Western thought which has left the impression that Genesis 1–3 was intended to describe *how* the universe, life, death, and suffering came into existence.[4] The perceived failure of Judeo-Christian thought to explain the problem of creaturely suffering has also been due to the tendency of many theologians to acknowledge human pain while dismissing animal pain entirely. However, the most significant reason theologians continue to struggle today may be due to the fact that theistic examinations of the problem of suffering are still typically confined to abstract philosophical and theological arguments which do not consider the empirical details of suffering to be important. Consequently, the scientific literature on the perception of pain across species has rarely been permitted to have a voice in the conversation when countering atheists' arguments. So, when Augustinian-influenced understandings of Genesis 1–3 are combined with the problem of suffering in the animal kingdom, atheists are able to depict the Judeo-Christian God as being either indifferent to suffering in creation or another non-existent deity in a pantheon of human gods. Non-theists have also recognized that the existence of animal suffering and death well before the first *Homo sapiens* further strengthens the *evidential problem of natural evil*.

[4] Augustine, *The Literal Meaning of Genesis* (ACW 41-42; trans. John H. Taylor; 2 vols.; New York: Newman, 1982).

Section 1.1 The Problem of Evil

The philosophical Problem of Evil falls into two sub-problems that employ different strategies: the *logical problem* and the *evidential problem*.[5] A "problem" in this context is an argument where the starting premises have credibility and the conclusion derived from those premises challenges the belief claims of their philosophical opponents.[6]

The Logical Problem of Evil argues the very strong claim that it is logically impossible for God and evil to coexist.[7] The Evidential Problem of Evil argues the weaker claim that evidence of evil in the world makes it unlikely that God exists.[8] The evils referred to in these premises fall into two broad categories: *moral evil* and *natural evil*. Moral evil "contains the wrongful and hurtful acts as well as the bad character traits of free human beings: actions such as murdering, lying, stealing, and traits such as dishonesty, greed, cowardice."[9] Natural evil "covers the physical pain and suffering that result from either impersonal forces or human actions," and these can include pain and death caused by flood, fire, famine, disease, and disability.[10]

Theistic and philosophical responses to the Problem of Evil have included theodicies, defenses, and defeaters. The term *theodicy* literally means "justification of God" with regard to the existence of evil.[11] A theodicy provides "an overarching framework within which to understand at least roughly how the evil that occurs is part of some overall good."[12] A *defense* (against the

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[5] Michael Peterson et al., *Reason and Religious Belief: An Introduction to the Philosophy of Religion* (New York: Oxford University Press, 2009 [4th edn]), 147.

[6] Peterson et al., *Reason*, 147.

[7] Peterson et al., *Reason*, 147.

[8] Peterson et al., *Reason*, 150.

[9] Peterson et al., *Reason*, 146.

[10] Peterson et al., *Reason*, 146.

[11] Michael Peterson, et al., *Philosophy of Religion: Selected Readings* (New York: Oxford University Press, 2010 [4th edn]), 635.

[12] Charles Taliaferro, "Philosophy of Religion," *The Stanford Encyclopedia of Philosophy* (ed. Edward N. Zalta; Fall 2019 Edition), Stanford University website [cited 11 April 2021]. Online: https://plato.stanford.edu/archives/fall2019/entries/philosophy-religion/.

Problem of Evil) does not need to show that theism is true, but rather contends "that some argument from evil fails to show that theism is inconsistent, irrational, improbable, and so forth."[13] Generally speaking, a defense "attempts to show that there is no logical incompatibility between the existence of evil and the existence of God."[14] A *defeater* can be either evidence or another belief "that, if accepted, makes it unreasonable to accept the first belief."[15] For example, if evidence showed that a trial witness had been bribed, then that would be a defeater which would undermine the reasonableness of believing the witness' testimony.

Section 1.2 The Logical Problem of Evil

The longstanding philosophical perception of the logical problem of evil was formulated by J. L. Mackie in 1955 and was first addressed in a comprehensive way in 1967 by Alvin Plantinga who then expanded upon it in 1974 and 1977.[16] In "Evil and Omnipotence," Mackie argued that evil in the world was logically incompatible with God's omniscience, omnipotence, and omnibenevolence.[17] In other words, it is not logically possible for God and evil to coexist. Alvin Plantinga responded in *God, Freedom, and Evil* that it is possible that God chose to create free beings that he does not control and who could choose between good and evil. If it is possible that God's purpose was to create creatures with

[13] Peterson, et al., *Philosophy of Religion*, 632.

[14] Michael Tooley, "The Problem of Evil," *The Stanford Encyclopedia of Philosophy*, (ed. Edward N. Zalta; Spring 2019 Edition), Stanford University website [cited 11 April 2021]. Online: https://plato.stanford.edu/archives/spr2019/entries/evil/.

[15] Peterson, et al., *Philosophy of Religion*, 632.

[16] John. L. Mackie, "Evil and Omnipotence," *Mind* 64 (1955): 200-212. Alvin Plantinga, *God and Other Minds: A Study of the Rational Justification of Belief in God* (Ithaca, N.Y.: Cornell University Press, 1967), 131-155. Alvin Plantinga, *The Nature of Necessity* (Oxford: Clarendon Press, 1974), 164-168. Alvin Plantinga, *God, Freedom, and Evil* (Grand Rapids, Mich.: Eerdmans, 1977) 29-34.

[17] Mackie, "Evil and Omnipotence," 200-201.

free will, then it is also possible that they might choose moral evil. As Plantinga explains:[18]

> A world containing creatures who are significantly free (and freely perform more good than evil actions) is more valuable, all else being equal, than a world containing no free creatures at all. Now God can create free creatures, but He can't *cause* or *determine* them to do only what is right. For if He does so, then they aren't significantly free after all; they do not do what is right *freely*. To create creatures capable of *moral good*, therefore, He must create creatures capable of moral evil; and He can't give these creatures the freedom to perform evil and at the same time prevent them from doing so. As it turned out, sadly enough, some of the creatures God created went wrong in the exercise of their freedom; this is the source of moral evil. The fact that free creatures sometimes go wrong, however, counts neither against God's omnipotence nor against His goodness; for He could have forestalled the occurrence of moral evil only by removing the possibility of moral good.

Plantinga's *free will defense* cited the possibility that God-given freedom of choice might result in some creatures who freely choose to do moral evil. The central thrust of Plantinga's response to Mackie's charge that it is logically impossible for God and evil to coexist is appropriately met by any possible narrative that involves the possibility of why God might allow it. No factual claims need to be made in the defense; the dispute is about logical possibility and impossibility. After about a decade of debate among theistic and non-theistic philosophers on the problem, Plantinga's strategy became generally accepted as a sound defensive response to the logical problem of evil.

The philosophical community, still believing that evil somehow remains a problem for belief in God, migrated to a different formulation of how it is that evil poses a problem for theistic and Judeo-Christian belief. Statements of what is now commonly labeled *the evidential problem of evil* have emerged.

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[18] Plantinga, *God, Freedom, and Evil*, 30.

Section 1.3 The Evidential Problem of Natural Evil

In his 1979 essay, "The Problem of Evil and Some Varieties of Atheism," William Rowe argued against the existence of an omnipotent, omniscient, wholly good God in the following manner:[19]

(1) There exist instances of intense suffering which an omnipotent, omniscient being could have prevented without thereby losing some greater good or permitting some evil equally bad or worse.

(2) An omniscient, wholly good being would prevent the occurrence of any intense suffering it could, unless it could not do so without thereby losing some greater good or permitting some evil equally bad or worse.

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(3) There does not exist an omnipotent, omniscient, wholly good being.

Rowe's famous Evidential Problem of Evil, which has been persuasive and widely cited throughout the philosophical literature, succinctly summarizes most aspects of the evidential problem of natural evil. Critical engagement with Rowe's argument involves assessing and addressing its two premises. Premise (1) functions as an *evidential premise*, a statement of perceived facts, and premise (2) serves as a *theological premise*, describing God's purposes and values. Stating Rowe's claims more explicitly:

- There is widespread suffering in the natural order.
- There is unnecessary suffering in the natural order.
- God is characterized as an omniscient, omnipotent being.
- A wholly good omniscient, omnipotent being (God) would prevent widespread and unnecessary suffering.
- God has *not* prevented widespread, unnecessary suffering.

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[19] William L. Rowe, "The Problem of Evil and Some Varieties of Atheism," *APQ* 16 (1979): 336.

- Therefore, an omnipotent, omniscient wholly good God does not exist.

Rowe adds two potential *defeaters* to his argument that would undermine its strength against the existence of an omnipotent, omniscient wholly good God:

- If the prevention of suffering permitted an evil equally bad or worse.
- If the prevention of suffering permitted the loss of a greater good.

It should be noted that for the purposes of this inquiry, the adjective "intense" will be set aside since all suffering is subjective and unquantifiable. Consequently, Rowe's argument will be evaluated by simply considering whether there is unnecessary suffering in nature.

As will be discussed in Section 2.1, some theistic responses of varying effectiveness have been offered to address one or more of these claims, but none have provided a widely accepted counterargument to defeat this line of reasoning as Mackie's argument was defeated by Plantinga. This is because Mackie's argument, which was based upon the claim that theism is logically incoherent, was susceptible to refutation by careful Plantingian clarifications on free will and God's purposes. In contrast, Rowe's argument is built on factual assertions which implicitly draw their strength from multiple academic fields. Claims of widespread pointless suffering in the animal world are offered as established fact based upon empirical observations from environmental and animal studies. The theological principle that a good, omnipotent, and omniscient God would prevent unnecessary suffering is derived from the fields of philosophy, theology, and indirectly, biblical studies. Therefore, in order to critically engage and evaluate the strength of Rowe's interdisciplinary argument, a central burden of this work will be to more deeply investigate the relevant areas of study to inquire whether improved counterarguments and theistic lines of reasoning might be available.

In the evidential premise (1) of Rowe's argument, suffering is cited as evidence that makes the non-existence of God a reasonable conclusion—as it is often framed, a conclusion that is "more probable than not." It should be noted that Rowe's classic argument cites natural evil in particular as having negative evidential bearing on theistic belief, a point reinforced by other atheists like evolutionary biologist and ethologist Richard Dawkins and philosopher Philip Kitcher.[20] As an example of support for premise (1), Rowe describes a fawn trapped in a forest fire dying a protracted agonizing death.[21] The case of "Bambi," as it is often called, purportedly typifies the many evils occurring daily in the natural world. The essential thrust is not that it is logically impossible for theism to be compatible with evil, but that theism is unlikely to be true given the evidence of evil. The important evidential premise (1) in the Rowe-type argument is supported by a variety of presumably factual claims about human and non-human suffering caused by natural processes such as forest fires, predation, parasitism, disease, famine, or instances of what appears to be acts of cruelty from animals against other animals. Furthermore, these claims suggest that life has evolved in such a way that the amount of suffering in the world has not been minimized and is instead probably alarmingly high. Nevertheless, while there is agreement that these natural processes can cause injury to creatures' tissues, a central associated quandary lies in whether creatures with injured tissues perceive pain identically across species. For this reason, the science behind pain perception should be a major consideration when evaluating the problem of creaturely suffering.

In the theological premise (2) of Rowe's argument, God's priorities are implicitly assumed to include the prevention of pain and discomfort throughout the creation, a position which may be called hedonistic

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[20] Philip Kitcher, "Some Answers, Admissions, and Explanations," in *Pragmatic Naturalism* (ed. M. I. Kaiser and A. Seide; Frankfurt: Ontos Verlag, 2013) 176-177. Dawkins, *River*, 131-132.

[21] Rowe, "Problem of Evil," 337.

utilitarianism for our purposes. However, since God's value system should provide insight into the problem of suffering, it would be reasonable to assess Rowe's theological assumptions against biblical texts like the Book of Job which address God's values and response to suffering.

Section 1.4 Indifferent Universe or Loving Judeo-Christian God?

Joining Rowe in thinking that much suffering in nature is unnecessary and excessive, Paul Draper cites biological failure in nature as additional support for the evidential premise regarding natural evil and makes a theological claim that, "a morally perfect God would strongly prefer that every sentient being flourish for a significant portion of their lives."[22] He argues that a wholly good God's goal would be to minimize suffering and maximize the biological success and pleasure of creatures.[23] It is therefore worth evaluating whether Rowe's and Draper's theological claims adequately reflect either a fair biblical interpretation or a holistic theological understanding of the Judeo-Christian worldview. Early on, their theological starting assumptions appear to be based upon the materialistic and hedonistic utilitarian value systems of many non-theistic philosophers, not the love-oriented ethic associated with the Judeo-Christian God, Yahweh Elohim (Deut 6:5; Lev 19:18b; Matt 22:36–40; 20:25–28; Mark 12:28–31; Luke 10:25–28; John 14:11–24; 15:12–13; Rom 12:1, 9–17; 1 John 4:7–12; 1 Cor 13:1–7).

Assuming the same general picture of God as Rowe, Draper claims that a morally perfect, omnipotent, omniscient God:[24]

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[22] Paul Draper, "Natural Selection and the Problem of Evil (2007)," Secular Web: Internet Infidels website [cited 17 February 2015]. Online: https://infidels.org/library/modern/paul_draper/evil.html.

[23] Paul Draper, "Pain and Pleasure: An Evidential Problem for Theists," *Noûs* 23 (1989): 334-337.

[24] Draper, "Pain," 336-337.

- could create goal-oriented creatures (including humans) without biologically necessary pain systems,
- would only employ pain and pleasure for moral enforcement and pedagogy,
- and would therefore maximize pleasure and minimize pain except when morally necessary.

Draper goes on to argue that the Hypothesis of Indifference (the atheistic worldview of an indifferent universe unconcerned with creaturely pleasure and pain[25]) is more probable given the evidence than the Hypothesis of Theism (the conceptual core of the Judeo-Christian worldview which revolves around God's love for creatures).[26] The argument strategy here is known as abductive reasoning, also called *inference to the best explanation*.[27] Inference to the best explanation is an evaluative procedure that weighs competing hypotheses against each other and is a familiar pattern of scientific reasoning. In such evaluations, the "best explanation" is usually determined by the hypothesis — or philosophical perspective in this case — that successfully encompasses the widest range of empirical evidence, has the greatest explanatory and predictive power, and thereby has the ability to correctly anticipate outcomes. For our consideration of the evidential problem of natural evil, inference to the best explanation can be used to compare the relative explanatory power of the Judeo-Christian and the atheistic worldviews with regard to the perception of pain and pleasure among creatures in the world.

[25] Dawkins, *River*, 132-133.

[26] Draper, "Pain," 331-350.

[27] Michael Peterson and Michael Ruse, *Science, Evolution, and Religion: A Debate About Atheism and Theism* (Oxford: Oxford University Press, 2017), 39. Alister McGrath, *A Fine-Tuned Universe: The Quest for God in Science and Theology* (Louisville, Ky.: Westminster John Knox, 2009), 42-49. Charles S. Peirce, *Collected Papers of Charles Sanders Peirce* (ed. C. Hartshorne and P. Weiss; 8 vols.; Cambridge, Mass.: Harvard University Press, 1960), 5:189.

Rowe closes his essay, "The Problem of Evil and Some Varieties of Atheism," by suggesting that a theist must be scientifically uninformed in order to believe in God, and calls this point of view "friendly atheism":[28]

> The more interesting question is whether some people in modern society, people who are aware of the usual grounds for belief and disbelief and are acquainted to some degree with science, are yet rationally justified in accepting theism. […] It is not difficult for an atheist to be friendly when he has reason to believe that the theist could not reasonably be expected to be acquainted with the grounds for disbelief that he (the atheist) possesses. For then the atheist may take the view that some theists are rationally justified in holding to theism, but would not be so were they to be acquainted with the grounds for disbelief—those grounds being sufficient to tip the scale in favor of atheism when balanced against the reasons the theist has in support of his belief.

Rowe asserts that theists would no longer be rationally justified in holding to theism if they were better acquainted with the findings of science. While it is true that a better assessment of the problem of pain will likely be obtained if the most current findings of science are incorporated into the reasoning process, it is still an open question whether atheism has more explanatory power regarding the fundamental nature of reality than does the Judeo-Christian worldview. It is possible that Rowe and Draper's statements regarding the evidence of pain in the world may, upon interaction with the scientific literature and the latest empirical evidence, be impressionistic at best.

[28] Rowe, "Problem of Evil," 340.

2. Theistic Responses to Suffering

Section 2.1 Literature Review

Many Christian theists have sought to protect God from the problem of creaturely suffering by addressing the types of claims summarized in Rowe's Evidential Problem of Evil. One general approach has been to diminish the strength of evidential premise (1) — *that an omnipotent, omniscient being could have prevented unnecessary suffering without thereby losing some greater good or permitting some evil equally bad or worse* — by treating animals as either theologically insignificant to God or ignoring credible empirical evidence of their pain. Another approach addresses premise (1) by suggesting that pain is an unfortunate but necessary product of the ordered regularity of the universe. However, most responses have sought to undermine the strength of theological premise (2) — *an omniscient, wholly good being would prevent the occurrence of any suffering it could, unless it could not do so without thereby losing some greater good or permitting some evil equally bad or worse* — by either a) maintaining God's goodness while limiting God's omniscience and/or omnipotence, or b) claiming that suffering in creation is necessary for either the punishment or promotion of moral agents. The following literature review will provide a general overview of the strengths and weaknesses of these approaches.

Section 2.1.1 Cartesian/Neo-Cartesian Defenses

Cartesian/Neo-Cartesian defenses take the position that animal suffering is either theologically insignificant to God or that there is no credible empirical evidence of animal pain. Approaches like these are intended to weaken the claim that animal suffering diminishes the probable existence of a wholly good omnipotent God.

It should be observed that the notion that animal suffering is theologically unimportant to God can be found back in the perspective of St. Augustine of Hippo (ca. 354 CE) who dismissed the suffering of animals based upon contemporary Stoic philosophical assumptions rather than the teachings of Scripture: "We can perceive by their cries that animals die in pain, although we make little of this since the beast, lacking a rational soul, is not related to us by a common nature."[29] As Augustine framed it, animal suffering is real but theologically insignificant because he held the belief that animals do not have souls, it is the soul that makes suffering meaningful, and therefore God only cares about the suffering of (ensouled) humans.

Yet there are theologians who would disagree with Augustine's view. For example, John Polkinghorne — theoretical physicist, theologian, and Anglican priest — criticizes such anthropocentric assumptions which claim that only human beings are of concern to God:[30]

> Many theologians are able to assent to this eschatological insight [regarding eternal life] in relation to the destinies of human beings, but the considerable anthropocentricity of so much theological thinking has made it difficult for many of them to appreciate fully the necessarily cosmic scope of the Creator's total concern. This vast universe is not just there to be the backdrop for the human drama, now taking place after an overture that has lasted fourteen billion years. It all has a value of its own. All creatures must be of concern to their Creator….

There is an understandable unease that anthropocentric theologians may be undervaluing the significance of Genesis 1 as it depicts God's attentive creation of each component of the cosmos — noticeably including fish, birds, and land animals — and follows each occasion by the words, "And God saw that it was

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[29] Augustine, as cited by Joshua M. Moritz, "Animal Suffering, Evolution, and the Origins of Evil: Toward a 'Free Creatures' Defense," *Zygon* 49 (2014), 351.

[30] John Polkinghorne, *Science and the Trinity: The Christian Encounter with Reality* (New Haven, Conn.: Yale University Press), 147.

good." These words would seem to imply that God places value upon both the human and non-human inhabitants of the created order and as Polkinghorne has said, "If we matter to God once – and we certainly do – then we must matter to God forever."[31]

Also contra Augustine, philosopher Trent Dougherty argues that animals do have souls which continue on after death and to the resurrection based upon Scripture, church traditions, and philosophical reasoning.[32] Christopher Southgate, a biochemist turned theologian, takes a similar but more indirect approach which argues for animal afterlife in the eschaton without explicitly claiming that animals have souls.[33] Dougherty and Southgate's views regarding animal afterlife will be more fully explored later in Section 2.1.6. Still, the notion that even animals will participate in the resurrection can be found far back in the eastern tradition of the church, as articulated in the Armenian liturgy:[34]

> Every creature which was created by you will be renewed at the resurrection, that day which is the last day of earthly existence and the beginning of our heavenly life.

Lending further support to animals having inherent theological significance, Dougherty shows that St. Basil the Great (ca. 330 CE), one of the most important theologians of the Eastern Orthodox Church, acknowledged a special kinship that humanity shares with animals in the following prayer:[35]

> O God, enlarge within us the sense of fellowship with all living things, our brothers the animals…. May we realize that they live, not for us alone, but for themselves and for thee, and that they have the sweetness of life.

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[31] Polkinghorne, *Science and the Trinity*, 147.
[32] Dougherty, *Animal Pain*, 154-166.
[33] Southgate, *Groaning of Creation*, 78-91.
[34] Dougherty, *Animal Pain*, 159.
[35] Basil of Caesarea, as cited by Dougherty, *Animal Pain*, 158-159.

St. Francis of Assisi (ca. 1200 CE) of the Roman Catholic Church represents another significant strand of the Christian community that embraced the theological value of animals. He purportedly preached even to the birds and referred to them as "little sisters":[36]

> [St. Francis] said to his companions, "Wait for me here by the way, whilst I go and preach to my little sisters the birds"; and entering into the field, he began to preach to the birds which were on the ground, and suddenly all those also on the trees came round him, and all listened while St Francis preached to them, and did not fly away until he had given them his blessing.

It is therefore important to acknowledge that though there have been significant differences of opinion regarding animals' inherent value to God, even among renown contemporaries of the young church like Basil of Caesarea and Augustine of Hippo, there have been strong segments of Christian tradition which have embraced the theological value of animals.

Setting aside the question of whether or not non-human creatures have theologically significant value, René Descartes developed the more modern Cartesian view of animal suffering which claims that animals do not have self-conscious awareness and therefore cannot experience morally significant pain.[37] Descartes' position was that animals were *insentient* machine-like organisms (unconscious automata):[38]

> For in my view, pain exists only in the understanding. What I do is explain all the external movements which accompany feeling in us; in animals it is these movements alone which occur, and not pain in a strict sense.

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[36] Ugolino di Monte Santa Maria, *Little Flowers of St. Francis* (trans. W. Heywood; New York: Vintage Books, 1998), Christian Classics Ethereal Library edition: ch. 16 [cited 6 May 2021]. Online: https://ccel.org/ccel/ugolino/flowers/flowers.iii.xvi.html.

[37] Murray, *Nature,* 41-72. Dougherty, *Animal Pain*, 56-95.

[38] René Descartes, "Letter to Mersenne of 1640" as cited by Murray, *Nature*, 50.

What Descartes was describing is the physiological phenomenon of *nociception*, which is an automatic reflexive response to harmful stimuli that is not accompanied by the experience of psychological distress typically associated with pain. In other words, he claimed that all animals (including the mammals he often did his experiments upon) lack the cognitive capacity to perceive pain, therefore their distressed responses were morally insignificant.

In contrast to the Cartesian point of view, Neo-Cartesian approaches are willing to acknowledge animals are *sentient*, yet claim animals lack some another aspect of human character that would enable the creature's experience to be understood as meaningful suffering. For example, Christian apologist C.S. Lewis suggested that since animals may have difficulty perceiving events as a proper temporal sequence (events A, B, then C), they might have sentience but lack the self-aware consciousness (or soul) necessary to perceive pain in a morally significant way.[39] John Hick, a philosopher of religion, likewise contended that non-human animals lack the cognitive ability to perceive pain.[40] Yale professor of historical theology, Marilyn McCord Adams took a similar position that animals could not experience suffering because they were incapable of being self-conscious "meaning-makers":[41]

> If all mammals and perhaps most kinds of birds, reptiles, and fish suffer pain, many naturally lack self-consciousness and the sort of transtemporal psychic unity required to participate in horrors.

Peter Harrison, philosopher and historian of science and religion, also promoted such views of animals' cognitive inability to experience suffering claiming:[42]

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[39] Clive S. Lewis, "The Problem of Pain" in *Complete C.S. Lewis Signature Classics* (New York: HarperSanFrancisco, 2002), 422.

[40] John Hick, *Evil and the Love of God* (New York: Palgrave Macmillan, 2010), 309-314.

[41] Marilyn McCord Adams, *Horrendous Evils and the Goodness of God* (Ithaca, NY: Cornell University Press, 1999), 28.

[42] Peter Harrison, "Theodicy and Animal Pain," *Philosophy* 64 (1989): 83-84.

> We should speak of animal responses, not as reactions to pain, or expressions of pain, but rather as adaptive behaviours and physiological reactions to potentially damaging stimuli. Their function is not primarily, or even at all, to express some internal state, but to adapt the organism behaviourally to a harmful aspect of its environment.

Like Descartes, Harrison's essay categorized all non-human animals, even mammals which are closest to humans on the evolutionary spectrum, as though they were only capable of nociception and unable to perceive the psychologically distressing aspect of pain. This is the sentient version of Descartes' automata. Harrison even made the questionable suggestion that since bacteria like *Protozoa* are capable of learning without consciousness, this may be true for other more highly evolved creatures as well.[43] However, while it may have been accurate in 1989 for Harrison to claim that "no strict argument can be mounted for or against the existence of animal pain," Dougherty is correct when he argues that this position is no longer tenable in light of empirical evidence now available in publications like the 2009 U.S. National Academy of Sciences' *Recognition and Alleviation of Pain in Laboratory Animals*.[44] In fact, because the science behind pain perception is so relevant to the problem of human and non-human suffering, the topic which will be analyzed more thoroughly in Section 3.3. Nevertheless, most of the more recent scholarship on the problem of natural evil recognizes that the empirical evidence strongly supports the existence of animal suffering.[45]

The Cartesian/Neo-Cartesian line of reasoning, which claims *no* non-human animals can perceive pain or suffer in a theologically meaningful way, has several serious weaknesses. First, claims that non-human animals are

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[43] Harrison, "Theodicy," 90-91.

[44] Harrison, "Theodicy," 81. Dougherty, *Animal Pain*, 61-64. National Academy of Sciences (NAS), *Recognition and Alleviation of Pain in Animals* (Washington, D.C.: National Academies Press, 2009).

[45] Murray, *Nature*, 41-72. Dougherty, *Animal Pain*, 56-95. Sollereder, *God, Evolution, and Animal Suffering*, 45-47. Schneider, *Animal Suffering*, 56-64.

incapable of feeling pain have tended to be more abstract and speculative than empirically based and are now easily undercut by scientific research (Section 3.3). As a result, these approaches are now generally unpersuasive to more scientifically informed segments of the population. Second, statements which suggest animals are theologically unimportant to God undermine the testimony of Scripture which maintains that God is loving towards all his creatures, providing food for them when they are hungry and watching over them even as they give birth (Gen 1:20–25, 30–31; Job 38:39–39:4; Ps 136:25; 145:15–16). Cartesian/Neo-Cartesian claims also appear to contradict the concern for creatures that Jesus described when he said that not even a sparrow could fall to the ground without God's notice (Matt 10:29).

In short, Cartesian/Neo-Cartesian defenses have the following strengths in that they:

- Affirm the omnipotence and omniscience of God.
- Protect God from the claim that God allows innocent animals to suffer.

However, the Cartesian/Neo-Cartesian defenses also have the following serious weaknesses in that they:

- Take an anthropocentric worldview which diminishes the theological significance of the other living creatures in creation.
- Take a theologically speculative position that is not well-supported by Scripture.
- Take a scientifically indefensible position that there are *no* animals which can perceive pain, only nociception which is an automatic reflexive response to harmful stimuli.
- Are defeated by contemporary scientific research which strongly supports the perception of pain in more highly evolved animals.

It is also significant that by ignoring the very real problem of animal pain theists often end up surrendering the interpretation of empirical evidence to proponents of philosophical naturalism alone. For example, it allows some

atheists like Dawkins and Kitcher to go unchallenged when they claim that *most* non-human animals, even caterpillars, suffer as human do — perhaps artificially inflating the strength of their case against the existence of a loving God.[46] Therefore, it seems a better approach for those interested in the problem of human and non-human suffering would be to study the scientific literature in order to become more accurately informed on the neurocognitive perception of pain along the evolutionary spectrum, then respond philosophically and theologically to those findings.

Section 2.1.2 Nomic Regularity Defenses

Nomic regularity defenses take the view that pain is a necessary, if not inevitable, aspect of the well-ordered universe of natural laws which God has created.[47] Proponents of this approach have tended to be scientist-theologians and include Arthur Peacocke, Holmes Rolston III, and John Polkinghorne.

Peacocke, a biochemist and theologian, took the position that pain and suffering are the complimentary opposites of pleasure and well-being that come with a creature's emergent consciousness and are necessary conditions for continued survival:[48]

> The emergence of pain and its compounding as suffering as consciousness increases seem to be inevitable aspects of any conceivable developmental process that would be characterized by a continuous increase in ability to process information coming from the environment. […] In the context of natural selection, pain has an energizing effect and suffering is a goad to action: they both have survival value for creatures continually faced with new problematic situations challenging their survival. […] In relation to our later theological reflections, it must be emphasized that pain, suffering and death are present in biological evolution, as a necessary

[46] Kitcher, "Some Answers," 176. Dawkins, *River*, 131.

[47] Murray, *Nature*, 135.

[48] Arthur Peacocke, *Theology for a Scientific Age: Being and Becoming – Natural, Divine, and Human* ((Minneapolis, Minn.: Fortress, 1993), 68.

> condition for survival of the individual and transition to new forms long before the appearance of human beings on the scene.

Rolston, an environmental ethicist as well as a philosopher of science and religion, better appreciated the dynamics of healthy ecosystems than many scholarly contributors to the problem of animal suffering. He understood that advanced sentient life only emerged from species higher up the food chain and even as creatures die, nothing ever goes to waste. Death is a necessary part of the cycle of life:[49]

> In the end, any individual must die, by accident or by internal collapse, and here the death of earlier creatures makes room for later ones, room to live and, in time, to evolve. If nothing much had ever died, nothing much could have ever lived. […] But what is premature death from one individual's point of view, and thus an evil, can be the source of life, and thus a good, from its eater's point of view.

Polkinghorne described the evolutionary universe as the divine gift of self-making potentiality given so that creation can participate in its own creating. However, it is a blessing that also comes with a price:[50]

> It can be claimed that a world of that kind of evolving fruitfulness is a greater good than a ready-made creation would have been. Yet, that goodness has a necessary cost. There is an inevitable shadow side to the evolutionary process, as a contingent exploration results not only in new kinds of fruitfulness, but it also leads to ragged edges and blind alleys. In an evolving world, the death of one generation is the necessary cost of the new life of the next. We know that biological evolution has been driven by genetic mutation, but if germ cells are to be able to mutate and produce new forms of life, then somatic cells will also, by the same process, be able to mutate and sometimes they will then become malignant. Some help is offered here to theology as it struggles with the deep perplexities of

[49] Holmes Rolston III, *Science and Religion: A Critical Survey* (Philadelphia, Pa.: Temple University Press, 1987), 136.

[50] John Polkinghorne, "The Universe as Creation" in *Philosophy of Religion: Selected Readings* (eds. Michael Peterson, et al.; New York: Oxford University Press, 2010 [4th edn]), 556.

> theodicy. The anguishing fact of cancer is not something gratuitous, as if a Creator who was a bit more competent or a bit less callous could easily have eliminated it. It is the necessary cost of creation in which creatures are allowed to make themselves.

Nomic regularity defenses such as these seek to weaken the evidential premise (1) of Rowe's argument by claiming that pain is a *necessary* component of the survival of living creatures and the absence of pain and death would permit the evil of non-existence which would be equally bad or worse. The strengths of nomic regularity defenses are that they:

- Appeal to the natural laws widely accepted in science.
- Emphasize the benefits of order and regularity that are empirically observable in the cosmos.
- Note the advantages of dynamic over static ecosystems.
- Lessen notions of wastefulness in nature.
- Point to empirically observable life/death/life cycles found in nature.
- Recognize death of one creature creates opportunity for life of another.
- Recognize the same neurocognitive ability to perceive pain enables a creature to perceive pleasure.
- Observe that pain is necessary for creatures' survival.

So, while this approach likely appeals to people persuaded by science, nomic regularity defenses also have several weaknesses in that they:

- Lack a compassionate approach to the suffering of the individual creature.
- Do very little to integrate the problem of suffering with canonical theism.
- Do not investigate possible pain mitigation strategies found in nature.

In other words, nomic regularity defenses are very good at providing a big picture view of how the order and regularity of nature benefits a biologically diverse and dynamic creation. Yet, they also paint a portrait of individual

creatures who each suffer alone for the greater good of evolutionary processes which they cannot comprehend. This approach can convey a God who is indifferent to the suffering of creatures caught in these processes, as though the good ends for the greater creation are sufficient to justify the difficult means endured by the individual creature: a very utilitarian view of God's value system.

However, philosopher Michael Murray recognized that the weaknesses of the otherwise strong nomic regularity defense could be mitigated by combining it with other theological approaches, like an animal afterlife theodicy. In short, by combining a series of strategies together, the resultant response might be greater than the sum of the individual parts.[51] Therefore, the nomic regularity defense might be improved when combined with the caring and attentive God found in canonical theism. Rolston, Peacocke, and Polkinghorne add this element to their argument in their Kenosis Approach (Section 2.1.3). Nomic regularity defenses could also be strengthened with the addition of information from the scientific literature explaining how natural processes may lessen unnecessary suffering in the created order.

The defense strategies presented and analyzed in the preceding paragraphs challenged the claim that suffering is *widespread* and *unnecessary* as summarized in Rowe's evidential premise (1) of the Problem of Evil. In evaluating the approaches that follow, it should be observed that these scholars accept the general premise that human and non-human suffering is widespread and unnecessary, but challenge the claims found in theological premise (2) of Rowe's Problem of Evil — *an omniscient, wholly good being would prevent the occurrence of any suffering it could, unless it could not do so without thereby losing some greater good or permitting some evil equally bad or worse*. In order to undermine this aspect of Rowe's argument, scholars employ strategies which

[51] Murray, *Nature*, 193-199.

attempt to a) maintain God's goodness while limiting his omniscience and/or omnipotence, or b) claim that suffering in creation is necessary for either the punishment or promotion of moral agents.

Section 2.1.3 Process Theism and Kenosis Approaches

In order to defend God's goodness in the midst of a creation where natural processes cause pain and death, some theologians have sought to remove God's responsibility for suffering by undermining his omniscience and omnipotence either directly or indirectly.[52] Process theologians who take this nonstandard approach to theodicy have argued that God does not have the power to prevent suffering.[53] This, they claim, is because God cannot know what will happen until it happens; God has no foreknowledge of events.[54] Furthermore, God's power over nature is limited because God does not exert power which controls, only the power of love to persuade.[55] Under these assumptions, process theists can affirm that God is wholly good as they claim suffering exists because God is incapable of preventing it.

While successfully affirming the good and loving nature of God, this approach has several weaknesses. Besides abandoning classical Christian

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[52] David R. Griffin, "Creation Out of Chaos and the Problem of Evil," in *Encountering Evil: Live Options in Theodicy* (ed. Stephen T. Davis; Edinburgh: T & T Clark, 1981), 105.

[53] Clark H. Pinnock, *Most Moved Mover: A Theology of God's Openness* (Carlisle: Paternoster, 2001). Charles Hartshorne, *Omnipotence and Other Theological Mistakes* (Albany, N.Y.: SUNY Press, 1984). Andrei Buckareff, "Divine Freedom and Creaturely Suffering in Process Theology: A Critical Appraisal," *Sophia* 39 (2000): 56-69. Donald Viney, "Process Theism," *The Stanford Encyclopedia of Philosophy* (ed. Edward N. Zalta; Summer 2018 Edition), Stanford University website [cited 22 January 2020]. Online: https://plato.stanford.edu/entries/process-theism/#Bib.

[54] Jay B. McDaniel, "Can Animal Suffering be Reconciled with Belief in an All-Loving God?" in *Animals on the Agenda: Questions about Animals for Theology and Ethics* (eds. Andrew Linzey and Dorothy Yamamoto; Chicago, Ill.: University of Illinois Press, 1998), 164.

[55] Ian G. Barbour, *Religion and Science: Historical and Contemporary Issues* (San Francisco: HarperCollins, 1997), 326-327. McDaniel, "Animal Suffering", 167. Sollereder, *God, Evolution, and Animal Suffering*, 65.

doctrines on God's omniscience and omnipotence,[56] it lacks scriptural support for its own position while ignoring these divine attributes as they are presented in the biblical text.[57] For example, God's omniscience is supported by Hebrews 4:13 (NIV) which states, "Nothing in all creation is hidden from God's sight." God's vast foreknowledge is proclaimed in Isaiah 46:9–10 (NIV):

> I am God, and there is no other;
> I am God, and there is none like me.
> I make known the end from the beginning,
> from ancient times, what is still to come.

A specific example of God's foreknowledge can be found in Genesis 15:13–16 where God revealed to Abram that his descendants would be enslaved for 400 years, but then would come out of slavery (in Egypt) and settle in the land promised to Abram.

The biblical text also supports God's active power over nature in passages like Psalm 147:8–9, 15–18 (NIV):

> He covers the sky with clouds;
> he supplies the earth with rain
> and makes grass grow on the hills.
> He provides food for the cattle
> and for the young ravens when they call.
> He sends his command to the earth;
> his word runs swiftly.
> He spreads the snow like wool
> and scatters the frost like ashes.
> He hurls down his hail like pebbles.
> Who can withstand his icy blast?
> He sends his word and melts them;
> he stirs up his breezes, and the waters flow.

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[56] Thomas C. Oden, *Classical Christianity: A Systematic Theology* (New York: HarperOne, 1992), 48-53.

[57] Creegan, *Animal Suffering*, 57-59. Sollereder, *God, Evolution, and Animal Suffering*, 64-67.

God's power over nature is not limited to the mundane daily routines of creation, but also includes intervening with judicious discernment as when God parted the Red Sea to allow the Israelites to evade Pharoah's armies (Exodus 14) and Jesus calmed the storm for his frightened disciples when the boat they were in was in danger of capsizing (Mark 4:35–41). Consequently, the claims of process theism appear to be theologically speculative without support from either traditional Christian reasoning or Scripture.

Furthermore, this depiction of God is one where God is powerless to stop evil and offers little comfort to those creatures that do suffer. As Oxford Fellow of Theology and Religion Bethany Sollereder observes:[58]

> A God who is essentially unable to bring about events or direct history in any effective way will not be able to bring about the eschatological recreation of the world either. There is no guarantee left that good will triumph over evil, for the divine lure towards the good has (evidently) already failed many times. […] Sacrificing the substance of hope for redemption ends up with a greater problem of evil and suffering, not a lesser one, since there is no clear end to evil.

Besides lacking the power to prevent harm, if God lacks foreknowledge, then it also suggests that either 1) God had no idea that the creation set in place would eventually produce disease, pain, and death, or 2) it was a risk that God was willing to take. Unlike the nomic regularity defense which affirms God's omniscient understanding of a complex universe, this paradigm of God's limited knowledge and power might leave the sufferer wondering whether his cancer arose because of God's ignorance or incompetence. Ultimately, process theism offers a weak defense which depicts a world of suffering created by a kind but powerless God who should not be blamed for what he could not foresee.

[58] Sollereder, *God, Evolution, and Animal Suffering*, 66.

In contrast, kenosis approaches are more robust than process theism in that they deny neither God's omniscience, omnipotence, nor God's ability to take action in the world.[59] Kenosis – which refers to self-emptying – makes the weaker and more defensible claim that God *chooses* to lay down his power in many circumstances compared to the stronger process theism claim that God's power is limited. In doing so, the kenosis approach has many of the advantages of process theism without as many of its weaknesses. For example, kenosis approaches would be compatible with Scriptural accounts where God healed the Israelites who were bitten by snakes (Num 21:6–9), Jesus healed lepers (Mark 1:40–42; Luke 17:11–14) and those who could not walk (Luke 5:17–26), as well as the rare occasions where Jesus raised the dead back to life (Luke 7:11–15; John 11:1–44). The kenotic approach embraces classical Christian doctrines of God's foreknowledge and power as well as God's eventual triumph of good over evil, yet kenosis still has some serious drawbacks.

First, kenosis does not explain why God does not exert power to stop either extreme suffering or the suffering of animals.[60] Why doesn't God heal disease and severe injury on a more regular basis? While it can be argued that God sets aside his power so that moral agents like humans might gain important moral or spiritual insight from the experience of suffering, this is harder to justify in the case of non-humans. Second, "while kenosis may explain the origin of suffering, it does not – by itself – offer hope to individuals who suffer."[61] Although proponents of kenosis like process theologian Jay McDaniel as well as Rolston and Peacocke contend that God enters into and

[59] John Polkinghorne, ed., *The Work of Love: Creation as Kenosis* (Grand Rapids, Mich.: Eerdmans, 2001).

[60] Thomas J. Oord, "An Open Theology Doctrine of Creation and Solution to the Problem of Evil," in *Creation Made Free: Open Theology Engaging Science* (ed. Thomas J. Oord; Eugene, Ore.: Wipf & Stock, 2009), 49. Thomas J. Oord, *The Uncontrolling Love of God: An Open and Relational Account of Providence* (Downers Grove, Ill.: IVP Academic, 2015), 169-170.

[61] Sollereder, *God, Evolution, and Animal Suffering*, 72.

shares the suffering of the creature,[62] Ruth Page, a senior lecturer in Divinity at the University of Edinburgh, objects that "God has merely changed from a powerful onlooker to a suffering onlooker, and creation remains on its own."[63]

In summary, the strengths of process theism approaches are that they:

- Acknowledge that the existence of animal pain is credible and that animals are theologically significant to God.
- Affirm the lovingkindness of a wholly good God.

The weaknesses of process theism approaches are that they:

- Reject God's omnipotence, omniscience, and thus responsibility for suffering in the created order.
- Depict a God who is powerless to stop evil and can offer little support to creatures that suffer.
- Lack scriptural support for their claims while ignoring biblical texts which depict God's omnipotence, omniscience, and power to ultimately overcome and defeat of evil.

The strengths of kenosis approaches are that they:

- Acknowledge that the existence of animal pain is credible and that animals are theologically significant to God.
- Affirm the lovingkindness of a wholly good God.
- Acknowledge God's omnipotence, omniscience, and responsibility for suffering in the created order.
- Affirm God's power to overcome and defeat evil.
- Depict a God who suffers alongside all creatures.

The weaknesses of kenosis approaches are that they:

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[62] McDaniel, "Animal Suffering", 165-166. Rolston, *Science and Religion*, 144-146. Arthur Peacocke, "The Cost of New Life," in *The Work of Love: Creation as Kenosis* (ed. John Polkinghorne; Grand Rapids, Mich.: Eerdmans, 2001), 37-39. Sollereder, *God, Evolution, and Animal Suffering*, 74.

[63] Ruth Page, *God and the Web of Creation* (London: SCM, 1996), 53.

- Depict a God who has inexplicably chosen to lay aside the power to intervene and alleviate suffering in the natural order.
- Offer no succor to creatures that suffer.

However, the self-limiting of God's intervening power in the kenosis approach could be strengthened if it were combined with naturally occurring pain mitigation strategies found in the natural order. This may be considered part of a *providential care defense* in that it "concerns how God *thinks ahead* to care for all creatures, fitting them for contingencies, for challenges… [and] needs as yet unrecognized by creatures."[64]

Section 2.1.4 Suffering as Punishment – The Theodicy of Adam's Fall

A more traditional approach used to explain suffering in the world has been to claim that it is the justified punishment for Adam and Eve's sin. In Western thought, which has been so deeply affected by Augustinian theology generally, theologians have followed Augustine in assuming that the purpose of Genesis 1–3 is to describe the origins of the material universe, pain, and biological death. In order to exonerate God for the existence of the latter two maladies, many Western theologians have subsequently treated suffering as a punishment for sin imposed upon humans and animals alike after the Fall. In *The Literal Meaning of Genesis*, Augustine wrote:[65]

> Death occurred on the day when our first parents did what God had forbidden. Their bodies lost the privileged condition they had had, a condition mysteriously maintained by nourishment from the tree of life, which would have been able to preserve them from sickness and from the aging process. […] When Adam and Eve, therefore, lost their privileged state, their bodies became subject to disease and death, like the bodies of animals….

[64] Oden, *Classical Christianity*, 144.
[65] Augustine, *Genesis* 11.32.42 (ACW[42] 2:164-165).

John Calvin later expanded on Augustine's thought, blaming the punishment of Adam and Eve for the suffering of all creatures: [66]

> It is then indeed meet for us to consider what a dreadful curse we have deserved, since all created things in themselves blameless, both on earth and in the visible heaven, undergo punishment for our sins; for it has not happened through their own fault, that they are liable to corruption. Thus the condemnation of mankind is imprinted on the heavens, and on the earth, and on all creatures.

This belief became very pervasive in the Western church and successfully absolved God from responsibility for creaturely suffering and laid that burden on human beings instead.

However, because this Genesis interpretation appears to offer a narrative which is scientifically-inconsistent with the age of the Earth, the origins of humanity, and the existence of disease and death before the existence of Adam and Eve,[67] a growing chorus of theologians, biblical scholars, philosophers, and scientists have been challenging the traditional Augustinian interpretation of Genesis 1–3 on many fronts.[68]

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[66] Romans 8:20–22 in John Calvin, *Commentaries on the Epistle of Paul to the Romans* (trans. John Owen; Edinburgh: Calvin Translation Society, 1849), Christian Classics Ethereal Library edition: n.p. [cited 26 January 2019]. Online: http://www.ccel.org/ccel/calvin/calcom38.xii.vi.html.

[67] Darwin, *On the Origin of Species.* Kenneth R. Miller, *Finding Darwin's God: A Scientist's Search for Common Ground Between God and Evolution* (New York: Harper Perennial, 2007). Dennis R. Venema and Scot McKnight, *Adam and the Genome: Reading Scripture after Genetic Science* (Grand Rapids, Mich.: Brazos, 2017). George Poinar, Jr. and Roberta Poinar, *What Bugged the Dinosaurs?: Insects, Disease, and Death in the Cretaceous* (Princeton, N. J.: Princeton University Press, 2008).

[68] Osborn, *Death Before the Fall.* Tatha Wiley, *Original Sin: Origins, Developments, Contemporary Meanings* (New York: Paulist, 2002), 3-75. William T. Cavanaugh and James K. Smith, eds., *Evolution and the Fall* (Grand Rapids, Mich.: Eerdmans, 2017). Stephen C. Barton and David Wilkinson, eds., *Reading Genesis After Darwin* (New York: Oxford University Press, 2009). Denis R. Alexander, *Creation or Evolution: Do We Have to Choose?* (Oxford: Monarch, 2008). Francis S. Collins, *The Language of God: A Scientist Presents Evidence for Belief* (New York: Free, 2007). Hick, *Evil and the Love of God*, 201-215. Murray, *Nature,* 73-106. Creegan, *Animal Suffering*, 14-43. Southgate, *Groaning of Creation*, 28-35. Bethany Sollereder does an exceptional job of analyzing the biblical texts as she exposes the weaknesses of the Fall theodicy in Sollereder, *God, Evolution, and Animal Suffering*, 13-43.

For example, many biblical scholars have recognized that the Genesis 1–11 text was strongly influenced by Ancient Mesopotamian socio-historical thought.[69] In fact, the text itself (Gen 2:10–14; 10:8–12; 11:1–4, 27–31) as well as recent geographical and geological research appears to place the location of these passages in the Mesopotamian plain of the Tigris-Euphrates rivers (see Figure 5.1 in Section 5.3.1).[70] Assuming the Bible is accurate in dating Genesis 2–3 to circa 4000 BCE, that would place Augustine — a resident of Hippo in Roman-controlled North Africa approximately 4,400 years later — at a great disadvantage when interpreting this text. This is because Augustine (ca. 400 CE) in the Western Roman Empire would have had a worldview shaped by Greco-Roman influences instead of the Ancient Mesopotamian paradigms found in the biblical literature. Consequently, important Mesopotamian theological concepts and metonymies found in Genesis 1–3 would have been foreign to the gentile influencers of the early church like Augustine.

Jean Delumeau, a French historian who specialized in the history of the Catholic Church, explained the profound impact Greco-Roman myths had upon the Church Fathers as they interpreted the Garden of Eden account and created an influential new genre of literature known as the *Hexaemeron*.[71] In "The Influence of Greek Philosophy on the Early Commentaries on Genesis",

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[69] Gordon Wenham, "Original sin in Genesis 1-11," *Churchman* 104 (1990): 321-324. Thorkild Jacobsen, "The Eridu Genesis", *Journal of Biblical Literature* 100 (1981): 513-529. John H. Walton, *Ancient Near Eastern Thought and the Old Testament: Introducing the Conceptual World of the Hebrew Bible* (Grand Rapids, Mich.: BakerAcademic, 2018). Bill T. Arnold and Brent A. Strawn, eds., *The World Around the Old Testament: The People and Places of the Ancient Near East* (Grand Rapids, Mich.: BakerAcademic, 2016). Mark W. Chavalas and K. Lawson Younger, Jr., eds., *Mesopotamia and the Bible: Comparative Explorations* (Grand Rapids, Mich.: BakerAcademic, 2002). Bill T. Arnold, Nancy L. Erickson, and John H. Walton, eds., *Windows to the Ancient World of the Hebrew Bible: Essays in Honor of Samuel Greengus* (Winona Lake, Ind.: Eisenbrauns, 2014). John H. Walton, *Ancient Israelite Literature in Its Cultural Context: A Survey of Parallels between Biblical and Ancient Near Eastern Texts* (Grand Rapids, Mich.: Zondervan, 1990).

[70] Carol A. Hill, "The Garden of Eden: A Modern Landscape," *PSCF* 52 (2000): 34-35. James A. Sauer, "The River Runs Dry: Creation Story Preserves Historical Memory," *Biblical Archaeology Review* 22 (1996): 52-57, 64.

[71] Jean Delumeau, *History of Paradise: The Garden of Eden in Myth and Tradition* (trans. Matthew O'Connell; Champaign, Ill.: University of Illinois Press, 2000), 6-21.

Frank Robbins — a professor of Greek — documented how the Hexaemeral writers were consciously and unconsciously shaped by the Greco-Roman philosophy and science of their day.[72] For example, Plato's *Timaeus* had an immense influence in framing their worldview, creating "a Platonic principle that God cannot be the cause of anything evil."[73] A logical result of this principle was that God could not be culpable for any of the tribulations found in the world: "Nor would our writers admit that God is the cause of the harm done by animals, poisonous plants and reptiles, or thorns; they escape all these difficulties by saying that man's sin was the cause of all."[74] Therefore, there are sound reasons for suspecting that pagan philosophical views helped create an intellectual milieu which diverted responsibility for pain and death in creation from God to the shoulders of humankind.

Furthermore, if the author of Genesis did mean to convey that Adam and Eve were ultimately responsible for all sin, pain and death in the created order, then one might expect this theme to be expounded in the rest of the Torah. Yet, as biblical scholars Joel Green and Tatha Wiley have observed, the Jewish writers of the Old Testament hardly mention Adam and Eve at all and did *not* view them as the source of human sin or the cause of pain and biological death.[75] Rather, the concept of the Fall as the origin of all human sin and suffering does not appear to have surfaced until ca. 200 BCE—100 CE after the Hellenization of Jewish lands.[76] This may explain the remarkable resemblance between Hesiod's etiological myth *Pandora's Jar* which was the Greek pagans' explanation of the origins of human suffering (ca. 750—650 BCE)

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[72] Frank Egleston Robbins, "The Influence of Greek Philosophy on the Early Commentaries of Genesis," *AJT* 16 (1912): 219.

[73] Robbins, "Influence of Greek," 221-222.

[74] Robbins, "Influence of Greek," 222.

[75] Joel B. Green, "Adam, What Have You Done?" in *Evolution and the Fall* (William T. Cavanaugh and James K. Smith, eds.; Grand Rapids, Mich.: Eerdmans, 2017), 98-116. Wiley, *Original Sin*, 28-35.

[76] Ben Witherington III, *New Testament History: A Narrative Account* (Grand Rapids, Mi.: BakerAcademic, 2006), 32-35.

and the subsequent Fallen view of Adam and Eve found in later noncanonical writings: *Life of Adam and Eve (Apocalypse of Moses)*, *4 Ezra*, *2 Baruch*, *Biblical Antiquities*, *Sirach 25:24*, and *Wisdom of Solomon 2:23–24*.[77]

However, these Hellenized thinkers who were using Genesis 2–3 to describe an introduction of physical illness and biological death into the world would have been ill-equipped to understand the broader theological implications of the term "death" in the Jewish worldview. As Old Testament professor Hans Walter Wolff explains, the Hebrew Bible views the living and the dead as more than biological states of existence. Those terms have theological implications where the "living" are those who can and do praise God in both works and word whereas the "dead" represent those who have broken relationship with God and "have been expelled from Yahweh's sphere of influence":[78]

> In the Old Testament life therefore means: to have relationship. Above all: to have relationship with God. […] Death… means lack of relationship.

This significant insight into the Jewish worldview assists when interpreting the competing claims of God and the serpent in the garden (Gen 2:16–17; 3:4–5 NIV).

> [16]And the Lord God commanded the man, "You are free to eat from any tree in the garden; [17]but you must not eat from the tree of the knowledge of good and evil, for when you eat from it you will certainly die."

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[77] Hesiod, *Theogony and Works and Days* (trans. M. L. West; New York: Oxford University Press, 2008), 39-40. Green, "Adam," 100-105. Wiley, *Original Sin*, 33-34. Green and Wiley date *Life of Adam and Eve (Apocalypse of Moses)* to the first century CE , *4 Ezra* to the late first century CE, *2 Baruch* to the late first or early second century CE, *Biblical Antiquities* (also known as Pseudo-Philo) to the first century CE, *Sirach 25:24* around 200 BCE, and *Wisdom of Solomon 2:23–24* around the late 100's BCE.

[78] Hans Walter Wolff, *Anthropology of the Old Testament* (trans. M. Kohl; London: SCM Press, 1981), 106-107.

> [4]"You will not certainly die," the serpent said to the woman. [5]"For God knows that when you eat from it your eyes will be opened, and you will be like God, knowing good and evil."

Whereas God was likely talking about relational death where a person rejects a right relationship with God, the snake appears to have defined death as merely biological. By using a different definition of "death", the serpent duplicitously yet truthfully answered that the humans would not die biologically on the day they disobeyed God and seized for themselves the fruit of the tree of knowledge of good and evil.[79] (Adam continued to live at least another 800 years according to Gen 5:3–5.) However, what the serpent did *not* tell the humans was that their relationship with God would "die" just as God had warned and result in their expulsion from the sacred space of the Garden.[80] In this understanding of the text, both the serpent and God speak the truth even as the passage reveals that there is more to life and death than just a heartbeat. The above interpretation of "death" as rejection of God is also likely given that much of the Old Testament that follows Genesis is dedicated to teaching human beings about the importance of embracing the wisdom of God so that they can "live" in right relationship with God and one another (e.g., the Book of Proverbs). Therefore, the primary pedagogical point of this Jewish story is probably intended to focus on relational life and death with God, not the origins of biological death in nature.

Besides recognizing the intellectual biases of Augustine's day, it is important to understand that information from Ancient Near Eastern (ANE)

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[79] Gerhard von Rad, *Genesis* (OTL; trans. John H. Marks; Philadelphia. Pa.: Westminster, 1961), 87. Bill T. Arnold, *Genesis* (NCBC; New York: Cambridge University Press, 2013), 65-66. Henri Blocher, *In the Beginning: The Opening Chapters of Genesis* (trans. D. G. Preston; Downers Grove, Ill.: InterVarsity, 1984), 139.

[80] Gordon J. Wenham, "Sanctuary Symbolism in the Garden of Eden Story," in *I Studied Inscriptions from Before the Flood: Ancient Near Eastern, Literary, and Linguistic Approaches to Genesis 1-11* (ed. Richard S. Hess and David T. Tsumura; Winona Lake, Ind.: Eisenbrauns, 1994), 404. R. Walter L. Moberly, "Did the Serpent Get it Right?" *JTS* 39 (1988): 16-18. Gordon J. Wenham, *Genesis 1-15* (WBC 1; Grand Rapids, Mich.: Zondervan, 2014), 74-75.

studies can open opportunities for alternative interpretations that would be unavailable to Augustine's worldview, as can be seen in the case of Genesis 1. ANE scholars have observed that ancient Sumerian temples from the Tigris-Euphrates valley were tripartite in structure,[81] an architectural feature that was reproduced later in the tabernacle during the time of Moses (Exodus 25–40; 35–40) and the temple built by Solomon (1 Kings 6–8; 2 Chronicles 3–7). Both of these had three sacred functional spaces that enabled fellowship between the community and God: the outer court, the holy place, and the holy of holies. Each of these three functional spaces was then filled with their designated furnishings. Once everything was set in order and priests were appointed, God's presence filled the tabernacle/temple (Exod 40:34–38; 1 Kgs 8:10–11; 2 Chr 7:1–2).

It is noteworthy that these passages do not tell the reader how long it took to weave the curtains or construct the ark, or any of the other tabernacle furnishings. Neither does it instruct the reader on how these objects were manufactured, although it does describe their appearance. What is important to each of these accounts is that a seven-day inauguration was associated with: 1) ordering these holy functional spaces, 2) setting their respective objects into place, and 3) consecrating the priests and the tabernacle/temple before God entered in to reside and reign.

Old Testament scholar John Walton suggests that Gen 1:3–2:3 similarly depicts the ordering and inauguration of God's *cosmic temple* which incorporates heaven and earth (Figure 1.1),[82] also known as the *cosmic*

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[81] J. Nicholas Postgate, *Early Mesopotamia: Society and Economy at the Dawn of History* (London: Routledge, 1994), 109-112. Harriet Crawford, *Sumer and the Sumerians* (Cambridge: Cambridge University Press, 2004 [2nd edn]), 69-75. Pascal Butterlin, "Late Chalcolithic Mesopotamia: Towards a Definition of Sacred Space and its Evolution," in *Defining the Sacred: Approaches to the Archaeology of Religion in the Near East* (ed. Nicola Laneri; Oxford: Oxbow Books, 2015), 62-68.

[82] John H. Walton, *The Lost World of Genesis One: Ancient Cosmology and the Origins Debate* (Downers Grove, Ill.: InterVarsity, 2009), 53-85. John H. Walton, *Genesis 1 As Ancient*

mountain.[83] Days 1-3 set up three functional spaces necessary to provide sustenance for all creatures:[84]

- Day 1 = TIME: differentiation of light/darkness, day/night
- Day 2 = WATERS (Seasonal): differentiation of waters above/below
- Day 3 = LAND & PLANTS: differentiation of land/water and kinds of seeds

Days 4-6 install functionaries in their appropriate functional spaces, enabling all creatures to be in relationship with God:[85]

- Day 4 = differentiation of lights to mark day, night, and seasons in TIME
- Day 5 = differentiation of birds and fish in WATERS above/below
- Day 6 = differentiation of land animals, men/women within LAND

The first thing to observe in this interpretation is that the three functional spaces (time, waters, and land with vegetation) are all necessary precursors for producing food for living creatures. Second, the character of the functional spaces is cumulative. That is, each successive space is dependent upon the prior functional space in order to bring forth food.

Cosmology (Winona Lake, Ind.: Eisenbrauns, 2011), 100-110. Ellen van Wolde, "'Creation Out of Nothing' and the Hebrew Bible," in *Creation Stories in Dialogue: The Bible, Science, and Folk Traditions* (BIS 139; ed. R. Alan Culpepper and Jan G. van der Watt; Leiden: Brill, 2015), 162-163. Joseph Lam, "The Biblical Creation in its Ancient Near Eastern Context," BioLogos website [cited 26 November 2018]. Online: https://biologos.org/uploads/projects/lam_scholarly_essay.pdf.

[83] John M. Lundquist, "What is a Temple? A Preliminary Typology," in *The Quest for the Kingdom of God: Studies in Honor of George E. Mendenhall* (ed. H. B. Huffmon, F. A. Spina, and A. R. W. Green; Winona Lake, Ind.; Eisenbrauns, 1983), 207-208. Carol L. Meyers, *The Tabernacle Menorah: A Synthetic Study of a Symbol from the Biblical Cult* (ASORDS 2; Missoula, Mont.: Scholars, 1976), 171-173. Henri Frankfort, *The Art and Architecture of the Ancient Orient* (New Haven, Conn.: Yale University Press, 1996), 20-22. Blocher, *In the Beginning*, 49-59. Umberto Cassuto, *A Commentary on the Book of Exodus* (trans. Israel Abrahams; Skokie, Ill.: Varda Books, 2005), 476. Peter J. Kearney, "Creation and Liturgy: The P Redaction of Exod 25-40," *ZAW* 89 (1977): 375-387. Moshe Weinfeld, "Sabbath, Temple and the Enthronement of the Lord – The Problem of the Sitz in Leben in Gen 1:1-2:3," in *Mélanges bibliques et orientaux en l'honneur de M Henri Cazelles* (Kevelaer: Butzon and Bercker, 1981), 501-506.

[84] Walton, *Lost World of Genesis One*, 53-61. Walton, *Genesis 1*, 152-171.

[85] Walton, *Lost World of Genesis One*, 62-70. Walton, *Genesis 1*, 172-178.

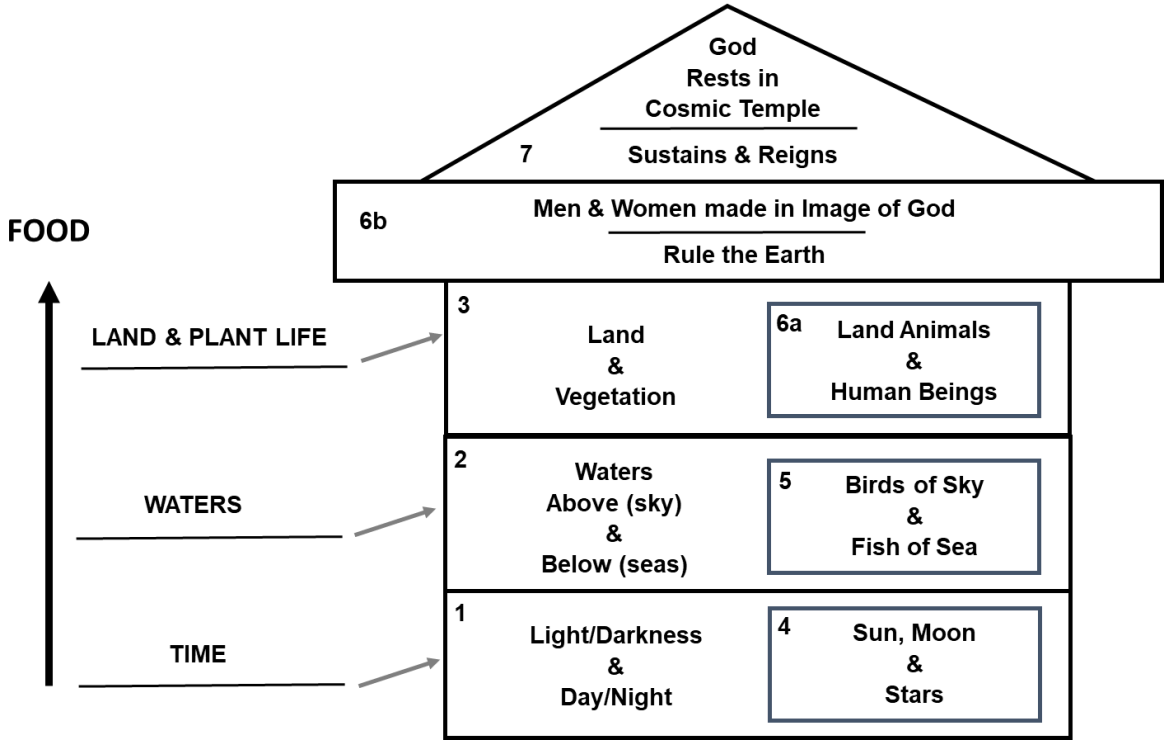

Figure 1.1 Seven days of ordering and inaugurating the Cosmic Temple.
The functional spaces (days 1-3) are indicated on the left. The functionaries installed in those functional spaces (days 4-6) are indicated within on the right. Men and women are made in the image of God and given responsibility to rule over the earth. God comes to rest in his Cosmic Temple on the seventh day.

The seasonal rains (waters above) and overflowing rivers (waters below) that are required during the growing season will be different from the water available during the dry harvest season. Therefore, TIME + WATERS provide the differing *seasons* of agriculture:

TIME + WATERS = SEASONS

The PLANTS which are the foundational base of the *food* chain for all animals (Gen 1:29–30) require SEASONS [TIME + WATERS] + LAND for growth:

SEASONS + PLANTS + LAND = FOOD

Once, these functional spaces are established, everything necessary for life has been prepared.

This depiction of Genesis 1 presents a picture of all creatures being given shelter and sustenance within God's cosmic temple — no creature is left on the outside, signifying that all are in relationship with and cared for by God. This concept is encapsulated by the Jewish notion of *divine providence*, signifying "God's control and guidance of the universe and all it contains":[86]

> Psalm 145 celebrates God's providential care for all his creation, declaring that "the Lord is good to all, his mercy is over all his works… The Lord upholds all who fall, and raises all who are bowed down. The eyes of all look hopefully to thee, and thou givest them their food in due season. Thou openest thy hand, and satisfies every living thing with favor… The Lord is near to all who call upon him… He hears their cry and saves them…"

The ANE cosmic temple interpretation of Genesis 1 is also significant because it undermines views that suggest God would be indifferent to the suffering of human or non-human creatures. From the Jewish perspective, a creature can only be "expelled from Yahweh's sphere of influence" by breaking relationship with God.[87] Since only the man and the woman used their free will to break relationship with God in the Garden (Genesis 3), it becomes difficult to explain using either the Hebrew Bible or worldview how animals would be displaced from God's providential care.[88] Unfortunately, these ANE paradigms would have been unfamiliar to Augustine and his Hellenized contemporaries whose worldviews were shaped by a Greco-Roman socio-historical context thousands of years later.

Augustine had other difficulties that complicated his ability to interpret the Genesis text, including his inability to read it in its original language: Hebrew. Augustine's translator, John Hammond Taylor, reports:

> [Augustine] knew no Hebrew…. […] Augustine's knowledge of Greek was on an elementary level, and when he was beginning his

[86] Philip Birnbaum, *A Book of Jewish Concepts* (New York: Hebrew Publishing, 1975), 172.
[87] Wolff, *Anthropology*, 106-110.
[88] Birnbaum, *Jewish Concepts*, 173.

> commentary on Genesis in 401 it was almost nonexistent. […] The Old Latin translation of the Old Testament which Augustine had at hand and which was used in the churches of North Africa was based on the Greek of the Septuagint, not on the Hebrew text.

This becomes significant with respect to Augustine's interpretation because the Greek Septuagint and the Latin Vulgate both frequently translate the Hebrew *hā-'ādām* in Genesis 2–3 as a proper name, Adam. Yet, *hā-* is the definite article which means "the" so the term *hā-'ādām* should have been translated as "the man", "the human", or "the mortal" until the proper name Adam appears to be used in Gen 3:17 followed by Eve's proper name in Gen 3:20.[89] Therefore, Augustine was likely unaware of the possibility that Genesis 2–3 intentionally referred to a generic *archetypal* man and woman and that the account may have intended to convey a universal theological message to *all* human beings.[90] In other words, the goal may have been to pass down a pedagogical story as a cautionary tale to every human being, warning that any one of us could be:

- The serpent—representing *usurpation* by rejecting God's authority and wisdom and replacing it with our own (Gen 2:16–17; 3:1–5)
- The woman—representing *syncretism* by compromising God's wisdom and blending it with false teachings (Gen 2:16–17; 3:2–3)
- The man—representing *disobedience* by acting on false teaching even though knowing that to do so is contrary to God's wisdom (Gen 2:16–17; 3:6)

In Genesis 1–3, the reader discovers that human beings are blessed above all other creatures to bear the image of God (Gen 1:26–28), but that blessing can also be our greatest temptation because it seems no other earthly creature falls

[89] Strong's #120. It should be noted that the Literal Standard Version does not use Adam as a proper name until Gen 4:25. J. Richard Middleton, "Reading Genesis 3 Attentive to Human Evolution," in *Evolution and the Fall* (William T. Cavanaugh and James K. Smith, eds.; Grand Rapids, Mich.: Eerdmans, 2017), 73. Victor P. Hamilton, *The Book of Genesis: Chapters 1-17* (NICOT; ed. R. K. Harrison and Robert L. Hubbard; Grand Rapids, Mich.: Eerdmans, 1990), 159-160.

[90] Venema and McKnight, *Adam and the Genome*, 152.

into the mistake of thinking they *are* God (Gen 3:5–6). As experience shows, human beings are tempted into thinking:[91]

1) We are the highest person in existence
2) We can make our own moral code
3) We can treat others as a means for our own self-gratification
4) We can remake God in our own image

So, an appeal to the universal condition of humanity may be the reason the text uses the anonymous term "the human" and does not employ the proper names of historical people (Adam and Eve) until the end of Genesis 3, where ancient readers would recognize Adam and Eve as those entrusted with the wisdom and values of God which were then passed down from Adam through the line of Seth, to Noah, and then to Abram (Genesis 5, 10, and 11:10–26).

Although the interpretations offered above are obviously not the only ways to read Genesis 1–3, they do illustrate that pertinent information originally unavailable to Augustine can make alternative interpretations both viable and insightful. Whilst Jewish and ANE paradigms have been shown to be useful methods of reanalyzing Augustine's historic interpretation here, there are many other scholars who have offered helpful critiques and evaluations of the Fall narrative. These include but are not limited to Ronald Osborn's *Death Before the Fall*,[92] Bethany Sollereder's biblical analysis and word studies,[93] and Scot McKnight's literary analysis and comparison of the many ways Adam and Eve have been viewed in the Jewish worldview.[94]

It should be observed that the interpretations of Genesis 1–3 offered above do *not* make the type of scientifically untenable assertions which can

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[91] Hamilton, *Genesis*, 165, 189-190. Rad, *Genesis,* 94.

[92] Osborn, *Death Before the Fall*, 25-121.

[93] Sollereder, *God, Evolution, and Animal Suffering*, 13-43.

[94] Venema and McKnight, *Adam and the Genome*, 111-191. Scot McKnight is a professor of New Testament at Northern Seminary.

cause Judeo-Christian belief to seem irrational and/or improbable. More specifically, when Genesis 3 is interpreted from a Jewish and ANE perspective rather than the Greco-Roman worldview, claims that the text describes the introduction of pain and biological death into Earth's history disappear along with its associated conflict with science. Therefore, it is essential to realize that the purported disagreements between Genesis 1–3 and science have been due to textual interpretations which were based upon Greco-Roman intellectual foundations rather than ANE paradigms.

Ancient Greek science also had an unfortunate impact on interpretations of Genesis 1–3 which continue to this day. For example, Alister McGrath — Oxford theologian, scientist, and Anglican priest — has noted that Augustine's influential teaching on the "fixity of species" (which discourages Christians from embracing Neo-Darwinian evolution) comes from Aristotelian science:[95] the same outdated science that caused the Galileo controversy over Copernicus' heliocentric solar system.[96] It should be noted that Augustine himself warned that much of the Genesis creation account should be taken in a figurative sense and that interpreters must struggle with unclear expressions which may be interpreted either spiritually or corporeally.[97] He further admonished those who, in their zeal for Scripture, talk nonsense on scientific topics:[98]

> Usually, even a non-Christian knows something about the earth, the heavens, and the other elements of this world, about the motion and orbit of the stars and even their size and relative positions, about the predictable eclipses of the sun and moon, the cycles of the years and the seasons, about the kinds of animals, shrubs, stones, and so forth,

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[95] McGrath, *Fine-Tuned Universe,* 101-108. Jonathan Barnes, ed., *The Complete Works of Aristotle: The Revised Oxford Translation* 1033^{b}26-1034^{a}8 (Boll 71; 2 vols.; Princeton, N. J.: Princeton University Press, 1984), 2:1632. Martin K. M. Duboisée de Ricquebourg, "Origin of Species or Specious Origins? A Reformed Presuppositional Apology to Darwin's Origin of Species and Descent of Man" (ThM diss., The Bible Institute of South Africa of the North-West University, 2011), 7-9.

[96] Barbour, *Religion and Science*, 4-13.

[97] Augustine, *Genesis* 1.1.1-1.1.3 (ACW^{41} 1:19-20).

[98] Augustine, *Genesis* 1.19.38-1.19.39 (ACW^{41} 1:42-43).

> and this knowledge he holds to as being certain from reason and experience. Now, it is a disgraceful and dangerous thing for an infidel to hear a Christian, presumably giving the meaning of Holy Scripture, talking nonsense on these topics; and we should take all means to prevent such an embarrassing situation, in which people show up vast ignorance in a Christian and laugh it to scorn. […] If they find a Christian mistaken in a field which they themselves know well and hear him maintaining his foolish opinions about our books [Scriptures], how are they going to believe those books in matters concerning the resurrection of the dead, the hope of eternal life, and the kingdom of heaven, when they think their pages are full of falsehoods on facts which they themselves have learnt from experience and the light of reason?

Augustine offered this warning because he recognized that scientifically uninformed theological assertions not only make non-Christians think Christians and the writers of the Scriptures are uneducated fools, but it will make it even harder for non-believers to accept the more difficult teachings of the Christian faith. Augustine presciently anticipated the attitude of people like William Rowe[99] who believe that Christians can only adhere to their beliefs because they are ignorant of science. Consequently, there is an onus on theologians and biblical scholars to offer interpretations of Genesis 1–3 which are textually sound, faithful to the narrative of Scripture, and not easily refuted by well-established empirical evidence.[100]

The theodicy of Adam's Fall, which has traditionally been promoted by theologians in the West, attempts to weaken claims behind Rowe's theological premise (2) — *an omniscient, wholly good being would prevent the occurrence of any suffering it could, unless it could not do so without thereby losing some greater good or permitting some evil equally bad or worse* — by claiming that suffering in creation is the deserved consequence of Adam and Eve's sin. This approach seeks to

[99] Rowe, "Problem of Evil," 340.

[100] Miller, *Finding Darwin's God.* Roger L. Revell, review of Christopher Southgate, *The Groaning of Creation: God, Evolution, and the Problem of Evil*, *ATR* 98 (2016): 604-606.

deflect responsibility for creaturely suffering and death away from God and place that blame on human beings instead.

The strengths of the Fall Theodicy are that:

- It has been the basis of a widely accepted theological worldview amongst Western Christians and scholars for over 1,500 years.
- It offers a theological explanation for the pain and death experienced by humans and non-humans in the created order.
- It appears to acknowledge God's omnipotence, omniscience, and power over nature.
- It depicts a God who punishes evil and will ultimately end suffering and death.

The weaknesses of this theodicy are that:

- This understanding of Genesis 1–3 is heavily dependent upon a Greco-Roman hermeneutical worldview rather than the Jewish and Ancient Near Eastern milieu of the original text.
- It does not offer a very strong explanation for why animals should be punished with pain and death for Adam and Eve's sin.
- It depicts a God who is indifferent to the suffering of non-human animals in contrast to Hebraic thought and biblical support for God's providential care of all creatures.
- It presents a challenge to God's omnipotence because the deathless paradise God purportedly created was too fragile to withstand the sins of Adam and Eve without being compromised.[101]
- It presents a challenge to God's omniscience because God should have anticipated the sin of Adam and Eve and acted accordingly to prevent the Fall and the suffering it would cause.
- It presents a logical problem in that if Adam and Eve in their original state were perfectly good, free, rational, and fully provided for in paradise, then how could they do something bad and fall into sin?[102]

[101] Murray, *Nature,* 82-83.
[102] Murray, *Nature,* 83-87.

- It is defeated by scientific evidence which shows that death and pain existed in creation before the existence of Adam and Eve.[103]

Therefore, while the Fall theodicy was once a very influential means of understanding the problem of pain and death in the created order, it is no longer a robust explanation of creaturely suffering.

Section 2.1.5 Other Corruption of Creation Theodicies

Scientific evidence which shows that death and pain preceded the existence of Adam and Eve has been a powerful defeater for the argument that God's perfect creation was corrupted by fallen human beings.[104] As Michael Lloyd, an Anglican priest and Cambridge director of Studies in Theology, succinctly explains:[105]

> Since Darwin, it has not been possible to characterize all the divisions of creation as the effects of the human Fall, because the evidence suggests that predation, pain, disease, and death pre-dated the emergence of human beings. Those who have sought to retain the notion of a fallen creation in modern times have therefore looked elsewhere for the agency which occasioned that fallenness….

In response to this conundrum regarding the human Fall, some scholars have turned to similar corruption of creation approaches which suggest that suffering is the work of shadowy dark, chaotic, or demonic-like forces.

For example, C.S. Lewis, Michael Lloyd, Gregory Boyd, Illtyd Trethowan, Alvin Plantinga, and Eric Mascall suggest that the predation, pain,

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[103] Darwin, *On the Origin of Species.* Miller, *Finding Darwin's God.* Venema and McKnight, *Adam and the Genome*. Poinar, Jr. and Poinar, *What Bugged the Dinosaurs?* Southgate, *Groaning of Creation*, 1-15. Dougherty, *Animal Pain*, 16-35. Schneider, *Animal Suffering*, 15-26.

[104] Darwin, *On the Origin of Species.* Miller, *Finding Darwin's God.* Venema and McKnight, *Adam and the Genome*. Poinar, Jr. and Poinar, *What Bugged the Dinosaurs?* Southgate, *Groaning of Creation*, 1-15. Dougherty, *Animal Pain*, 16-35. Schneider, *Animal Suffering*, 15-26.

[105] Michael Lloyd, "Are Animals Fallen?" in *Animals on the Agenda: Questions about Animals for Theology and Ethics* (eds. Andrew Linzey and Dorothy Yamamoto; Chicago, Ill.: University of Illinois Press, 1998), 156.

disease, and death observed in nature — frequently identified under the philosophical label, *natural evil* — are the result of a pre-human angelic Fall that caused a perversion of God's good creation.[106] This view contends that either Satan, demons, or other evil spirits are responsible for the purported disvalues and death in the created order and will be analyzed more fully at the end of this section.

Taking a slightly different tack, theologian and mathematician Nicola Hoggard Creegan uses Jesus' parable of the Wheat and the Tares (Matt 13:24–30, 36–43) as a platform to suggest that "dark powers" are responsible for harms experienced in the ecosphere.[107] The parable compares the kingdom of heaven to a field of newly planted wheat where under the cover of darkness an enemy came and sowed tares into the field. (Tares are weeds that look identical to wheat until harvest when they produce no edible grain.) The owner of the field tells his servants to leave both the weeds and the wheat to grow together until the harvest when the noticeable difference in identity will allow them to be separated. When discussing this parable, Jesus explained (Matt 13:37–42 NRSV):

> The one who sows the good seed is the Son of Man; [38]the field is the world, and the good seed are the children of the kingdom; the weeds are the children of the evil one, [39]and the enemy who sowed them is the devil; the harvest is the end of the age, and the reapers are angels. [40]Just as the weeds are collected and burned up with fire, so will it be at the end of the age. [41]The Son of Man will send his angels, and they will collect out of his kingdom all causes of sin and all

[106] Lewis, "Problem of Pain", 423-424. Lloyd, "Are Animals Fallen?", 147-160. Gregory A. Boyd, *Satan and the Problem of Evil: Constructing a Trinitarian Warfare Theodicy* (Downers Grove, Ill.: InterVarsity, 2001), 293-318. Boyd is a pastor and theologian who embraces Open Theism and Anabaptism. Illtyd Trethowan, *An Essay in Christian Philosophy* (London: Longmans, Green & Co., 1954), 128. Trethowan was a Roman Catholic priest and theologian. Plantinga, *God, Freedom, and Evil*, 57-59. Eric L. Mascall, *Christian Theology and Natural Science* (New York: Ronald, 1956), 301-302. Mascall was an Anglican priest and theologian.

[107] Creegan, *Animal Suffering*, 82-96, 127-137.

> evildoers, [42]and they will throw them into the furnace of fire, where there will be weeping and gnashing of teeth.

In light of Jesus' explanation of this parable, it is peculiar that Creegan never explicitly identifies the dark powers of her theodicy with either the devil, Satan, or demonic spirits.[108] This makes it more difficult for the reader to evaluate who or what she is empowering with culpability, as she leaves it unclear whether she seeks to avoid defending the existence of the devil or is just trying to leave intellectual space for malevolent powers that may be more palatable to modern sensibilities such as trans-dimensional beings, non-terrestrials, or some "alien influence of an evil entwined with the good"[109] reminiscent of the Dark Force in the movie Star Wars.

While Creegan's dark powers approach circumvents the problem of dating creation's corruption to the existence of human beings, it does not explain how or when the onset of creation's dysfunction began. Did God create the dark powers, too, or did the dark powers coexist with God from the beginning as in dualistic Zoroastrianism or Manicheanism, where good and evil are locked in a cosmic battle for existence? Creegan does not offer a very satisfying answer as she denies accusations of dualism while admitting that a provisional Christian dualism is warranted by her proposed wheat and tares world.[110] Furthermore, she openly acknowledges that she is extending this parable beyond its original scope (regarding the judgment and harvest of humanity) to present a negative force in the world with sufficient power to undermine God's plans for creation.[111] Generally speaking, this is a poor hermeneutical approach to Scripture, especially since she supplies very few Scripture passages to support this broader interpretation. This can be

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[108] Sollereder, *God, Evolution, and Animal Suffering*, 69-70. Schneider, *Animal Suffering*, 32-33.

[109] Creegan, *Animal Suffering*, 87.

[110] Creegan, *Animal Suffering*, 127.

[111] Creegan, *Animal Suffering*, 91.

theologically irresponsible because as New Testament scholar Ben Witherington III notes: "A text without a context is just a pretext for whatever you want it to mean."[112] Nevertheless, Creegan's unique approach still falls comfortably in line with other corruption of creation theodicies and can be evaluated as such.

Theologian and biologist Celia Deane-Drummond also takes a corruption of creation view but rejects Satan, who she views as a mythological figure, as a possible causal agent.[113] She suggests instead along the lines of Sergii Bulgakov, a Russian Orthodox theologian (1871-1944), that unlike the divine Wisdom of God – *Sophia* – which was incarnate and exemplified in Jesus Christ, a *shadow sophia* is responsible for "the dark possibility of evil in the world."[114] Sollereder helpfully explains that "the notion of sophia (wisdom) and shadow sophia (anti-wisdom) stand as the cosmic goods and evils," respectively.[115] Elaborating on Bulgakov's view that the shadow sophia emerged after the Fall of humanity, Deane-Drummond writes:[116]

> After the fall, humanity falls *under* the power of nature because humanity has the mistaken belief that higher spiritual knowledge can be attained through the elements of this world alone. Such a belief, he suggests, means that nature now is vulnerable to nonbeing and chaos, thus expressing the dark face of fallen sophia.

Bulgakov sought to avoid claims of dualism by asserting that the shadow sophia's dark possibility of evil was not an ontological force of reality, but rather a "privation of the good, a state of creaturely being, or rather nonbeing."[117] While the Deane-Drummond/Bulgakov portrayal of shadow

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[112] Ben Witherington III, *Invitation to the New Testament: First Things* (New York: Oxford Press, 2013), 52.

[113] Deane-Drummond, *Christ and Evolution*, 187.

[114] Celia Deane-Drummond, "Shadow Sophia in Christological Perspective: The Evolution of Sin and the Redemption of Nature," *Theology & Science* 6 (2008): 20-21.

[115] Sollereder, *God, Evolution, and Animal Suffering*, 64.

[116] Deane-Drummond, *Christ and Evolution*, 186.

[117] Deane-Drummond, "Shadow Sophia", 21.

sophia diverts responsibility for natural evil away from God and avoids associating the corruption of nature directly with the origin of human beings, it has several problems.[118]

First, as discussed in Section 2.1.4 on the Theodicy of Adam's Fall, the human Fall narrative is heavily dependent upon Greco-Roman interpretations of an Ancient Near Eastern text. If the Fall interpretation is no longer tenable, then what happens to the notion of shadow sophia which purportedly came into existence after the human Fall? Did it still emerge into existence? If so, how and when? Since the shadow sophia is not a concept taught or supported by Scripture, there would appear to be no way of knowing. Second, how is it possible for the shadow sophia to have agency and act upon the created order? The divine Sophia (wisdom of God) has agency through the person of Jesus Christ. If the shadow sophia does not have ontological existence, then how does privation of the good or nonbeing explain earthquakes, forest fires, cancer, or viruses? Deane-Drummond leaves the connection between the shadow sophia and empirically observable examples of natural evil quite ambiguous. As a result of the unanswered questions above, the shadow sophia appears to be a relatively weak explanation for a corruption of creation theodicy.

There are other theologians, like Thomas Oord and Gregory Boyd,[119] who appeal to either primordial chaos or ancient monsters, Rahab and Leviathan, as alternative sources of corruption that undermine God's good creation. In 1895, German Old Testament scholar Hermann Gunkel famously put forward the fascinating *Chaoskampf* theory which claimed that the first verses of Genesis depict a mythological struggle between the Creator God and a primeval chaos represented by the waters of the deep and associated with the

[118] Sollereder, *God, Evolution, and Animal Suffering*, 64.
[119] Oord, "Open Theology", 28-49. Boyd, *Satan*, 314-315.

Babylonian goddess Tiamat.[120] (Gunkel based his argument upon the word *təhôm* from Gen 1:2.) While this theory was readily embraced by some prominent scholars,[121] more recent scholarship has significantly undermined Gunkel's claims[122] by recognizing that Mesopotamian thought was not only influenced by the Babylonians and Assyrians but also by the Sumerian and Akkadian civilizations that preceded them. Philip Johnston, Old Testament scholar at Cambridge, points out that the meaning of *təhôm* is unlikely to have been derived from the Akkadian *tiʾâmat* and cites numerous scholars who have concluded that *təhôm* and *tiʾâmat* have been derived separately from the proto-Semitic root *tiham*.[123]

Rather than referring to a pagan goddess, this "proto-Semitic" root (*tiham*) may originate from Sumerian (ti-ḫa$_2$-a-am$_3$)[124] which would translate as something like "to be the waters of diverse and plentiful life" — a meaning which would fit the context of Genesis 1. Furthermore, in the Sumerian worldview the waters of the deep, also known as the Abzu,[125] held very positive

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[120] Hermann Gunkel, *Creation and Chaos in the Primeval Era and the Eschaton: A Religio-Historical Study of Genesis 1 and Revelation 12* (trans. K. William Whitney, Jr.; Grand Rapids, Mich.: Eerdmans, 2006). Hermann Gunkel, *Genesis* (trans. Mark E. Biddle; Macon, Ga.: Mercer University Press, 1997), 126-132.

[121] Rad, *Genesis*, 46-49. Karl Barth, *The Doctrine of Creation* (vol. 3 of *Church Dogmatics*; Edinburgh: T. and T. Clark, 1960), 289-368. Brevard S. Childs, *Old Testament Theology in a Canonical Context* (London: SCM, 1985), 223-224.

[122] David Tsumura, *Creation and Destruction: A Reappraisal of the Chaoskampf Theory in the Old Testament* (Winona Lake, Ind.: Eisenbrauns, 2005), 36-76. Sollereder, *God, Evolution, and Animal Suffering*, 20.

[123] Philip S. Johnston, *Shades of Sheol: Death and Afterlife in the Old Testament* (Downers Grove, Ill.: InterVarsity, 2002), 119-120. Alexander Heidel, *The Babylonian Genesis* (Chicago, Ill.: University of Chicago Press, 1951), 100. Kenneth A. Kitchen, *Ancient Orient and Old Testament* (London: Tyndale, 1966), 89-90. Claus Westermann, *Genesis 1-11* (trans. John J. Scullion; Minneapolis, Minn.: Fortress, 1994), 105. Tsumura, *Creation and Destruction*, 42-43, 196. John Day, *God's Conflict with the Dragon and the Sea* (Cambridge: Cambridge University Press, 1985), 50. Gerhard F. Hasel, "The Polemic Nature of the Genesis Cosmology," *EvQ* 46 (1974): 82-85. Arnold, *Genesis*, 38.

[124]John A. Halloran, *Sumerian Lexicon: A Dictionary Guide to the Ancient Sumerian Language* (Los Angeles, Ca.: Logogram, 2006), 277, 109, 1, 18. [tiham = ti-ḫa$_2$-a-am$_3$ = ti/til$_3$, 'life' + ḫa$_2$, 'numerous; diverse' + a, 'water' + am$_3$, 'to be'].

[125] Jeremy Black and Anthony Green, *Gods, Demons, and Symbols of Ancient Mesopotamia: An Illustrated Dictionary* (London: British Museum Press, 2004), 27.

connotations. Abzu [ZU.AB][126] in Sumerian comes from ab[AB][127] meaning "sea, lake" or "father" and zu[128] meaning "wisdom, knowledge"; consequently, this term can refer to a "sea of wisdom" or the "wisdom of the father." The *Electronic Pennsylvania Sumerian Dictionary* describes the Abzu as "(cosmic) underground water; a ritual water container in a temple"[129] which also has positive implications that are compatible with the cosmic temple view of Genesis 1.

As the Apostle Peter reminded his followers, "long ago by God's word the heavens existed and the earth was formed out of water and by water" (2 Pet 3:5b NIV) — a benevolent characterization of the waters of the deep in the creation event. Now whether this water had to cover creation in order to a) ritually purify it before God ordered it with his commands, or b) imbue it with God's wisdom before coming into being is unclear (Gen 1:1–10). The point is that there are ANE interpretations of the waters of the deep that do not carry the negative overtones of a primordial chaos in opposition to God.

This is important to acknowledge because all too often perfectly innocent passages about the sea or waters can become misconstrued as a hostile force threatening the created order. For example, Boyd states that the author of Proverbs 8 "plainly understands God's act of creation to have involved some type of conflict with cosmic chaos" because God "established the fountains of the deep" (*təhôm*) and "assigned the sea its limit, so that the waters might not transgress his command" (Prov 8:27-29).[130] What Boyd seems to overlook is that in those very same verses it is not only the waters that are being bounded and limited, but also the heavens (v. 27), the clouds above (v. 28), and the

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[126] Halloran, *Sumerian Lexicon*, 14.

[127] Halloran, *Sumerian Lexicon*, 13.

[128] Halloran, *Sumerian Lexicon*, 316.

[129] Electronic Pennsylvania Sumerian Dictionary (ePSD) website [cited 20 May 2021]. Online: http://psd.museum.upenn.edu/epsd/nepsd-frame.html.

[130] Gregory A. Boyd, *God at War: The Bible and Spiritual Conflict* (Downers Grove, Ill.: InterVarsity, 1997), 86.

foundations of the earth (v. 29). In short, when the other details are included in the reading, especially as Wisdom speaks in verses Prov 8:22–31, it becomes readily apparent that the passage is not about God imprisoning a rival but rather the ordering of creation, similar to the description in Gen 1:3–31. Another example of this can be found in Boyd's chapter, "This An Enemy Has Done," where the brief mention of the sea in Job 38:6–11 is described as the "'raging waters' of chaos defying the Almighty and threatening his creation [and so] must be kept at bay."[131] A closer inspection of this passage within the broader context of Job 38 reveals that it is discussing the knowledge and power of God over *all* of creation and does not single out the sea as any sort of enemy. An identical distortion of water from created servant into God-opposing nemesis is found when Boyd removes Psalm 104:7–9 from its surrounding context in verses 5–26.[132]

Similar issues arise when scholars try to use Rahab and Leviathan to support corruption of creation theodicies.[133] Rahab's rivalry against God is purportedly cited in Job 9:13; 26:12–13; Ps 89:9–10 and Leviathan's threat is likewise misrepresented with Job 7:12; 41:1–34; Ps 74:10–17; Isa 27:1.[134] However, closer inspection of the passages shows:

- Job 9:13 — Rahab cowers at God's feet
- Job 26:12–13 — God pierced Rahab and cut it to pieces
- Ps 89:9–10 — Rahab was crushed by God
- Job 7:12 — describes a sea monster kept under guard
- Job 41:1–34 — Leviathan hooked & tied, begging mercy from God
- Ps 74:10–17 — heads of Leviathan crushed by God

[131] Boyd, *Satan*, 301.
[132] Boyd, *Satan*, 301.
[133] Sollereder, *God, Evolution, and Animal Suffering*, 19-20.
[134] Boyd, *Satan*, 301.

Isaiah 27:1 uses Leviathan figuratively as a symbol of wicked nations like Egypt while the prophet discusses the deliverance of Israel in the proceeding and following passages. What is more, scholars ignore Scriptures like Psalm 104:25–26 (NIV) where the Leviathan is depicted as playing in the water with the other sea creatures God created:

> There is the sea, vast and spacious,
> teeming with creatures beyond number—
> living things both large and small.
> There the ships go to and fro,
> and Leviathan, which you formed to frolic there.

It must be observed that while Rahab and Leviathan may represent hostile forces either figuratively or literally, all the related Scripture verses repeat the refrain that they are fully subjugated to God's control. Nowhere in the texts does it support the claim that these creatures have the power to thwart God's will or corrupt the creation God called "very good" (Gen 1:31). So, when scholars assert that God is in conflict with either a primordial chaos, Rahab, or Leviathan, their claims appear to be based upon preconceived notions projected onto Scripture rather than a clean exegesis of the text.[135] It is therefore unwarranted to suggest that predation, pain, parasitism, disease, or death have been caused by any of these agents standing in opposition to God.

Compared to the previous approaches examined, the Satanic/demonic corruption of creation theory has the strongest support. First, in numerous texts the biblical account affirms the existence of Satan, the devil, and his demons. Job 1:6–7 describes Satan standing in the presence of the Lord God

[135] John Schneider takes the unusual tack of suggesting that God intentionally created chaos who is depicted as the serpent in the garden (Genesis 3), and then uses an interpretation of Job primarily based upon the work of Carol Newsom and Samuel Balentine to support this view that God created chaos and that Job's suffering was pointless. Here the sea and Leviathan are also interpreted to be examples of cosmic chaos created by God. Schneider, *Animal Suffering*, 107, 164-192. Carol A. Newsom, *The Book of Job: A Contest of Moral Imaginations* (New York: Oxford University Press, 2003). Samuel E. Balentine, *Job* (Macon, GA: Smyth & Helwys, 2006).

and the other heavenly beings. Jesus depicted the activity of the devil amongst humanity in the Parable of the Wheat and the Tares previously mentioned from Matt 13:37–42. The Apostle Matthew testifies that Jesus was tempted by the devil in the wilderness (Matt 4:1–11). Jesus attested to seeing "Satan fall like lightning from heaven" (Luke 10:18 NIV). Furthermore, not only did Jesus accuse some of worshipping the devil in his own day (John 8:44), but there are extra-biblical accounts of people who have worshipped Satan both in the past, as described by King James I in *Demonology* (1597),[136] as well as in the present in the Church of Satan which was the first above-ground church dedicated to the devil and established in San Francisco, California in 1966.[137] So, there are biblical and historical reasons to support the existence of Satan and demonic entities.

Second, the Bible supports the claim that Satan and his demons are allowed to afflict human beings with harmful tribulations. For example, in the Book of Job, Satan has the power to:

- Entice the Sabeans and the Chaldeans to kill Job's servants and steal his livestock (Job 1:13–15, 17).
- Call down fire from heaven to kill livestock and people (Job 1:16).
- Summon a strong wind to collapse the house sheltering Job's adult children who were subsequently killed (Job 1:18–19).
- Afflict Job with painful sores from the soles of his feet to the top of his head (Job 2:7).

Scripture tells us that demons can also cause suffering, for example:

- An evil spirit tormented King Saul after he broke relationship with God (1 Sam 16:14).

[136] King James I, *Demonology* (Las Vegas, Nev.: Forgotten Books, 2008).

[137] Church of Satan website [cited 21 May 2021]. Online: https://www.churchofsatan.com/.

- A demon afflicted a child, causing him to convulse and throw himself into the fire (Luke 9:38–43).
- A legion of demons possessed and tormented a man on the shore of Gerasenes (Mark 5:1–20).
- Jesus sent out the twelve Apostles to drive out demons and to cure diseases (Luke 9:1).

However, several problems arise when scholars suggest that Satan and his minions have taken both the power and authority to cause the predation, pain, parasitism, disease, and death associated with natural evil in *violation* of God's will.[138]

First, it is made clear in the story of Job that although Satan may gain permission to inflict harm, he may not do so more than God permits. Initially, God told Satan he could strike everything Job had "but on the man himself do not lay a finger" (Job 1:8–12 NIV). Later, in order to test Job further Satan was permitted to strike Job's flesh and bones but was told he could not take his life (Job 2:1–6). Consequently, it is important to recognize that Satan cannot afflict more than God allows. (The overall purpose of Job's testing will be examined later in Section 5.3.)

Second, other biblical texts teach that though the devil may attack, his power can be nullified by those who oppose him with the power of God:

- "Submit yourselves, then, to God. Resist the devil, and he will flee from you." (James 4:7)
- "Finally, be strong in the Lord and in his mighty power. Put on the full armor of God, so that you can take your stand against the devil's schemes." (Eph 6:10–11)

[138] Lewis, "Problem of Pain", 423-424. Lloyd, "Are Animals Fallen?", 147-160. Boyd, *Satan*, 293-318. Trethowan, *Essay in Christian Philosophy*, 128. Plantinga, *God, Freedom, and Evil*, 57-59. Mascall, *Christian Theology*, 301-302.

In other words, Satan is not only less powerful than God, but it appears he is less powerful than those human beings who follow God.

Third, the biblical accounts imply that Satan's power is neither limitless nor arbitrary, but intentionally directed towards the purpose of testing, tempting, and taking human souls. For example, Jesus told Simon Peter during the Last Supper that Satan had asked to sift him and the disciples like wheat (Luke 22:31–32). Peter later warned the church that "the devil prowls around like a roaring lion looking for someone to devour" (1 Pet 5:8). Thus, the biblical record suggests the devil's power is permitted by God in order to test human souls, not to make animals eat each other for the sake of marring creation.

This leads to two additional problems associated with blaming a purportedly corrupt creation on an angelic Fall. As Boyd points out, the notion that fallen angels and spirits were responsible for a perversion of the natural order goes back to the early church:[139]

> Natural Evil was explained as resulting from these spirits rebelling against God and thus abusing their authority over creation. Hence, for example, Origen argued that famines, scorching winds and pestilence were not "natural" in God's creation; they were rather the result of fallen angels bringing misery whenever and however they were able. These perverted guardians were also "the causes of plagues… barrenness… tempests [and] similar calamities." "Diseases and other grievous calamities," Tertullian added, were the result of demons, whose "great business is the ruin of mankind." When "poison in the breeze blights the apples and the grain while in the flower, or kills them in the bud, or destroys them when they have reached maturity," one can discern the work of these rebellious guardian spirits.

The first problem arises from claims that hardships like famines, scorching winds, and pestilence are not natural in God's creation and therefore must be

[139] Boyd, *Satan*, 294-295.

the result of fallen angels. This is because the testimony of Scripture clearly refutes this depiction of reality. It is God who appointed a scorching east wind to make Jonah become faint (Jonah 4:8). It is the Lord of hosts who punishes with earthquake, whirlwind, tempest, and consuming fire (Isa 29:6). It is God who sends the sword, famine, and pestilence against his enemies (Jer 24:10). In Deuteronomy 28, it is God who takes credit for blessing with prosperity, protection, abundant food, good health, and fertility for both people and livestock even as God also claims responsibility for punishing with drought, famine, infertility, blight, mildew, disease, fever, boils, tumors, and death. Exodus 7:14–12:30 provides yet another example which shows it was God, not rogue spirits, who brought plagues of frogs, gnats, flies, boils, hail, locusts, darkness, and death down upon Egypt. So, it was a misrepresentation by the early Church Fathers to suggest that God has nothing to do with the either the ecological systems or hardships found in the created order.

Boyd further mentions that early Christian thinkers like Athenagoras perpetuated the idea that it was angels, fallen and unfallen, who were responsible for ordering all the facets of the heavens and earth.[140] However, Athenagoras (ca. 177 CE) is a prime example of pagan who converted to Christianity and then used neo-Platonic concepts to make Christianity more palatable to Greco-Roman society. As discussed in Section 2.1.4, corruption of creation narratives likely gained prominence in the early church because the gentile worldview had been shaped by Greco-Roman philosophy and mythology rather than the teachings of the Hebrew Bible.

A second problem associated with the angelic Fall narrative arises from scholars' use of the Gap Theory to support a pre-human fall of non-human creation. New Testament scholar, Frederick Bruce stated that the "doctrine of the cosmic fall is implicit in the biblical record from Genesis 3 to Revelation 22,"

[140] Boyd, *Satan*, 294. This view has also been echoed more recently by Trethowan, *Essay in Christian Philosophy*, 128.

and professor of Old Testament and Hebrew, John Bimson, notes that the *Scofield Reference Bible* (1907) was responsible for giving this view wide popularity.[141] However, Bimson disagrees with Bruce's basic premise:[142]

> This approach is unsatisfactory on several counts. Most obviously, a pre-human fall of the non-human creation is referred to nowhere in the Bible. It can only be shoe-horned into Genesis 1:1–2 by strained exegesis that goes against the grain of Hebrew grammar and syntax.

Old Testament scholar Victor Hamilton agrees that neither the sentence structure nor the Hebrew verb tenses support the Gap Theory interpretation.[143] Systematic theologian, Henri Blocher, further notes that Gap Theory "draws no support from the text, but rather brings its own framework, digging its own imaginary gap between the two verses in order to set it up" and does not submit itself to the field of philology.[144] In other words, the claim that there was a pre-human angelic Fall that occurred between the first two verses of Genesis 1 is based upon an argument from silence rather than substance. Consequently, there is little support from the biblical text that either Satan or his demonic forces corrupted the good creation that God has made.

In summary, corruption of creation theodicies attempt to weaken the argument behind Rowe's theological premise (2) — *an omniscient, wholly good being would prevent the occurrence of any suffering it could, unless it could not do so without thereby losing some greater good or permitting some evil equally bad or worse* — by claiming that suffering in creation is caused by either shadowy dark, chaotic, or demonic-like forces. These approaches seek to deflect responsibility

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[141] Frederick F. Bruce, *The Epistle of Paul to the Romans* (TNTC; London: Tyndale, 1963), 169. John J. Bimson, "Reconsidering a 'Cosmic Fall'", *SCB* 18 (2006): 66. Cyrus I. Scofield, *The Scofield Reference Bible* (New York: Oxford University Press, 1945). Michael Murray suggests this theory gained traction in the early nineteenth century from Scottish theologian Thomas Chalmers – Murray, *Nature*, 100.

[142] Bimson, "Cosmic Fall", 67.

[143] Hamilton, *Genesis*, 115-116.

[144] Blocher, *In the Beginning*, 41-43.

for creaturely suffering and death away from God and place that blame instead upon malevolent powers in opposition to God.

The strengths of the corruption of creation theodicies are that:

- They have the advantages of the Adamic Fall theodicy without being vulnerable to the scientific evidence which shows that death and pain existed in creation before the existence of Adam and Eve.
- They offer a theological explanation for the pain and death experienced by humans and non-humans in the created order.
- There is biblical support for the existence of Satan, the devil, and demonic entities.
- The angelic Fall has been an acceptable theological worldview amongst Western Christians and scholars from at least the time of Athenagoras (ca. 177 CE).

The weaknesses of these theodicies are that:

- They present a challenge to God's omniscience because God should have foreknown the threat of the shadowy dark, chaotic, or fallen angelic forces and acted accordingly to prevent them from corrupting the creation God had made.
- They present a challenge to God's omnipotence because the purportedly perfect deathless paradise God created was too fragile to withstand the attacks of malevolent forces without being compromised.[145]
- They depict a God who, if omnipotent and omniscient, is indifferent to protecting humans and non-humans from the to the suffering inflicted by malevolent forces.
- The angelic Fall theodicies appear to be heavily dependent upon a Greco-Roman hermeneutical worldview rather than the Jewish and Ancient Near Eastern milieu of the Old Testament texts cited.
- The claim that either shadowy dark, chaotic, or demonic forces have the power to violate and overwhelm the power and will of God has little to no support in the biblical text.

[145] Murray, *Nature,* 101.

- There is no scientific evidence to support the claim that the biological world has ever been free of predation, ecological cataclysms, or death.[146]

Therefore, while corruption of creation theodicies initially appear to be attractive alternatives to the Adamic Fall theodicy, they often have little empirical or biblical evidence to support them[147] even as they undermine classical doctrines of God's omnipotence and omniscience.[148] These approaches which suggest either shadowy dark, chaotic, or demonic-like forces thwarted God's will and destroyed God's intended paradise imply that God's creations have far more power over God's plans than God does, a contention not well-supported by Scripture (Ps 102:25–27; 104; Isa 44:24–28; 45:12; 55:10–11; Jer 10:11–16; 32:17; Heb 1:10–12). Consequently, corruption of creation theodicies tend to be susceptible to weaknesses similar to those associated with the Adamic Fall and thus do not provide a robust explanation of creaturely suffering.

Section 2.1.6 Animal Afterlife and Saint-Making Theodicies

As was discussed for corruption of creation theodicies, there are many theologians who acknowledge that 1) the existence of animal pain is credible, and 2) animals are theologically significant to God. Yet, there is a growing number of these theologians who no longer believe corruption of creation arguments are sufficiently plausible to explain why the phenomenon of animal suffering exists. Therefore, in order to reduce the weight behind Rowe's theological premise (2) — *an omniscient, wholly good being would prevent the occurrence of any suffering it could, unless it could not do so without thereby losing some greater good or permitting some evil equally bad or worse* — some theologians

[146] Southgate, *Groaning of Creation*, 5. Miller, *Finding Darwin's God*.

[147] Sollereder, *God, Evolution, and Animal Suffering*, 17-20, 64, 69-70. Southgate, *Groaning of Creation*, 1-20. Murray, *Nature*, 73-106.

[148] Oden, *Classical Christianity*, 48-53.

begin with a nomic regularity-like defense, then further suggest that the reason God allows animals to suffer in this life is because they will be healed and blessed in the infinitely abundant afterlife. These approaches acknowledge God's omnipotence and omniscience and therefore accept God's responsibility for creaturely suffering and death, but argue that the eternal bliss that creatures will experience after death will more than make up for any of the negative experiences they have had in this life.

As discussed in Section 2.1.1, influential leaders and scholars in the church have long advocated for the theological dignity of animals. Theologians like St. Basil the Great of the Eastern Orthodox Church,[149] St. Francis of Assisi of the Roman Catholic Church, [150] and John Polkinghorne of the Anglican Church[151] are among those who have contended that all creatures — both human and non-human — matter to God. And as mentioned previously, the Armenian liturgy proclaims that all creatures made by God "will be renewed at the resurrection, that day which is the last day of earthly existence and the beginning of our heavenly life."[152] John Wesley (ca. 1750 CE), the Anglican priest and theologian who started the Methodist movement, also trusted in God's complete restoration of animals in the new creation as he preached on the twenty-first chapter of Revelation:[153]

> The whole brute creation will then, undoubtedly, be restored, not only to the vigour, strength, and swiftness which they had at their creation, but to a far higher degree of each than they ever enjoyed. […] In the new earth, as well as in the new heavens, there will be nothing to give pain, but everything that the wisdom and goodness of God can create to give happiness. As a recompence for what they

[149] Basil of Caesarea, as cited by Dougherty, *Animal Pain*, 158-159.
[150] Ugolino, *Little Flowers*, ch. 16.
[151] Polkinghorne, *Science and the Trinity*, 147.
[152] Dougherty, *Animal Pain*, 159.
[153] John Wesley, "The General Deliverance," Sermon 60 in *The Sermons of John Wesley* (ed. Thomas Jackson, 1872), Global Ministries of the United Methodist Church website: n.p. [cited 27 January 2019]. Online: https://www.umcmission.org/Find-Resources/John-Wesley-Sermons/Sermon-60-The-General-Deliverence. Wesley, "The General Deliverance."

> once suffered, while under the "bondage of corruption," when God has "renewed the face of the earth," and their corruptible body has put on incorruption, they shall enjoy happiness suited to their state, without alloy, without interruption, and without end.

More recent theologians who have endorsed the concept of animal resurrection include Keith Ward, Jay McDaniel, Michael Murray, Christopher Southgate, Bethany Sollereder, Trent Dougherty, and John Schneider.[154] However, while John Polkinghorne supported the resurrection of animals, he argued for a more limited number of creatures in the new heavens and earth:[155]

> I believe that every human being that has ever lived will live again beyond their deaths, but should I also believe this to be true of every dinosaur? Even more problematically, what about every bacterium that has ever lived? For two billion years or so, single-celled entities were the only living creatures on Earth and even today they represent a significant fraction of its biomass. Some sort of balanced conjecture seems to be called for. On the one hand, I cannot imagine that there will be no animals in the new creation. […] On the other hand, I think it highly unlikely that they will all be there. There is a human intuition, shared by many but not by all, that animals are indeed to be valued, but more in type than in the token.

Polkinghorne's strange reference to the amount of biomass taken up by bacteria suggests a concern that there would be a limited amount of room available in the new creation for animal habitation, denoting a somewhat skeptical view of God's omnipotence. Consequently, his statement implies that there is no point in restoring every creature that ever lived: token representatives of the animal kingdom would be enough. But if nature tells the observer anything about

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[154] Keith Ward, *Rational Theology and the Creativity of God* (New York: Pilgrim, 1982), 201-202. Keith Ward is an Anglican priest, philosopher, and theologian. Jay B. McDaniel, *Of God and Pelicans: A Theology of Reverence for Life* (Louisville, KY: Westminster/John Knox, 1989), 44-47. Murray, *Nature,* 41-72. Southgate, *Groaning of Creation*, 78-91. Sollereder, *God, Evolution, and Animal Suffering*, 156-182. Dougherty, *Animal Pain*, 134-178. Schneider, *Animal Suffering*, 219-269.

[155] Polkinghorne, *Science and the Trinity*, 152.

God, it reveals God's delight in overflowing abundance and diversity. As Wesley perceptively observes in *The General Deliverance*:[156]

> "But of what use will those creatures be in that future state?" I answer this by another question, What use are they of now? If there be (as has commonly been supposed) eight thousand species of insects, who is able to inform us of what use seven thousand of them are? If there are four thousand species of fishes, who can tell us of what use are more than three thousand of them? If there are six hundred sorts of birds, who can tell of what use five hundred of those species are? […] Consider this; consider how little we know of even the present designs of God; and then you will not wonder that we know still less of what he designs to do in the new heavens and the new earth.

Polkinghorne as well as C. S. Lewis appear to take the position that non-human creatures are only of value as they benefit human beings, as in their companionship as pets, rather than being of intrinsic value they possess in their own right.[157] As Lewis claims, "The beasts are to be understood only in their relation to man and, through man, to God."[158] However, these perspectives go against the Jewish concept of God's providential care for all creatures, the views of St. Basil and St. Francis, as well as Wesley's astute observation that God has created a world of overwhelming biodiversity even when much of it escapes human attention. Though outside of human notice, not even a sparrow can fall to the ground outside of the Father's care (Matt 10:29 NIV). Moreover, Polkinghorne and Lewis reveal an anthropocentric utilitarianism being used to evaluate the worth of non-human creatures. In contrast, Sollereder depicts a new creation built upon the God-creature relationships first disclosed in the

[156] Wesley, "The General Deliverance."

[157] John Polkinghorne, *The God of Hope and the End of the World* (New Haven, Conn.: Yale University Press, 2002), 123. Lewis, "Problem of Pain", 424-426.

[158] Lewis, "Problem of Pain", 424.

Genesis 1 creation account. Responding to Polkinghorne's notion of limited animal resurrection, Sollereder writes:[159]

> If God does love each creature individually, then a creature cannot be adequately represented by a token or a type, no matter how little distinction lies between it and another individual of the same species. God's interest with that individual includes a unique history and a unique relationship in time and space that cannot be held by any other. […] The new life will be theocentric, not anthropocentric, and so the theological imagination should be shaped by the abundance of God's love and the (already evident) scope of God's creativity. Nor (to meet another common objection), in a world without death or decay, can there be a lack of space or resources for those numberless creatures. There is no reason to think that all should have to co-exist within the present terrestrial boundaries, nor that the present laws of physics which enforce those boundaries will apply.

Southgate takes a somewhat different view from Polkinghorne in that he proposes that the purpose of animal afterlife would be to compensate creatures whose lives were either too short or disadvantageous to allow them to achieve their full potential. Southgate distinguishes between various levels of creaturely flourishing or "selving":[160]

- **Fulfilled** – a state in which the creature is utterly being itself, in an environment in which it flourishes (including an appropriate network of relationships with other organisms), with access to the appropriate energy sources and reproductive opportunities.
- **Growing toward fulfillment** – not yet mature, but still with the possibility of attaining the "fulfilled" state.
- **Frustrated** – held back in some way from fulfillment, whether by adverse mutation or environmental change, or through old age, or being predated upon or parasitized, or being unable to find a mate through competition or species scarcity.

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[159] Sollereder, *God, Evolution, and Animal Suffering*, 163-164. Southgate agrees that there will be no shortage of space or resources for animals in heaven – Southgate, *Groaning of Creation*, 84-85.

[160] Southgate, *Groaning of Creation*, 64.

While Southgate's categories have much to recommend them, as they do offer a plausible explanation of why animal suffering must be overcome in the afterlife,[161] there is a danger of viewing creaturely success and failure purely along biological metrics. Like Paul Draper (Section 1.4), there is a tendency amongst some scholars to assume that human and non-human creatures cannot flourish or experience completeness without perfect health, long life, and reproductive fruitfulness. Such a perspective overlooks how social acceptance and affectionate relationships can enhance and transform creaturely experience, enabling a sense of flourishing even in the midst of tribulations. For example, flourishing can be observed in human lives despite the presence of deafness, blindness, injury, childlessness, or poverty, so why might not the same be true for animals? Therefore, theologians should be cautiously hesitant to assume that creaturely fulfillment can be solely based upon categories typically associated with biological "success."

Nevertheless, animal afterlife theodicies would seem to provide a robust compensation for creaturely suffering and can find some degree of support in Scripture (Isa 11:6–9; 65:25; Rom 8:19–22; Col 1:15–20).[162] These approaches can be plausible by theologically postulating that everything God declared "good" in the old creation (Genesis 1) would be present in the new creation (Revelation 21–22), including non-human animals.

While agreeing with Southgate that an afterlife is necessary to compensate animals for their suffering, Dougherty goes further by suggesting that the reason *why* God has permitted animals to suffer is to offer them the opportunity to develop into saints. He contends that God will gift animals posthumously with the cognitive ability to make meaning of their suffering and

[161] Southgate, *Groaning of Creation*, 78-91.
[162] Wesley, "The General Deliverance."

they can thereby experience joy by accepting their pain as a part of God's plan.[163] Dougherty explains:[164]

> I upped the ante from [animal] soul-making to saint-making by noting that (i) the evils of this world make available not just generally good moral character, valuable as that is, but true saintliness, the value of which is almost inestimable, and (ii) most of the highest virtues may be seen as revelations of agape love. Then I noted that one paradigmatic way evil may be defeated is through martyrdom, a love-generated (love for both God and for those made in the image of God) willingness to suffer for the sake of others and to glorify God, to give oneself wholly to God and abandon oneself to his plan.

Dougherty goes further to argue that animals bear the image of God and that animal deification must be included with resurrection in order to adequately compensate for their sufferings on earth.[165] However, he also states that each creature's peace in heaven will be conditional on reconciling with God and upon whether the animal has been "virtuous" or not.[166] This echoes a perspective in the literature which suggests that animals and nature are either fallen or sinful and therefore need to exhibit the appropriate mentalities and/or behaviors to be redeemed and earn a place in heaven.[167] John Schneider, an economist and theologian, also endorses Dougherty's line of reasoning that animals can become analogous to saints, experiencing martyrdom on earth through their suffering.[168] Schneider suggests that it will not just be the heavenly bliss that comforts animals in the afterlife, but the praise, admiration, and gratitude they will receive from God and all the angelic host for their sacrifice. He goes on to say that this will likely be a meaningful reward for

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[163] Dougherty, *Animal Pain*, 134-153.
[164] Dougherty, *Animal Pain*, 134.
[165] Dougherty, *Animal Pain*, 143-148.
[166] Dougherty, *Animal Pain*, 153.
[167] Moritz, "Animal Suffering," 362-374. Deane-Drummond, "Shadow Sophia," 20-24.
[168] Schneider, *Animal Suffering*, 261-269.

animals because experience shows how much cats and dogs respond positively to praise:[169]

> One easily imagines that some of the songs sung by the angels, saints, and human martyrs will be sung for them, or even *to* them. […] It is entirely plausible that sentient animals could be made to know that they are being admired, even if not to comprehend precisely why they are. Perhaps sensitivity to praise could easily be intensified by "deification" in the messianic Heaven.

These saint-making theodicies of Dougherty and Schneider make an admirable attempt to not only offer creaturely compensation for suffering, but to also propose a reason why God has allowed animals to suffer. However, compared to the more robust animal afterlife theodicies, saint-making theodicies appear to be *ad hoc* explanations for animal suffering which have several weaknesses.

First, they may anthropomorphize animals too much, as if they were inadequately created as animals in Genesis 1 and can only be compensated by becoming more human-like, both cognitively and morally, in the new creation.

Second, the notion that animals who have suffered must earn their place in heaven through self-reflection or virtuous behavior seems to add insult to injury by suggesting animals must work hard to earn God's favor and consolation in heaven. Theologians holding a view that creatures may be sinful, or at least lack a heaven-worthy virtue, implicitly assume that animals have a deficient relationship with God that makes them unfit for heaven despite the fact that animals do not break relationship with their Creator by mistaking themselves for God as humans do. On the contrary, Scripture suggests that animals are always embraced by the intimate love and providential care of God (Job 38–39; Matt 10:29).

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[169] Schneider, *Animal Suffering*, 268.

Third, the proponents of the animal saint-making theodicies offer no scriptural support for either the sinfulness, deification, moral agency, sainthood, or martyrdom of animals. Moreover, Dougherty and Schneider stretch the concepts of martyrdom and sainthood beyond recognition. According to Thomas Oden's *Classical Christianity*, the term "martyr" comes from the Greek word *martus*, meaning "witness", and was used to describe the apostles' witness to the life and resurrection of Jesus Christ.[170] With regard to persecution, "*martus* became reserved for those who had suffered for the faith, and especially those who had died for the faith." It is very difficult to see how animals who died from predation or disease can be plausibly associated with those who died to pass on the Christian faith. Moreover, the English word "saint" is derived from the Latin *sanctus*, meaning "holy or consecrated."[171] The Greek (*hagios*) and Hebrew (*qadosh*) forms of the word for sacred/holy are only associated in Scripture with God, the things of God (e.g., the Spirit, God's covenant, holy places), angels, and human beings — never animals. As Oden explains:[172]

> A saint (*hagios*) is one set apart whom God's grace is making holy, who in eternity will share fully in God's holiness, and in whose life is already recognizable some fruits of a holy, charitable, merciful, humble life (Eph 1:18; 3:8, 18). Note that the same term is applied to those who are justified and newly born in faith (1 Cor 1:2), being separated from sin and consecrated to God's service.

Therefore, no matter how well-intended the theological explanation may be, the use of the term "saint" applied to animal suffering bears little resemblance to the traditional usage of the term in the Christian faith.

In summary, animal afterlife and saint-making theodicies have the following strengths:

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[170] Oden, *Classical Christianity*, 582.
[171] Oden, *Classical Christianity*, 660.
[172] Oden, *Classical Christianity*, 660.

- They acknowledge that the existence of animal pain is credible and that animals are theologically significant to God.
- They acknowledge God's omnipotence, omniscience, and responsibility for suffering in the created order.
- They offer restoration and compensation in the blissful afterlife for the suffering experienced by humans and non-humans in the created order.
- The animal afterlife theodicies have some level of church tradition and scriptural support for animal resurrection and immortality in the new creation.

The weaknesses of these theodicies are that:

- Theologians can often emphasize either biological or anthropocentric priorities over theocentric values which are directed toward God's love-oriented care for individual creatures.
- Animal saint-making theodicies claim without scriptural support that animals who have suffered must work to earn God's favor and consolation in heaven.
- Animal saint-making theodicies claim without scriptural support that animals can be moral agents, saints, and martyrs.
- Animal saint-making theodicies try to explain animal suffering by using the terms "saint" and "martyr" in ways that bear little resemblance to the traditional usage of the terms in the Christian faith.

In conclusion, animal saint-making approaches appear to create a theologically speculative addendum to animal afterlife theodicies which offer more scripturally plausible and intellectually satisfying accounts of God's compensation for animal suffering in the new creation.

Section 2.1.7 Literature Review Conclusions

The preceding analysis has described the strengths and weaknesses of the various defenses and theodicies offered to address the evidential problem of natural evil. The strongest of these appear to be *nomic regularity defenses*, *kenosis*

approaches, and *animal afterlife theodicies.* If these multiple approaches are combined together as recommended by Michael Murray,[173] they can begin to provide a robust explanation for creaturely suffering that:

- Acknowledges that the existence of animal pain is credible and that animals are theologically significant to God.
- Acknowledges God's omnipotence, omniscience, and responsibility for suffering in the created order.
- Appeals to the natural laws widely accepted in science.
- Emphasizes the benefits of order and regularity that are empirically observable in the cosmos.
- Notes the advantages of dynamic over static ecosystems.
- Lessens notions of wastefulness in nature.
- Points to empirically observable life/death/life cycles found in nature.
- Recognizes death of one creature creates opportunity for life of another.
- Recognizes the same neurocognitive ability to perceive pain enables a creature to perceive pleasure.
- Depicts a God who cares for and is near to all creatures that suffer.
- Offers a scripturally sound narrative of restoration and compensation in the afterlife for the suffering experienced by humans and non-humans.

Nevertheless, a combined *nomic regularity*, *kenosis*, and *animal afterlife theodicy* would still lack:

- A depiction of God who mitigates the suffering of individual creatures in this life.
- The application of a canonical theism rooted in the Judeo-Christian Scriptures to better understand the purpose of suffering in this life.
- A theological as well as biological explanation of why suffering has been allowed for both human and non-human creatures in the natural order.

[173] Murray, *Nature*, 193-199.

However, these weaknesses might be addressed by combining *nomic regularity*, *kenosis*, and *animal afterlife* approaches with additional information and defensive strategies in order to create a new theodicy of creaturely suffering.

Section 2.2 Seeking a New Theodicy for Suffering

In most philosophical and theological assessments, pain caused by natural processes such a predation, fire, famine, and disease is thought to be an avoidable evil inflicted upon human and non-human creatures alike. This viewpoint consequently necessitates an explanation of why such an evil would be allowed by an omniscient, omnipotent, wholly good God who purportedly loves his creatures. As a result, theistic and non-theistic explanations for the existence of creaturely pain have generally fallen into one or more of the following approaches:

- Denying the existence of animal pain
- Denying God's concern for animals
- Denying God's omnipotence
- Denying God's responsibility for the existence of pain
- Denying God's loving care of creatures
- Denying God's existence

Yet, for the sake of being fair and open to alternative understandings of God and pain, it is worth asking whether pain caused by natural occurrences is, in fact, superfluous to the biological success and theological telos of living creatures. This unlocks a number of questions regarding the evidential and theological premises of Rowe's argument which make Draper's Hypothesis of Indifference appear to be more probable than the Judeo-Christian Hypothesis of Theism:

1) Is pain an unnecessary perception that is widespread among living creatures?
2) Is there some evil equally bad or worse which would be permitted without the existence of pain?
3) Is there a theological purpose to pain which would entail the loss of a greater good if eliminated from creation?
4) Would a better understanding of the biblical texts and scientific literature associated with suffering shed light on whether Draper's Hypothesis of Indifference or the Judeo-Christian Hypothesis of Theism is more probable?

While some well-reasoned responses offered by scientist-theologians have sought to integrate the descriptive scientific resources that explain "how" the world works with the Christian theological resources that explain "why" the world is as it is,[174] the literature shows that few theists have evaluated rigorously the possibility that pain is an intended part of God's good creation, being biologically necessary for many creatures while playing a necessary role in the telos of creation. An interesting exception to this can be found in *The Gift of Pain* where medical doctor Paul Brand and Christian author Philip Yancey demonstrate that a deeper understanding of the scientific, medical, and psychological aspects of pain can provide insight into the problem of suffering.[175]

Still, generally speaking, theists appear to overlook the question: "Are there possible reasons why pain might play a good and necessary role in a world created by a loving God?" Furthermore, most do not take the time to distinguish between acute, persistent, and chronic pain in order to discover

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[174] Arthur Peacocke, "Complexity, Emergence, and Divine Creativity," in *From Complexity to Life: On the Emergence of Life and Meaning* (ed. Niels H. Gregersen; New York: Oxford University Press, 2003), 187-205. John Polkinghorne, *Science and Theology: An Introduction* (Minneapolis, Minn.: Fortress, 1998). Holmes Rolston III, *Genes, Genesis and God: Values and Their Origins in Natural and Human History* (New York: Cambridge University Press, 1999).

[175] Paul Brand and Philip Yancey, *The Gift of Pain: Why We Hurt and What We Can Do About It* (Grand Rapids, Mich.: Zondervan, 1997).

whether each type of discomfort serves a different purpose and thereby has a different pain mitigation strategy. In fact, many theologians sustain an understanding of nature that is too superficial to shed light on the weaknesses of atheists' claims and the problem of creaturely suffering. It is also not uncommon to find theologians who offer only a cursory nod to Scripture itself, then search for the theological purpose of suffering in the work of other scholars rather than the Word of God. Yet, there remains a yearning for "theodicies that engage with real situations rather than philosophical abstractions, and endeavor to give an account of the God of the Christian Scriptures."[176] In response to that aspiration, the scope of this work will be to offer a unique contribution to the problem of creaturely suffering that 1) engages the scientific literature to analyze the neurocognitive aspects of human and non-human pain perception along the evolutionary spectrum, 2) considers the necessary features of ecological balance in healthy ecosystems, and 3) ascertains whether there are naturally occurring pain mitigation processes available for creatures in the natural order. This work will also 4) evaluate Scripture, particularly an ANE-influenced understanding of the Book of Job, to better understand the reasons a loving God would allow the experience of pain in nature.

Therefore, in seeking to determine whether there is a more robust theistic response to the problem of creaturely suffering, this study will be organized in the following manner. First, this analysis begins with the previously discussed *nomic regularity*, *kenosis*, and *animal afterlife* premises as its foundation (Sections 2.1.2, 2.1.3, and 2.1.6, respectively).

Second, it will offer a *providential care defense* in Part One which will attempt to address and weaken Rowe's evidential premise (1) — *that an omnipotent, omniscient being could have prevented unnecessary suffering without*

[176] Southgate, *Groaning of Creation*, 132.

thereby losing some greater good or permitting some evil equally bad or worse. The providential care defense will address the claims of natural evil (e.g., forest fires, predation, disease, etc.) that are usually associated with natural ecosystems and the animal species therein (Chapters 3 and 4). Consequently, since this section is intended to evaluate claims of unnecessary suffering in natural environments rather than human environments it will more heavily investigate pain mitigation and providential care amongst animals in life-threatening situations, although examples of *stress-induced analgesia* will also be illustrated for human beings in dangerous situations like war, traumatic injury, or predator attack. However, the main focus of Part One will be to question whether suffering is as widespread or unnecessary in natural environments as non-theists claim.

Third, it will offer a *theodicy of social attachment and empathetic love* in Part Two which will seek to address and weaken Rowe's theological premise (2) — *an omniscient, wholly good being would prevent the occurrence of any suffering it could, unless it could not do so without thereby losing some greater good or permitting some evil equally bad or worse* (Chapter 5). It will first interface the theological insights of Jewish philosopher Martin Buber's *I-Thou* relationships with an ANE understanding of the Book of Job (Sections 5.1, 5.2, and 5.3) to offer a viable alternative to the anti-pain utilitarian assumptions of Draper and Rowe which are found in theological premise (2) of Rowe's Evidential Problem of Evil. Then, with these anti-pain theological assumptions unable to claim ascendency, a conceptual space will be opened to consider a theodicy for human and non-human suffering based upon the *brain opioid theory of social attachment* found in the scientific literature (Sections 5.4, 5.5, and 5.6). Part Two will then focus upon the mitigation of pain typically associated with injuries, illnesses, and/or emotional anguish in humans and non-humans — pain which may be persistent or chronic but is *not* imminently life-threatening. Because human beings more frequently experience these kinds of pain situations and

can verbally express their feelings during scientific studies of pain, this section will initially address natural pain mitigation strategies in humans associated with the *brain opioid theory of social attachment*, then follow by showing that socially connected empathetic care can also reduce pain in mammals and birds. Lastly, the natural pain mitigation enabled by positive social interactions in both humans and non-humans will be used to support a theodicy which claims that God's providential care has provided a means for non-sufferers to reduce the pain of sufferers and marks the significance of empathetic love in creation.

Together, the approaches to creaturely suffering in Parts One and Two are intended to 1) test the evidential and theological claims regarding natural evil cited by non-theists, and 2) combine science, theology, and biblical insights to develop a theodicy that:

- Affirms the existence of animal pain.
- Affirms God's concern for animals.
- Affirms God's omnipotence.
- Affirms God's responsibility for the existence of pain.
- Affirms God's loving care of creatures.
- Affirms God's existence.

The conclusion of this interdisciplinary study (Chapter 6) will finish its philosophical investigation of relevant scientific, theological, biblical, and ANE research by revisiting Rowe's Evidential Problem of Natural Evil (Section 6.1) and reevaluating the superiority of Draper's Hypothesis of Indifference (Section 6.2). This work will close by using inference to the best explanation to determine whether the Judeo-Christian worldview can offer a scientifically tenable explanation of suffering in a Neo-Darwinian world which makes the Hypothesis of Theism more probable than the Hypothesis of Indifference.

It is hoped that this study can address the concerns of those who think theistic Judeo-Christian belief is compellingly undermined by scientific

evidence. Therefore, while the existing philosophical frameworks of Rowe and Draper will be employed to structure and analyze the different aspects of the evidential problem of natural evil, the evidence used to address and challenge the philosophical claims of widespread and unnecessary suffering in nature will be predominantly from the field of science rather than abstract theological conjecture. It has been unfortunate that while many scientifically informed believers, seekers, and skeptics carry reasonable doubts about the existence of a loving Creator in a world where televised animal predation and personal human suffering make those doubts credible, well-meaning theistic philosophers and theologians rarely offer more than speculative abstract solutions to the problem of suffering that have little connection to real life situations. Therefore, one of the goals of this study is to respect and address the views of those who consider the scientific method to be the "gold-standard" of obtaining evidence with regard to comprehending the nature of our reality. Furthermore, it will offer theological perspectives of God and creation which are firmly grounded in Judeo-Christian Scriptures and ANE paradigms rather than philosophical views of God that can often be traced back to Greco-Roman intellectual influences in Western thought. In doing so, it is hoped that this analysis of the problem of creaturely suffering (the suffering experienced by both humans and non-humans) can bring better understanding to both academic circles as well as pastoral settings and personal lives.

Section 2.3 Methodology

The contextual framework for this research will be an integration of scientific studies, philosophical claims, biblical texts, and theological concepts.

Peer-reviewed journal articles and other publications from scientists, doctors, and researchers in ecological and ethological studies will be used to provide information from the field of science to examine claims of suffering in

nature. The term "Neo-Darwinian" will be used because it accurately refers to contemporary evolutionary theory which employs both Darwin's theory of evolution by natural selection and Gregor Mendel's theory of genetics. It is not uncommon to find that many philosophers and theologians have tended to focus solely on Darwinian natural selection in their analyses since it is most closely associated with the death of the creature or the inability of an organism to successfully pass on their heritable traits. However, it hinders the analysis of suffering to ignore beneficial versus detrimental genetic factors when determining whether there is a stronger or weaker evolutionary impetus for the selection of pain in a creature. This becomes relevant when comparing the evolutionary pressures for and against pain perception in invertebrates versus vertebrates (Section 3.3.4) and when addressing Richard Dawkins' question regarding whether natural selection would favor a tranquilizing gene in creatures like gazelles.[177] Therefore, the term "Neo-Darwinian" will be employed to include both the genetic component of contemporary evolutionary theory, which provides a powerful mechanism for biological diversity on earth, as well as the natural selection component which was famously provided by Charles Darwin.[178]

The philosophical formulations of Rowe and Draper will be used in this study because they have been persuasive and widely cited throughout the philosophical literature as robust arguments against Judeo-Christian depictions of a loving Creator.

Socio-historical textual analysis will be applied to lengthy biblical excerpts which are known to be difficult to interpret, like Genesis 1–3 and the Book of Job. In other circumstances, briefer scriptural references will be cited in order to provide biblical examples of theological concepts or critique the claims

[177] Dawkins, *River*, 131-132.

[178] Denis R. Alexander, *The Language of Genetics: An Introduction* (West Conshohocken, Pa.: Templeton, 2011), 88-89, 92-97.

of other scholars. This study supports the position that ANE interpretation undermines claims that Genesis 1–3 was intended to offer a pseudo-scientific materialistic description of the origins of the physical universe, living organisms, pain, and biological death. Instead, the implicit framework of this analysis envisions that as God spoke creation into existence, God brought the laws of physics, chemistry, and biology into existence. As these natural laws which order the cosmos came into being, the laws of physics empowered and defined the laws of chemistry, which empowered and defined the laws of biology. Through these structures of cosmic order, God created a universe in which living organisms could arise and natural ecosystems could unfold. This study takes the viewpoint that Neo-Darwinian evolutionary theory is currently the best explanation for the mechanisms which brought living biodiversity into existence, but that God is the originator of those mechanisms. Consequently, *theistic evolution* – the position that belief in an all-powerful, all-good God is compatible with the theory of evolution – is the term which best describes the theological backdrop of this body of work.

PART ONE:

A PROVIDENTIAL CARE DEFENSE

3. Pain Experience in an Evolutionary World

Many arguments against the existence of a loving providential God involve some empirical claim to the effect that there has been a large amount of gratuitous pain among most creatures in the natural world for millions of years. The plausibility of such a claim must be evaluated in order to assess its force in the argument from natural evil. Routinely, such sweeping claims are cited as evidence that God is either cruel or indifferent, if he exists at all, or that more probably there is no God and the universe is purely apathetic toward suffering. In other words, the evidence is better explained by atheism than theism. Both scientists and philosophers have cited pain in the natural world as the primary atheistic evidence. For example, Oxford ethologist and evolutionary biologist Richard Dawkins presents the cruel picture of nature upon which philosophers of atheism depend to construct their arguments of natural evil against theism:[179]

> If Nature were kind, she would at least make the minor concession of anesthetizing caterpillars before they are eaten alive from within. But Nature is neither kind nor unkind. She is neither against suffering nor for it. Nature is not interested one way or the other in suffering, unless it effects the survival of DNA. It is easy to imagine a gene that, say, tranquilizes gazelles when they are about to suffer a killing bite. Would such a gene be favored by natural selection? Not unless the act of tranquilizing a gazelle improved that gene's chances of being propagated into future generations. It is hard to see why this should be so, and we may therefore guess that gazelles suffer horrible pain and fear when they are pursued to the death—as most of them eventually are. The total amount of suffering per year in the natural world is beyond all decent contemplation. During the minute it takes me to compose this sentence, thousands of animals are being eaten alive; others are running for their lives, whimpering with fear; others are being slowly devoured from within by rasping parasites; thousands of all kinds are dying of starvation, thirst and disease. It must be so. If there is ever a time of plenty, this very fact will automatically lead

[179] Dawkins, *River*, 131-132.

> to an increase in population until the natural state of starvation and misery is restored.

Such claims are presented by philosophers like Philip Kitcher as well: [180]

> I do think that the Darwinian account of the history of life intensifies the troubles that Christianity faces in addressing the problem of evil. […] For at least two hundred million years there have been animals capable of feeling pain, and that most of these have had lives that were dominated by pain. Nor is the pain accidental to the dynamic process, presumably instituted by a benevolent creator, for the evolution of life. The struggle for existence shows up in such "benign" strategies as those of the ichneumonidae [wasps] that paralyze the motor nerves of the caterpillars in which they lay their eggs—sensory nerves are intact as the young eat their way out. Darwin cited this as a prime example of the difficulties that attend the view that species were separately created by a wise and benevolent being, but it is no less challenging if the mode of creation is indirect [creation by evolutionary processes]: why would any such being introduce a lengthy life-history in which this sort of strategy is written into the basic script?

Because claims regarding animal suffering are the backbone of the argument from natural evil, the theist should critically examine the validity of these claims. If the claims are true, they would appear to vindicate the atheist, but if they are false or misrepresentations of the living world, then that realization would seem to support the worldview of the theist.

Section 3.1 Empirical Claims Regarding God's Cruelty in Nature

The following claims can be derived either explicitly or implicitly from Dawkins' and Kitcher's preceding statements:

(1) Starvation and misery represent the normal state of creatures in nature.

[180] Kitcher, "Some Answers," 176.

(2) Sufferings can be treated as objective quantifiable units that are cumulative.

(3) It is doubtful that a benevolent, loving, omnipotent God would need to create pain.

(4) Most creatures are capable of suffering, from caterpillars to human beings.

(5) The majority of animal lives are dominated by pain.

(6) Animals endure unnecessary suffering from parasites, disease, and predators.

In light of these claims, it is appropriate to ask the following questions:

(1) Is it accurate to depict starvation and misery as the "norms" in the natural world?

(2) Is it appropriate to treat suffering as an objective quantitative entity?

(3) Is pain biologically necessary and what happens to creatures when they cannot feel it?

(4) Is it true that most living creatures produced by evolutionary processes are capable of suffering?

(5) Is it correct to claim that most animals live in a perpetual state of pain most of their lives?

(6) Does the evidence support the claim that creatures endure unnecessary suffering from parasites, disease, and predator attack?

In addition to these claims, other examples have been cited to support the contention that the natural world is filled with unnecessary suffering and cruelty. A famous example is William Rowe's burned fawn that suffers needlessly after being trapped during a forest fire.[181] Other examples have been provided by theists, like Holmes Rolston's insurance chick which is killed due to avian siblicide as well as the cruelty of killer whales who play with their prey

[181] Rowe, "The Problem of Evil," 337.

before they eat it.[182] These are the pieces of evidence presented in the argument that the world was not created by the loving, benevolent, omniscient, omnipotent God of the Judeo-Christian faith, so it will be these claims that are analyzed in Part One — *A Providential Care Defense*.

Section 3.2 Mistaken Reasoning and Understandings of Pain

Well-meaning scientists and philosophers may accurately communicate empirical observations of animal behavior in their arguments, but it may be asked whether they are sufficiently apprised of the scientific literature to understand the broader scope of what occurs in nature, especially regarding the problem of pain. This appears to have caused some misunderstandings regarding the issue of animal suffering, such as to what degree the neurocognitive capacity to perceive pain exists along the evolutionary spectrum (Section 3.3), and misconceptions related to natural processes and animal behavior (Chapter 4).

However, in other cases, proponents of non-theistic metaphysical naturalism appear to make category errors or present distorted accounts of nature in order to further their arguments. Some examples of these will be addressed in this section.

Section 3.2.1 Perpetual Starvation Versus Nature's Movement Toward Equilibrium

Dawkins asserts that "if there is ever a time of plenty, this very fact will automatically lead to an increase in population *until the natural state of starvation and misery is restored*," (emphasis added).[183] Since Dawkins does not appear to

[182] Rolston III, *Science and Religion*, 137-140. Holmes Rolston III, "Naturalizing and Systematizing Evil," in *Is Nature Ever Evil? Religion, Science, and Value* (ed. Willem B. Drees; London: Routledge, 2003), 67.

[183] Dawkins, *River*, 132.

be contrasting a natural state versus an artificial state of starvation and misery, one must conclude he is claiming that starvation and misery are the "normal" state of creatures in nature. However, this is a highly dubious claim to make since natural systems tend to move towards the equilibrium, where populations match food supply. What Dawkins seems to be suggesting is that nature perpetually moves towards a disequilibrium state, where starvation is the norm. This is not supportable by the empirical evidence, nor does Dawkins supply his own selection of peer-reviewed scientific research to support his claim. Whether or not famished animals are left to starve in misery will be addressed in Section 4.2.

Section 3.2.2 The Subjective Nature of Pain

"Pain is always subjective."[184] This is the conclusion of the International Association for the Study of Pain. Suffering is an entirely subjective experience and as such is qualitative in nature rather than a quantitative entity. Consequently, it cannot be treated like an object that can be summed over time or from creature to creature as Darwin did when he concluded that "the sufferings of millions of the lower animals throughout almost endless time" cannot be reconciled with a creator of "unbounded" goodness.[185] Rather, the pain of each creature must be addressed on an individual rather than a collective basis. This means that "the total amount of suffering per year"[186] cannot be quantified over time and species any more than animal play and satiation can be quantified over the ages. It is a meaningless statement because it is making the category error of treating a subjective value as an objective one.

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[184] Harold Merskey and Nikolai Bogduk, eds., "IASP Taxonomy – Pain," International Association for the Study of Pain website [cited 22 July 2017]. Online: https://www.iasp-pain.org/Taxonomy?navItemNumber=576#Pain.

[185] Charles Darwin, "Letter to Hooker of 13 July 1856," as cited by Michael J. Murray, *Nature Red in Tooth and Claw: Theism and the Problem of Animal Suffering* (Oxford: Oxford University Press, 2011), 2.

[186] Dawkins, *River*, 131-132. Murray, *Nature*, 41.

Yet, this is what metaphysicians do when they put forward the argument that once all the pain and suffering over the ages is added together, one can safely conclude that God does not love his creatures.[187] That is a bit like suggesting that if we add up all the crying of babies during human existence, we can safely conclude that their mothers do not love them. It ignores the fact that suffering, which is a personal relativistic experience, must be understood and comforted on a case-by-case basis. Each child that cries is comforted individually by the attending presence of its mother. It would be the product of unsound reasoning to suggest that the cumulative sum of a baby's cries can prove the mother does not love it. By the same token, it is a non-sequitur to suggest that a cumulative sum of creaturely pain is somehow evidence that God does not love his creatures.

So instead of looking for an abstract philosophical macro-solution to the problem of creaturely suffering, it would be categorically more sound to seek to understand suffering on the level of the subjective experience of the individual creature.[188] Therefore, a closer examination of what occurs during the processes of pain and suffering, leading up to death, will need to be considered before drawing conclusions about the compassionate nature of God.

Section 3.2.3 The Relation of Pain to Survival and Healthy Longevity

Pain is a biologically necessary trait that enhances the odds of survival in more highly evolved creatures.[189] Yet Kitcher appears to advocate for a reality where

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[187] David L. Hull, "God of the Galapagos," *Nature* 352 (1992): 486. Kitcher, "Some Answers," 176. Beth Seacord, review of Trent Dougherty, *The Problem of Animal Pain: A Theodicy for All Creatures Great and Small*, *Religious Studies* 51 (2015): 597. John Fiske, as cited by Michael J. Murray, *Nature Red in Tooth and Claw: Theism and the Problem of Animal Suffering* (Oxford: Oxford University Press, 2011), 4.

[188] McDaniel, *Of God and Pelicans*, 45-49.

[189] Ronald Melzack and S. G. Dennis, "Neurophysiological Foundations of Pain," in *The Psychology of Pain* (ed. R. A. Sternback; New York: Raven, 1978), 1-26. R. G. Northcutt and J. H. Kaas, "The Emergence and Evolution of Mammalian Neocortex," *TN* 18 (1995): 373-379. G. F. Streidter, *Principles of Brain Evolution* (Sunderland, Mass.: Sinauer, 2005).

such creatures do not feel any pain even when injured. However, the facts are that such realities already exist, and they go by the names of *leprosy* and *congenital analgesia*, both being conditions that are harmful rather than beneficial to the creature. A creature that cannot perceive or respond to harmful stimuli cannot seek to protect itself from harm.[190] The purpose of pain is to act as the body's warning system that physical damage is threatening its tissues.

An ordinary person who can feel pain will limp when they have a blister on the foot, avoiding the repetitive stress that would prevent the foot from healing. However, a person with leprosy who can no longer feel pain will continue to walk on the blister until it becomes infected and the repetitive stress on the wound causes fragments of bone to break off and be discharged from the wound until there is no bone left.[191]

The inability to perceive the body's warning system, a condition called congenital analgesia, causes unnecessary and premature death in humans: "Children born with congenital insensitivity to pain are incapable of feeling pain and often die in the first few years of life because they injure themselves relentlessly, often falling victim to deadly infections."[192] Pain is a protective mechanism of the body. Increased sensitivity to pain near the location of a wound is made possible by inflammation and a change in the local nerve cells which lowers their normal threshold for pain.[193] This ensures that the body will quickly draw away from anything that comes in contact with the injured tissue, protecting the area from further damage.

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[190] Theodore J. Price and Gregory Dussor, "Evolution: The Advantage of 'Maladaptive' Pain Plasticity," *CB* 24 (2014): R384.

[191] Brand and Yancey, *Gift of Pain*, 123.

[192] Matthew D. Lieberman, *Social: Why Our Brains Are Wired to Connect* (New York: Broadway Books, 2013), 44.

[193] Brand and Yancey, *Gift of Pain*, 193. Ryan K. Butler and David P. Finn, "Stress-Induced Analgesia," *PN* 88 (2009): 185.

While at first it may seem obvious to think that creatures could have evolved with a warning system that would protect creatures from physical damage without causing pain, researchers have discovered that this simply is not the case. Gloves and socks were designed with either buzzers or flashing lights to warn leprosy patients when the wearer was in danger of causing themselves physical harm, yet patients would simply ignore or override the system. Patients disregarded the sensors because they did not trust such abstract warnings of pain.[194] This made the team of doctors and engineers designing the artificial pain sensors realize that their patients would not respond to the warnings unless they actually hurt. In response, they designed a small battery-operated coil which was added to the sensor system that would apply a harmless but painful electric shock to a part of the body which could still feel pain, like an armpit. Unfortunately, Dr. Paul Brand soon realized that their project to create an artificial pain warning system would ultimately fail:[195]

> I was looking for a tool in the manual arts workshop when Charles, one of our volunteer patients, came in to replace a gasket on a motorcycle engine. He wheeled the bike across the concrete floor, kicked down the kickstand, and set to work on the gasoline engine. I watched him out of the corner of my eye. Charles was one of our most conscientious volunteers, and I was eager to see how the artificial pain sensors on his glove would perform.
>
> One of the engine bolts had apparently rusted, and Charles made several attempts to loosen it with a wrench. It did not give. I saw him put some force behind the wrench, and then stop abruptly, jerking backward. The electric coil must have jolted him. […] Charles studied the situation for a moment, then reached up under his armpit and disconnected a wire. He forced the bolt loose with a big wrench, put his hand in his shirt again, and reconnected the wire. It was then that I knew we had failed. Any system that allowed our patients freedom of choice was doomed.

[194] Brand and Yancey, *Gift of Pain*, 193.
[195] Brand and Yancey, *Gift of Pain*, 195-196.

The few patients that were still willing to participate in the study continued to resent the shocks from the socks and gloves, viewing them as punishment for "breaking the rules" rather than a protective artificial pain system. These researchers came to understand that while a healthy person recognizes internalized pain as a part of their own self-preservation mechanism, this artificial external source of signaling pain would never be intimately linked with the person's sense of self, becoming a source of resentment rather than a tool of self-preservation. Dr. Brand describes the conundrum thusly:[196]

> A person who never feels pain is task-oriented, whereas a person who has an intact pain system is self-oriented. The painless person may know by a signal that a certain action is harmful, but if he really wants to, he does it anyway. The pain-sensitive person, no matter how much he wants to do something, will stop for pain, because deep in his psyche he knows that preserving his own self is more significant than anything he might want to do.

In other words, any warning system that does not cause sufficient pain to get the creature's attention and change their behavior will be ignored and ineffective. Consequently, the ability of creatures to perceive pain is the only way they will adequately protect themselves from tissue damage, enhancing their own chances for survival and a healthy longevity.[197] In terms of natural selection, more intelligent long-lived species would be unlikely to exist because they would not be able to respond appropriately to hazards found in their environment. In short, *pain is a necessary warning mechanism that contributes to the survival of more highly evolved creatures, helping to prevent their premature death which would be an evil equally bad or worse than life with the possibility of pain.*

[196] Brand and Yancey, *Gift of Pain*, 195.
[197] Price and Dussor, "Evolution," R384-R386.

Section 3.3 Nociception, Pain, and Suffering Along the Evolutionary Spectrum

The Problem of Pain has been a part of the philosophical Problem of Natural Evil for generations.[198] When discussing the problem of creaturely pain, the philosophical community has tended to embrace two extreme approaches: the Cartesian/neo-Cartesian approach which denies the perception of pain in non-human creatures,[199] and the anthropocentric approach which contends that non-human creatures experience suffering just as humans do.[200] Yet, the literature in evolutionary biology and neuroscience shows that these approaches fail to incorporate the insights of evolutionary theory and animal neurophysiology; namely, as there is a diverse spectrum of evolutionary development among creatures there will also likely be a *wide degree of variability among creatures to perceive pain*. However, since the neo-Cartesian and anthropocentric approaches to animal pain both revolve around the human experience of pain, that is where this analysis will begin.

Section 3.3.1 Components of Human Pain: Sensory and Distressing

A corrective to the more extreme views of pain perception among creatures may be found in the wealth of information provided by the neurosciences regarding the workings of the human brain through the use of innovative imaging systems such as *positron emission tomography* (PET) and *functional*

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[198] Borden Bowne, as cited by Michael J. Murray, *Nature Red in Tooth and Claw: Theism and the Problem of Animal Suffering* (Oxford: Oxford University Press, 2011), 3.

[199] René Descartes, "Letter to Mersenne of 1640" as cited by Michael J. Murray, *Nature Red in Tooth and Claw: Theism and the Problem of Animal Suffering* (Oxford: Oxford University Press, 2011), 50. Lewis, *Problem of Pain*, 422. Harrison, "Theodicy," 79-92.

[200] Jeremy Bentham, as cited by Helga Kuhse and Peter Singer, ed., in *Bioethics: An Anthology* (Oxford: Blackwell, 1999), 640. David R. Griffin, *God, Power, and Evil: A Process Theodicy* (Louisville, Ky.: Westminster John Knox, 2004), 190-192. Kitcher, "Some Answers," 176.

magnetic resonance imaging (fMRI).[201] These techniques allow scientists to study the regions of the brain employed during the manifestation of memories, thoughts, emotions, and sensations. Researchers have discovered that when a person experiences physical injury, two different cortical regions of the brain are involved in the experience of pain, yet the two perceptions are experienced simultaneously as one: the *sensory* aspect of pain, and the *distressing* aspect of pain.[202] These two distinct aspects of pain have also been recognized by the International Association for the Study of Pain (IASP) which describes pain as comprising both "an unpleasant sensory experience" (sensory aspect) and an "emotional experience associated with actual or potential tissue damage or described in terms of such damage" (distressing aspect).[203] It should be noted that sensory experiences without accompanying emotional distress cannot be categorized as pain.[204] This is why an injured patient who takes painkillers and no longer suffers is described as "no longer in pain." The injury remains, but their distressing emotional state is gone.

Functional magnetic resonance imaging reveals that the sensory aspects of pain are detected in the *somatosensory cortex* (SI and SII) and the *posterior insula* (P. Ins) located in the parietal region (back half) of the brain. The somatosensory cortex and posterior insula, which track the distinct regions of the body, distinguish the variety and the location of pain: a burn on the hand, a blister on the foot, a cut on the knee.

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[201] M. C. Bushnell and A. V. Apkarian, "Representation of Pain in the Brain," in *Wall and Melzack's Textbook of Pain* (ed. S. B. McMahon and M. Koltzenburg; Philadelphia, Pa.: Elsevier Churchill Livingstone, 2006 [5th edn]), 107–124. Stuart W. G. Derbyshire, "Measuring Our Natural Painkiller," *TN* 25 (2002): 67–68.

[202] Lieberman, *Social*, 50-53. Jeanne D. Talbot et al., "Multiple Representations of Pain in Human Cerebral Cortex," *Science* 251 (1991): 1355-1358. Pierre Rainville et al., "Pain Affect Encoded in Human Anterior Cingulate but Not Somatosensory Cortex," *Science* 277 (1997): 968-971. NAS, *Recognition*, 6.

[203] Merskey and Bogduk, "IASP Taxonomy—Pain."

[204] Eric L. Garland, "Pain Processing in the Human Nervous System: A Selective Review of Nociceptive and Biobehavioral Pathways," *PCCOP* 39 (2012): 561-571.

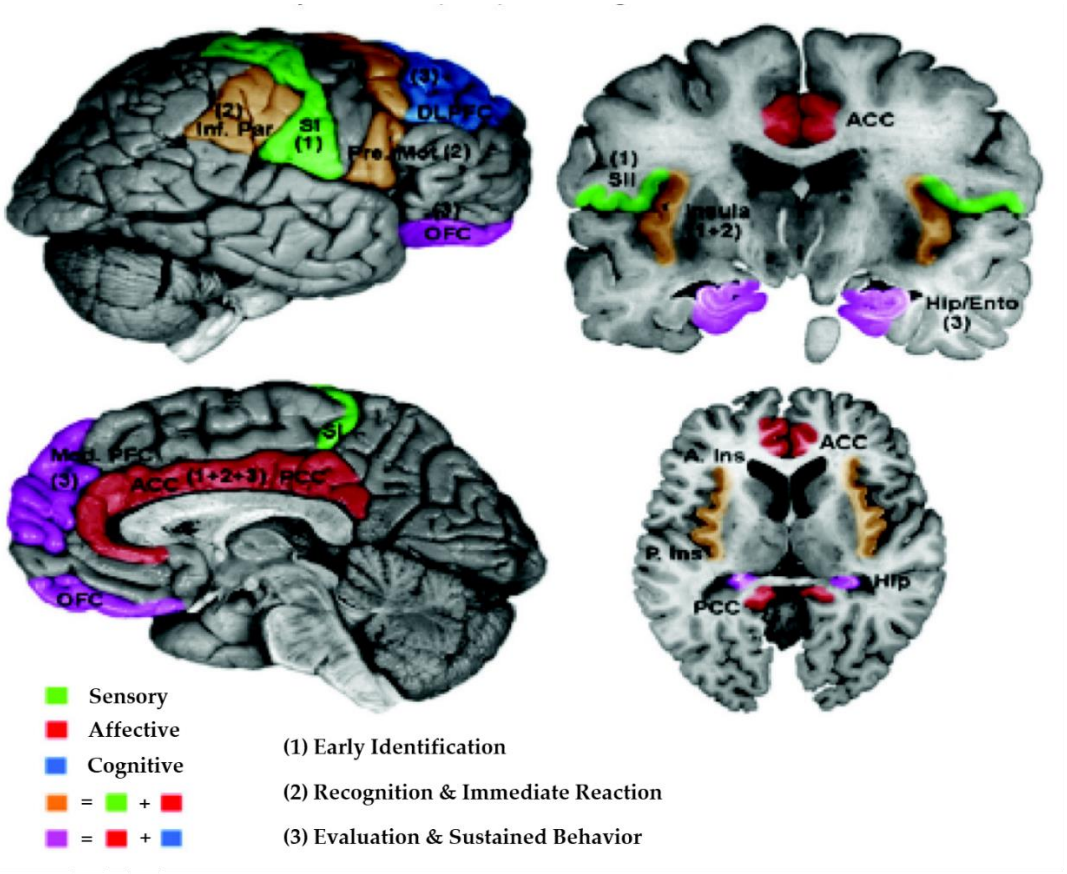

Figure 3.1 Brain areas functionally related to pain processing.
The highlighted areas summarize areas found active in previous functional imaging studies. Color-coding reflects the hypothesized role of each area in processing the different psychological dimensions of pain. Numbers in parentheses indicate the relative involvement of these areas during different temporal stages of the pain experience. Areas displayed include insula, anterior cingulate cortex (ACC), posterior cingulate cortex (PCC), primary somatosensory cortex (SI), secondary somatosensory cortex (SII), inferior parietal lobe (Inf. Par), dorsolateral prefrontal cortex (DLPFC), pre-motor cortex (Pre-Mot), orbitofrontal cortex (OFC), medial prefrontal cortex (Med. PFC), posterior insula (P. Ins), anterior insula (A. Ins), hippocampus (Hip), entorhinal cortex (Ento). [Reprinted with permission from Casey and Tran, Ch. 12, Handbook of Clinical Neurology, vol. 81, 2006]. Reprinted with permission © Borsook et al.; licensee BioMed Central Ltd. Open Access article distributed under the terms of the Creative Commons Attribution License.[205]

[205] (http://creativecommons.org/licenses/by/2.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. Accessed 15 October 2017. Online: https://commons.wikimedia.org/wiki/File:Schematic_of_cortical_areas_involved_with_pain_processing_and_fMRI.jpg.

In contrast, the distressing aspects of pain are perceived in the medial frontal lobe of the brain in the *anterior cingulate cortex* (ACC), particularly the *dorsal anterior cingulate cortex* (dACC), and in the *anterior insula* (A. Ins). The distinct roles these regions play in the temporal stages of the pain experience are illustrated in Figure 3.1.[206] The somatosensory cortex (sensory) regions are shown in green while the anterior cingulate cortex (affective/emotional) is shown in red. The red regions are responsible for producing the psychological distress associated with "suffering."

Together, the sensory and the distressing aspects of the human brain's response to harmful stimuli comprise the phenomenon known as "pain":

$$\text{PAIN}_{(\text{human})} = \text{Sensory Aspect (locational)} + \text{Distressing Aspect (emotional)}$$

This is significant because it means that a person or a species without a working ACC to provide the distressing aspect of pain would be emotionally indifferent to the sensory aspect of a physical injury. In fact, this has already been demonstrated in humans.

In the 1950's, neurosurgeons began treating patients suffering from chronic pain with a procedure called a *cingulotomy* which disconnected the dACC from the surrounding brain regions. After the procedure, patients would still report feeling the sensory aspects of pain but noted that the pain was no longer distressing.[207] Dr. Paul Brand recalls a woman who had such a procedure done for incapacitating vaginal pain that had left her socially isolated at home and threatened her marriage. A year after the surgery, Brand

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[206] David Borsook et al., "Neuroimaging Revolutionizes Therapeutic Approaches to Chronic Pain," *MP* 3 (2007): n.p. Kenneth L. Casey and Tuan D. Tran, "Cortical Mechanisms Mediating Acute and Chronic Pain in Humans," in *Pain* (ed. Fernando Cervero and Troels S. Jensen; vol. 81 of *Handbook of Clinical Neurology*; Amsterdam: Elsevier, 2006), 159-177. Irene Tracey and Giandomenico D. Iannetti, "Brainstem Functional Imaging in Humans," *SCN* 58 (2006): 52-67.

[207] E. L. Foltz and L. E. White, Jr. "Pain 'Relief' by Frontal Cingulumotomy," *JN* 19 (1962): 89. Lieberman, *Social*, 53.

asked the woman if she could still feel the pain, and she responded, "Oh, yes, it's still there. I just don't worry about it anymore. In fact, it's still agonizing. But I don't mind."[208] It is significant that a person cannot feel the distress associated with pain unless their dorsal anterior cingulate cortex is intact.[209] This strongly suggests that creatures that have evolved without the neurocognitive equivalent of the dACC will be incapable of experiencing the emotional suffering that human beings associate with pain.

It should be noted that the distressing aspect of pain appears to be uniquely associated with species capable of social relationships, particularly humans and non-human mammals. In such creatures the ACC not only creates the distressing aspect of physical pain, but the emotional distress associated with social pain as well.[210] This association is part of the phenomenon commonly referred to as the *brain opioid theory of social attachment*. The ACC has the highest density of opioid receptors in the human brain. Endogenous opioids (e.g., endorphins) are the brain's naturally produced painkillers and have an efficacy far more powerful than morphine which diminishes the distressing aspects of pain, whether physical or social in origin. It appears that in order to nurture social relationships and protect against social isolation, particularly between dependent mammalian young and their caregivers, the body uses the same ACC brain system to warn of either damaged tissues or damaged social relationships.

This connection between social relationships and the dACC has been linked to mother-infant social attachment behavior in both human and non-human mammals.[211] Separation of infants from their caregivers causes an

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[208] Brand and Yancey, *Gift of Pain*, 210-211.

[209] J. Sharim and N. Pouratian, "Anterior Cingulotomy for the Treatment of Chronic Intractable Pain: A Systematic Review," *PPJ* 19 (2016): 537-550.

[210] Lieberman, *Social*, 39-70. Tor D. Wager et al., "An fMRI-Based Neurologic Signature of Physical Pain," *NEJM* 368 (2013): 1388-1397.

[211] Lieberman, *Social*, 47-50.

increase in cortisol (a stress hormone) and emotional distress for both the caregiver and the infant. Researchers liken the emotional distress of separation to opioid withdrawal-like pain, whereas reconnection between the caregiver and infant is an effective painkiller because their reunion causes opioid levels to increase naturally in both.[212] In other words, the brain opioid theory of social attachment suggests that opioids released from positive social interactions can soothe emotional distress created in the dACC, whether the distress is caused by physical or social pain.

Therefore, the current neurocognitive research appears to indicate that the emotionally distressing aspect of pain associated with suffering arises from the more evolutionarily advanced frontal lobe of humans and mammals for the purpose of nurturing social interdependence. These relationships, which can mitigate the perception of pain, will be fruitfully explored in Chapter 6 — Theodicy: Suffering and Empathetic Love — in a way that dispels the notion that it is only God's role to dispel pain from creaturely existence. However, for the purposes of this discussion, it is sufficient to point out that most non-mammalian, non-social creatures likely lack the more highly evolved anterior cingulate cortex structures which generate the distressing aspect of pain. This means that while such creatures may be able to detect the sensory aspects of an injury using the somatosensory cortex in the parietal region of their brain, they would be incapable of experiencing the emotional agony humans associate with pain. In essence, like the cingulotomy patients they would be aware of an injury without being distressed by it: detecting harm without suffering. This leads to a discussion of a lower level of injury detection in creatures called *nociception*.

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[212] Jaak Panksepp et al., "The Biology of Social Attachments: Opiates Alleviate Separation Distress," *BioPsy* 13 (1978): 607-618.

Section 3.3.2 Nociception

According to the U.S. National Academy of Sciences' publication, *Recognition and Alleviation of Pain in Laboratory Animals*, it is important to make a distinction between *nociception* and the experience humans call *pain*.[213] Noxious stimuli are events that harm or threaten to harm tissues (like severing, smashing, or burning) which activate special sensory nerve endings called nociceptors.[214] Nociception represents the response of the peripheral nervous system (the smaller nerve fibers that branch off from the spinal cord into the rest of the body and extremities) to noxious stimuli. The peripheral nervous system transmits its information to the brain via the spinal cord, the brainstem and the thalamus.[215] The thalamus' extensive nerve network takes the signals from the brainstem, separates and sends the various signals to all the relevant regions of the brain, working as a sensory and motor signal relay to the rest of the cerebral cortex. It is in the cerebral cortex, specifically the somatosensory cortex (SI and SII) and the anterior cingulate cortex (ACC), that the sensory and distressing aspects of pain are perceived respectively. The cerebral cortex then sends messages back to the tissues via the thalamus, to the brainstem and spinal cord and from there to the rest of the body. It should be noted that human processing of noxious stimuli includes both 1) a nociceptive response that only involves the spinal cord and 2) a cognitive response that involves the cerebral cortex, with the additional observation that the nociceptive response is far more instantaneous than the cognitive response. *Medical Surgical Nursing: An Integrated Approach* depicts this combined reaction to noxious stimuli with the example of burning one's hand on a stove. The following excerpt describes the

[213] NAS, *Recognition*, 13-23. Garland, "Pain Processing," 561-571.

[214] NAS, *Recognition*, 13. Fernando Cervero and Harold Merskey, "What is a Noxious Stimulus?" *JP* 5 (1996): 157-161.

[215] NAS, *Recognition*, 33-34. Alan Fein, "Nociceptors and the Perception of Pain," 99-101 [cited 5 November 2017]. Online: https://cell.uchc.edu/pdf/fein/nociceptors_fein_2012.pdf.

nociceptive spinal reflex which causes a person to yank their hand away from a harmful heat source:[216]

> Cutaneous pain rapidly travels through a simple reflex arc from the nerve ending (point of pain) to the spinal cord at approximately 300 feet per second, with a reflex response evoking an almost immediate reaction. This is the reason when a hot stove is touched, the person's hand jerks back *before* there is conscious awareness of damage. After a hot stove is touched, a sensory nerve ending in the finger skin initiates nerve transmission that travels through the dorsal root ganglion to the dorsal horn in the gray matter of the spinal cord. The impulse then travels through an interneuron that synapses with a motor neuron at the same level in the spinal cord. This motor neuron stimulating the muscle is responsible for the swift movement of the hand away from the hot stove.

Notice that this quick motor response occurs at the neurological level of the peripheral nervous system and the spinal cord alone. The cerebral cortex is not engaged in this response to the noxious stimuli. However, in humans, there is an additional level of response that involves the cerebral cortex which is described as the excerpt continues:

> In the case of the hot stove, the sensory neuron also synapses with an afferent sensory neuron. The impulse travels up the spinal cord to the thalamus, where a synapse sends the impulse to the brain cortex. Once the impulse is interpreted, the information is consciously available. Then the person is aware of the location, intensity, and quality of pain [sensory aspect of the somatosensory cortex]. Previous experience adds the affective [emotional] feature to the pain experience [distressing aspect of the anterior cingulate cortex].

As explained in the preceding Section 3.3.1 as well as in the *Recognition and Alleviation of Pain in Laboratory Animals* chapter titled "Mechanisms of Pain," pain is a product of higher processing in the brain centers of the cerebral cortex. Figure 3.2 is reproduced from "Mechanisms of Pain" and schematically

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[216] Lois White, Gena Duncan, and Wendy Baumle, *Medical Surgical Nursing: An Integrated Approach* (Clifton, N.Y.: Delmar Cengage Learning, 2013 [3rd edn]), 112.

differentiates between the nociception and the pain perception regions of the mammalian nervous system.[217]

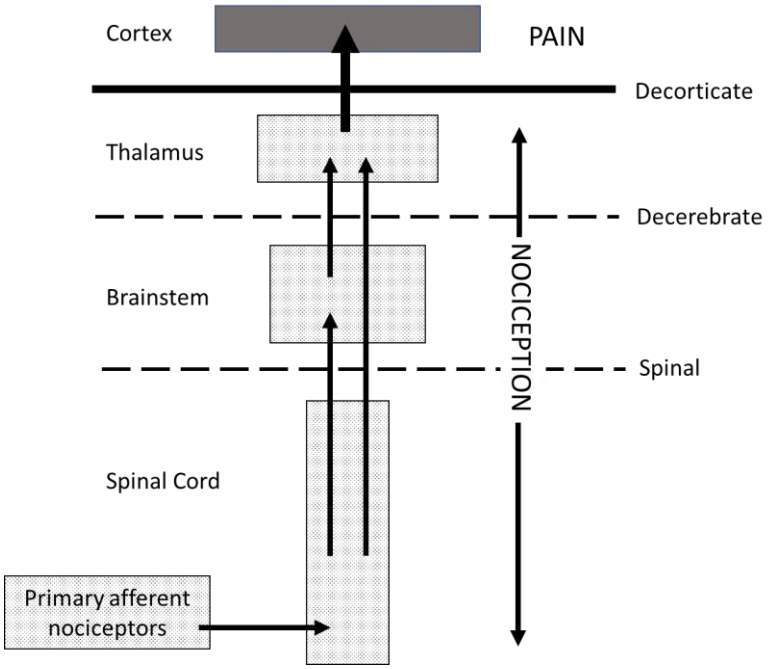

Figure 3.2 Anatomical distribution of nociception and pain.
This figure schematizes the major neuroanatomical structures that differentiate nociception and pain, an understanding of which is essential for studies in which the animals may experience pain. Nociception refers to the process through which information about peripheral stimuli is transmitted by primary afferent nociceptors to the spinal cord, brainstem, thalamus, and subcortical structures. In contrast, the experience of pain can result only when there is activity of thalamocortial networks (represented in the dark shaded box at the top) that process the information conveyed by pathways of nociception. The magnitude of pain is determined to a great extent by the strength of descending inhibitory and facilitatory controls (in the lighter shaded boxes) that originate throughout the neuraxis and regulate the processing of ascending nociceptive messages. The figure also illustrates several important surgical preparations used to study nociceptive processing under conditions in which different parts of the brain are disconnected from afferent nociceptive input. Thus, transection of the spinal cord produces a "spinal" preparation. Decerebrate preparation entails transection of the brain between the midbrain (at the level of the colliculi) and the thalamus. In the decorticate preparation, connections from the thalamus to the cortex are severed. In all of these conditions, information generated by the activity of nociceptors located below the level of transection is unlikely to reach structures above the transection. No evidence exists at present that hormonal or other nonneural mechanism are able to "bypass" the transection to access the brain and evoke a pain perception. Reprinted with permission from National Academies Press.

[217] NAS, *Recognition*, 34.

It is important to note that none of the nociceptive processes below the cerebral cortex, that is from the thalamus down through the brainstem, spinal cord and peripheral nervous system, can cause the experience humans call "pain." In other words, "nociception can occur in the absence of pain."[218] This means a creature can display nociceptive responses *without* experiencing pain. Non-pain responses to nociception can include reactions such as withdrawal reflexes, increased heart rate or elevated blood pressure.[219] Therefore, in order to accurately evaluate which animals cannot experience pain and which can, it is important to discern which creatures have only developed nociceptive neurological systems *without* the neurocognitive capacity for perceiving pain, and which creatures are highly evolved enough to perceive physical discomfort and emotional distress similar to what humans associate with pain. Clarifying the facts here will assist in evaluating the many sweeping claims about suffering in the living world.

Section 3.3.3 Distinguishing Between Nociception and Pain in Animals

The National Academy of Sciences (NAS) gives some guidelines for determining which creatures only have the capacity for unconscious nociceptive responses without the experience of conscious pain. They provide three examples of responsiveness to noxious stimuli without accompanying pain: "(1) in organisms with either no nervous system or a nervous system so simple that scientists believe the organism is not capable of affect [emotion]; (2) in mammals whose forebrains are not receiving input from the periphery; and (3) in humans whose pain has been suppressed (e.g., by analgesics/anesthetics)."[220]

[218] NAS, *Recognition*, 33.
[219] NAS, *Recognition*, 14.
[220] NAS, *Recognition*, 19.

The following examples show that *automatic responses to noxious stimuli* can be observed even in situations where it has been clearly established that the subject is *not* experiencing pain:[221]

> In adult humans, postoperative cortisol output [an indicator of elevated stress response] is undiminished by analgesics that successfully treat the reported pain (Schulze et al. 1988 cited by Lee et al. 2005; Dahl et al. 1992; see also Carrasco and Van de Kar 2003). Sympathetic responses such as tachycardia [rapid heart rate], hypertension [high blood pressure], and pupil dilation occur in response to noxious stimuli in decerebrate rats and dogs [animals whose brainstem has effectively been disconnected from the cerebral cortex by severing the neural connection between them] (Sherrington 1906, reviewed in Sivarao et al. 2007).

Simple avoidance responses can even be observed in subjects without a working cerebral cortex:[222]

> Nonlearned avoidance responses are present in even simple single-celled organisms and require no affect [emotion] (Rolls 2000; Tye 2007; Winkielman et al. 2005). The withdrawal of body parts (e.g., limbs, tails) from noxious stimuli also occurs in decerebrate cats (Sherrington 1906), and spinal-transected cats and rats in which connections to the brain are severed (e.g., Grau et al. 1998). In spinally transected cats, pinching or clamping the tail promotes

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[221] NAS, *Recognition*, 19. Susan J. Lee et al., "Fetal Pain: A Systematic Multidisciplinary Review of the Evidence," *JAMA* 294 (2005): 947-954. J. B. Dahl, J. Rosenberg, and H. Kehlet, "Effect of Thoracic Epidural *Etidocaine* 1.5% on Somatosensory Evoked Potentials, Cortisol and Glucose During Cholecystectomy," *AAS* 36 (1992): 378-382. Gonzalo A. Carrasco and Louis D. Van de Kar, "Neuroendocrine Pharmacology of Stress," *EJP* 463 (2003): 235-272. C. S. Sherrington, *The Integrative Action of the Nervous System* (New York: Charles Scribner's Sons, 1906). Digavalli V. Sivarao et al., "Colorectal Distension-Induced Pseudoaffective Changes as Indices of Nociception in the Anesthetized Female Rat: Morphine and Strain Effects on Visceral Sensitivity," *JPTM* 56 (2007): 43-50.

[222] NAS, *Recognition*, 19. Edmund T. Rolls, "Precis of the Brain and Emotion," *BBS* 23 (2000): 177-191; discussion 192-233. Michael Tye, "Qualia," *The Stanford Encyclopedia of Philosophy* (ed. Edward N. Zalta; Fall 2007 Edition), Stanford University website [cited 9 June 2008]. Online: http://plato.stanford.edu/archives/fall2007/entries/qualia/. Piotr Winkielman, Kent C. Berridge, and Julia L. Wilbarger, "Emotion, Behavior and Conscious Experience: Once more Without Feeling," in *Emotion and Consciousness* (ed. L. F. Barrett, P. M. Niedenthal, P. Winkielman; New York: Guilford, 2005), 335-362. Sherrington, *Integrative Action*. James W. Grau, Douglas G. Barstow, and Robin L. Joynes, "Instrumental Learning Within the Spinal Cord: I. Behavioral Properties," *BN* 112 (1998): 1366-1386. R. G. Lovely et al., "Effects of Training on the Recovery of Full-Weight-Bearing Stepping in the Adult Spinal Cat," *ExpN* 92 (1896): 947-954. Colin Allen, "Animal Pain," *Noûs* 38 (2004): 617-643.

> stepping movements of the hindlimbs (Lovely et al. 1986), as though simple locomotory escape movements can occur even without pain. Some learned avoidance responses (e.g., classically conditioned withdrawal) have even been observed in the sea slug Aplysia (reviewed by Allen 2004). Other research reveals the instrumental learning of avoidance responses normally associated with pain with no possible involvement of the brain: spinally transected rats learn to keep their limbs withdrawn for longer periods of time if doing so will terminate the insult (Grau et al. 1998).

It has been reported that other behavioral responses which can be observed in the absence of pain include, "turning of the head and neck toward the noxious stimulus, some vocalization, and the licking of affected paws may occur in decerebrate animals (Baliki et al. 2005; King et al. 2003; Sherrington 1906)"[223]

What these examples demonstrate is that avoidance responses, reflexes, vocalizations, licking affected areas, elevated blood pressure, rapid heart rate, and pupil dilation can be observed in creatures even when it is impossible for them to be feeling pain. Consequently, these cues cannot be definitive for correctly determining whether a creature is experiencing pain.

Instead, NAS has concluded that to determine whether creatures can experience pain (not simply nociception), it is necessary to demonstrate that they can (1) "discriminate painful from nonpainful states," (2) "make decisions based on this discrimination in a way that cannot arise from evolved nonconscious nociceptive responses," (3) "demonstrate motivations to avoid pain," and (4) "display affective states of fear or anxiety if threatened with noxious stimuli."[224] They also note that animals that are experiencing pain "might be expected to exhibit spontaneous behavioral changes including

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[223] NAS, *Recognition*, 19. Marwan Baliki et al., "Spared Nerve Injury Rats Exhibit Thermal Hyperalgesia on an Automated Operant Dynamic Thermal Escape Task," *MP* 1 (2005): 18. C. D. King et al., "Differential Effects of Stress on Escape and Reflex Responses to Nociceptive Thermal Stimuli in the Rat," *BR* 987 (2003): 214-222. Sherrington, *Integrative Action*.

[224] NAS, *Recognition*, 20.

sustained signals of distress and impairments in normal behaviors such as sleep."[225]

Operant experiments demonstrate animal ability to discriminate between painful and non-painful states. It has been shown that rats with arthritis can not only discern the difference between injections of aspirin and injections of saline, but they even learn to select aspirin injections to reduce their pain:[226]

> Rats show by shifting their operant response for food that they are able to distinguish injections of aspirin from injections of saline; furthermore, rats with arthritis learn this distinction more readily than do control rats (Weissman 1976; see also Colpaert 1978 and Swedberg et al 1988). Thus, pain can serve as a discriminative stimulus, something the committee does not believe could occur without awareness.

Experiments reveal motivations behind animal actions to avoid pain or noxious stimuli, implying conscious awareness of pain: [227]

> In learning paradigms in which an operant delivers an analgesic, rats in models-of-pain experiments lever press to self-medicate, and at a much higher rate than control animals. […] Rats, mice, primates, and pigeons also lever press to avoid electric shock (which may be painful depending on its intensity and duration; cf. Carlsson et al. 2006). Furthermore, oral self-administration of nonsteroidal anti-inflammatory drugs (NSAIDs) is observed in lame (i.e., arthritic) rats and chickens but not in their healthy counterparts (Colpaert et al. 1980; Danbury et al. 2000).

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[225] NAS, *Recognition*, 20.

[226] NAS, *Recognition*, 20. Albert Weissman, "The Discriminability of Aspirin in Arthritic and Nonarthritic Rats," *PBB* 5 (1976): 583-586. Francis C. Colpaert, "Discriminative Stimulus Properties of Narcotic Analgesic Drugs," *PBB* 9 (1978): 863-887. Michael D. Swedberg et al., "Pharmacological Mechanisms of Action of Flupirtine: A Novel, Centrally Acting, Nonopioid Analgesic Evaluated by Its Discriminative Effects in the Rat," *JPET* 246 (1988): 1067-1074.

[227] NAS, *Recognition*, 20. Katrina Carlsson et al., "Predictability Modulates the Affective and Sensory-Discriminative Neural Processing of Pain," *NeuroImage* 32 (2006): 1804-1814. Francis C. Colpaert et al., "Self-Administration of the Analgesic Suprofen in Arthritic Rats: Evidence of *Mycobacterium Butyricum*-Induced Arthritis as an Experimental Model of Chronic Pain," *LSci* 27 (1980): 921-928. T. C. Danbury et al., "Self-Selection of the Analgesic Drug Carprofen by Lame Broiler Chickens," *VR* 146 (2000): 307-311.

NAS has concluded that, at the time of publication, conclusive evidence for the conscious experience of pain *was only strong for mammals and birds*, but further research for other taxa such as fish, reptiles and amphibians should be conducted.[228] Until such issues were resolved, they decided that all vertebrates used in laboratory experiments should be treated as if they were capable of experiencing pain. Although some scientists argue that only humans, specifically humans past the age of early infancy, can experience pain (neo-Cartesian), while other scientists contend that all vertebrates and possibly some (or all) invertebrates can feel pain as humans do (anthropocentric), the Academy concludes that "between these extremes lies a range of other, more generally accepted assessments."[229] That is, that the strongest empirical evidence seems to support the conclusion that pain is only experienced in vertebrates, and among vertebrates the evidence of pain is strongest in mammals and birds and is currently lacking among other taxa such as fish, reptiles and amphibians. While it seems an appropriate safeguard that laboratories involved in animal experimentation should do everything possible to prevent unnecessary pain in their creatures, on a philosophical basis the empirical evidence is lacking to claim that creatures other than mammals or birds can feel pain.

Section 3.3.4 Claims Regarding Universal Creaturely Suffering

It is somewhat ironic that metaphysical atheists like Dawkins and Kitcher appeal to science to make their arguments, yet appear to omit the insights of pain-related science and Neo-Darwinian evolutionary theory in their analysis of creaturely pain. They also seem unaware that, according to the U.S. National Academy of Sciences, the empirical evidence only strongly supports the

[228] NAS, *Recognition*, 21.
[229] NAS, *Recognition*, 20-21.

perception of pain in the more highly evolved brains of mammals and birds.[230] Furthermore, Darwinian evolutionary theory would seem to make it rather obvious that lower order organisms would lack the neurocognitive abilities found in higher organisms.[231] Consequently, while mammals have the capacity to experience the sensory aspect as well as the distressing aspect of pain to the degree that their parietal lobes and frontal lobes have evolved respectively, it would seem to be anthropocentric speculation to assume that evolutionarily lower organisms inevitably perceive pain and suffering identically to mammals. In fact, many scientific studies confirm that this is not the case.

For example, the *Proceedings of the National Academy of Sciences* argues that it is highly dubious to suggest that insects have the capacity for subjective experience that would be required for the perception of pain.[232] In fact, entomologists conclude that insects seem to be entirely oblivious to their injuries:[233]

> No example is known to us of an insect showing protective behavior towards injured body parts, such as limping after leg injury or declining to feed or mate because of general abdominal injuries. On the contrary, our experience has been that insects will continue with normal activities even after severe injury or removal of body parts. An insect walking with a crushed tarsus, for example, will continue applying it to the substrate with undiminished force. Among our other observations are those on a locust which continued to feed whilst itself being eaten by a mantis; aphids continuing to feed whilst being eaten by coccinellids; a tsetse fly which flew in to feed although half-dissected; caterpillars which continue to feed whilst tachinid larvae bore into them; many insects which go about their normal life whilst being eaten by large internal parasitoids; and male mantids which continue to mate as they are eaten by their partners. Insects show no immobilization

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[230] NAS, *Recognition*, 21.

[231] Northcutt and Kaas, "Emergence and Evolution," 373-379. Streidter, *Brain Evolution*.

[232]Brian Key, Robert Arlinghaus, and Howard I. Browman, "Insects Cannot Tell Us Anything About Subjective Experience of the Origin of Consciousness," *PNASUSA* 113 (2016): E3813.

[233] C. H. Eisemann et al., "Do Insects Feel Pain? – A Biological View," *Experientia* 40 (1984): 164-167.

> equivalent to the mammalian reaction to painful body damage, nor have our preliminary observations of the response of locusts to bee stings revealed anything analogous to a mammalian response.

So, the scientific literature has noted the lack of pain perception in insects for decades, yet proponents of metaphysical naturalism like Dawkins and Kitcher still try to bolster their argument against the Judeo-Christian faith by citing the supposed pain caused to caterpillars by the ichneumonidae wasp whose larvae consume the caterpillar from within.[234] But if insects do not have nervous systems with the equivalent of a frontal lobe to perceive pain, how can their existence be said to include the experience of suffering? At first this counterintuitive concept of bodily destruction without pain may be difficult for human minds to accept since it is outside of our immediate experience, but upon further reflection, the average adult human being endured the death of billions of their cells in the last 24 hours due to the process of apoptosis (programmed cellular death). Now the question is this: "Were all these people writhing in pain as their body's cells died?" Obviously not, and the reason is because human bodies are not wired with a nervous system to detect this kind of death or destruction within the body. It would serve no purpose, so the human body did not evolve to experience pain due to apoptotic cellular death. In the same way, insects like the caterpillar did not evolve with the necessary nervous system to feel pain even when they are dying from within. Neither caterpillars nor any other insect can feel pain. Yet Richard Dawkins declares, "If Nature were kind, she would at least make the minor concession of anesthetizing caterpillars before they are eaten alive from within."[235] Apparently, Nature has done just that since caterpillars cannot feel pain at all. So, perhaps it is time to realize that Nature is far kinder than she is given credit for?

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[234] Dawkins, *River,* 176. Kitcher, "Some Answers," 176.
[235] Dawkins, *River*, 131.

This lack of ability to perceive the emotional, subjective, distressing response to pain called "suffering" is not unique to insects. It appears that it is also likely lacking from the entire category of animals classified as invertebrates. As noted by the International Association for the Study of Pain, it is the subjective, emotional component that causes distress in a creature, not the activation of nociceptive receptors in the body: "Activity induced in the nociceptor and nociceptive pathways by a noxious stimulus is not pain, which is always a psychological state, even though we may well appreciate that pain most often has a proximate physical cause."[236] Consequently, creatures without the capacity for psychological (emotional) cognitive states are incapable of feeling the pain that humans associate with suffering.

It is therefore significant that a growing body of scientific evidence suggests that while invertebrates may have the capacity to experience a nociceptive response to noxious stimuli, they do not have the neurocognitive psychological capacity to experience pain or "suffering."[237] This conclusion is based upon 1) the evolutionary function of pain, 2) the neural capacity of invertebrates and 3) the observed behavior of invertebrates.[238]

First, in the case of vertebrates, the accompaniment of pain and emotionally distressful suffering is an evolutionary advantage as an educational tool to avoid harms which could affect the longevity of the animal.[239] Because vertebrates are generally longer-lived than invertebrates, they have more time to learn from experiences of both pain and pleasure which in turn will improve their chances for survival. In contrast, the lifespan of

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[236] Merskey and Bogduk, "IASP Taxonomy – Pain."

[237] Senate Standing Committee on Legal and Constitutional Affairs (SSCLCA), "Proceedings of the Standing Senate Committee on Legal and Constitutional Affairs, Issue 7 – Evidence for February 12, 2003," Senate of Canada website [cited 22 July 2017]. Online: https://sencanada.ca/en/Content/SEN/Committee/372/lega/07eva-e?Language=EandParl=37andSes=2andcomm_id=11.

[238] SSCLCA, "Do Invertebrates Feel Pain?" Senate of Canada website [cited 22 July 2017]. Online: https://sencanada.ca/content/sen/committee/372/lega/witn/shelly-e.htm.

[239] Melzack and Dennis, "Neurophysiological Foundations," 1-26.

invertebrates tends to be shorter and their behavior is generally thought to be genetically determined. Consequently, there is a weaker evolutionary impetus for the selection of suffering in invertebrates.[240]

Second, the neural capacity of invertebrates, with the exception of cephalopods (e.g., octopus, squid), has been found to be quite limited compared to vertebrates.[241] Invertebrate nervous systems are composed of many small brains (ganglia) with relatively few neurons distributed throughout their nervous systems. As such, they are thought to have limited cognitive capacity since they have evolved without the complex nervous system required for the development of a psychological response like suffering. Cephalopods have been considered a possible exception to this because of their larger centralized nervous systems which share similarities to those of fish.[242] However, a recent review of the literature on pain perception in fish (evaluating more than 200 peer-reviewed scientific papers) has concluded that while fish do have nociceptive responses to negative stimuli, they do not have the neurophysiological capacity to perceive pain or suffer in a conscious fashion as humans do.[243] The international team of neurobiologists, behavioral ecologists and fishery scientists who examined the literature concluded that a vast majority of studies on the ability of fish to perceive pain were flawed for several reasons. For example, researchers did not adequately consider the significant anatomical and neurophysiological differences between humans and fish that would suggest very different perception capabilities between the species.[244] Also, the methodologies they used lacked the ability to distinguish between unconscious nociceptive perception and conscious perception of emotional

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[240] Eisemann, "Do Insects Feel Pain?" 164-167.

[241] Thomas Matheson, "Invertebrate Nervous Systems," in *Encyclopedia of Life Sciences* (ed. Gina Fullerlove; London: Nature Publishing Group, 2002): 1-6 [cited 7 November 2017]. Online: https://www2.le.ac.uk/departments/npb/people/matheson/matheson-neurobiology/images/publications/Matheson_ELS_2002.pdf.

[242] Jane A. Smith, "A Question of Pain in Invertebrates," *ILAJ* 33 (1991): 25-31.

[243] J. D. Rose, et al., "Can Fish Really Feel Pain?" *FFish* 15 (2014): 97-133.

[244] Rose, "Fish," 111-114.

suffering, making it impossible to deduce emotional states from fish behavior.[245] The result of this was that human interpretations of fish responses too often simply assumed the presence of emotional pain. Furthermore, findings that pain killers like morphine had little to no effect on fish suggest that fish are either completely oblivious to pain in human terms or they respond to pain in a way that is unrecognizable to human observers. In fact, dosages given to fish at "10 times the lethal dose for any bird or mammal that has ever been studied" were insufficient to "alter the swimming behavior of the trout."[246] The conclusion of the reviewers was that "fish responses to nociceptive stimuli are limited and fishes are unlikely to experience pain."[247] It is therefore logical to conclude that if vertebrates like fish seem to lack the psychological ability to suffer, it is even less likely that invertebrate cephalopods would have such a capacity.

Third, invertebrates show little to no behavior that would suggest the presence of emotion. Most invertebrates lack evidence of social behavior, with many cannibalistically eating their own young when given the opportunity. The absence of social behavior is true for cephalopods as well, who do not provide parental care for their young, suggesting that their ability to hunt, hide from predators, and communicate must be genetically determined rather than learned behaviors.[248] Furthermore, many invertebrates, like the insects cited earlier, continue to behave normally even after severe injury. Consequently, based upon the three criteria mentioned above, it is reasonable to conclude that invertebrates have not evolved the neurocognitive ability to perceive emotional suffering.

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[245] Rose, "Fish," 104-109.

[246] Rose, "Fish," 107.

[247] Rose, "Fish," 97.

[248] Hanlon, Roger T. and John B. Messenger, *Cephalopod Behavior* (Cambridge: University of Cambridge Press, 1996).

This is significant because it provides empirically derived, scientifically based reasoning to exclude the vast majority of species on earth from the category of those that can experience suffering. As Oxford zoologist Robert May concluded in *Science,* approximately 97% of animal species are invertebrates.[249] This means there are approximately 3,152,500 species on earth that have evolved to live and die, but will never experience the emotional distress associated with suffering.[250] Therefore, only the 3% of earth's animal species that are vertebrates (approximately 41,000 species) are candidates that may or may not be able to experience suffering. Yet as was discussed in the case of fish, many of these species also appear to lack the neurocognitive psychological capacity to perceive what humans experience as emotional suffering.

For example, researchers note the challenges of studying pain in reptiles. They observe that captive reptiles frequently suffer thermal burns because they perch themselves too close to heat sources and do not move even when their tissue is being damaged.[251] So if some reptiles have shown themselves to be so insensitive to harmful stimuli that they do not move to protect themselves, it seems even less likely that the case can be made that reptiles experience traumatic psychological states caused by pain. Furthermore, reptilian anatomy lacks the neurophysiological structures needed to experience the distressing aspect of pain as mammals do since "the ACC is one of the neural adaptations that distinguishes mammals from our reptilian ancestors."[252]

It is also doubtful that amphibians have the neurocognitive psychological capacity to perceive emotional suffering since they are even less highly evolved than reptiles, so that leaves birds (*Aves*) and mammals

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[249] Robert M. May, "How Many Species Are There on Earth?" *Science* 241 (1988): 1446.

[250] May, "How Many Species,"1444.

[251] Craig Mosley, "Pain and Nociception in Reptiles," *APM* 14 (2011): 49.

[252] Lieberman, *Social*, 51. Paul D. MacLean, "Brain Evolution Relating to Family, Play, and the Separation Call," *AGP* 42 (1985): 405.

(*Mammalia*) as the most likely candidates for having the ability to experience emotional distress to varying degrees among species. With approximately 9,000 species of birds and 4,500 species of mammals, this means there are only about 13,500 species, or 0.98% of all species on earth, that may have the capacity to experience suffering. So, when metaphysical atheists categorically lump all creatures together in one great heaping mass of misery, the science suggests they are making a claim that cannot be substantiated by the empirical evidence.

4. Natural Processes and Animal Behavior

Besides giving the false impression that most creatures on earth experience lives of intense misery and suffering, metaphysical atheists also tend to misrepresent the natural processes of the earth's ecosystems as being unnecessarily cruel and inefficient. Many examples of suffering described in the philosophical literature are either misrepresentations of what occurs in the natural order, or anthropocentric interpretations of animal behavior. Furthermore, death and destruction are often incorrectly conflated with suffering and cruelty, which is a questionable association at best. By using scientific findings to correct distortions of the facts of suffering, it becomes possible to move towards an improved response to the atheistic argument from natural evil. Therefore, the following sections will offer a more thorough understanding of the natural processes found in ecosystems regarding forest fires, predation, parasitism, disease, famine, and claims of animal cruelty.

Section 4.1 Forest Fires

In 1979, William Rowe created the infamous image of a burned fawn suffering a prolonged and agonizing death in the forest for his argument that God allows unnecessary suffering:[253]

> Suppose in some distant forest lightning strikes a dead tree, resulting in a forest fire. In the fire a fawn is trapped, horribly burned, and lies in terrible agony for several days before death relieves its suffering. So far as we can see, the fawn's intense suffering is pointless.

In reality, it may be more accurate to say that Rowe's imagined scenario of the fawn's intense suffering is pointless, or at least highly improbable. In contrast

[253] Rowe, "Problem of Evil", 337.

to the dire invention of philosopher Rowe, U.S. Fish and Wildlife fire ecologist Bill Leenhouts reveals a completely different reality: "Don't worry about the animals. Most animals actually escape the fires."[254] As a matter of fact, closer scrutiny of Rowe's caricature shows it has little in common with real-world observations of animal behavior in times of fire. As extension forestry specialist Yvonne Barkley at the University of Idaho clarifies:[255]

> Many people believe that all wildlife flees before the flames of a fire like the animated characters in the movie "Bambi." Contrary to this belief, scientists studying animal behavior during the 1988 burns in the Greater Yellowstone area saw no large animals fleeing the flames. Bison, elk, and other ungulates were observed grazing and resting, often 300 feet or less from burning trees.

These observations are among several reasons why the suffering fawn scenario is so highly unlikely. For example, it is often overlooked that most animals' sense of smell is excellent. Consequently, wildlife may be far more likely to detect the whiff of smoke on the wind before a person would, giving the animals plenty of time to move a safe distance from the fire.[256] Furthermore, since any wind driving the blaze will also send the smoke downwind into the direction the fire is travelling, it would seem to provide a surprisingly accurate way of forewarning any animals in its path. So rather than becoming "trapped," the fawn would likely have more than sufficient time to move away from the approaching fire to protected areas with the other large wildlife.

This is not to say that large animal mortality never occurs from wildfires, but when it does it is usually caused by smoke inhalation from very large and

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[254] Michael S. James, "Animals Co-Exist with Wildfires," *ABC News* (26 August 2000): n.p. [cited 25 July 2017]. Online: http://abcnews.go.com/Technology/story?id=119700.

[255] Yvonne Barkley, "Wildfire and Wildlife Habitat," (10 August 2010), U.S. Cooperative Extension website [cited 15 July 2017]. Online: http://articles.extension.org/pages/23714/wildfire-and-wildlife-habitat.

[256] E. V. Komarek, Sr., "Fire and Animal Behavior," in *Proceedings of the Tall Timbers Fire Ecology Conference: No.9., Tallahassee, FL* (1969), 170 [cited 17 November 2017]. Online: http://talltimbers.org/wp-content/uploads/2014/03/Komarek1969_op.pdf.

fast-moving fires.[257] In such cases, the animal is deprived of oxygen to the brain, quickly resulting in unconsciousness, then death. Consequently, these animals will not suffer in any way if the flames of the fire reach their bodies. Unfortunately, it is often livestock restrained by fence perimeters that truly are "trapped" and become the casualties of wildfires.[258] Yet if cattle are unable to escape the devastating effects of a wildfire due to fences built by human hands, is their suffering effectively caused by God or human beings?

Philosophers and others who try to imply that such destructive processes in nature are evidence of God's cruelty or indifference often neglect the fact that fire is a natural and necessary part of healthy ecosystems, with plants and animals alike adapting to fire in the environment.[259] Highly mobile animals easily avoid the heat and the noxious fire gases by flying or moving away at the first scent of smoke. Low mobility animals like snails and other invertebrates also appear to have adapted to fire-prone environments. Snails like the *Triodopsis albolabris* tend to shelter in areas protected from fire and lay their eggs in such places as well.[260] Researchers observed that even when larger numbers of snails died (painlessly, since they are invertebrates) after an intense fire, the population was restored to its original size before a year had passed. Similar population re-establishment was observed after fire for populations of *Orthoptera* (e.g., grasshoppers, locusts, crickets) and *Hemiptera* (e.g., cicadas,

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[257] Barkley, "Wildfire and Wildlife Habitat".

[258] Matthew Brown, "Dead Livestock, Devastation Left in Wake of Western Fires," *Billings Gazette* (26 July 2012): n. p. [cited 21 January 2017]. Online: http://billingsgazette.com/news/state-and-regional/montana/dead-livestock-devastation-left-in-wake-of-western-fires/article_48f1f91d-d247-5df4-8ff1-78dee1f9d93d.html.

[259] Chi-Ru Chang, "Ecosystem Responses to Fire and Variations in Fire Regimes," in *Sierra Nevada Ecosystem Project: Final Report to Congress* (vol. II, *Assessments and Scientific Basis for Management Options*; Davis, Ca.: University of California, Centers for Water and Wildland Resources, 1996), 1070-1099 [cited 17 November 2017]. Online: http://vvww.krisweb.com/biblio/ccv_snep_chang_1996_39.pdf. Richard J. Vogl, "Effects of Fire on the Plants and Animals of a Florida Wetland," *AMN* 89 (1973): 334-347.

[260] E. V. Komarek, "Wildlife and Fire Research: Past, Present, and Future," in *USDA Forest Service General Technical Report INT-GTR-186. Ogden, UT - Intermountain Forest and Range Experiment Station* (July 1985), 5 [cited 9 October 2017]. Online: https://www.fs.fed.us/rm/pubs_int/int_gtr186.pdf.

aphids, leafhoppers) as well.[261] Other animals like the reed frog (*Hyperolius nitidulus*) and the red bat (*Lasiurus borealis*) appear to use a combination of chemo-reception of smoke, responsiveness to heat, visual detection of flames or smoke, and the sounds of fire to evade danger.[262] Sedge wrens (*Cistothorus platensis*) and Henslow's sparrows (*Ammodramus henslowii*) were witnessed flying short distances away to shrub thickets near wet soil where they were protected from the fire.[263] Eastern fence lizards (*Sceloporus undulatus*) have been spotted either burrowing or climbing trees to escape the effects of the flames.[264] Meadow voles (*Microtus pennsylvanicus*) have sheltered underground, fled to undisturbed areas, and even found safety on the bare ground of a burrow mound belonging to a pocket gopher (*Geomys bursarius*).[265] Three different species of montane rattlesnakes (*Crotalus lepidus, C. molossus, and C. willardi obscurus*), which were radio-tagged for monitoring, were detected sheltering safely in underground burrows during a low intensity ground fire.[266] However, it should be noted that snakes do appear to be more vulnerable to fire when they are in mid-ecdysis, the stage before they shed their skin, which temporarily impairs their senses.[267] Yet, since other reptiles have shown no evidence of pain from thermal burns, it may be reasonable to assume that snakes killed by fire do not suffer either.[268]

Burrows generally appear to be safe shelters for younger, smaller, or less mobile animals in times of fire. For example, Cuban parrots that nest in limestone holes in the pine forests of the Bahamas lost none of their nests after fire passed through their area.[269] During a surface fire, temperature and CO_2

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[261] Komarek, "Wildlife and Fire Research," 5.

[262] R. Todd Engstrom, "First-Order Fire Effects on Animals: Review and Recommendations," *FEco* 6 (2010): 116.

[263] Engstrom, "First-Order," 116.

[264] Engstrom, "First-Order," 116.

[265] Engstrom, "First-Order," 116.

[266] Engstrom, "First-Order," 117.

[267] Engstrom, "First-Order," 118.

[268] Mosley, "Pain and Nociception in Reptiles," 49.

[269] Engstrom, "First-Order," 117.

levels were measured in a 1.2-meter-deep cavity of the type commonly used by the Cuban parrot. The carbon dioxide levels increased less than 3-fold even as the air temperature in the bottom of the burrow increased by only 0.4 degrees Celsius. Consequently, it is not unreasonable to surmise that similar protection from fire would be available to creatures in underground burrows as well.

While the primary effect of fire causes very little animal death, the more serious secondary effect can be the destruction of habitat. Yet many plants and trees have not only adapted to fire, but depend on periodic fire for seed germination, the removal of dead vegetation, and the return of nutrients to the soil.[270] For example, Ponderosa pines in the western United States are able to survive fires because they have evolved thick trunks that are fire resistant and high branches that are out of reach of flames from the fires typical of ecologically-balanced forests.[271] Even though there may be a short-term lack of food and shelter immediately after a fire, Leon Neuenschwander, a fire ecologist with the University of Idaho states that fires are actually necessary and advantageous for all wildlife: "In the long term, these wildfires will benefit all animals. In the short term, some animals will be displaced."[272] The severity of this problem will be proportional to the size of the fire.[273] Smaller fires leave surviving habitats for the forest animals to migrate into to meet their needs. While some of these creatures may move on, others move into the newly scorched area for the unusually nutrient-rich new plant growth which emerges from the ash debris. These burned areas of woodland are effectively returned to meadowland, providing an inviting environment for plants and animals that prefer open fields, organically rich soils and additional sunlight. Such areas

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[270] V. H. Bonnet, Anna W. Schoettle, and Wayne D. Shepperd, "Postfire Environmental Conditions Influence the Spatial Pattern of Regeneration for *Pinus ponderosa*," *CJFR* 35 (2005): 37-47.

[271] United States National Park Service (USNPS), "Video: Living with Fire in the Grand Canyon," [cited 15 July 2017]. Online: https://www.nps.gov/grca/learn/management/firemanagement.htm.

[272] James, "Animals Co-Exist with Wildfires".

[273] Chang, "Ecosystem Responses to Fire," 1075.

become lush with wildflowers, bees and other pollenating insects, as well as the birds that feed on those insects. New meadows also attract deer, elk and mice as well as their predators: coyotes, bobcats, mountain lions, bears and wolves.[274] It is the start of a refreshed cycle of the natural ecosystem which will eventually become forest again with the passage of time.

Unfortunately, human interference has upset the natural ecology of forests in several different ways, unnecessarily worsening the effects of fire for both plants and animals. First, human encroachment on forest lands can have the effect of reducing the overall amount of habitat available to wildlife. This means less territory that animals can migrate into when their habitat has been damaged by fire. Second, the unintended effect of human fire suppression has been to increase the severity and destructive power of wildfires when they do occur. Because fire suppression was the standard protocol of the U.S. National Park Service for the past 100 years, the accumulation of dead wood and undergrowth has resulted in far more fuel for fires than would occur naturally, causing fires that burn hotter, higher, and longer than they would otherwise.[275] Fires of this magnitude can overwhelm species which would otherwise be suitably adapted to fire, like the ponderosa pine.[276] While these overgrown fires may be resulting in the unnecessary death of plants and animals, the responsibility would seem to lay at the feet of human beings, not the processes of the natural world.

Fires are a healthy part of forest ecosystems and a necessary part of an intricate and beneficial balance of growth and destruction, life and death.[277] It should be remembered from the previous discussion in Sections 3.3.3 and 3.3.4

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[274] James, "Animals Co-Exist with Wildfires".

[275] USNPS, "Video: Living with Fire".

[276] Leigh B. Lentile, Frederick W. Smith, and Wayne D. Shepperd, "Patch Structure, Fire-Scar Formation, and Tree Regeneration in a Large Mixed-Severity Fire in the South Dakota Black Hills, USA," *CJFR* 35 (2005): 2875-2885.

[277] Komarek, "Fire and Animal Behavior," 160-207.

that the empirical evidence suggests that only mammals and birds are capable of experiencing the agony associated with pain. This means that the creatures most vulnerable to fire are the ones that are *least* likely to feel pain, namely invertebrates and other non-mammalian, non-avian vertebrate species. In contrast, the mammals and birds who would be capable of feeling pain escape injury by fleeing or sheltering during the fire.[278] Those creatures who die of asphyxiation lose consciousness and die very quickly due to the lack of oxygen to their brains, consequently having little chance to perceive pain before their death. Therefore, it is accurate to state that there is very little evidence to suggest that animals suffer due to forest fires. Rather, animal behavior in the natural order has evolved in such a way as to minimize the pain resulting from such destructive events. It is therefore a distortion for scholars like Rowe to misrepresent complex, well-balanced natural systems as scenarios of natural evil and then accuse God of causing unnecessary suffering. On the contrary, the natural life and death processes of forest fires in healthy biomes appear to have evolved in such a way as to minimize animal suffering while providing benefits for all the creatures therein. As such, these processes are consistent with a benevolent God who seeks to minimize suffering and creates new life even in the midst of death.

Section 4.2 Pain, Predation, and Ecological Balance

In philosophical discussions predation is usually equated with natural evil and is considered a primary source of suffering in nature. However, it is appropriate to reconsider this association in light of additional information available on pain and animal behavior. To begin, it is important to distinguish the different forms of pain available in more highly evolved creatures: acute pain, persistent pain, and chronic pain. *Acute pain* refers to a momentary pain

[278] Vogl, "Effects of Fire," 334-347.

that quickly passes, like a pinch or the stick of a needle.[279] This form of pain warns the creature of immediate harm to their tissues in order to withdraw from the danger as quickly as possible. *Persistent pain*, like that associated with a sprained ankle, refers to pain that can last for days or weeks as a creature heals and needs unpleasant sensory feedback in order to avoid further injury to the damaged tissues.[280] *Chronic pain* is pain that continues past the expected time necessary for healing. This kind of pain is typically associated with poorly healed injuries, age-related issues like arthritis and tissue degeneration, or destructive diseases like cancer.[281] Unlike acute and persistent pain, chronic pain does not appear to produce a survival benefit to the creature and seems to be an unhelpful side effect of the body's pain system that causes prolonged suffering. This is where the role of predators come in.

It has long been recognized that predators have evolved with the ability to detect prey animals that are either injured, sick, or weak; in other words, they notice the animals most likely to be in pain and distress. For instance, researchers observed that black sea bass preferentially preyed upon injured squid over uninjured squid.[282] This preference for distressed prey is probably an evolutionary development which minimizes the energy expenditure of the predator while maximizing their caloric intake.[283] Yet the fringe benefit is that such predation can minimize the pain duration of weak or sickly animals that would otherwise suffer. This has been shown in scientific studies on natural selection and predation.

For example, researchers compared data to determine whether predator birds killed randomly or by depending on specific features of the individual prey. To test this, yellow-legged gulls were culled using two methods: by

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[279] NAS, *Recognition*, 16.
[280] NAS, *Recognition*, 16.
[281] NAS, *Recognition*, 16.
[282] Price and Dussor, "Evolution," R384.
[283] Butler and Finn, "Stress-Induced Analgesia," 185.

shooting birds randomly, and by the predation of raptors. After veterinary analysis of the bird carcasses, researchers concluded that predators did not kill at random, but rather preferentially selected their prey based upon age, muscle condition, and sickness. Birds with parasites, infections, diseased organs, injuries or other weaknesses were statistically more likely to be killed by raptors than by random shooting. The researchers suggest that this appears to be because the predators are adapted to recognize the signs of distress in their prey in ways that are hidden to human eyes:[284]

> Our study also shows that not only individuals with severe diseases but also those with mild diseases are predated preferentially, indicating that subtle changes in behaviour or condition may have been sufficient to increase susceptibility to predation. This was also found by Miller et al (2000) who showed that prion infection in deer [a chronic wasting disease] increased the rate of predation of deer by mountain lions (*Puma concolor*) nearly fourfold, even if few of the deer killed were recorded as "noticeably ill" by field observers prior to their deaths.

Because predators appear able to detect the earliest changes in the body language of prey due to the onset of debilitating conditions, it suggests that prey are typically killed in nature *before* they have to endure long-term pain. This conclusion, that predators seem more likely to kill animals suffering from conditions that will result in chronic pain than to kill their healthier counterparts, is also supported by related neurobiological evidence.

Stress-induced analgesia (SIA) is a natural part of the mammalian pain suppression response that ensues when an animal is subjected to a stressful or fearful situation.[285] SIA is a part of the fight-or-flight response which suppresses pain while the animal is endangered by predators or other life-

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[284] Meritxell Genovart et al., "The Young, the Weak and the Sick: Evidence of Natural Selection by Predation," *PLoS ONE* 5 (2010): e9774. Michael W. Miller et al., "Lions and Prions and Deer Demise," *PLoS ONE* 3 (2008): e4019.

[285] Butler and Finn, "Stress-Induced Analgesia," 184-202. Allan I. Basbaum and H. L. Fields, "Endogenous Pain Control Systems: Brainstem Spinal Pathways and Endorphin Circuitry," *ARN* 7 (1984): 309-338.

threatening situations. The analgesia, or suppression of pain, is facilitated by the release of endogenous opioids. SIA increases the animal's chance of survival by allowing it to focus on evading the threat rather than tending to an otherwise painful injury.[286] However, once the danger has passed, nociception and pain perception become elevated, increasing sensitivity to pain in the surrounding tissues of an injury in order to discourage normal behaviors which could cause further damage.[287]

Stress-induced analgesia also helps mammals survive by minimizing the signs of injury that would attract predators in the first place. This is one of the reasons that injured or ill monkeys seek to mask their pain when they know they are being observed by other creatures: to minimize attack from predators.[288] Intriguingly, SIA appears to be reduced or absent in animals that suffer from chronic pain: "Studies have shown that rats which are in chronic pain rather than acute pain express elevated pain behaviours in the presence of an aversive stimulus."[289] In other words, mammals with chronic pain may actually experience *hypersensitivity* to pain, hyperalgesia, when subjected to stressful stimuli.[290] A reduction in SIA was also demonstrated in animals that were subjected to other long-term stresses, such as situations where rats were chronically undernourished or deprived of REM sleep.[291] These results suggest that mammals that are weakened by naturally-occurring long-term stresses, like famine or drought, may have diminished stress-induced analgesia, making it

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[286] DeeAnn M. Reeder and Kristin M. Kramer, "Stress in Free-Ranging Mammals: Integrating Physiology, Ecology, and Natural History," *JM* 86 (2005): 225-235.

[287] Price and Dussor, "Evolution," R384-R386. Allen I. Basbaum et al., "Cellular and Molecular Mechanisms of Pain," *Cell* 139 (2009): 267-284.

[288] Roland Plesker and Valentin Mayer, "Nonhuman Primates Mask Signs of Pain," *LPN* 47 (2008): 1-3 [cited 8 September 2017]. Online: https://www.brown.edu/Research/Primate/lpn47-1.pdf.

[289] Butler and Finn, "Stress-Induced Analgesia," 186.

[290] Cyril Rivat et al., "Non-Nociceptive Environmental Stress Induces Hyperalgesia, Not Analgesia, in Pain and Opioid-Experienced Rats," *Neuropsychopharmacology* 32 (2007): 2217-2228.

[291] Butler and Finn, "Stress-Induced Analgesia," 188.

harder to hide painful body language from predators and resulting in the swift ending of the creature's suffering.

This may help to explain the predation behavior known as "surplus killing," where predators kill more than they can immediately eat during times of extreme distress in a prey population. Besides killing animals that are suffering, it helps to bring the population back into equilibrium with the environment's available resources and alleviate the scarcity and suffering among the remaining animals. Such behavior has been observed in crocodiles at watering holes in times of drought, and in wolves during extremely hard winters. So, if predatory behavior is driven not only by hunger, but also by an instinctual motivation to kill animals that are suffering, then it may illuminate why surplus killing occurs in times of duress. This predator-prey behavior was observed in Yellowstone National Park during the winter of 1996-1997:[292]

> Heavy snows in November and December made it tough for elk and other ungulates to move around and find forage. Then around New Years, typically a very cold time, it started raining, followed soon afterward by temperatures plummeting to well below zero. The heavy snow, then rain, then extreme cold turned the snow pack to concrete, sealing off grasses under a hard shell of ice—a catastrophic situation for ungulates. Before long both elk and bison began leaving the park in huge numbers, with thousands of elk dying along the way. Nor would many of their calves make it through the winter. […] As for the wolves, in late winter of 1997 it seemed they couldn't kill enough elk. Indeed, this was the only year we've documented so-called surplus killing, which refers to wolves taking more than they can immediately eat. Even so, as we continued to watch those carcasses over the next few weeks, many of which did in fact still have meat on them, we saw wolves returning to feed a second and even a third time. In truth some reports of surplus killing stem from people surprising wolves on a kill and thus driving them away, then being incredulous about how little they consumed. Despite a sordid mythology that paints wolves as bloodthirsty killing machines, in the vast majority of cases a wolf taking everything he can means just plain getting

[292] Douglas W. Smith and Gary Ferguson, *Decade of the Wolf: Returning the Wild to Yellowstone* (Guilford, Conn.: Lyons Press, 2005), 129-130.

> enough to keep going. For every hunt that leads to a kill a pack endures many times that number of failed attempts; in Yellowstone proper, only one out of every five attempts is successful.

There are several observations to make from this account. First, it supports the growing body of evidence that predators preferentially select the suffering and distressed animals for their prey, effectively limiting the pain these creatures would otherwise experience. Second, it suggests that surplus killing only occurs when ecological factors stress an entire population of prey, as in times of famine or drought. Third, even though predators may kill more prey than they can immediately eat, other carnivores, scavengers, and decomposers will consume the carcass eventually. There is no net waste in nature. Fourth, when there are an insufficient number of predators, prey animals must die a slower, more protracted and painful death, either by starvation, parasitism, or disease. Fifth, it makes the point that not every predator attack will result in a kill; wildlife observation shows that wolf predation only results in a 20% kill rate in Yellowstone. This low success rate is not unique to the Yellowstone wolves (*Canis lupus occidentalis*). Predator success rates are typically around 30%.[293] The spotted hyenas (*Crocuta crocuta*) inhabiting the Masai Mara National Reserve in south-west Kenya only successfully capture prey in one-third (33%) of all hunting attempts.[294] Great White Sharks (*Carcharodon carcharias*), an apex predator, had a kill rate of about 48% during surface attacks on Cape fur seals near Seal Island.[295] While at first glance it would seem that these sharks are better hunters, their kill rate is most likely a reflection of the fact that they were hunting solitary juveniles which would be much easier prey to stalk because of

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[293] Michael W. Eysenck, *Psychology: A Student's Handbook* (Hove, East Sussex: Psychology, 2000), 173.

[294] Kay E. Holekamp, L. Smale, R. Berg, S. M. Cooper, "Hunting Rates and Hunting Success in the Spotted Hyena (*Crocuta crocuta*)," *JZ* 242 (1997): 1-15.

[295] Shark Research, "Predatory Behavior of Great White Sharks," University of Miami website [cited 6 November 2017]. Online: https://sharkresearch.rsmas.miami.edu/research/projects/great-white-predation.

their inexperience.[296] These are important numbers to consider since philosophical contemplation of predation often seems to assume that predators are guaranteed winners and tends to treat them as unwelcome interlopers in an otherwise unspoiled natural system, but this is simply not an accurate depiction of reality. In fact, mammalian predators that do not eat will suffer as much as their distressed prey. Furthermore, the entire ecosystem is thrown out of balance and weakened when predators are removed from the food chain.[297]

Apex carnivores, which exist at the top of the food chain, are a necessary part of healthy biomes. The food cycle begins with the energy of the sun being harnessed and stored by plants through the process of photosynthesis. These plants are then eaten by herbivores like mice, rabbits, deer, bison and elk. These in turn are consumed by carnivores like bears, wolves, cougars and coyotes, who after their own death are eaten by scavengers and decomposers which return the nutrients of their bodies back to the soil to be taken up by plants again. The unintended consequences of predator absence can be most clearly seen in the case of Yellowstone National Park.

Without the presence of wolves in Yellowstone, elk could linger unhindered among the young vegetation, grazing upon the willow and cottonwood shoots that grow along the banks of the park's waterways.[298] This led to the degradation of the waterside environments, the loss of beaver populations, and an elk population that grew so large that it had to be culled by human hunters lest the elk die of starvation. The reintroduction of wolves not only brought the elk population back into equilibrium but appears to have led

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[296] Shark Research, "Predatory Behavior of Great White Sharks". Robin W. Baird and Lawrence M. Dill, "Occurrence and Behaviour of Transient Killer Whales: Seasonal and Pod-Specific Variability, Foraging Behavior, and Prey Handling," *CJZ* 73 (1995): 1306, 1309.

[297] James A. Estes et al., "Trophic Downgrading of Planet Earth," *Science* 333 (2011): 301-306. John Winnie, Jr. and Scott Creel, "The Many Effects of Carnivores on Their Prey and Their Implications for Trophic Cascades, and Ecosystem Structure and Function," *FWeb* 12 (2017): 88-94.

[298] Smith and Ferguson, *Wolf*, 15.

to an unexpected trophic cascade that reached far further into the Yellowstone ecosystem than researchers originally anticipated. Once the wolves' presence became reestablished, it changed the elk feeding behavior, causing them to move away from feeding along streams and rivers with low visibility. As a result, the willows, cottonwoods, and other beleaguered vegetation was able to make a comeback, and with their return came the beaver. Renewed construction of beaver dams created additional ponds and waterways in the park that became home to populations of yellow and Wilson's warblers, muskrat, fish, waterfowl, and amphibians. Wolves even created safer habitats for prey animals like pronghorn deer, particularly pronghorn fawns, who were experiencing undue predatory pressure from coyotes whose population grew unchecked before the reintroduction of wolves.[299]

Not only did the presence of these predators create and improve habitats for a greater diversity of species, but it also indirectly increased the food supply for many species. "In all the planning, all the studies," says biologist John Varley, "the one thing we totally underestimated was how many other mouths the wolves would feed."[300] Whenever wolves make a kill, typically deer, elk, moose, or bison depending on pack size, there will always be scraps left behind for scavengers. Biologists have observed at least twelve different species of scavengers feeding off the carcasses left behind by wolves, including ravens, magpies, coyotes, as well as golden and bald eagles. The wolves also indirectly feed songbirds, like the mountain bluebird, which eat the beetles and flies whose growth and development occur upon the remains of carcasses. Additionally, by decreasing the coyote population, the wolves helped to increase the populations of other animals in addition to the pronghorn deer, like red foxes and rodents.[301] The increased number of rodents in Yellowstone

[299] Smith and Ferguson, *Wolf*, 125.
[300] Smith and Ferguson, *Wolf*, 121-122.
[301] Smith and Ferguson, *Wolf*, 125.

meant an increase in the available food supply for owls and hawks, supporting their populations as well.

Studies such as these suggest that predators are not only necessary, but beneficial to other species including prey animals.[302] Without predators, animals suffer needlessly in times of starvation or when they become sick and weak. Predators have an instinct to kill animals showing signs of distress (pain and suffering). It must be emphasized that predation is a part of the natural order which in fact minimizes the suffering of creatures; it in itself is not the source of pain in nature. Medical ethicists argue that quick deaths that shorten the experience of pain are often preferable to lingering deaths that prolong unnecessary pain and suffering.[303] As the 2013 edition of the *American Veterinary Medical Association Guidelines for the Euthanasia of Animals* states: "When animals are plagued by disease that produces insurmountable suffering, it can be argued that continuing to live is worse for the animal than death."[304] This is why human beings euthanize animals when they have painful conditions that are resistant to treatment; to allow protracted suffering rather than ending it is considered cruel.[305] In the same way, animals with ailments which would eventually cause long-term pain and suffering are euthanized in the natural order by the actions of predators that seek out creatures that are sickly, weak, or in distress.

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[302] Estes, "Trophic Downgrading," 301-306. Winnie and Creel, "Trophic Cascades," 88-94.

[303] Josef Kuře, ed., *Euthanasia – The "Good Death" Controversy in Humans and Animals* (Rijeka, Croatia: InTech, 2011) [cited 5 November 2017]. Online: http://nphf.nl/footage/fm/File/Euthanasia_-__The____Good_Death____Controversy_in_Humans_and_Animals.pdf.

[304] American Veterinary Medical Association, *AVMA Guidelines for the Euthanasia of Animals: 2013 Edition*, 7 [cited 5 November 2017]. Online: https://www.spandidos-publications.com/var/AVMA%20euthanasia%20guidelines%202013.pdf.

[305] Bernard E. Rollin, "Ethics and Euthanasia," *CVJ* 50 (2009): 1081-1086.

Section 4.3 Perceptions of Predator-Targeted Animals

Even though most human beings are far enough removed from natural environments to escape being attacked by apex predators, they exhibit physiological responses similar to other mammals in such life-threatening situations. Consequently, the firsthand experiences of human beings attacked by predators can provide additional insight into the scientific literature regarding the perceptions of predator-targeted animals.

Now based upon the previous section, it fair to pose the following query: "It may be true that predators minimize the amount of pain and suffering in the natural order by euthanizing weak and sickly animals. It may also be true that predators are a necessary part of a balanced and healthy ecosystem. However, surely the pain an animal feels when it is being killed by a predator is unnecessary and cruel?" In Richard Dawkins' discourse on Nature's indifference to suffering in *River Out of Eden*, he addresses this point, suggesting that Nature would be kinder if there was "a gene that, say, tranquilizes gazelles when they are about to suffer a kill bite."[306]

> Would such a gene be favored by natural selection? Not unless the act of tranquilizing a gazelle improved that gene's chances of being propagated into future generations. It is hard to see why this should be so, and we may therefore guess that gazelles suffer horrible pain and fear when they are pursued to the death—as most of them eventually are.

Looking more closely, Dawkins is making two similar although slightly different requests. First, he wishes that animals like gazelles did not experience pain and fear when they are pursued by predators. Second, it appears that Dawkins desires a "tranquilizing effect" of some sort to calm the prey before it receives the attack that would kill it. It is therefore ironic that Dawkins insists that these accommodations would be evidence in favor of Nature's kindness

[306] Dawkins, *River*, 131.

(and indirectly theism) because that is unwittingly close to what Nature *has* provided, despite the fact that Dawkins believes that such a calming mechanism would be unlikely based upon his personal interpretations of gene propagation as he states in the quote above.

Dawkins "guesses" that gazelles suffer horrible pain and fear when they are pursued by predators, but the physiological evidence does not support this supposition. As has been mentioned previously, it is precisely the onset of a stressful and/or fearful event that induces SIA in mammals which is part of the fight-or-flight response.[307] It should be noted that although fear may be an unwelcome emotion, that appears to be part of the point: it removes all other distractions from the creature's attention.[308] Moreover, a major part of what makes feelings of fear so unpleasant is the corresponding cascade of stress hormones from the adrenal system that prepare the creature's body for survival when in danger.[309] Cortisol prepares the body to flee or fight by flooding it with glucose as an immediate energy source to the muscles while simultaneously inhibiting insulin production which would store that excess glucose.[310] As cortisol constricts the arteries, epinephrine increases the heart rate and together these two mechanisms cause the blood to pump harder and faster. In addition, epinephrine improves cognitive brain function, increasing awareness and alertness.[311] Endogenous opioids are released which suppress

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[307] Butler and Finn, "Stress-Induced Analgesia," 184-202. Basbaum and Fields, "Endogenous Pain Control Systems," 309-338.

[308] Reeder and Kramer, "Stress in Free-Ranging Mammals," 226.

[309] Reeder and Kramer, "Stress in Free-Ranging Mammals," 225-228. Harold G. Koenig, "Altruistic Love and Physical Health," in *Altruism and Health: Perspectives from Empirical Research* (ed. Stephen G. Post; Oxford University Press, 2007), 423-424.

[310] Genetic Science Learning Center, "How Cells Communicate During Fight or Flight," (2010, September 2) University of Utah website [cited 5 November 2017]. Online: http://learn.genetics.utah.edu/content/cells/fight_flight/. M. A. Febbraio et al., "Effect of Epinephrine on Muscle Glycogenolysis during Exercise in Trained Men," *JAP* 84 (1998): 466-467. Dina Aronson, "Cortisol – Its Role in Stress, Inflammation, and Indications for Diet Therapy," *TD* 11 (2009): 38 [cited 9 October 2017]. Online: http://www.todaysdietitian.com/newarchives/111609p38.shtml.

[311] Jane B. Reece et al., *Campbell Biology: Concepts and Connections* (New York: Pearson, 2011 [7th edn]), 528.

pain perception in the animal, allowing the creature to focus on escaping from danger.[312] Other physiological changes like the inhibition of digestion (often associated with a queasy sensation in the stomach region) and shaking are partially the result of diversion of the blood flow to the large skeletal muscles needed for fighting and escape.[313] Another unpleasant but necessary side effect of the adrenal response is increased muscle tension throughout the body for the purpose of providing the animal with additional strength and speed. But no matter how odious, none of these physiological changes or their corresponding emotional responses that we associate with fear are either gratuitous or "painful." Rather, all are necessary components of the survival mechanism, the purpose of which is to help the creature stay alive.

As people of the twenty-first century, it is hard to understand what it "feels" like to be prey in the presence of a predator. Much of our knowledge about predator attack comes from watching nature documentaries like Blue Planet or National Geographic where the prey response can only be witnessed from a third-person point of view. As such, it is easy to impose our own notions of fear and pain upon the creatures that are being viewed upon the screen. Unlike the animals in the footage, however, human beings sitting safely in a room would not only feel pain like a pinch or a cut to its full extent, but their neurocognitive ability to feel empathy causes them to feel sympathetic pain in their own body as they watch an animal being attacked.[314] However, these observers need to realize that their bodies are in a completely different physiological state than the animals they are observing. The animals they see under attack are flooded with stress hormones that minimize their sensation of pain, while making them stronger and more effective at eluding the predator. Even though animals cannot tell us these things for themselves, we can identify

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[312] Rivat, "Non-Nociceptive Environmental Stress," 2217-2228.

[313] Henry Gleitman, James Gross, and Daniel Reisberg, *Psychology* (New York: W. W. Norton and Company, 2010 [8th edn]), 473-477.

[314] Lieberman, *Social*, 155.

these effects in the accounts of human beings who have been subjected to predator attack.

Achmat Hassiem's account of his shark attack illustrates many of the products of the fight-or-flight response.[315] It was the summer of 2006 and he was swimming off Sunrise Beach with his younger brother, Taariq. They were among a group of lifeguards doing life-saving training:

> Two guys stayed in a boat nearer the shore while Taariq and I were a little farther out, both treading water. Then something caught my eye—I looked around and saw a large shark fin darting towards my brother. It didn't look real, like something out of a film. I shouted to the guys in the boat to get Taariq out. As they headed for him, I knew I had to do something to distract the shark, so I started slapping the water. It worked. But now the fin turned and came towards me, before disappearing.
>
> I felt relieved that Taariq was safe, but scared because I was now the only person in the water. It was the worst feeling, knowing that there was a predator right there and yet I couldn't see it. Seconds later, a huge black shape rose up beside me. Its head was enormous, particularly the mouth—it looked big enough to walk into. I was face to face with a 15ft great white. I touched the shark with my feet to try to push myself away, but that only sent it into a frenzy. It swung its body round, making a colossal splash.
>
> It was nearly on me now, and my instinct was somehow to get on top of it. I tried desperately to push myself up, but for some reason my right leg wouldn't move. I looked down and saw why: everything below my knee was in the shark's mouth. It was like a dog with a bone, shaking me violently. 'This is it,' I thought. 'I'm about to die.' I thought about not being able to say goodbye to my parents, that this was the end.
>
> I screamed to the guys in the boat. By now the whole incident had lasted less than a minute, so there hadn't been time for them to reach me or call for help—they'd only just picked up my brother. I remember seeing them screaming back in total panic.

[315] Achmat Hassiem, "Experience: A Great White Shark Ate My Leg," *The Guardian* (15 October 2010): n. p. [cited 2 March 2016]. Online: https://www.theguardian.com/lifeandstyle/2010/oct/16/experience-shark-attack-paralympian.

> By now I was dangling against the side of the shark's body, out of breath and in shock. Then it took me underwater, still shaking me with my leg in its mouth. I took a gulp and my lungs felt as if they were on fire.
>
> Then I got so angry, I thought, 'I'm not going down without a fight.' I started attacking the shark with all my remaining strength, grabbing its eye and punching its nose—I was hitting it so much that when I reached hospital, there was no skin left on my knuckles.
>
> I could feel my body moving farther from its mouth as its teeth slid down the bone towards my ankle. I gave one last enormous push and heard a great snapping sound. Suddenly, I was free. I had been dragged about 50m under water and when I broke the surface I was close to blacking out.
>
> The boat was nearer now, and Taariq saw me floating in the water. He grabbed my hand and started pulling me out. As I looked back, I could see the shark powering towards me, chewing what must have been my foot. I collapsed into the boat as it brushed past. My brother had my injured leg between his bicep and forearm, trying to stop the bleeding, and to shield me from the extent of my injury.
>
> I didn't know it, but halfway down my shin there was nothing left.

It is noteworthy that Achmat survived the attack and went on to join South Africa's national swimming team and represented his country at the 2008 Beijing Paralympics. Yet his experience in the water with the shark provides an excellent example of what actually occurs from the perspective of the prey when under attack by a predator. Achmat's first sighting of the shark fin initiates the fear event that begins the corresponding adrenal response and his stress-induced analgesia. (It is also instructive to notice here that Achmat's splashing successfully distracted the shark from his brother Taariq because predators preferentially target prey in distress, which Achmat was simulating.) Achmat is more fearful now that he is alone in the water with the shark and this fear will continue to keep his stress hormones elevated. Consequently, moments later when the shark attacks, he will not feel pain from the event. Like most prey, Achmat at first tries to flee. He touches the shark with both feet to push away and tries to get up on top of the shark but is surprised that he

can't. He doesn't know why his right leg won't move and must look down to visually ascertain that his leg is clenched in the teeth of the shark. Notice that his somatosensory cortex is working, telling him the location of his leg, but his anterior cingulate cortex is suppressed by endogenous opioids, so he is not able to feel any pain associated with the injury.[316] When Achmat is dragged underwater and the saltwater in his lungs feels like fire, we observe the adrenal fight instinct of the cornered animal kicking in. He feels anger, uses clear-headed strategies like grabbing the eye and punching the nose, and he continues to experience stress-induced analgesia as he punches the shark until there is no skin left on his knuckles. In fact, the analgesia effect is so strong that he breaks his own leg in one enormous push to free himself. Even when safely in the boat, his natural pain suppression is so great that Achmat doesn't realize that halfway down his shin there is nothing left of his leg.

The reason Achmat is so insensitive to his injuries is because the endogenous opioids in his pain suppression systems continue to operate throughout his ordeal and afterward, as has been demonstrated in the long-term analgesic responses of rats.[317] Researchers have discovered that the central nervous system has numerous pathways for the suppression of pain perception.[318] These involve both opioid and non-opioid mechanisms which are anatomically and neurochemically distinct from each other.[319] Researchers found that rats subjected to *inescapable* electric shock demonstrated a short-term non-opioid analgesic response for up to 30 minutes, and a long-term opioid analgesic response that lasted as long as 24 hours after the original shocks had

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[316] Lieberman, *Social*, 50-53. Talbot, "Multiple Representations," 1355-1358. Rainville, "Pain Affect," 968-971. Butler and Finn, "Stress-Induced Analgesia," 184-202.

[317] Steven F. Maier et al., "Opiate Antagonists and Long-Term Analgesic Reaction Induced by Inescapable Shock in Rats," *JCPP* 94 (1980): 1172-1183. James W. Grau et al., "Long-Term Stress-Induced Analgesia and Activation of the Opiate System," *Science* 213 (1981): 1409-1411. Steven F. Maier, "Determinants of the Nature of Environmentally Induced Hypoalgesia," *BN* 103 (1989): 131-143.

[318] Basbaum and Fields, "Endogenous Pain Control Systems," 309-338.

[319] Linda R. Watkins and D. J. Mayer, "Organization of Endogenous Opiate and Nonopiate Pain Control Systems," *Science* 216 (1982): 1185-1192.

ended.[320] However, "rats that were allowed to escape shock did not experience analgesia, whereas subjects administered an equivalent amount of uncontrollable shock did [experience analgesia]."[321] The results of these studies suggest that opioid-induced analgesia only occurs when the subject cannot evade or avoid the trauma. Achmat, who also found himself in an inescapable traumatic situation, appears to have undergone the same opioid-induced analgesia experienced by the rats exposed to inescapable shock. Therefore, it is reasonable to conclude that other mammals experience the same enduring opioid-induced analgesia when they undergo inescapable predator attack, eliciting the strong endogenous pain suppression mechanisms that can block their pain perception for hours.

A key point to recognize from these examples of stress-induced analgesia is that human beings in otherwise safe environments experience pain differently than humans and other mammals under duress.[322] This may partially explain the observations of anesthesiologist Dr. Henry K. Beecher of Harvard Medical School. He observed a correlation between a person's perception of pain and their psychological frame of mind. He called this the "Anzio effect," describing what he observed from the treatment of casualties at the Anzio beachhead in World War II. Of 215 casualties, "only one in four soldiers [25%] with serious injuries (fractures, amputations, penetrated chests or cerebrums) asked for morphine, though it was freely available. They simply did not need help with the pain, and indeed many of them denied feeling pain at all."[323] Beecher contrasts the soldier's response to pain to that of his patients

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[320] Maier et al., "Opiate Antagonists," 1172-1183. Grau et al., "Long-Term Stress-Induced Analgesia," 1409-1411. Maier, "Determinants," 131-143.

[321] Grau, et al., "Long-Term Stress-Induced Analgesia," 1409.

[322] Fein, "Nociceptors," 136.

[323] Brand and Yancey, *Gift of Pain*, 203-204.

in private practice, where 80% of patients healing from surgical wounds plead for morphine or other painkillers. He concludes that:[324]

> There is no simple direct relationship between the wound *per se* and the pain experienced. The pain is in very large part determined by other factors, and of great importance here is the significance of the wound…. In the wounded soldier the response to injury was relief, thankfulness at his escape alive from the battlefield, even euphoria; to the civilian, his major surgery was a depressing, calamitous event.

These observations may also be explained by the studies on rats exposed to inescapable shock.[325] Like the opioid response of these rats, the soldiers who faced the inescapable trauma of a battlefield environment would be far more likely to exhibit an ongoing opioid-induced analgesia than patients undergoing (escapable) surgery in a hospital setting. Consequently, the patients would experience more pain from their surgical injuries than the soldiers experienced from their grievous wounds.

However, injury-induced pain suppression is not limited to life-threatening wounds or highly traumatic environments. A case in point is that of a civil engineer who was doing worksite evaluation on the banks of a creek. While walking alongside the stream, the man slipped on some wet leaves and slammed his foot into the base of tree. Both the inner and outer bones of his ankle snapped with a sound like a tree branch breaking, leaving his foot hanging uselessly. Fortunately, the injured man was able to use his cell phone to call for help, yet he felt no pain during the 30 minutes it took until he was put into an ambulance and given synthetic pain medication. In other words, injury-induced analgesia can be experienced with serious injuries even when there is no imminent external threat to the creature's life.

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[324] Brand and Yancey, *Gift of Pain*, 204.

[325] Maier et al., "Opiate Antagonists," 1172-1183. Grau et al., "Long-Term Stress-Induced Analgesia," 1409-1411. Maier, "Determinants," 131-143.

Naturally suppressed pain experience appears to be available not only for humans, but for animals who survive serious injuries (see Sections 5.4 and 5.5). Doug Smith, Yellowstone's wolf research leader has observed that wild animals like the wolf have a very strong resistance to pain:[326]

> Four or five times, Doug Smith has caught a wolf to replace a collar and discovered that the animal had a healed-up broken leg. "Since I put their first collar on, I'd been tracking them the whole time; there was *never* an indication that, meanwhile, they'd broken a leg!" Once Smith was in a helicopter over a running pack. "They were doing the porpoising thing in deep snow. I darted the one at the back to put a collar on. When we reached it on the ground, I was shocked to see that it had only three legs. From the air I couldn't see anything wrong with how that wolf was running." In that same group with the three-legged wolf, another wolf got a broken shoulder in late winter, probably from a kick by an elk or bison. "She was *ten* years old"—exceptional longevity for a free-living wolf—"and she lasted all the next spring and summer. I think the others were helping her." In autumn, she faded out.
>
> "When you examine their bones, you see that these guys have a very rough life *and* they're *incredibly* tough." Smith once spotted an alpha female whose leg was dangling; she was attentively watching her pack hunt. Instead of hiding and nursing her break, "she was right there, alert to what was going on." She healed and survived.
>
> "No," declares Doug. "Wolves never feel sorry for themselves. It's never, 'Poor me.' They're always *'Forward!'* Their question is always: 'Next?'"

The lesson here is that scholars need to avoid not only anthropocentric assumptions about animal suffering in the natural world, but they must be more self-aware that their protected, comfortable environments and relative unfamiliarity with life-threatening fear makes them far less capable of correctly interpreting animal pain than they may realize.

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[326] Carl Safina, *Beyond Words: What Animals Think and Feel* (New York: Henry Holt, 2015), 152-153.

The cumulative evidence suggests that prey do not suffer from pain while they are fleeing and fighting to survive, but what about those moments near death? Surely, the kill bite must be painful? Again, as observers a safe distance from danger, we often assume this must be the case. Yet the empirical evidence does not seem to support this conclusion either. As shown in the case of Achmat, the endogenous opioid system continues to operate throughout the threatening episode and beyond.[327] If exhaustion or asphyxiation leads to unconsciousness, as it nearly did for Achmat, it would leave the prey unaware of any additional attacks or injuries from the predator. It is also significant that many of the mechanisms that harm creatures in nature, whether caused by predation, sickness, or accidents, can quickly initiate a life-threatening condition known as *shock*.

Shock can be caused by heavy bleeding (hemorrhagic/hypovolaemic shock), damage to the spine (neurogenic shock), or infection that enters the blood stream (septic shock).[328] Shock is linked to a drop in blood pressure which reduces the flow of oxygen and nutrients to the brain, heart, lungs, and other organs, and if not reversed, can quickly lead to unconsciousness and death. Furthermore, cases of traumatic injury and sepsis activate the neuroendocrine and endogenous opiate systems, producing analgesia for the critically ill creature.[329] For example, an elderly woman who had broken her hip was found cold and shaking on the floor quite some time later by a family member and was subsequently taken to the hospital in the early stages of shock. Three days later after being sent to a rehabilitation facility to heal from her successful surgery, the woman still had no memory of her trip to the

[327] Maier et al., "Opiate Antagonists," 1172-1183. Grau et al., "Long-Term Stress-Induced Analgesia," 1409-1411. Maier, "Determinants," 131-143.

[328] Department of Health and Human Services, "Shock," State Government of Victoria, Australia website [cited 12 September 2017]. Online: https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/shock.

[329] Patricia E. Molina, "Opioids and Opiates: Analgesia with Cardiovascular, Haemodynamic and Immune Implications in Critical Illness," *JIM* 259 (2006): 138-154.

hospital due to the activation of her neuroendocrine and endogenous opiate systems. Researchers have also discovered that "hemorrhagic shock produces an immediate activation of the autonomic nervous system and endogenous opioid pathways," blocking the pain of the creature as it bleeds to death.[330] Therefore, the empirical evidence suggests that creatures like the gazelle do experience analgesia both before and after the "kill bite."

It should also be noted that the manner of death will often be dependent upon the age of the animal. Young animals can be killed so quickly and efficiently by predators that there is often no chance for them to feel pain at all. Killer whales kill baby seals with a single bite, leaving no time to suffer before death. Young lion cubs killed by an invading pride of lions have little time to experience pain either, as demonstrated when an adult male killed three 3-month-old cubs with a single bite to the head of one, and a bite to each of the abdomens of the other two.[331] All three had been killed in less than two minutes. With such quick attacks, the animal is likely dead before the peripheral nervous system can carry nociception signals from the body to the brain for processing.[332]

In contrast, more mature animals will have greater skill and strength for eluding predators, but this may mean having to endure a longer period of fighting or fleeing as well, as in the case of a seal lion eluding killer whales or a zebra being pursued by hyenas. It is important to note that as an animal depletes its stores of glucose during the fight-and-flight response, it begins showing symptoms of hypoglycemia: neurogenic and neuroglycopenic.[333]

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[330] Patricia E. Molina, "Endogenous Opioid Analgesia in Hemorrhagic Shock," *JTIICC* 54 (2003): 126-132.

[331] Stefano Parmigiani and Frederick S. Vom Saal, eds., *Infanticide and Parental Care* (vol. 13 of Ettore Majorana International Life Sciences; Singapore, Harwood Academic, 1994), 280.

[332] While some may object that the real issue here is the moral wrongness of young animals being killed, that aspect of the problem deals with moral agency, not pain, and will be addressed in Chapter 3—*Accounts of Cruel Animals: Killer Whales and Insurance Chicks*.

[333] Philip E. Cryer, "Hypoglycemia, Functional Brain Failure, and Brain Death," *JCI* 117 (2007): 868-869.

Neurogenic hypoglycemia symptoms occur when glucose levels become too low and cause the activation of the autonomic nervous system; the symptoms can include trembling, heart palpitations, nervousness, sweating, hunger, as well as a tingling sensation in the peripheral nerves.[334] Neuroglycopenic hypoglycemia symptoms are the result of glucose blood concentrations that are too low to fuel normal operation of the brain; these symptoms can include confusion, a feeling of warmth, weakness/fatigue, drowsiness, severe cognitive failure, seizure, or coma.[335]

As prey endure prolonged pursuit by predators which seek to exhaust them, their glucose levels decrease accordingly.[336] This is because the continued consumption of glucose in the prey's muscles causes blood glucose levels to decrease which would eventually result in functional brain failure.[337]

At progressively lower plasma glucose concentrations, measurable cognitive dysfunction occurs as well as increasing risk of neuronal death.[338] This means that it is very likely that prey who are experiencing fatigue are also beginning to experience the accompanying neuroglycopenic symptoms of disorientation, confusion, drowsiness, and cognitive failure associated with

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[334] Dwight A. Towler et al., "Mechanism of Awareness of Hypoglycemia. Perception of Neurogenic (Predominantly Cholinergic) Rather than Neuroglycopenic Symptoms," *Diabetes* 42 (1993): 1791-1798. Philip E. Cryer, "Symptoms of Hypoglycemia, Thresholds for their Occurrence, and Hypoglycemia Unawareness," *EMCNA* 28 (1999): 495-500.

[335] Cryer, "Symptoms of Hypoglycemia," 495-500. Towler et al., "Mechanism of Awareness," 1791-1798.

[336] Eysenck, *Psychology*, 172. Genetic Science Learning Center, "How Cells Communicate".

[337] Cryer, "Hypoglycemia," 868. Agnès Aubert et al., "Brain Lactate Kinetics: Modeling Evidence for Neuronal Lactate Uptake upon Activation," *PNASUSA* 102 (2005): 16448-16453. Avital Schurr, "Lactate: The Ultimate Cerebral Oxidative Energy Substrate," *JCBFM* 26 (2006): 142-152. Jeffery M. Lubow et al., "Brain Oxygen Utilization is Unchanged by Hypoglycemia in Normal Humans: Lactate, Alanine, and Leucine Uptake are Not Sufficient to Offset Energy Deficit," *AJPEM* 290 (2006): E149-E153. Donald D. Clarke and L. Sokoloff, "Circulation and Energy Metabolism of the Brain," in *Basic Neurochemistry: Molecular, Cellular and Medical Aspects* (ed. G. Siegel, B. Agranoff, R. W. Albers, and P. Molinoff; New York: Raven, 1994), 645-680. G. Blomqvist et al., "Facilitated Transport of Glucose from Blood to Brain in Man and the Effect of Moderate Hypoglycaemia on Cerebral Glucose Utilization," *EJNM* 18 (1991): 834-837.

[338] Cryer, "Hypoglycemia," 869-870.

glucose depletion. Due to this mammalian neuroglycopenic response to decreasing blood glucose levels, exhausted animals may simultaneously feel opioid-induced analgesia as well as loss of cognitive awareness and fear before they are killed by their predator.

Again, animals cannot tell us what they are feeling as they reach a state of exhaustion caused by the depletion of their blood glucose levels. However, these same effects can be experienced by humans under predator attack such as Brandon Johnson, who was nearly killed by a 525-pound bear who attacked him at night in the middle of a thick forest.[339] Johnson, a hunter himself, was trying to help track down a black bear his friend had shot and presumably killed. While searching for bear tracks in a dense section of woods in the low moonlight, the wounded bear charged him and briefly knocked him unconscious. Armed with nothing but a 5-inch knife, he realized he was injured: "One tooth of the bear just broke the (left arm) bone right in half." Initially as the bear attacked again and again, Johnson felt the energy and adrenaline of the fight-and-flight response. However, as time passed, exhaustion set in:

> "It's just going to town on my hand and I just keep stabbing it and stabbing it and stabbing away and I am screaming and yelling," he said. It worked. The bear backed off and soon walked away, but minutes later it came back.
>
> "I could feel like all the energy and adrenaline I had built up was leaving," he said.
>
> The bear left a second time while Johnson screamed for help from his fiancée and friends in the woods. But, for a third time, the nightmare returned.

[339] Chris Hrapsky, "Man with Knife Survives Attack by 525-Pound Bear," *USA Today* (9 December 2014): n. p. [cited 13 February 2015]. Online: https://www.usatoday.com/story/news/nation-now/2014/12/09/man-bear-attack-knife-minnesota/20127583/.

> "Once I got to the point where I thought I was going to die, and I got myself to the point where I was ready to die, there was no more fear," he said.
>
> Johnson said he shoved his hand into the bear's open mouth, stabbing its throat. The bear grabbed Johnson's leg, picked him up, slammed him to the ground, and walked away. Johnson said he walked with the help of two friends 700 yards to waiting ambulances. Friends found the bear carcass the next day, 50 feet from where the attack occurred.

In Johnson's account, the fight-and-flight response is evident, but we can also see that his increasing physical fatigue was accompanied by an increasingly peaceful mental state prepared for death. As his strength ebbed away along with his blood glucose, Johnson felt no more fear. If the mammalian response to fatigue and impending death is similar to that of humans, then exhausted animals may simultaneously feel analgesia and a loss of fear before they are killed by their predator.

This combination effectively mimics Dawkins' "tranquilizing effect," which occurs when an animal has depleted its stores of glucose and no longer has the strength to fight or flee any more. In light of these findings, it may be time to reexamine metaphysical assertions of Nature's cruelty and indifference, and instead conclude that Nature may be much more concerned for the suffering of her creatures than appears on the surface.

Section 4.4 Accounts of Cruel Animals

Philosophical arguments that imply nature is cruel can come in many different forms and from theists and atheists alike. As demonstrated in the previous chapter, all too frequently philosophical claims of natural evil are supported by either the imposition of anthropocentric assumptions upon non-human animals, or incomplete representations of what occurs in the natural world. However, a better scientific understanding of pain, animals, and their environments can rectify mistaken assumptions and offer insights that are pertinent to our eventual conclusion regarding God's providential care of creatures and suffering. For instance, the predatory behaviors of orcas as well as accounts of avian siblicide have been prime examples of such misunderstandings. In these cases, poorly understood observations of animal behavior have been used in the philosophical literature to suggest that evolution has produced creatures that are either cruel to the weak or inflict unnecessary suffering on other animals, thereby causing needless suffering in the world. Fortunately, with scientific advances in environmental ecology, and animal behavior and development, such misconceptions can be corrected.

Section 4.4.1 Understanding the Behavior of Killer Whales

Theists Holmes Rolston III and Christopher Southgate both appear to have unintentionally contributed to philosophical misunderstandings of animal cruelty with their examples of orca behavior and the "insurance chick" associated with avian siblicide. Regarding the predatory practices of orcas, Rolston wrote the following:[340]

> My inquiry is about nonmoral evil, in the weaker sense, of events and processes, which, though not culpable agents, are bad, harmful, cruel, injurious. Here, too, often nature just is. When Comet Shoemaker-Levy crashed into Jupiter in 1994 and upset the

[340] Rolston III, "Naturalizing and Systematizing Evil," 67.

> flow bands, I was not prompted to ask questions of good and evil. There does not seem to be anything evil out there in space. The place to look is here on Earth. Orcas catch sea lions for food, and play with them, tossing the struggling lions into the air, prolonging their agony. I do not fault the killer whales, but I might ask whether the nature is evil that, through natural selection, results in the nature of such beasts.

Regrettably, Rolston does not provide a reference for his contention that orcas torture their prey as they play with them, effectively "prolonging their agony." This lack of citation makes it harder to research what combination of behaviors were actually observed, and to discern if there may be an error in their interpretation. Southgate inadvertently compounds the misunderstanding when he misquotes then understandably misinterprets a *National Geographic* article to support Rolston's conclusion that some orcas have chosen a gratuitously cruel method of predation:[341]

> As I noted in the preface, Rolston describes the behavior of certain kinds of orca which, in killing sea lions, will toss their victims playfully in the air, prolonging their agony [citing Rolston quote above]. This type of orca is so feared by its prey animals that dolphins will drag themselves onto land and suffocate rather than face their predators [citing "Investigating a Killer"[342]]. As we consider this behavior, our focus may be on the orcas themselves. The freedom of behavior involved in their lifestyle as predators can lead to what seems to human observers like gratuitous infliction of suffering, but it does not necessarily do so. Other types of orca do not show this behavior, and often predators (unless teaching their young to hunt) kill their prey with the minimum of energy and fuss.

Southgate appears to construe the behavior of the dolphin- and sea lion-consuming orcas as though theirs is an intentionally chosen lifestyle to be vicious which has been rejected by other orcas and predators that do not engage in such "cruel" practices. Part of the problem here is that Southgate has

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[341] Southgate, *Groaning of Creation*, 45.

[342] Douglas H. Chadwick, "Investigating a Killer," *NatGeo* 207 (2005): 99.

misquoted the "Investigating a Killer" article in the preface of his book: "Dolphins will swim alongside the fish-eaters, but 'have been known to hurl themselves up the beach in a suicidal frenzy to escape the mammal-hunting orcas.'"[343] The actual quote from the orca article states that, "Dolphins are known to hurl themselves *up onto beach rocks* in a suicidal frenzy to escape the mammal-hunting orcas," (emphasis added).[344] Southgate's misquote leads him to misrepresent the behavior of dolphins and describe them as creatures that contemplate and intentionally commit suicide as they "drag themselves onto land and suffocate rather than face their predators" who would otherwise cause the "gratuitous infliction of suffering."[345] Unfortunately, this is not a faithful rendering of the original article's meaning.

The *National Geographic* article, "Investigating a Killer," actually explains that there are at least three distinct subspecies of orca in the waters of North America's Pacific coast, and these have probably not interbred for the last 10,000 years. Orcas are in truth the largest, strongest, and brainiest dolphins in the world. These orca groups differ by diet, "physical traits, travel patterns, social groupings, call patterns, and learned traditions."[346] The orca pods that have evolved on a diet of fish, particularly salmon, tend to remain close to the same Pacific shorelines and are commonly referred to as *resident* orcas. Another orca subspecies off this coast feeds exclusively on warm-blooded mammals: seals, sea otters, sea lions, porpoises, dolphins, and whales. These pods migrate greater distances in search of prey and are therefore known as *transient* orcas. An additional group of orcas seen near the coast much less frequently are called *offshore* orcas, since they spend most of their time out at sea. These appear much smaller in size compared to the *transients* and *residents* and are suspected

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[343] Southgate, *Groaning of Creation*, ix.

[344] Chadwick, "Investigating a Killer," 99.

[345] It should also be noted that, as a mammal, the dolphin breathes oxygen through its blowhole and as such does not die from suffocation when beached, but dehydration.

[346] Chadwick, "Investigating a Killer," 102.

to eat a diet that includes sharks. As researchers continue to study orcas around the world, they discover other specialized populations with some feeding primarily on tuna, others on squid, and others on whales. Consequently, the hunting behaviors observed differ from group to group.[347]

Resident orca pods call to each other freely with their high-frequency pulses and clicking while they are hunting, openly broadcasting sonar in order to locate their food (salmon). This is why mammals like dolphins, porpoises, and sea lions will swim alongside resident orcas; they recognize that they are not a threat. In contrast, transient orca pods hunt these more intelligent mammals and as such must stalk their quarry cautiously. They make longer dives, directional feints, remain silent underwater, or send out only brief sonar clicks which match the sounds of stones knocking together in the surf. Transient orcas must use their strength, strategy, speed, and stealth to take their prey by surprise. This is what causes dolphins, otters, seals and sea lions to flee abruptly once transient orcas make their presence known; transients are their predators, residents are not. Therefore, it is a misrepresentation of the predator-prey dynamic to suggest that mammals flee because transient orcas are cruel, rather than to acknowledge that mammals flee because they recognize the presence of their predator.

Further investigation of orca behavioral research reveals that it is also a distortion to suggest that orcas cause the "gratuitous infliction of suffering" by playing with their food and unnecessarily prolonging the agony of their prey. Close observation of transient orca behavior demonstrates that there is no gratuitous delay between predator-prey encounter and prey death (T_K).[348] Researchers observed 136 successful prey attacks: 130 were or were suspected to be harbor seals (difficult to determine when a kill occurs underwater), 3 were

[347] James R. Heimlich-Boran, "Behavioral Ecology of Killer Whales (*Orcinus orca*) in the Pacific Northwest," *CJZ* 66 (1988): 565.

[348] Baird and Dill, "Occurrence," 1300-1311.

harbor porpoises, two were sea lions, and one was an adult male elephant seal. The evidence suggests that approximately 80% of kills occur in 5 minutes or less.[349] This may be because harbor seals are much easier to kill, particularly inexperienced individuals and pups, than faster or stronger prey like harbor porpoises, sea lions, or elephant seals. Marine ecologists, Robin Baird and Lawrence Dill report that "the required minimum T_K value appears to be greater (i.e., > 1 min) only for prey that are more difficult to capture or dangerous, such as Dall's porpoises or sea lions, respectively...."[350] They also made two other significant observations regarding whether transient orcas cruelly torment their food before eating it. First, these orcas do often engage in social-play behaviors, but only *after* a kill. This is because transient killer whales must hunt by stealth, and "social-play behaviors are characterized by frequent body contact between individuals and extensive percussive behavior (such as breaches, spyhops, tail lobs, and cartwheels)."[351] Researchers recognize the noisy behavioral patterns of orca playfulness, and they do not occur until after a kill because they would otherwise reduce the chances of hunting success. The second significant observation of Baird and Dill is that while young orcas have been observed to increase the handling time of their prey, or "play with their food," it is only *after* the prey is dead and during seasons (like the seal pupping period) when the immature orcas are especially well-fed.[352] Researchers believe that prolonged prey handling is linked to social-play behavior, and is a necessary component of learning in young animals.

The importance of teaching juvenile killer whales how to hunt and handle prey should not be underestimated. Young orcas can nurse for as long as three years, but before the flow of the mother's milk stops, the pod must

[349] Baird and Dill, "Occurrence," 1306.
[350] Baird and Dill, "Occurrence," 1309.
[351] Baird and Dill, "Occurrence," 1308.
[352] Baird and Dill, "Occurrence," 1309.

ensure that their offspring are capable of catching food for themselves.[353] It is in these circumstances that adult orcas are observed to pursue, but not kill, prey animals in order to teach their young how to hunt. This behavior has been witnessed in both resident and transient orcas. A resident orca mother was observed herding a harried coho salmon without catching it until her calf was finally able to capture it in its own jaws.[354] Transient orca pod members were witnessed teaching juveniles and calves how to hunt seals and penguins on ice flows.[355] The pod demonstrated how to create waves to break up ice flows, move them away from other large pieces of ice, and wash the prey off the ice into the water. It is striking that the orcas frequently allowed the prey to return to the ice flow so that the hunting tactics could be repeated in the presence of the young orcas: "During two attacks the dislodged seals were carried in the mouth of a killer whale but were either released, escaped, or were deposited, still alive, on another ice floe."[356] Three of the seven hunting lesson sessions ended without even killing the prey.[357]

Stunning prey is another technique used by many subspecies of orca and passed down through family groups.[358] Young orcas have observed their elders encircling a school of herring in open water, forcing the fish into a tightly swimming ball.[359] In this tactic, called carousel feeding, the whales take turns striking the circling ball of fish with their flukes, "stunning mouthful after mouthful." Populations of orcas in the region of New Zealand and Papua New Guinea have been spotted stunning sharks with their tail, rendering the

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[353] Chadwick, "Investigating a Killer," 104.

[354] Chadwick, "Investigating a Killer," 104.

[355] Ingrid N. Visser et al., "Antarctic Peninsula Killer Whales (*Orcinus orca*) Hunt Seals and a Penguin on Floating Ice," *MMS* 24 (2008): 225-234.

[356] Visser et al., "Antarctic Peninsula Killer Whales," 226.

[357] Visser et al., "Antarctic Peninsula Killer Whales," 227.

[358] Douglas Main, "Scientists Explain Video of Orca Punting a Seal 80 Feet in Air," *Newsweek* (29 October 2015): n.p. [cited 1 October 2017]. Online: http://www.newsweek.com/scientists-explain-video-orca-punting-seal-80-feet-air-388554.

[359] Chadwick, "Investigating a Killer," 104.

otherwise dangerous prey dazed and harmless.[360] This stunning technique is also used on marine mammals, with orcas striking their prey with their tails. Rüdiger Riesch, evolutionary ecologist at the University of London explains:[361]

> A lot of marine mammals, like seals and sea lions, have very sharp claws and teeth, so killer whales are at risk of suffering a severe injury when hunting these prey. Therefore, the safest course of action is for the killer whales to debilitate their prey before getting anywhere near them. To do this they use a combination of rams, often head-on, and slapping the prey with their flukes, or tail fins. This can go on for 30 minutes or more, until the seal or sea lion is too injured to fight back or potentially already dead.

It is the tail-strikes that sometimes toss the prey animals into the air. This "flipping ability" is a learned hunting technique that stuns the prey into an unconscious or semiconscious state. Steve Ferguson, an evolutionary ecologist at the University of Manitoba who studies Arctic mammals points out that sometimes "this behavior has been attributed to mothers teaching their young how to hunt, [to make] the prey easier targets."[362] It is this behavior that Rolston claimed was "evil," not understanding that this was one of the safest ways adult orcas and their young could handle dangerous prey animals. It should be remembered that orcas, like other predators, target the weak, sickly, or distressed members of prey populations, effectively minimizing suffering within that population. Additionally, marine mammals like land mammals engage their adrenal systems during times of predator attack, effectively flooding their brains with analgesic opioids. This means these prey animals are experiencing stress-induced analgesia even as they are being pursued by orcas. Furthermore, any animal that has been stunned by orca tail-strike(s) will likely be in an unconscious or semiconscious state when the kill bite occurs,

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[360] Daily Mail Reporter, "Pictured: The Moment a Whale Delivers a Deadly 'Karate Chop' Blow to a Killer Shark," *Daily Mail* (27 November 2009): n.p. [cited 13 February 2015]. Online: http://www.dailymail.co.uk/sciencetech/article-1231454/Killer-whales-Death-karate-chop-deadly-tactic-used-orcas-sharks.html.

[361] Main, "Scientists Explain Video."

[362] Main, "Scientists Explain Video."

minimizing the experience of pain before death. It is therefore difficult to see how orca behaviors can be accurately described as either needlessly cruel or evil.

Section 4.4.2 Understanding Avian Siblicide

The death of the "insurance chick" associated with avian siblicide is a far more complex and difficult evolutionary behavior to interpret. Siblicide is an observed behavior among some predatory species of birds where a chick causes the death of its sibling directly or indirectly, by either forcing it out of the nest to die of exposure, being so aggressive that the weaker chick does not eat and dies of starvation, or pecking it until it dies.[363] Rolston presented the example of siblicide among white pelican chicks as thoroughly and as fairly as the scientific evidence in 1987 allowed, and Southgate accurately reiterates Rolston's argument.[364] Rolston validly raised the following critiques of such an evolutionary process: 1) it seems an inefficient method of reproduction 2) that causes unnecessary suffering, and 3) appears to exhibit an uncaring indifference toward the hapless chick. He sadly but understandably concluded: "If God watches the sparrows fall, God must do so from a great distance."[365]

Since the publication of Rolston's *Science and Religion*, additional scientific information has come to light regarding the broader background surrounding avian siblicide that is relevant to the current discussion. To begin, avian siblicide is a form of brood reduction that has only been observed in altricial bird species that are predatory, such as eagles, ospreys, boobies, egrets, and pelicans.

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[363] Douglas W. Mock, Hugh Drummond, and Christopher H. Stinson, "Avian Siblicide," *AmSci* 78 (1990): 438-449.

[364] Rolston III, *Science and Religion*, 137-140. Southgate, *Groaning of Creation*, 46-47.

[365] Rolston III, *Science and Religion*, 140.

Altricial birds are those whose hatchlings require intensive parental care and provision as they are unable to stand, walk, fly, or survive on their own. Altricial birds include pigeons and doves (*Columbiformes*), perching and song birds (*Passeriformes*), and raptors like owls, hawks, and eagles (*Accipitriformes*).[366] In contrast, *precocial* birds are well-developed at hatching and are able to stand, walk, leave the nest and feed themselves shortly after birth. Precocial birds include most domestic poultry and waterfowl species, like chickens, turkeys, and ducks (*Anseriformes* and *Galliformes*).[367] Because the survival of altricial chicks is so dependent upon the parents' success in providing food for them after hatching, changes in relative food abundance from year to year is a determinative factor on the species' reproductive success. Consequently, while various forms of altricial brood reduction may seem inefficient on a superficial level, they actually maximize the number of offspring that can be successfully fledged in any given year.

Oxford ornithologist David Lack recognized that in order to increase the chances of producing one or more fledged chicks in an uncertain food environment, altricial bird species have evolved with the strategy of laying more eggs than they may be able to successfully provide for:[368]

> Lack (1947) proposed that adult inability to predict food availability weeks in advance of a brood's peak food requirements often prevents a tidy fit between supply and demand. In the face of such ecological uncertainty, avian parents were seen as producing an egg or two beyond their usual provisioning capacity (enabling them to capitalize if resources prove abundant), while strategically establishing competitive mismatches among

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[366] British Ornithologists' Union Taxonomic Committee (BOUTC), "Bird Families of the World," British Trust for Ornithology website [cited 1 October 2017]. Online: https://www.bto.org/about-birds/birdfacts/bird-families. Jacquie Jacob, "Precocial and Altricial Birds," (5 May 2015): n.p. [cited 1 October 2017]. Online: http://articles.extension.org/pages/65368/precocial-and-altricial-birds.

[367] BOUTC, "Bird Families of the World."

[368] Douglas W. Mock, P. L. Schwagmeyer, and Matthew B. Dugas, "Parental Provisioning and Nestling Mortality in House Sparrows," *AnB* 78 (2009): 677-678. David Lack, "The Significance of Clutch-Size, Parts 1 and 2," *Ibis* 89 (1947): 302-352, *Ibis* 90 (1948): 25-45.

> broodmates (to facilitate family trimming if and when resources prove insufficient). Lack's view depicted parents as maximizing each breeding cycle's eventual recruitment into the breeding population and explicitly identified the trade-off between quantity and quality of young at independence.

The female's ability to create "competitive mismatches among broodmates" includes the ability to cause asynchronous hatching and lay different sized eggs. These are especially relevant factors in understanding avian siblicide.

The *a*-egg typically hatches 1-3 days before the *b*-egg, giving the young *a*-chick several days to grow larger as it monopolizes all the food that the parents bring to the nest. In addition to manipulating the hatching dates of the eggs so they are asynchronous, females consistently lay a larger *a*-egg and a much smaller *b*-egg. (It is interesting to note that when females lay only one egg, it tends to be an intermediate size between the *a*- and *b*-eggs of two-egg clutches.)[369] These different-sized eggs reflect the disparities of their relative nutrient (yolk) and energy (lipid) content. Chicks from these smaller *b*-eggs display suppressed growth rates, the delayed development of feathers, and an increased likelihood of mortality both before and after fledging.[370] Taken together, the separation of hatching dates compounded by the difference in egg size means that the *a*-chick may weigh two to three times more than the *b*-chick when it finally hatches.[371]

It is important to point out that the *a*-egg/chick will not necessarily live to fledging; eggs can be stolen or infertile, and additional factors may kill or weaken an *a*-chick before the second chick hatches (hence the evolutionary need for a second "insurance" chick to ensure the survival of the species).

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[369] Douglas W. Mock, "Infanticide, Siblicide, and Avian Nestling Mortality," in *Infanticide: Comparative and Evolutionary Perspectives* (ed. G. Hausfater and S. B. Hrdy; New York: Aldine, 1984), 13.

[370] Karen L. Wiebe and Gary R. Bortolotti, "Parental Interference in Sibling Aggression in Birds: What Should We Look For?" *Ecoscience* 7 (2000): 2.

[371] Mock, "Infanticide," 13.

Researchers consistently find that the probability of producing at least one fledging chick is dramatically greater for two-chick nests than one-chick nests.[372] For black eagles (*Aquila verreauxii*), researchers found that one-chick nests produced a fledged chick only 49.0% of the time, whereas two-chick nests successfully produced a fledged chick at a rate of 76.4%. The difference in fledging success was even more dramatic in masked boobies (*Sula dactylatra*), where one-chick nests were only able to produce a fledged chick 20% of the time compared to a 63% fledging rate among two-chick nests.

Asynchronous hatching and egg-size disparities maximize the number of offspring the parents can successfully fledge in any given year while minimizing the harm that would come to both chicks if they were at identical stages of development in the nest. Researchers discovered this relationship through experimental interventions in which synchronously hatched cattle egret chicks (*Bubulcus ibis*) were compared to chicks hatched at the normal 1.5-day interval, and chicks where the interval delay was doubled (a 3-day interval between hatchings).[373] The synchronized hatching significantly increased the amount of fighting between the two chicks and increased the mortality rate for both as well. The nests with the normal 1.5-day interval had less fighting because the older *a*-chick was able to intimidate the younger *b*-chick and get more food, yet the *b*-chick was still able to eat. The chicks that were hatched with the doubled asynchrony (3-day interval) had the least fighting, but the *a*-chick was so competitively over-advantaged that the *b*-chick received very little food. Therefore, rather than being an inefficient method of reproduction, it appears that evolution has tuned the asynchronous hatching and differential egg size of these altricial birds so that both chicks' chances for survival have been optimized.

[372] Mock, "Infanticide," 14.
[373] Mock, Drummond, and Stinson, "Avian Siblicide," 445.

It should be noted that simply because the *b*-chick is at a competitive disadvantage does not mean that its death is inevitable. Most cases of avian siblicide are *facultative*, meaning that the weaker *b*-chicks will typically die only when there is food scarcity due to either a lack of food resources or weather conditions prevent the adults from bringing sufficient quantities of food back to the nest. In abundant years, the adult birds spend less time obtaining food and more time in the nest where they can intervene and prevent sibling aggression.[374] Documented parental interference behaviors include dividing the brood between the parents, separating the offspring at feeding, more frequent feedings, clustering of meals, prolonged feedings to distract nestlings, and/or preferential feeding of weaker nestlings.[375] Acute parental responses to aggression can include physical interventions where the adult blocks, pecks, grabs, or sits on the aggressive nestling. Adults have also been known to deceive nestlings by calling a (false) alarm, providing a false feeding, or distracting them by throwing nest material at the aggressive chick. When food is plentiful, the *b*-chick is able to obtain sufficient nutrition to fully develop and eventually fledge the nest. However, when food is scarce, there will be insufficient nutrition available to fledge both chicks and the *b*-chick will remain developmentally delayed, frail, and vulnerable to sickness, injury and starvation. Studies have also shown that in times of scarcity the *a*-chick's aggressive tendencies towards its sibling increase with hunger.[376] Moreover, since the adults will spend a greater percentage of time away from the nest seeking food, they will not be present to protect the malnourished *b*-chick from its stronger sibling. It is under these circumstances that facultative siblicide occurs.

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[374] Wiebe and Bortolotti, "Parental Interference," 5.

[375] Wiebe and Bortolotti, "Parental Interference," 2.

[376] Joël White et al., "Sustained Increase in Food Supplies Reduces Broodmate Aggression in Black-Legged Kittiwakes," *AnB* 79 (2010): 1095-1100.

The rarer form of siblicide that occurs is *obligate.*[377] Unlike *facultative* siblicide, which will be dependent upon environmental factors affecting food availability, *obligate* siblicide almost always results in the death of the weaker *b*-chick. It is important to note that obligate siblicide appears to occur in avian species that have few to no natural predators, like eagles in remote nests and boobies on isolated islands. While gulls have been known to consume booby eggs and the youngest of hatchlings, gape-limitation prevents them from swallowing hatchlings more than a couple of days old. Consequently, there is no other form of predation available to eliminate the creatures that are weak or sickly. Under these circumstances it appears that natural selection has chosen the stronger of the two predatory siblings to fulfill this role.[378] This observation is supported by the fact that obligate siblicide appears to decrease among birds of prey as size decreases and susceptibility to predation increases:[379]

> The family of diurnal raptors (*Accipitridae*), shows a full spectrum of brood-reduction strategies (Newton, 1977), from obligate siblicide (some c/2 eagles) to conditional facultative siblicide (other eagles plus medium-sized Buteo and Accipiter spp.) to a total absence of fighting among the smallest raptors, even when their large broods face starvation."

It must be remembered that the predator's role is to minimize creaturely suffering in ecosystems by identifying and quickly killing the weak, sickly, and distressed in prey populations. Usually, altricial chicks in nests are accessible to other creatures, making the young within them vulnerable to predation. Yet, when nests are either remote or protected by apex predators like eagles, it seems reasonable to conclude that these species would depend upon obligate siblicide in order to terminate the lives of malnourished chicks. Nevertheless, the question could justifiably be raised, "Even though predation is intended to

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[377] Mock, Drummond, and Stinson, "Avian Siblicide," 441.

[378] Edward O. Wilson, *The Social Conquest of Earth* (New York: Liveright Publishing, 2012), 166-182.

[379] Mock, "Infanticide," 17. Ian Newton, "Breeding Strategies in Birds of Prey," *LivB* 16 (1977): 51-82.

minimize suffering and distress, doesn't the pecking and/or starvation associated with siblicide cause the unnecessary suffering of chicks before they die?" The best answer to this question seems to be, "No, it does not."

To come to this conclusion, the contrasts between altricial and precocial bird species must be further elaborated upon. Altricial and precocial birds have each made an evolutionary trade-off when it comes to the reproductive costs and timing of neurological development.[380] This divergence has come about because of differences in food availability and predation pressures in the birds' respective environments. Precocial birds tend to nest on or near the ground where predation and food resources are both the greatest. Because they are faced with greater predation pressure, their young must be capable of leaving the nest almost immediately after hatching, avoiding easy predation and the possibility of the entire brood being devoured at once. In order to produce hatchlings that are developmentally matured enough to stand, walk, and feed independently, precocial females must consume abundant resources *before* laying, and the nutrition consumed will determine how many eggs can be laid. The precocial mothers lay energy-rich eggs that enable the substantial in-egg growth of their developmentally advanced chicks before their hatching. As a result, precocial eggs tend to contain nearly double the calories per unit weight compared to altricial eggs. This allows most neurogenesis to occur before hatching, and precocial chick species will have nearly the same number of brain neurons as adults, just packed with a much higher cell density, particularly in the telencephalic regions of the brain [the anterior part of the forebrain].[381] Consequently, precocial chicks are hatched with significantly larger, more

[380] Paul R. Ehrlich, David S. Dobkin, and Darryl Wheye, "Precocial and Altricial Young," Stanford University website [cited 26 September 2017]. Online: https://web.stanford.edu/group/stanfordbirds/text/essays/Precocial_and_Altricial.html.

[381] Andrew N. Iwaniuk and John E. Nelson, "Developmental Differences Are Correlated with Relative Brain Size in Birds: A Comparative Analysis," *CJZ* 81 (2003): 1913-1928 (1923-1924).

advanced brains than altricial chicks. This advanced development is what enables precocial chicks to fend for themselves at such an early age.

In contrast, altricial birds tend to nest off the ground, reducing predation pressures to some extent. As a result, hatchlings do not need to be as developed at birth and females will not have to meet such large nutritional demands before they lay their eggs. Consequently, altricial chicks are born with much smaller, under-developed brains than the precocial chicks whose brains resemble those of adults at birth. Empirical evidence confirms this:[382]

> The brains of hatchlings of altricial species, on the other hand, do not resemble those of adults. In hatchlings of the Common Pigeon (*Columba livia*), the brain regions are clearly differentiated, but few fibre tracts are visible (Starck 1993). The brain of the hatchling Budgerigar (*Melopsittacus undulates*) has poorly differentiated neurons and fibre tracts and consist solely of growing axonal processes (Starck 1993). A lack of myelination and poor cellular differentiation is also present in the hatchling Java Sparrow (*Padda oryzivora*). Both the Budgerigar and the Java Sparrow also possess relatively large proliferative zones, clearly indicating that the bulk of telencephalic neurogenesis occurs post hatching.

Nevertheless, though altricial young are born with underdeveloped neurological growth, this deficiency will be overcome if their parents are able to provide the protein-rich diet typical of these species.[383] So why is the altricial chick's underdeveloped telencephalic region significant regarding its ability to perceive pain? Because research has found that circuits in the forebrain that regulate social behavior and pain perception in birds are homologous to those found in mammals.[384] As discussed previously in Sections 3.3.1 and 3.3.3,

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[382] Iwaniuk and Nelson, "Developmental Differences," 1924. J. Matthais Starck, "Evolution of Avian Ontogenies," *CurOr* 10 (1993): 275-366.

[383] Ehrlich, Dobkin, and Wheye, "Precocial and Altricial Young."

[384] Isabella B. R. Scheiber, Brigitte M. Weiß, Sjouke A. Kingma and Jan Komdeur, "The Importance of the Altricial-Prococial Spectrum for Social Complexity in Mammals and Birds – A Review," *FrZ* 14 (2017): 3 [cited 9 October 2017]. Online: https://frontiersinzoology.biomedcentral.com/articles/10.1186/s12983-016-0185-6. James L. Goodson, "The Vertebrate Social Behavior Network: Evolutionary Themes and Variations,"

mammals are only able to perceive pain because they have a neurologically advanced frontal lobe that contains the anterior cingulate cortex (ACC) in addition to the somatosensory cortex found in the parietal lobe. The ACC creates the distressing aspect of pain whereas the somatosensory cortex perceives the location of the injury. While pain perception has been demonstrated for precocial chicks (e.g., white leghorn chickens), it must be remembered that their neural networks are nearly identical to those of precocial adults.[385] In contrast, altricial *a*-eggs tend to contain only half of the caloric value per unit weight than those of precocial eggs, so *a*-chicks hatch with a neurological disadvantage compared to precocial chicks. Since altricial *b*-eggs are even smaller than *a*-eggs, *b*-chicks begin life with significantly fewer nutrients for neurological development, so a malnourished *b*-chick possesses considerably stunted neurological growth compared to any precocial chick. The fact that altricial chicks often lack both cellular differentiation and the myelination of axons that allow for the efficient transfer of neurological signals in the brain, and the bulk of neurogenesis in the anterior part of the forebrain can only occur with the consumption of nutrient-rich food intake *after* hatching, it is reasonable to conclude that malnourished *b*-chicks who are the victims of siblicide have brains that are too neurocognitively underdeveloped to perceive the distressing aspect of pain associated with the ACC found in the frontal lobes of mammals. This conclusion is supported by other studies on post-fledging neural and behavioral development:[386]

> The fact that postfledging parental care [for altricial chicks] was correlated with relative brain volume more consistently than the

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HorB 48 (2005): 11-22. Erich D. Jarvis, "Bird Brain: Evolution" in *Encyclopedia of Neuroscience, Vol. 2* (ed. L. R. Squire; Oxford: Oxford Academic, 2009), 209-215. Erich D. Jarvis et al., "Avian Brains and A New Understanding of Vertebrate Brain Evolution," *NRN* 6 (2005): 151-159. Onur Güntürkün, and T. Bugnyar, "Cognition Without Cortex," *TCS* 20 (2016): 291-303.

[385] Jaak Panksepp et al., "Endogenous Opioids and Social Behavior," *NBR* 4 (1980): 473-487. Iwaniuk and Nelson, "Developmental Differences," 1913-1928.

[386] Iwaniuk and Nelson, "Developmental Differences," 1925. F. Nottebohm, "The Anatomy and Timing of Vocal Learning in Birds," in *The Design of Animal Communication* (ed. M. D. Hauser and M. Konishi; Cambridge, Mass.: MIT Press, 1999), 63-110.

> other developmental traits examined strongly suggests that postfledging parental care may be a key period of neural development. Unlike the embryonic or nestling stages, it is likely that postfledging neural development is primarily in the form of fibre growth, myelination, synaptogenesis, and increases in cell size as demonstrated in studies of song learning (e.g., Nottebohm 1999).

In other words, the evidence appears to suggest that most neurological development in altricial bird species occurs after fledging, and until that time their neurocognitive abilities are lacking compared to either precocial chicks or altricial adults. The absence of pain perception in undernourished, developmentally delayed chicks might be expected since pain is only an evolutionary advantage for animals capable of learning. Since the chicks have not yet reached the stage of physical and neurological development that would allow them to either learn from or respond to negative stimuli, it would be premature for them to experience pain. It is important to note that chicks being pecked by their siblings often exhibit responses that seem to show an indifference to pain and injury, rather like the cingulotomy patients whose dorsal anterior cingulate cortexes (dACC) were disconnected from their surrounding brain regions (discussed in Section 3.3.1). Furthermore, research shows that aggression between the chicks decreases dramatically as they begin to develop and mature, suggesting that as the neurocognitive likelihood of perceiving pain increases, the natural instincts to attack nest mates decreases.[387] So instead of being a source of needless suffering, avian siblicide in altricial birds appears to have evolved in a way that ensures that chicks who will not survive to fledging are removed *before* they can feel pain from either starvation, exposure, or injury.

The preceding detailed discussion of the insurance chick shows that, rather than being an inefficient method of reproduction causing unnecessary

[387] Wiebe and Bortolotti, "Parental Interference," 3.

suffering, the role of avian siblicide maximizes altricial species' reproductive success in the midst of an unpredictable food environment while minimizing the suffering of those who will not survive. This leaves the accusation that God displays an uncaring indifference toward the hapless chick considerably weakened.

Before proceeding, it should not go unnoticed that the reason the insurance chick is selected over other examples of chick death is because of the issue of *siblicide*. Implicit in this selection is the understandable anthropocentric belief that it is morally wrong to kill either one's child or a family member. Yet, neither the 5-day old cattle egret nor its 3-day old sibling have any such abstract notions of familial love, social cohesion, or betrayal. In contrast, these concepts are powerfully important to humans who have achieved evolutionary success because of their capacity for abstract thought, language, and eusociality.[388] Therefore, to claim that animals are behaving in ways that are morally inappropriate is to impose anthropocentric assumptions onto non-human creatures as well as shift away from claims of natural evil to moral evil.

Atheists are not on firm footing when they intimate that it is morally wrong for an adult lion to kill cubs or for a young chick to kill its sibling because their assertion contains a contradiction of their own worldview. Such claims work to the theist's advantage in two respects, and against the theist in none. First, to claim that there are situations where it is morally wrong for one animal to kill another appeals to the notion that there must be some universal standard of morality of which even animals must be aware. If this universal standard of morality exists, where does it come from? What is its source? Can it be deduced from the physical characteristics of atoms or the wavelengths of light? No, quite the contrary. Morality is not a property of matter, so the atheist (who also tends to be a metaphysical naturalist/materialist) is arguing

[388] Wilson, *Social Conquest*.

for the existence of something that cannot be supported by their worldview. Second, even if the atheist will concede that there is a universal standard of morality that animals created by God should be expected to abide by, the theist can easily point out that only moral agents are capable of recognizing and adhering to moral standards of behavior.[389] This is why young children are not held to the same standard of behavior as adults; they do not yet have the neurocognitive maturity necessary for adult moral behavior. Henri Blocher points out that Moses describes young children as being those "who this day have no knowledge of good or evil" (Deut 1:39), and are "unsuitable to answer for their actions or to control their own conduct."[390] Therefore, in order to contend that it is reasonable to expect moral behavior from animals, the atheist is left in the difficult position of showing that the non-human creatures along the evolutionary spectrum have evolved the neurocognitive capacity to recognize the difference between moral and immoral behavior. Then, if the atheist does manage to show that non-human creatures are capable of discerning moral from immoral behavior, they must explain how "random," non-teleological evolutionary processes produced a universal, non-relativistic standard of morality.

In contrast, the theist can argue that while there is a universal standard of morality, non-human animals are not moral agents in the sense that human beings are, and although many mammals are capable of showing intra- and extra-species kindness, protection, and empathy, this does not mean they should be judged by the same behavioral standards as human beings.[391] Furthermore, many philosophers overlook the fact that in the Judeo-Christian worldview there are actually three categories of moral behavior: moral

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[389] Peter Carruthers, *The Animals Issue: Moral Theory in Practice* (Cambridge: Cambridge University Press, 1992).

[390] Blocher, *In the Beginning*, 132.

[391] Frans de Waal, *Good Natured: The Origins of Right and Wrong in Humans and Other Animals* (Cambridge, Mass.: Harvard University Press, 1996).

(associated with justice), immoral (associated with injustice), and non-moral (associated with non-justice).[392] In the biblical worldview, the calamities that are associated with natural disasters are caused by the non-sentient aspects of dynamic natural processes, like floods, fires, earthquakes and hurricanes, and as such, are treated as non-moral agents in Scripture.[393] Animal predation and aggressive behaviors also fall into the non-moral category since non-humans are not moral agents according to biblical standards.[394] As non-moral agents, animals are neither aware of notions of justice, nor do they perceive themselves as victims of injustice. Such concepts are not a part of their reality and therefore can neither enhance nor detract from their existence. In light of this, it becomes readily apparent that the atheist's worldview has fewer conceptual resources to respond to notions of unjust animal behavior than that of the theist.

Section 4.5 Summary

After the preceding analysis of Part One — *A Providential Care Defense* — the following conclusions may be drawn:

(1) It is inaccurate to claim that starvation and accompanying misery represent the normal state of creatures in the wild since natural systems move towards equilibrium states (ecological balance between population and food supply) rather than towards disequilibrium states (perpetual hunger).

(2) It is inappropriate to treat creaturely sufferings as though they are quantifiable units that can be summed to show God does not love his creatures. This is a category error because creaturely suffering is a qualitative, relativistic, subjective experience, and as such cannot be

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[392] Matitiahu Tsevat, "The Meaning of the Book of Job," in *The Meaning of the Book of Job and Other Biblical Studies: Essays on the Literature and Religion of the Hebrew Bible* (New York: Ktav, 1980), 37.

[393] John H. Walton and Tremper Longman III, *How to Read Job* (Downers Grove, Ill.: IVP Academic, 2015), 127-128.

[394] David Werther and Mark D. Linville, eds., *Philosophy and the Christian Worldview: Analysis, Assessment and Development* (New York: Continuum International, 2012), 162.

summed any more than creaturely pleasure. As a subjective experience, suffering must be both understood and comforted on an individual basis.

(3) Just as it is logically impossible to create a square circle, it appears that it may be biologically impossible to create thinking, task-oriented creatures without including an internalized, pain-driven warning system. Pain has been found to be a biological necessity amongst more highly evolved creatures capable of learning. The perception of pain increases the likelihood of a creature's survival and its healthy longevity. Creatures that cannot feel or learn from their pain and pleasure experiences will be more likely to die prematurely.

(4) It is misleading to suggest that most creatures produced by evolutionary processes are capable of suffering. The preponderance of empirical evidence reveals that 97% of all animal species on earth are invertebrates and lack the neurocognitive psychological capacity to feel pain. In fact, the National Academy of Sciences has concluded that the evidence for the conscious experience of pain was only strong for mammals and birds. Therefore, it is irresponsible for philosophers and scientists to continue to cite less highly evolved species that are neurocognitively incapable of perceiving pain as their illustrations of cruelty in nature.

(5) It is a significant misrepresentation to suggest that for millions of years on earth most creatures have spent the bulk of their lives suffering horribly. First, fewer than 1% of all species have the neurocognitive capacity to experience suffering. Second, of those who begin to suffer when their health deteriorates, predators quickly detect and dispatch them while the prey animal's brain is flooded with endogenous opioids, effectively minimizing the experience of pain in nature. That is why the claim that animal existence is "dominated by pain" is both exceedingly misleading as well as poorly reasoned. Chronic pain would diminish, not enhance, the ability of creatures to survive, so it is a trait that one would expect to be eliminated by natural selection and prevented from being passed down to following generations. Third, it is significant that the creatures which can feel pain, namely mammals and birds, are social creatures who are able to mitigate one another's pain through their relationships (as will be discussed in Sections 5.4 and 5.5). This is associated with the *brain opioid theory of social attachment*.

(6) The empirical evidence does not support the claim that creatures endure unnecessary suffering from parasites, disease and predator attack. Scientific studies have confirmed that predators have evolved to recognize and preferentially prey upon animals who begin to show the earliest signs of physical distress due to parasites, disease, or injury.

> Those creatures with the capacity for pain (e.g., mammals) also possess adrenal systems which release endogenous opioids and other stress hormones when they are under predator attack that will help them survive and suppress any feelings of pain until the point the animal is no longer being pursued or has been killed.

In fact, by Richard Dawkins' own criteria, it would be reasonable to claim that Nature is *not* indifferent to suffering since it appears that unnecessary suffering in creation has been minimized to a very great extent. This is consistent with the theist's worldview that a loving, benevolent, omniscient, and omnipotent God created a beautiful world shaped by his providential care and inhabited by the many diverse species in which he delights.

Therefore, it is fair for the theist to conclude that the familiar claims of cruelty in nature have been considerably weakened. First, the empirical evidence suggests that the experience of suffering is *not* widespread across the evolutionary spectrum and that it is curtailed far more than previously assumed. Second, *without pain more highly evolved long-lived species with greater intelligence would be unlikely to exist, their non-existence being an evil equally bad or worse than an existence with pain perception*. Together, these two conclusions greatly diminish Rowe's evidential premise (1) — *that an omnipotent, omniscient being could have prevented unnecessary suffering without thereby losing some greater good or permitting some evil equally bad or worse.*

PART TWO:

A THEODICY OF SOCIAL ATTACHMENT AND EMPATHETIC LOVE

5. Theodicy: Suffering and Empathetic Love

Part One — *A Providential Care Defense* — explained that pain is a biologically necessary trait that enhances the probability of survival in more highly evolved creatures. The scientific literature also showed that pain perception varies with neurocognitive ability across the evolutionary spectrum. As a result, the U. S. National Academy of Sciences has concluded that the psychologically distressing aspect of suffering is empirically supported only in mammals and birds.[395] Therefore, Part One has diminished the strength of Rowe's Evidential Problem of Evil by showing that pain is neither widespread nor unnecessary in nature and prevents the equally bad or worse evil of premature death.

It should be remembered that Section 2.1.4 — *Suffering as Punishment – The Theodicy of Adam's Fall* — revealed that improved interpretation of Genesis 1–3 based upon socio-historical and linguistic information from the Jewish and ancient Mesopotamian worldview removes purported conflicts between these Scriptures and science. This means that the Judeo-Christian faith speaks neither for nor against the findings of science, whether the subject matter pertains to the heliocentric nature of the solar system, the age of the earth, or the origin of species.

It also undercuts the Hellenized Augustinian interpretation of Genesis 3 which claims that pain and biological death entered the world because of the sin of Adam and Eve,[396] even though that view is supported nowhere else in the Hebrew Bible. Once the assumptions from the Greco-Roman worldview are removed, these Scriptures need no longer conflict with the scientific record which shows that biological death predated the existence of human beings. Therefore, rather than being an aberration of the natural order, it would be

[395] NAS, *Recognition*, 21.
[396] Green, "Adam," 100-105. Wiley, *Original Sin*, 33-34.

logical for theists to conclude that mortality as well as biologically necessary pain (Section 3.2.3) are important parts of God's intended creation. The question then becomes, "*Why would a loving God create a world with pain?*" This query will be further probed by asking the following questions:

(1) Is the value system of the Judeo-Christian God one of hedonistic utilitarianism or costly love?

(2) How might empathetic love mitigate the pain of those that suffer?

(3) According to Scripture, what is the role of non-sufferers regarding the alleviation of pain?

(4) In the long-term, which behavior would be expected to lead to the experience of less pain? Self-oriented hedonism or self-giving, socially oriented empathetic love?

(5) How valid are claims from some scientists that selfishness is the hardwired setting of creatures and favored by natural selection?

(6) Do non-human mammals and birds also experience pain mitigation from positive social interactions?

(7) Is there empirical evidence of empathetic kindness exhibited in the natural order among non-human mammals and birds?

(8) What may be the theological purpose of pain?

Part Two — *A Theodicy of Social Attachment and Empathetic Love* — will address these questions as it concludes the philosophical, scientific, and theological analysis of the problem of the creaturely pain in the following manner. First, it will critically examine the materialistic and hedonistic utilitarian philosophical assumptions of Draper and Rowe found in theological premise (2) of Rowe's Evidential Problem of Evil. Second, it will share a Judeo-Christian explanation for suffering using Martin Buber's *I-Thou* relationships as well as the Book of Job. Third, the scientific literature will assess whether empathetic social relationships can enable pain reduction in human and non-human mammals and birds via the *brain opioid theory of social attachment*. Fourth, evidence from multiple fields of scholarship will evaluate atheistic claims that selfishness is

the default setting of natural selection and biological success. Lastly, this thesis will draw to a close by suggesting that *creaturely suffering in this world is mitigated by self-giving empathetic love and allowed by a loving God in order that the children of God, who choose to love even when costly, can be revealed (Rom 8:19–22).* Following this theodicy, the Hypothesis of Theism provided by the Judeo-Christian faith will be contrasted with the Hypothesis of Indifference to determine which has more explanatory and predictive power.

Section 5.1 A Critical Analysis of God's Value System

In Section 2.1.4 — *Suffering as Punishment – The Theodicy of Adam's Fall* — and the discussion on the waters of the deep (the Sumerian "Abzu") in Section 2.1.5, it was shown that rather than giving a materialistic, pseudo-scientific account of cosmic and creaturely origins, Genesis 1–3 reveals the wisdom of God being imparted into all of creation, especially human beings who have been created in the image of God.[397] The wisdom given to humans focuses upon two commandments which effectively summarize the ethical teachings of the Torah: 1) to love God and his wisdom and 2) to love one's neighbor as oneself.[398] By obeying this wisdom, humans can avoid bringing moral evil into the world themselves, and comfort those who suffer from either natural evil or the moral evil of others.[399] However, human beings are warned in Genesis 3 to be wary of

[397] John H. Walton, Victor H. Matthews, and Mark W. Chavalas, *The IVP Bible Background Commentary: Old Testament* (Downers Grove, Ill.: IVP Academic, 2000), 492-493. Terence E. Fretheim, *God and World in the Old Testament: A Relational Theology of Creation* (Nashville, Tenn.: Abingdon, 2005), 205-210.

[398] Prior to Jesus, this view was taught by the great rabbi Hillel the elder (110 BCE—10 CE) who was grandfather of Gamaliel the elder (Acts 5:27–40): *Šhabbat* 31a:6, Sefaria website [cited 6 December 2018]. Online: https://www.sefaria.org/Shabbat.31a.6?lang=bi. These commandments are found in Deut 6:5 (which would indicate a reference to the entire Shema – Deut 6:4–9; 11:13–21; Num 15:37–41); Lev 19:18b; Mark 12:28–31; Matt 22:36–40; Luke 10:25–28. The two greatest commandments are central to Wesleyan theology and important in the wider Christian community.

[399] John Wesley, "The Character of a Methodist" in *The Works of John Wesley* (1872), ed. Thomas Jackson, Global Ministries of the United Methodist Church website: n.p. [cited 12

earthly wisdom that tempts them to make themselves god and their own desires the highest source of moral authority. When this occurs, as it did in the line of Cain (Genesis 4 and 6), the pain and suffering of others is ignored as the human focus is redirected towards one's own desires. This is where atheistic philosophers often err in their assumptions about God: they imagine a god with their own values who would endorse their own loves and priorities while eliminating any barriers to obtaining them.

Consequently, hedonistic-utilitarians like Rowe and Draper mistakenly assume that the wholly-good, omniscient, omnipotent God of the Bible should share their value system and thus create a world where longevity, reproductive success, and pleasure are efficiently maximized while pain is wholly minimized unless necessary for biological success or moral pedagogy.[400] But they do not explain how a pleasure-seeking ethic would produce free agents that would stand against moral evil and seek to mitigate the pain of others, particularly at times when such action would cause the agent pain, even death, rather than pleasure. In fact, Draper goes further, saying that pain and pleasure themselves are *moral* goods: "Pain is intrinsically bad, and pleasure is intrinsically good."[401] While Draper's assertion will be challenged, it does make the point that hedonism is one of the popular currencies of atheistic worldviews which assumes that maximizing pleasure is the proper goal of life.

In contrast, the coin of the realm in the Judeo-Christian worldview is not one of pleasure, but love (1 John 4:7–21). This is because moral behavior cannot produce love, yet love produces moral behavior (1 Corinthians 13). So, rather than a hedonistic utilitarian god that emphasizes the attainment of biological success or pleasure, the God of the Bible is one who emphasizes love—love of God and love of neighbor—even when it may be costly. Therefore, in response

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February 2019]. Online: http://www.umcmission.org/Find-Resources/Global-Worship-and-Spiritual-Growth/The-Wesleys-and-Their-Times/The-Character-of-a-Methodist.

[400] Draper, "Pain," 336-337. Rowe, "Problem of Evil," 335-338.

[401] Draper, "Pain," 336.

to atheist critiques regarding suffering in this creation, the following question must be asked: *"If this world is where the children of God reveal themselves by loving even when costly, how could they do so in a world without cost?"*

Section 5.2 "I-It" Associations Versus "I-Thou" Relationships

Love is about relationship, not the possession of "goods." Martin Buber points out that the human tendency is to turn relationships into I-It associations (for self-oriented goods) rather than I-Thou communion (for loving self-giving).[402] In I-It relationships, we objectify the Other, creating a Self + Object inequality between two persons. In such relationships, we selfishly seek to obtain "goods" from the Other: happiness, wealth, pleasure, status, etc. Regrettably, this is not confined to our treatment of other human beings; this tends to be the way we treat God as well. God is treated as an It, who is the impersonal vendor of "goods" for our fulfillment and pleasure. Buber insightfully sees that when we objectify God,[403] we will inevitably objectify people as well, using them as a means of fulfilling our own hedonistic wishes.[404]

In contrast, I-Thou relationships are not self-seeking, but rather seek to know and understand the Other as we know and understand our own Self. In these relationships, fellowship is the goal rather than the possession of goods. This is one of the crucial misunderstandings about relationship with God. Loving relationship with God and others is much more like a conversation (I-Thou) than something we can possess (I-It).[405] Something that can be possessed requires no participation of the Other. Like a conversation, relationship requires a continuous flow of communication and fellowship between the

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[402] Martin Buber, *I and Thou* (trans. W. Kaufmann; New York: Touchstone, 1970), 148-168.

[403] Buber, *I and Thou*, 153-155, 164.

[404] Buber, *I and Thou*, 153-157, 167 .

[405] Buber, *I and Thou*, 155-156, 162-165, 167.

participants. If one of the parties ceases to contribute to the conversation, then the conversation withers and dies, even if both persons remain in proximity to one another. Relationship is like this, and it is as true for fellowship with God as it is for fellowship with other human beings. When we cease sharing ourselves, our thoughts, our time, our friendship with the other, the relationship dies. Likewise, when we seek God's blessings but not his fellowship, the relationship becomes a dead thing. God has been objectified as a source of goods rather than a Person to love and be loved by. This is the wisdom teaching behind the story of Job.

Section 5.3 Understanding Righteousness and I-Thou Relationship Amidst Job's Suffering

The Book of Job offers ancient insights into God's reasons for allowing suffering. It suggests that life's hardships 1) reveal the true nature of one's relationship with God and 2) offer non-sufferers the opportunity to live out their role as children of God who love others. The text acknowledges that though sufferers may feel abandoned by God, God remains near and attentive. These Scriptural observations will later be linked to and explained by the medical literature and neuroscience in Section 5.4.

Section 5.3.1 Ancient Mesopotamian Background of the Book of Job

The Book of Job has long been recognized as an ancient theological account that addresses the problem of suffering, yet the text's meaning has remained somewhat enigmatic because of translation difficulties. For example, Marvin Pope, Professor of Northwest Semitic Languages at Yale, discusses these obstacles in his introduction to *The Anchor Bible – Job*:[406]

[406] Marvin H. Pope, *Job* (AB 15; Garden City, N.Y.: Doubleday, 1973 [3rd edn]), xlvii-xlviii.

> The Book of Job also presents formidable linguistic and philological problems. Sometimes it is hard to say whether the difficulty of a given passage is more a philological than a textual problem. There are more *hapax legomena* (words which occur only once) and rare words in Job than any other biblical book. […] The problems of Job, however, are not simply lexical, but also morphological and syntactic. The language is ostensibly Hebrew, but with so many peculiarities that some scholars have wondered whether it might not be influenced by some other Semitic dialect.

Yet, scholars have long noted the similarities between the Book of Job and other ancient Mesopotamian wisdom literature. In fact, archaeological discoveries from Egypt and the Near East have revealed that biblical books bear great resemblance to literature of earlier Near East civilizations in both their content and form.[407] Wilfred Lambert, professor of Assyriology at University of Birmingham, documented the problem of the righteous sufferer in ancient Mesopotamian literature perhaps going back as far as the Third [Sumerian] Dynasty of Ur:[408]

> Suffering necessarily implies guilt. A Sumerian text is thought to deal with this problem more directly, though the difficulties of translation are considerable. Two religious texts on tablets written during the First Dynasty of Babylon illustrate the problem. The first is a Babylonian dialogue between a man and his god, in which the man says, "The crime which I did I know not", the same thought as, "What is my guilt?" The second takes the matter a step farther. This is a bilingual Sumero-Babylonian text in which the speaker says, "I have been treated as one who has committed a sin against his god." Here the speaker evidently does not acknowledge any personal sin, though he finds himself beset with what should be the punishment for sin. Since two Sumerian texts, one being bilingual, know the problem of the righteous sufferer, it

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[407] Samuel Noah Kramer, *History Begins at Sumer: Thirty-Nine Firsts in Recorded History* (Philadelphia, Pa.: University of Pennsylvania Press, 1956), 141. William W. Hallo, "Biblical History in its Near Eastern Setting: The Contextual Approach," in *Scripture in Context: Essays on the Comparative Method* (PTMS 34; ed. C. D. Evans, W. W. Hallo, and J. B. White; Pittsburgh, Pa.: Pickwick Press, 1980), 1-26. Walton, *Ancient Near Eastern*. Arnold and Strawn, *World Around the Old Testament*. Chavalas and Younger, Jr., *Mesopotamia.* Arnold, Erickson, and Walton, *Windows to the Ancient World*. Walton, *Ancient Israelite Literature*.

[408] Wilfred G. Lambert, *Babylonian Wisdom Literature* (Winona Lake, Ind.: Eisenbrauns, 1996), 10-11.

> must have arisen in the Sumerian academies of at least the Isin-Larsa period, and perhaps under the Third Dynasty of Ur.

Samuel Noah Kramer, world-renown Sumerologist and Professor Emeritus of Assyriology at the University of Pennsylvania, also reported that the first "Job" account went back to a Sumerian poetic essay about 135 lines long:[409]

> Here is a man, unnamed to be sure, who had been wealthy, wise and righteous, or at least seemingly so, and blessed with both friends and kin. One day sickness and suffering overwhelmed him. Did he defy the divine order and blaspheme? Not at all! He came humbly before his god, with tears and lamentation, and poured out his heart in prayer and supplication. As a result, his god was highly pleased and moved to compassion; he gave heed to his prayer, delivered him from his misfortunes, and turned his suffering to joy.

Though the Book of Job's origins and meaning may have been enigmatic for many years making it a more difficult text to interpret, Lambert and Kramer's recognition that this story dates back to Sumer hints that the translation difficulties noted by Pope in the Hebrew text may be due to Sumerian socio-historical references and words that linger within the biblical account.

For example, the placement of the Book of Job in the time and region of ancient Sumer-Akkad rather than post-Exodus Canaan would address scholars' puzzlement over the absence of references to either the Torah, the Israelite covenants, or the Jerusalem temple, as well as explain why Job had to serve as priest for his family.[410] Locating the original Job context in the region of ancient Sumer rather than Canaan would also explain several other anomalies in the text.

First, the Sabeans of Yemen and the Chaldeans of Mesopotamia would be in much greater proximity to attack Job's household if he lived in the region

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[409] Quote from page 112 of Kramer, *History Begins at Sumer*, 111-115. Samuel Noah Kramer, "'Man and His God': A Sumerian Variation on the 'Job' Motif," in *Wisdom in Israel and in the Ancient Near East* (VTSup 3; Leiden: Brill, 1955), 170-182.

[410] Walton and Longman III, *How to Read Job*, 221.

of southern Mesopotamia than the region of Canaan (Job 1:13–17).[411] Second, the mention of camels in Job 1:1–3, which William Albright asserted was anachronistic,[412] is only inaccurate if the reader tries to place the location of Job in the southern Levant rather than southern Mesopotamia which had camels before the land of Canaan. Archaeozoologist Lidar Sapir-Hen along with archaeologist Erez Ben-Yosef came to the conclusion that "the first significant appearance of camels in the Aravah Valley was not earlier than the last third of the 10th century BCE," while direct evidence places camels outside of Israel in Arabia before the fifth millennium BCE,[413] with domestication of the camel occurring in Syria as early as 1800—1650 BCE,[414] Egypt circa 2200 BCE,[415] and the ancient Oxus civilization just north of modern-day Afghanistan circa 2300-1700 BCE.[416] Martin Heide at Philipps University of Marburg also used archaeological evidence to conclude that the domesticated two-humped Bactrian camel came from the region east of the Zagros mountains to "the Mesopotamian civilization sporadically by the middle of the 3rd millennium and more frequently at the end of the 3rd/beginning of the 2nd millennium." [417]

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[411] John E. Hartley, *The Book of Job* (NICOT; ed. R. K. Harrison and Robert L. Hubbard; Grand Rapids, Mich.: Eerdmans, 1988), 76-77. Pope, *Job*, 13-14.

[412] William F. Albright, *Archaeology and the Religion of Israel* (Baltimore, Md.: John Hopkins Press, 1956), 96-97.

[413] Caroline Grigson, John A. J. Gowlett and Juris Zarins, "The Camel in Arabia – A Direct Radiocarbon Date, Calibrated to about 7000 BC," *JAS* 16 (1989): 360.

[414] Richard W. Bulliet, *The Camel and the Wheel* (New York: Columbia University Press, 1990), 62-64. Walters Art Museum, "Cylinder Seal with a Two-Humped Camel Carrying a Divine Couple," (Syria, 1800 – 1650 BCE), The Walters Art Museum website [cited 28 June 2018]. Online: https://art.thewalters.org/detail/27381/cylinder-seal-with-a-two-humped-camel-carrying-a-divine-couple/.

[415] Michael Ripinsky, "The Camel in Dynastic Egypt," *JEA* 71 (1985): 138-139.

[416] Metropolitan Museum of Art, "Bactrian Camel," (Bactria-Margiana, late 3rd – early 2nd millennium BCE), The Met website [cited 28 June 2018]. Online: https://www.metmuseum.org/art/collection/search/324256. Bulliet, *Camel*, 183. T. M. Kennedy, "The Date of Camel Domestication in the Ancient Near East," (17 February 2014), Biblical Archaeology Society website [cited 28 June 2018]. Online: http://www.biblearchaeology.org/post/2014/02/17/The-Date-of-Camel-Domestication-in-the-Ancient-Near-East.*aspx*#comment.

[417] Martin Heide, "The Domestication of the Camel: Biological, Archaeological and Inscriptional Evidence from Mesopotamia, Egypt, Israel and Arabia, and Literary Evidence from the Hebrew Bible," *UF* 42 (2011): 367-368.

All of this suggests that the account in the Book of Job is more likely to have had its origins in an ancient Sumerian setting than in post-Exodus Canaan.

It also makes sense that Abram would have been familiar enough with the Sumerian story of Job to pass it down to his descendants because he and his father emigrated from the Sumerian city of Ur to Harran in what is modern day Turkey (Gen 11:27–31).[418] In fact, there has been corroborating scientific evidence in recent years to support the claim that Abram and his ancestors lived in the Shinar plain of the Tigris-Euphrates valley (Gen 2:10–14; 10:8–12; 11:2–4), a region known by scholars as Sumer-Akkad and the source of the story of Job (Figure 5.1).[419]

But even if scholars find this view questionable, it is well understood that Sumerian thought and culture had significant influence on regions like Mari, Ebla, and Nuzi whose excavated libraries have given scholars great insight into the world of the biblical patriarchs.[420] Sumero-Akkadian culture and literature was even appropriated by the Amorites when they came to power in Mesopotamia after the fall of the Third [Sumerian] Dynasty of Ur.[421] Noted Assyriologist Marc van de Mieroop explains how the Sumero-Akkadian civilization brought about a common culture in Mesopotamia:[422]

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[418] Alan R. Millard, "Where was Abraham's Ur? The Case for the Babylonian City," *BAR* 27 (2001): 52-53, 57. Peter R. S. Moorey, *Ur 'of the Chaldees': A Revised and Updated Edition of Sir Leonard Woolley's Excavations at Ur* (Ithaca, N. Y.: Cornell University Press, 1982). Crawford, *Sumer*, 48-49.

[419] Hill, "The Garden of Eden," 31-46. Sauer, "River Runs Dry," 52-57, 64.

[420] Walton, *Ancient Israelite Literature*, 45-65. Aage Westenholz, "Personal Names in Ebla and in Pre-Sargonic Babylonia," in *Eblaite Personal Names and Semitic Name-Giving* (ARES 1; ed. Alfonso Archi; Rome: Missione Archeologica Italiana in Siria, 1988), 99-105. Jack M. Sasson, "Mari and the Holy Grail," in *Orientalism, Assyriology and the Bible* (HBM 10; ed. Steven W. Holloway; Sheffield: Sheffield Phoenix Press, 2007), 186-198. Craig S. Keener and John H. Walton, eds., *NIV Cultural Backgrounds Study Bible: Bringing to Life the Ancient World of Scripture* (Grand Rapids, Mich.; Zondervan, 2016), 19, 52, 54. Postgate, *Early Mesopotamia*, 44, 98-99, 183-184.

[421] Marc van de Mieroop, *A History of the Ancient Near East ca. 3000-323 BC* (Oxford: Blackwell, 2007 [2nd edn]), 90.

[422] Mieroop, *History of the Ancient Near East*, 61.

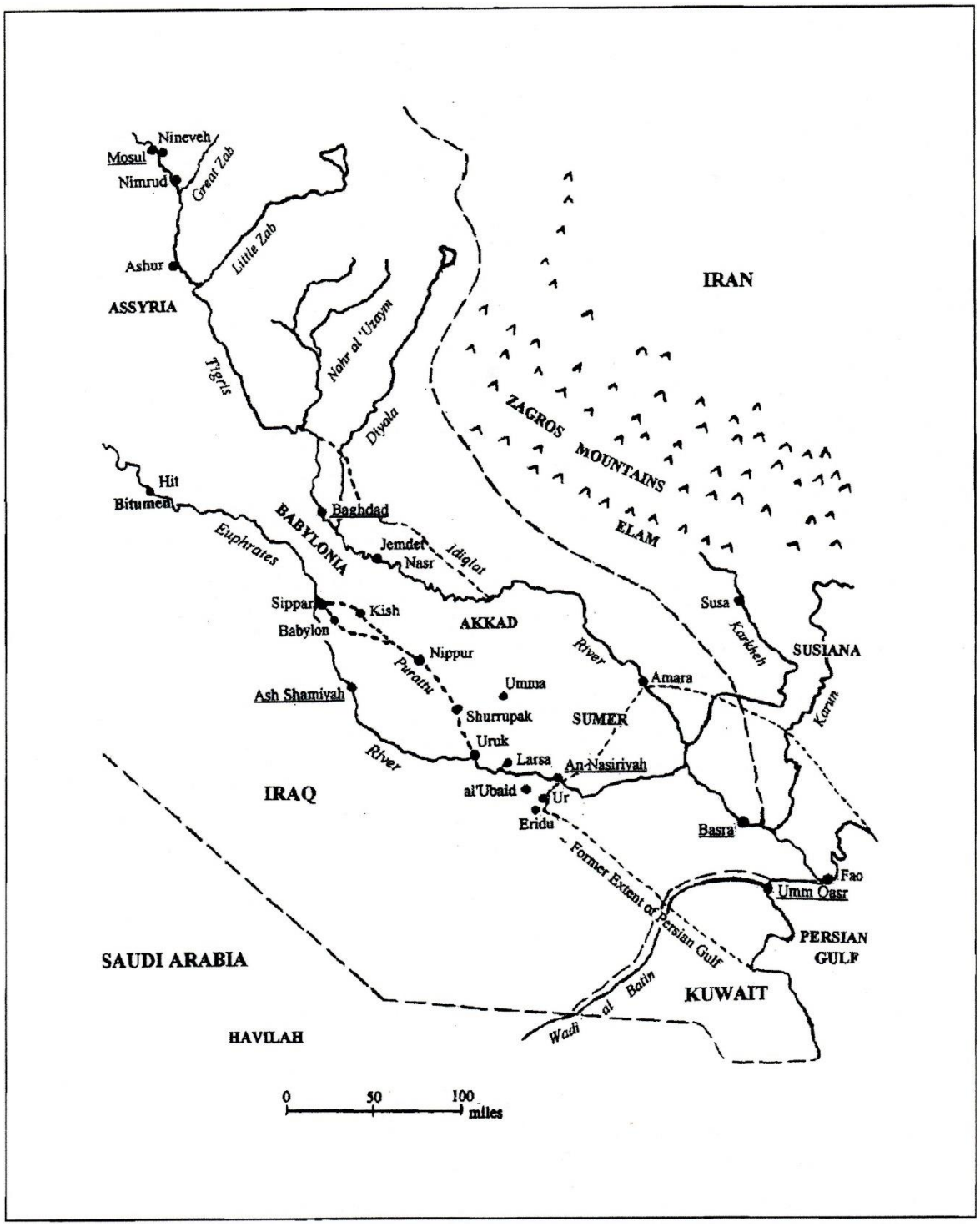

Figure 5.1 The ancient regions and cities of Mesopotamia.
The former courses of the ancient Euphrates (AKK *Purattu*) and Tigris (AKK *Idiqlat*) Rivers, and the former approximate extent of the Persian Gulf, are denoted by short dashes. Long dashes denote present-day boundaries between countries. **Reproduced with permission from Carol A. Hill.**

> In the middle of the third millennium, we thus see a cultural *koine* in the literate Near East. The intellectual center was southern Mesopotamia [Sumer], where the scribal practices and most literary texts were first produced. The technique of writing was exported to Syria and northern Mesopotamia when urban cultures developed there, and certain cities probably acted as intermediaries in this process. Northern Babylonian Kish was very important, as was Mari on the Middle Euphrates. Some texts at Ebla state that "young scribes came up from Mari,"[423] which suggests that the city provided training to Syrian scribes. People from western Syria read the same texts as those of southern Iraq. They employed the same scribal practices, shaping their clay tablets similarly, writing the same cuneiform signs, organizing them in the same way on the tablets, and so on.

It should therefore be unsurprising that Abram from the Sumerian city of Ur and his Hebrew descendants would share the cultural worldview of the Sumerians whose influential knowledge was disseminated throughout Mesopotamian history. In fact, Kramer noted that Sumerian wisdom texts were "the prototypes of the wisdom literature current all over the Near East and exemplified by the Bible's *Book of Proverbs*."[424]

Knowing that residual Sumerian influences may be present in the Book of Job can help the interpreter in a very practical sense. For example, the word *ʾēd* is one of those rare words that Pope referred to that is only used in Gen 2:6 and Job 36:27. This word (HEB *ʾēd*) which is translated as "springs/stream/mist" in Gen 2:6 NLT/NIV/ESV, respectively appears to refer to a water source like the outlet of an aquifer, with the Sumerian e_4-$ed_{2,3}$ meaning "water issues forth (from the ground)" from e_4 "water" and ed_2 "to go out, come out, emerge; to

[423] Alfonso Archi, "Transmission of the Mesopotamian Lexical and Literary Texts from Ebla," in *Literature and Literary Language at Ebla* (QuadSem 18; ed. P. Fronzaroli; Florence: Dipartimento di Linguistica, 1992), 23.

[424] Samuel Noah Kramer, *Sumerian Mythology: A Study of Spiritual and Literary Achievement in the Third Millennium BCE* (Philadelphia, Pa.: University of Pennsylvania Press, 1972 [revised edn]), 15.

send forth; to issue" and ed$_3$ "to exit; to rise; to drain."[425] The use of *ʾēd* in both Gen 2:6 and Job 36:27 would seem to refer to the surface-level freshwater outlets found in the Tigris-Euphrates river valley above the Dammam aquifer.[426] This example demonstrates that understanding the influence of ancient Sumerian (from Southern Mesopotamia) upon biblical texts can help the reader with some of the more difficult linguistic and cultural aspects of the story of Job.

Placing the location of Job in ancient southern Mesopotamia also explains the strange detail at the end of the story where the daughters of Job inherit along with their brothers (Job 42:12–15). While such apportioning was unheard of in Israelite society,[427] not so in Sumerian culture. There the head of the household was responsible for providing his daughters with dowries before his death, otherwise the sons were required to set aside some of the father's estate for this purpose.[428] This is consistent with scholars' observations that "the women in ancient Mesopotamia seem to have been treated more equally than in many more recent societies"[429] and that Sumerian "women could hold land and other property"[430] in contrast to later Israelite culture. Not only is Job far more generous towards his female family members with his wealth than traditional Israelite society, but his three daughters are specifically named in the text while Job's seven sons remain nameless. Interestingly, the names of Job's beautiful daughters, Jemimah (HEB *yəmîmâ*), Keziah (HEB *qəṣîʿâ*), and

[425] All Sumerian translations presented in this thesis and its appendices were obtained using both John Halloran's *Sumerian Lexicon* as well as the *Electronic Pennsylvania Sumerian Dictionary* (ePSD) as recommended by Nicholas Postgate. Halloran, *Sumerian Lexicon*, 1, 2, 41, 58. ePSD website [cited 28 October 2018]. J. Nicholas Postgate, review of John A. Halloran, *Sumerian Lexicon: A Dictionary Guide to the Ancient Sumerian Language*, *JSS* 54 (2009): 255-257.

[426] Hill, "Garden of Eden," 40-42. Sadeq Al Jawad et al., "Groundwater Quality and Their Uses in Iraq," *JESGE* 8 (2018): 132.

[427] Pope, *Job*, 353. Walton, Matthews, and Chavalas, *Old Testament*, 511. Hartley, *Book of Job*, 5421-543.

[428] Postgate, *Early Mesopotamia*, 97.

[429] Postgate, *Early Mesopotamia*, 105.

[430] Crawford, *Sumer*, 32.

Keren-Happuch (HEB *qeren happûk*) reveal Job's joy and restoration as they translate from Sumerian as follows:[431]

- (SUM u_6-e_4-mi_2-mah)—"to be impressed by splendid female offspring"
- (SUM ka_9-zi-a)—"settlement of accounts for the good and faithful father"
- (SUM kar_2-$en_{2,3}$-ha_2-pu_2-pu_3-$uku_{2,5}$)—"a time of brightness—numerous lush orchards for the uprooted poor man"

The paragraphs above support the idea that the more enigmatic words, names, and passages in the Book of Job can be better understood when we apply a knowledge of ancient Sumerian culture and linguistics to the text. The next section intends to demonstrate that by doing so, the interpreter can bring greater clarity to the theological purpose of suffering permitted by a God who loves his creatures.

Section 5.3.2 Lessons from the Book of Job

In this section, Sumerian linguistics will be applied to the Book of Job in order to help illuminate the theological teachings of the story. One of the characteristics of names in Sumerian and Akkadian literature is that they reveal the descriptive attributes of the person named rather than function as static labels for people as is typical in modern Western societies.[432] That also appears to be why the Book of Job employs several different names for the God of heaven — *yəhwâ* (Job 1:6; 2:2; 38:1), *ʾĕlôah* (Job 4:9), and *ʾēl-šadday* (Job 13:3) —

[431] Appendix C—p288.

[432] Robert A. Di Vito, *Studies in Third Millennium Sumerian and Akkadian Personal Names: The Designation and Conception of the Personal God* (Rome: Editrice Pontificio Istituto Biblico, 1993), 1-22.

which describe God's varied attributes and appear to translate phonetically from Sumerian as follows:[433]

- (SUM u-e$_4$-PA.E$_2$)—"Lord Father in charge of the temple household"
- (SUM u-e$_4$-pa-e$_3$)—"Lord Father who manifests himself in shining, resplendent appearance"
- (SUM u-e$_4$-pa$_3$)—"Lord Father who reveals himself, swears by himself, seeks and finds, speaks, and appoints the chosen and called"

- (SUM e$_{2,4}$-la-ḫe$_2$)—"father's house of abundant bliss, youth, beauty, luxury and wealth"
- (SUM e$_4$-li-aḫ$_3$)—"father who rejoices over the purified"
- (SUM e$_4$-lu-aḫ$_3$)—"father of purified multitudes"

- (SUM-AKK *eli*-*šadu*-di)—"the supreme, excellent, radiant, abundant, powerful one who speaks from the cosmic mountain" [AKK *šadu* = SUM kur = cosmic mountain]
- (SUM-AKK *il*-*šadu*-di)—"the God of Heaven who speaks from the cosmic mountain" [AKK *il* = SUM AN = God of Heaven; AKK *šadu* = SUM kur = cosmic mountain]

The story opens in the land of Uz, meaning the "land of nanny-goats,"[434] a suitable region for a man wealthy in livestock like Job. Job's name has five different meanings which are implied by the changing context of the story. In Job 1:2–3, the hearer is told that Job is the greatest man among the people of the

[433] Appendix B—p279-282. Wolfram von Soden, *The Ancient Orient: An Introduction to the Study of the Ancient Near East* (trans. Donald G. Schley; Grand Rapids, Mich.: Eerdmans, 1994), 177. Frank Moore Cross, "Yahweh and the God of the Patriarchs" *HTR* 55 (1962): 225-259. According to Walther Sallaberger and Aage Westenholz, *Mesopotamien: Akkade-Zeit und Ur III-Zeit* (OBO 160.3; Freiburg, Schweiz: Universitätsverlag; Göttingen: Vandenhoeck and Ruprecht, 1999), 79, 84: The Akkadian god *Il* or *Ilum* referred to "a specific but unnamed god" who was presumably a high, universal deity, similar to the Sumerian god of heaven, An. From ED IIIb onward, the name of *Il* could be written with the sign AN.

[434] Appendix C—p283.

East in his time with 7,000 sheep, 3,000 camels, 500 yoke of oxen, and 500 donkeys. In this context, Job's name (HEB *ʾîyôb*) in Sumerian means:[435]

- (SUM ia_3-ab_2)—"fat of cows, cream"—(implying wealth, Job 29:4–6)
- (SUM u_2-a-ab)—"important high-ranking elder who cares for the poor and vulnerable"—(Job 29:7–17)

He is also the wealthy father of seven sons and three daughters and has many servants in his household. After times of family feasting, Job would offer sacrifices for each of his children to purify them from any sins they may have incurred against God (Job 1:4–5). This is why his name also means:[436]

- (SUM u_5-e-ab)—"father who lifts up prayers"

Meanwhile in the presence of the heavenly children of God and Satan, God (HEB *yəhwâ*, SUM u-e_4-PA.E_2, "Lord Father in charge of the temple household") honors Job as his faithful servant: "There is no one on earth like him; he is blameless and upright, a man who fears God and shuns evil" (Job 1:8 NIV). John E. Hartley describes this as a combination of trust and love as Job strives "to please God in faithful obedience inspired by love."[437]

These details of the prologue are essential for understanding the unfolding of the rest of the story. Here God's own mouth vindicates the character of Job; he is a blameless person who loves God and cares for others. However, Satan suggests that Job does not love God for his own sake, but merely for the blessings that God bestows (Job 1:9–11).[438] He even goes on to say that if God takes away all of his goods, Job will "surely curse you to your face." In other words, Satan is accusing Job of having merely an *I-It association*

[435] Appendix C—p283. Walton, Matthews, and Chavalas, *Old Testament*, 506-507.
[436] Appendix C—p283.
[437] Hartley, *Book of Job*, 67.
[438] Walton, Matthews, and Chavalas, *Old Testament*, 497. Fretheim, *God and World*, 223.

with God that is about the acquisition of goods rather than an *I-Thou relationship* that would survive even if every blessing was taken away.[439]

This is not some kind of whimsical wager between safely-distant, emotionally-disengaged partisans.[440] This question reaches to the core of Job's character and his relationship with God: "Does Job truly love God, or just his 'stuff'?"[441] No matter how much God loves Job and delights in blessing him, the true answer to this question can only be given by allowing Job to freely choose how he will respond to tragedy and loss; the character of Job's love cannot be proved genuine by mere speculation or lip-service. Therefore, Satan is given restricted permission to strike at everything Job has, but not the man himself (Job 1:12). It thus comes to pass that raiders invade Job's land, stealing his livestock and slaughtering his servants. Then a strong wind causes the eldest son's house to collapse upon all of Job's children where they had gathered to feast together as a family (Job 1:13–19). The events of these passages are echoed in the Sumerian meanings of Satan (HEB *śāṭān*) and Job's names:[442]

- (sa$_2$-ta-An)—"(one who) competes to be equal in nature to God"
- (sa$_2$-ta$_6$-An)—"(one who) abandons the counsel of God"
- (sa$_{12}$-ta$_3$-an)—"(highest?) servant of God who afflicts from heaven"

- (u$_{3,4}$-a-ab)—"lamenting father"

Yet even in the midst of his grief over the deaths of his children, Job worships the Lord without sinning (Job 1:20–22).

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[439] Tsevat, "Book of Job," 2.
[440] Fretheim, *God and World*, 223-225. Pope, *Job*, lxxiv-lxxv. Hartley, *Book of Job*, 74.
[441] Pope, *Job*, lxxiii. Hartley, *Book of Job*, 70.
[442] Appendix C—p283-285.

So again, in the heavenly court God praises Job's integrity despite his undeserved hardship (Job 2:3). In response, Satan challenges Job's purported love for God as too easy when he does not experience suffering in his own body: "But now stretch out your hand and strike his flesh and bones, and he will surely curse you to your face" (Job 2:4–5 NIV). Once more, Job's love for God will be tested and he cannot be allowed to know the reason for his suffering otherwise it would nullify the ambiguity necessary to frame his candid response.[443] So, God grants Satan permission to strike Job's flesh, but forbids him from taking Job's life (Job 2:6–8). Job becomes covered in painful sores and is left impoverished sitting in a pile of ashes with his wife telling him to "curse God and die" (Job 2:9 NIV).[444] Yet Job rejects such a response as his reply reveals his I-Thou relationship with God: "Shall we accept good from God, and not trouble?" (Job 2:10 NIV).

Notice that this story addresses the most commonly experienced causes of human suffering which are relevant to the central question of this thesis. To summarize so far, Job is a human being who: 1) has lost his financial security and now lives in poverty, 2) has to endure the grief and loss associated with his children's death, 3) has lost most of those from his former household except his unsupportive wife, and 4) has to bear the agony of his illness, the humiliation of his appearance, and the uncertainty of his fate. This leads to the last meaning of Job's name:[445]

- (i-ab)—"elder father crying in pain"

Nevertheless, the prologue has made clear that Job is a person whom God has found to be "blameless and upright, a man who fears God and shuns evil" (Job 2:3). None of his misfortunes are punishment for sin, foolishness, or a lack of piety — faults that ancient Mesopotamian wisdom literature often blamed for

[443] Tsevat, "Book of Job," 3. Pope, *Job*, lxxiv.
[444] Hartley, *Book of Job*, 83, 86.
[445] Appendix C—p283.

suffering.[446] This is important to remember because what follows is a critique of improper theological responses to suffering which are depicted by the three friends of Job who represent various versions of the Retribution Principle: that blessings are rewards for righteousness and sufferings are punishments for wickedness.[447] This is relevant to this thesis' discussion of suffering because these approaches are often employed theologically, yet appear to be in conflict with God's purposes (Job 42:7–9).

Although scholars have long had difficulty determining the lands each friend originated from,[448] this is because their names and descriptions are in fact theological, not geographical, in nature (Job 2:11). In each case, it appears that the friend's name represents their "advice" to Job whereas their descriptor represents their theological outlook.[449] The first friend is Eliphaz (HEB *ʾĕlîpaz*) the Temanite (HEB *hattêmānî*) whose name translated from Sumerian means:[450]

- (e-li-pa-azu)—"says to be happy with the branch (of discipline) and the healer"

The reference to the "branch" appears to refer to the rod of discipline mentioned in passages like Prov 13:24, and Eliphaz's advice is epitomized in Job 5:17–18 (NIV) when he counsels:[451]

> "Blessed is the one whom God corrects;
> so do not despise the discipline of the Almighty.
> For he wounds, but he also binds up;
> he injures, but his hands also heal."

The moniker "the Temanite" translates as:[452]

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[446] Lambert, *Babylonian Wisdom Literature,* 10-20.

[447] Pope, *Job*, lxxviii. Walton, Matthews, and Chavalas, *Old Testament*, 493, 497. Fretheim, *God and World*, 222. Tsevat, "Book of Job," 27.

[448] Walton, Matthews, and Chavalas, *Old Testament*, 496.

[449] Walton and Longman III, *How to Read Job*, 67.

[450] Appendix C—p286.

[451] Hartley, *Book of Job*, 125.

[452] Appendix C—p286.

- (at-te-ma$_3$-ni$_2$)—"I approach the Father with fear and respect (piety)"

It would appear that Eliphaz the Temanite is arguing that the *pious* person has nothing to fear, as he stresses respect and devotion (piety) towards God.[453] In his first speech, he emphasizes putting confidence in piety (Job 4:6) and that mortals suffer discipline because they are less righteous than God and so perish (Job 4:17–21). In his second speech, he unfairly admonishes Job for undermining piety and hindering devotion to God (Job 15:4), suggests that the sin of Job's own mouth has brought suffering on him (Job 15:5–6), and claims that mortals are born impure, unrighteous, and untrustworthy (Job 15:14–16). In his third speech, Eliphaz confidently states that Job's suffering is due to his lack of piety (Job 22:4–5) and then proceeds to falsely accuse him of wickedness (Job 22:6–11) even though the audience knows that God has elevated Job as an example of a truly pious man (Job 1:8).

The second friend is Bildad (HEB *bildad*) the Shuhite (HEB *haššûḥî*) whose name translated from Sumerian means:[454]

- (bil$_{2,3}$-da$_6$-ad)—"the son should submit to the Father's beatings"
- (aš-šu-ḫi)—"(life is) one mixed portion"

In Job 8:3–4, Bildad the Shuhite emphasizes God's justice and argues that the *innocent* person has nothing to fear, therefore Job's children must have sinned to have received such punishment.[455] He goes on to suggest that God provides compensation to those whose ways are pure and upright (Job 8:5–7), which may explain his outlook that existence is "one mixed portion" of punishment and blessing.

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[453] Lambert, *Babylonian Wisdom Literature,* 15. Hartley, *Book of Job*, 106-107, 129.

[454] Appendix C—p286.

[455] Lambert, *Babylonian Wisdom Literature,* 10. Kathleen M. O'Connor, *Job* (NCBCOT 19; Collegeville, Minn.: Liturgical, 2012, 17. Hartley, *Book of Job*, 154-156, 164. Fretheim, *God and World*, 228.

Job's third friend is Zophar (HEB *ṣôpar*) the Naamathite (HEB *hanna'ămātî*) whose name in Sumerian gives the following meaning:[456]

- (zu-par$_6$)—"wisdom comes from penitence and the throne of God"
- (an-na-a-ma-ti)—"heavenly knowledge (is necessary) to dwell in the house of the Father"

In Job 11:1–20, Zophar the Naamathite emphasizes God's wisdom and argues that the *penitent* person has nothing to fear, because only the wisdom which comes from the throne of God can reveal human sin.[457] In other words, sins of ignorance cause people like Job to fall into iniquity and punishment so it is best to simply repent even when they do not have the wisdom to understand what they have done wrong.[458] So while all three friends' theological explanations for suffering would seem to be plausible, none are correct for God reveals that these men "have not spoken the truth about me" (Job 42:7–8). Therefore, there must be another explanation for why God allows suffering.

It should be noted that during the discussion between Job and his friends, God is referred to as *'ĕlôah/'ĕlōah* ("father who rejoices over the purified [multitudes]") and *'ēl-šadday* ("the God of Heaven who speaks from the cosmic mountain").[459] Unfortunately, both of these names are being used in ways that suggest distance between God and sufferers like Job. Since *'ĕlôah* refers to God as a father who delights in those who are purified and provides wealth and bliss for those of the family of God,[460] its usage in the midst of Job's suffering implies that Job is sinful rather than pure, thus inciting God's displeasure and discipline. Even Job has abandoned God's name of close intimacy, *yəhwâ* (Job 1:21), instead using *'ēl-šadday* (Job 13:3) which implies that God is so far off that

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[456] Appendix C—p287.

[457] Lambert, *Babylonian Wisdom Literature,* 15-16. Hartley, *Book of Job*, 196-200, 204. O'Connor, *Job*, 18.

[458] Fretheim, *God and World*, 230.

[459] Appendix B—279, 282.

[460] Appendix B—p279.

he must come closer for Job to make his case before him (Job 13:1–24).[461] Feelings of separation between sufferers and God is highlighted when young Elihu insists that *šadday* "is beyond our reach/we cannot find him" (Job 37:23 NIV/ESV). This is what makes God's appearance in the midst of the whirlwind all the more shocking (Job 38:1) and points to *God's* answer for suffering.[462]

The name for God used here is not the remote *šadday* but the intimate *yəhwâ* (Job 38:1)—"the Lord Father who reveals himself in resplendent appearance and speaks."[463] Rather than being distant and unmoved by Job's lamentations, God has been carefully paying attention to every word Job and his friends have spoken.[464] It is therefore significant that God reveals himself not only in the tempest, but in the storm of Job's life as well.[465]

Through the story of Job, several theological lessons about suffering are conveyed to the hearer. First, while the Retribution Principle will ultimately be fulfilled either in this life or the afterlife (Ps 37; Matt 13:24–30; Luke 16:19–31), there are times in this world where the righteous may suffer while the wicked prosper (Jer 12:1–4; Ps 35; Matt 5:45; Luke 16:19–31). Second, the listener now knows that even the *pious*, the *innocent*, and those *wise* in the ways of God may endure undeserved suffering. In other words, even the righteous may experience inexplicable grief, loss, humiliation, and hardship.

Third, the friends bore false witness against an innocent man in order to exonerate God (Job 13:6–8),[466] violating the ethics of the very God they were purportedly honoring (Exod 20:16; 23:1; Deut 5:20; Prov 25:18). Only Job spoke in defense of the innocent man — himself — even when under duress from his friends. Fourth, the friends spoke falsely about God (Job 42:7) in order to

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[461] Tsevat, "Book of Job," 6-8.
[462] O'Connor, *Job*, 31. Hartley, *Book of Job*, 487.
[463] Appendix B—p281.
[464] Hartley, *Book of Job*, 487.
[465] O'Connor, *Job*, 32.
[466] Tsevat, "Book of Job," 4. Fretheim, *God and World*, 232.

defend their own theological understandings of him.[467] Despite testifying that God's wisdom surpasses that of human beings, they could not accept the possibility that God's decision — allowing a righteous person to suffer — might involve a wisdom greater than they could understand. This is sadly similar to theologians who have blamed suffering in creation upon the purported sin-guilt of Adam and Eve. Such theology may also be guilty of bearing false witness against innocents by suggesting their sufferings and deaths were caused by inheriting the sin of Eden's exiles rather than the ordering of creation put in place by the wisdom of God.[468] Instead, as the speeches in Job 38–41 reveal, *God takes full responsibility for everything that is allowed to exist in creation, including the suffering of the guiltless* (Job 1:8).[469]

Lastly, the theologian-friends misrepresented God as far away and out of reach of his creatures (Job 5:1; 37:23). God refutes this both by his appearance before Job and by the revelation that *he is in constant communion with the entire created order* (Job 38–39). This speech is a very personal description of God's tabernacling relationship amongst creation that was conveyed more abstractly by the cosmic temple in Genesis 1 (Section 2.1.4).[470] Furthermore, God's revelation *does* provide an answer to the problem of suffering, although theologians appear to miss it because they wrongly expect a clever answer to the problem of pain rather than recognizing that *the I-Thou relationship between God and his creatures is the answer*.[471] In fact, it appears that every question addressed to Job along the lines of "Were you there when…?" or "Can you…?" is a rhetorical device to make the point that, though Job has been absent in

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[467] Pope, *Job*, lxxx.

[468] Augustine, *Genesis* 10.15.26-10.16.29 (ACW[42] 2:115-118).

[469] Fretheim, *God and World*, 225, 237. Hartley, *Book of Job*, 74, 504. Osborn, *Death Before the Fall*, 154. Sollereder, *God, Evolution, and Animal Suffering*, 74.

[470] James L. Crenshaw, *Studies in Ancient Israelite Wisdom: Selected with a Prolegomenon by James. L. Crenshaw* (LBS 18; ed. Harry Orlinsky; New York: Ktav, 1976), 31-32. J. Gerald Janzen, "The Place of Job in the History of Israel's Religion," in *Ancient Israelite Religion: Essays in Honor of Frank Moore Cross* (ed. Patrick Miller, Paul Hanson, and S. Dean McBride; Philadelphia: Fortress, 1987), 528. Walton, Matthews, and Chavalas, *Old Testament*, 509.

[471] Tsevat, "Book of Job," 8-12.

every aspect of creation, *God has always been intimately present.* No creature suffers alone.[472] No stage of creaturely life goes unseen. God himself cares for and feeds all creatures and their young, whether they are herbivores (deer, goats), carnivores (lions), or scavengers (ravens) (Job 38:39–39:4).[473] God even delights in the wild and dangerous aspects of the natural order depicted by the Leviathan and Behemoth (Job 40:15-41:34).[474] Truly, not even a sparrow can fall to the ground outside of the Father's care (Matt 10:29).

So, while some scholars believe that God's speeches are an attempt to humiliate Job into silence,[475] that does not seem likely in light of God's affection for Job (1:8) as well as Job's contented response after God's speech has concluded (Job 42:1–6).[476] This has previously not been clear due to uncertainty regarding the meaning of verse 42:6,[477] but this can be revealed in Sumerian. Job's concluding words are typically translated as follows (Job 42:5–6 NIV):

> "My ears had heard of you
> but now my eyes have seen you.
> Therefore I despise myself (*ʾemʾas*)
> and repent (*niḥamtî*) in dust and ashes."

The Hebrew words *ʾemʾas* and *niḥamtî* translate from Sumerian as the following:[478]

- (em$_3$-as)—"to be fettered or caged by goods/property"

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[472] Sollereder, *God, Evolution, and Animal Suffering*, 74. Southgate, *Groaning of Creation*, 55-56. Rolston, *Science and Religion*, 144-146. Peacocke, "Cost of New Life,", 37-39. Page, *Web of Creation*, 52-58.

[473] Hartley, *Book of Job*, 504-506. O'Connor, *Job*, 33.

[474] Fretheim, *God and World*, 233-237. O'Connor, *Job*, 35. Hartley, *Book of Job*, 516.

[475] James L. Crenshaw, "When Form and Content Clash: The Theology of Job 38:1–40:5," in *Creation in the Biblical Traditions* (Washington, DC : Catholic Biblical Assoc of America, 1992), 74, 78-79.

[476] Samuel E. Balentine, "'What Are Human Beings, That You Make So Much of Them?' Divine Disclosure from the Whirlwind: 'Look at Behemoth,'" in *God in the Fray: A Tribute to Walter Brueggemann* (ed. Tod Linafelt and Timothy K. Beal; Minneapolis: Fortress, 1998), 265. O'Connor, *Job*, 35, 38. Fretheim, *God and World*, 227. Hartley, *Book of Job*, 537.

[477] Fretheim, *God and World*, 232.

[478] Appendix C—p287-288.

- (ni$_3$-ḫa$_2$-am$_2$-ti)—"to cease payment of assorted goods"
- (ni$_2$-ḫe$_2$-am$_2$-ti)—"to approach someone (God) and pay out abundant awe and respect"
- (ni$_2$-ḫe$_2$-am$_3$-te)—"to refresh oneself with abundance (within)"

Since the loss of his loved ones, his wealth, his health, and his stature, Job has been sitting in the dust and ashes which represent death and the end of all things. It is here that Yahweh comes to Job and speaks with him face-to-face. It is only here, at what appears to be the end of his existence, that Job recognizes the shackles of worldly goods and that life's payment of assorted blessings will one day come to an end. It is at that time that the person in I-Thou relationship with Yahweh will be approached by the One worthy of abundant awe and respect and be refreshed with abundance within.[479] What Job is describing is very like the concept captured in the Hebrew word for peace — shalom (HEB šālôm, SUM ša$_3$-lum) — which in Sumerian means "to be satisfied, contented, and flourish within the heart."[480] This is the fruit of the I-Thou relationship between the human and the divine.

In contrast, Satan and Job's friends described the human-divine connection as an I-It association with each party manipulating the other for their own gain.[481] Satan claimed that God was plying Job with blessings to buy his fidelity. Job's friends implied that God could be manipulated with "goods" such as piety, wisdom, or confession in order to obtain God's blessings.[482]

What this story reveals is that the "divine-human relationship is a mutual one where neither party controls the other, but both are free."[483] It is also a warning that every person, no matter their piety, innocence, or wisdom, may have to endure undeserved suffering like Job. We too may 1) lose our

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[479] Tsevat, "Book of Job," 22-23. Hartley, *Book of Job*, 537.
[480] Strong's #7965. Appendix C—p287.
[481] O'Connor, *Job*, 38. Hartley, *Book of Job*, 129, 204.
[482] Hartley, *Book of Job*, 538-539.
[483] O'Connor, *Job*, 38.

financial security, 2) endure grief or the loss of a child, 3) lose the support of our family or spouse, or 4) bear the agony and stigma of illness or attack as well as the uncertainty of our fate. The story of Job teaches that such sufferings are not signs of God's displeasure or powerlessness. However, in such situations the question that is asked of us is, "How will we respond to such hardship?" Will we "curse God and die" for allowing troubles to come? Or will we seek God all the more in I-Thou relationship, even when that love is costly?

Section 5.4 A Study of I-Thou Relationships in the Presence of Pain

While it is true that either wellness or death will eventually take away the pain of the sufferer, what till then? Has God left us sitting alone in our agony until we heal, bury ourselves in self-medication, or die? No. There is a tonic for pain, and it is found in the balm of I-Thou relationships.[484]

Returning to the story of Job, there are several important observations that are relevant to understanding the theological purpose of suffering. First, the healing of Job's emotional turmoil begins as he reclaims his I-Thou relationship with God, now realizing that God is ever present with his creatures and suffering is not a sign of God's absence, indifference, or disapproval (Job 38:1–42:6). Second, as Job approached death, he realized that the gains and losses of this world will fade away but are nothing compared to the abundance found in relationship with the Lord Father (Job 42:6). Third, as one looks carefully at what consoled Job, it was not the doubling of his previous wealth, but the loving and supportive presence of his friends and family (Job 42:10–11). Now the question that follows is this: "Do these observations have any basis in reality?" In other words, is there any empirical evidence that supports the

[484] Harry T. Reis, "Relationship Experiences and Emotional Well-Being," in *Emotion, Social Relationships, and Health* (ed. Carol Ryff and Burton Singer; Oxford University Press, 2001), 62-63.

biblical claim that those who suffer can be comforted by their relationship with God or the empathetic love of others? The answer is an emphatic "yes."

The medical literature is replete with studies which reveal that the sufferer's perception of their pain and mental outlook is heavily dependent upon whether they believe God is for them or against them.[485] Those who had positive views of their relationship with God (e.g., "seeing God as a partner, seeking God's love and care, focusing on religion to stop worrying") were statistically more likely to have better mental health, quality of life, and coping strategies than those with negative views of God.[486] For example:

- Patients with *advanced chronic kidney disease* that had positive religious/spiritual (R/S) coping strategies[487] had a higher health-related quality of life.[488]
- Affirmative religious coping significantly increased the ability of *arthritis patients* to control and decrease their pain while maintaining a positive outlook.[489]
- Those who attended church once or more per week had the lowest pain scores from *sickle cell disease*.[490]

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[485] Harold G. Koenig, Dana E. King, and Verna Benner Carson, *Handbook of Religion and Health* (New York: Oxford University Press, 2012), 94-120; this handbook includes the work of over 4,000 peer-reviewed articles. Amy B. Wachholtz, Michelle J. Pearce, and Harold Koenig, "Exploring the Relationship between Spirituality, Coping, and Pain," *JBM* 30 (2007): 311-318.

[486] Quote from Koenig, King, and Carson, *Handbook*, 104. Trever Dangel and Jon R. Webb, "Spirituality and Psychological Pain: The Mediating Role of Social Support," *MHRC* 20 (2017): 246-259.

[487] Positive religious/spiritual (R/S) coping strategies include seeking spiritual meaning and support, turning to religious assistance to forgive others, seeking to cooperate with God, re-evaluating a situation from a religious/spiritual point of view, forgiving oneself, and focusing on the practices of one's spiritual or religious tradition (Koenig, King, and Carson, *Handbook*, 36-47, 95.)

[488] Sara N. Davidson, "The Relationship between Spirituality, Psychosocial Adjustment to Illness, and Health-Related Quality of Life in Patients with Advanced Chronic Kidney Disease," *JPSM* 45 (2013): 170-178.

[489] Francis, J. Keefe et al., "Living with Rheumatoid Arthritis: The Role of Daily Spirituality and Daily Religious and Spiritual Coping," *JP* 2 (2001): 101-110. Ana F. Abraído-Lanza, Elizabeth Vásquez, and Sandra E. Echeverría, "En las Manos de Dios [in God's Hands]: Religious and Other Forms of Coping Among Latinos with Arthritis," *JCCP* 72 (2004): 91-102.

[490] M. Ojinga Harrison et al., "Religiosity/Spirituality and Pain in Patients with Sickle Cell Disease," *JNMD* 193 (2005): 250-257.

- Religious belief correlated positively with better life satisfaction and happiness in patients with *advanced cancer* who reported "significantly lower levels of pain, even though they were no less likely to report the presence of pain."[491]
- Adolescents with *cystic fibrosis (CF)* used positive religious coping to increase their emotional functioning which in turn was an indicator against "declines in pulmonary function and nutritional status and predicted fewer hospitalizations over time"—key indicators for mortality in CF patients.[492]

In contrast, negative religious perceptions in patients (such as feeling anger at or punishment from God, feeling abandoned by God and/or the religious community, or attacked by demonic oppression) were "uniformly related to negative emotional states such as depression, anxiety, or other distressed states of mind."[493]

It appears that the employment of religious/spiritual (R/S) resources is "more often related to improved pain tolerance and less related to reduced reports of pain severity."[494] This means that while the presence of pain was not eradicated, *the patients with positive perceptions of God had a reduced sensitivity to pain*, a finding anticipated in light of the role the dorsal anterior cingulate cortex (dACC) plays in physical and social pain.

Section 5.4.1 Neural Overlap of Physical and Social Pain Perception

The previous passage shows that people who have love-oriented I-Thou-type relationships with God experience greater pain tolerance. This suggests that

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[491] Jerome W. Yates et al., "Religion in Patients with Advanced Cancer," *MPO* 9 (1981): 121.

[492] Nina Reynolds et al., "Spiritual Coping Predicts 5-Year Health Outcomes in Adolescents with Cystic Fibrosis," *JCF* 13 (2014): 598.

[493] Quote from Koenig, King, and Carson, *Handbook*, 97. Wachholtz, Pearce, and Koenig, "Spirituality," 313-314. Kirsten A. Tornøe et al., "The Power of Consoling Presence – Hospice Nurses' Lived Experience with Spiritual and Existential Care for the Dying," *BMCN* 13 (2014): n.p.

[494] Wachholtz, Pearce, and Koenig, "Spirituality," 313.

suffering may be allowed in order to encourage people to nurture their relationship with God. However, the following sections will also explore the significance of the physical-social pain neural overlap and how non-sufferers may play an unexpected and important role in lessening the pain of sufferers among both humans and non-humans. Furthermore, this exploration may suggest that suffering not only tests the *sufferer's* relationship with God, but it may test whether the *non-sufferer* will love and comfort those that suffer. In other words, most theodicies ask, "Why does God allow suffering?" whereas this theodicy considers the possibility that the theological answer to suffering may be found in asking, "Has God tasked non-sufferers with an essential role in mitigating the suffering of others for a greater purpose?" To pursue this query, the following passages in Section 5.4 will use the scientific literature and the insights from Job to consider a new and benevolent theological explanation for pain in creation.

As mentioned previously (Section 3.3.1), the *brain opioid theory of social attachment* reveals that opioids released in mammals and birds[495] from positive social interactions can soothe emotional distress created in the dorsal anterior cingulate cortex (dACC), whether that distress is caused by physical or social pain.[496] This is because of the shared neural circuitry which causes physical-social pain overlap.[497]

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[495] Panksepp et al., "Biology," 607-618. Panksepp et al., "Endogenous Opioids," 473-487. Jaak Panksepp et al., "Opioid Blockade and Social Comfort in Chicks," *PBB* 13 (1980): 673-683. Jaak Panksepp and P. Bishop, "An Autoradiographic Map of (3H)diprenorphine Binding in Rat Brain: Effects of Social Interaction," *BRB* 7 (1981): 405-410. Ned H. Kalin, "Opiate Modulation of Separation-Induced Distress in Non-Human Primates," *BR* 440 (1988): 285-292.

[496] Lieberman, *Social*, 47-52, 61-70. Panksepp et al., "Biology," 607-618. Eric B. Keverne, Nicholas D. Martensz, and Bernadette Tuite, "Beta-Endorphin Concentrations in Cerebrospinal Fluid of Monkeys are Influenced by Grooming Relationships," *Psychoneuroendocrinology* 14 (1989): 155-161.

[497] Naomi I. Eisenberger, "The Pain of Social Disconnection: Examining the Shared Neural Underpinnings of Physical and Social Pain," *NRN* 13 (2012): 428-430. Ethan Kross et al., "Social Rejection Shares Somatosensory Representations with Physical Pain," *PNASUSA* 108 (2011): 6270-6275. Naomi I. Eisenberger, "Why Rejection Hurts: What Social Neuroscience Has

We can see examples of this social soothing of distressed companions through empirical observations of nature and daily life. For example, there are thousands of cases which show that chimpanzees console each other in times of distress with hugging and kissing.[498] Birds like ravens have been observed comforting the loser of a fight by gently grooming their feathers and nudging them beak-to-beak.[499] Human infants as young as one year old also offer comforting behaviors to others in distress:

> When psychologist Carolyn Zahn-Waxler visited homes to find out how children respond to family members instructed to feign sadness (sobbing), pain (crying out "ouch"), or distress (coughing and choking), she discovered that children little more than one year of age already comfort others. It is a milestone in their development: an aversive experience in another person draws a concerned response, such as patting, hugging, rubbing the victim's hurt, and so on.[500]

In other words, mammals and birds are neurologically hard-wired to be comforted by positive social interactions.

In contrast, when mammals like humans feel social rejection, it activates the dACC which is the same cortical region that is activated by physical injury. Simply put, this means social rejection *hurts* and is referred to here as *social pain*. As a result of this neural overlap, heightened sensitivity to social pain leads to increased sensitivity to physical pain.[501] That is, patients who report feelings

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Revealed About the Brain's Response to Social Rejection," in *The Oxford Handbook of Social Neuroscience* (ed. Jean Decety and John T. Cacioppo; New York: Oxford University Press, 2011), 586-598.

[498] Frans De Waal, *The Bonobo and the Atheist: In Search of Humanism Among the Primates* (New York: W.W. Norton, 2013), 5.

[499] Waal, *Bonobo*, 6.

[500] Waal, *Good Natured*, 45.

[501] Geoff MacDonald and Mark R. Leary, "Why Does Social Exclusion Hurt? The Relationship Between Social and Physical Pain," *PB* 131 (2005): 202-223. Anna Ehnvall, et al., "Pain During Depression and Relationship to Rejection Sensitivity," *APSc* 119 (2009): 375-382. Robert J. Waldinger, et al. "Mapping the Road from Childhood Trauma to Adult Somatization: The Role of Attachment," *PM* 68 (2006): 129-135. Paul S. Ciechanowski, et al., "Attachment Theory: A Model for Health Care Utilization and Somatization," *PM* 64 (2002): 660-667. Naomi

associated with social rejection also report more physical pain as well. The reverse is also true — physical pain can cause more feelings of social pain:[502]

> Patients with chronic pain, who experience more physical pain, are also more sensitive to social pain than control subjects, as evidenced by greater fear and avoidance of social interactions and a greater incidence of social phobia.[503] Moreover, higher levels of daily pain affect are associated with higher levels of anxious attachment or a greater concern about being rejected by others.[504]

In fact, experiences of physical pain have been shown to cause an increase in feelings of social exclusion even when social exclusion is absent.[505] This is because of the neural overlap for physical and social pain in the dACC: a region of the brain that registers pain when activated, whether generated by physical or social causes.

However, just as physical and social hurts can enhance the pain intensity of one another, mitigation of one type of hurt can reduce the painful experience of the other.[506] For example, over-the-counter pain relievers like Tylenol (acetaminophen) were shown over a two-week time period to reduce both self-reported hurt feelings as well as neural activity in the dACC despite experimentally-induced social exclusion events.[507] There is also a considerable amount of research that demonstrates that sufferers with social support, even from strangers, experience less physical pain than those without such

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I. Eisenberger, et al., "An Experimental Study of Shared Sensitivity to Physical Pain and Social Rejection," *Pain* 126 (2006): 132-138. Michael J. Bernstein and Heather M. Claypool, "Social Exclusion and Pain Sensitivity: Why Exclusion Sometimes Hurts and Sometimes Numbs," *PSPB* 38 (2012): 185-196.

[502] Eisenberger, "Pain of Social Disconnection," 428.

[503] Gordon J. G. Asmundson, G. R. Norton, and S. J. Jackobson, "Social, Blood/Injury, and Agrophobic Fears in Patients with Physically Unexplained Chronic Pain: Are They Clinically Significant?" *Anxiety* 2 (1996): 28-33.

[504] Geoff MacDonald and Rachell Kingsbury, "Does Physical Pain Augment Anxious Attachment?" *JSPR* 23 (2006): 291-304.

[505] Paolo Riva, James H. Wirth, and Kipling D. Williams, "The Consequences of Pain: The Social and Physical Pain Overlap on Psychological Responses," *EJSP* 41 (2011): 681-687.

[506] Eisenberger, "Pain of Social Disconnection," 429-430.

[507] C. Nathan DeWall, et al., "Acetaminophen Reduces Social Pain: Behavioral and Neural Evidence," *PS* 21 (2010): 931–937.

support.[508] When people who were in pain were in the company of their loved one, looked at a photo of them, or touched their hand, they reported a decrease in their own pain levels which was accompanied by lower pain-related neural activity in the dACC as well.[509] Such observations indicate that *there is a neurophysiological response to the presence of a loved one that reduces the experience of physical pain,* suggesting that non-sufferers play an important role in the problem of suffering.

This may also help explain why the employment of religious/spiritual (R/S) resources are "more often related to improved pain tolerance and less related to reduced reports of pain severity."[510] Improved pain tolerance without reduction in pain severity suggests that 1) the psychologically distressing aspect of pain in the dACC is being mitigated by the release of endogenous opioids (endorphins) while 2) the somatosensory cortex continues to register the sensory aspect of pain (Figure 3.1). This was illustrated in the case of the woman with excruciating vaginal pain who had a cingulotomy (Section 3.3.1).[511] After her dACC had been surgically disconnected from the surrounding regions of the brain, she could still feel the discomfort registered by her somatosensory cortex, but the sensory experience was no longer

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[508] Jennifer L. Brown, et al., "Social Support and Experimental Pain," *PM* 65 (2003): 276-283. Christine Zaza and Natalie Baine, "Cancer Pain and Psychosocial Factors: A Critical Review of the Literature," *JPSM* 24 (2002): 526-542. James A. Kulik and Heike I. Mahler, "Social Support and Recovery from Surgery," *HP* 8 (1989): 221-238. Kathleen B. King, et al., "Social Support and Long-Term Recovery from Coronary Artery Surgery: Effects on Patients and Spouses," *HP* 12 (1993): 56-63. B. Chalmers, et al., "Companionship in Labour: Do the Personality Characteristics of Labour Supporters Influence Their Effectiveness?" *Curationis* 18 (1995): 77-80. John Kennell, et al., "Continuous Emotional Support During Labor in US Hospital: A Randomized Control Trial," *JAMA* 265 (1991): 2197-2201. Naomi I. Eisenberger, et al., "Neural Pathways Link Social Support to Attenuated Neuroendocrine Stress Response," *Neuroimage* 35 (2007): 1601-1612.

[509] Jarred Younger, et al., "Viewing Pictures of a Romantic Partner Reduces Experimental Pain: Involvement of Neural Reward Systems," *PLoS ONE* 5 (2010): e13309. Sarah L. Master, et al., "A Picture's Worth: Partner Photographs Reduce Experimentally Induced Pain," *PS* 20 (2009): 1316-1318. Naomi I. Eisenberger, et al., "Attachment Figures Activate a Safety Signal-Related Neural Region and Reduce Pain Experience," *PNASUSA* 108 (2011): 11721-11726.

[510] Wachholtz, Pearce, and Koenig, "Spirituality," 313.

[511] Brand and Yancey, *Gift of Pain*, 210-211.

emotionally distressing.[512] Matthew Lieberman and Naomi Eisenberger offer a helpful analogy:[513]

> A useful metaphor is the sound of music on a radio, with sensory intensity likened to the radio's volume and subjective distress likened to the extent to which the music experienced is unpleasant. Above a certain threshold, increasing volume will usually be highly correlated with increasing unpleasantness. Nevertheless, the same volume can produce different levels of unpleasantness depending on the level of ambient noise from being in a quiet room versus outdoors at a barbeque or one's sensitivity to or tolerance of loud noises. Thus, intensity can be distinguished from unpleasantness such that under different conditions or across different people, the same degree of sensory intensity might produce different degrees of unpleasantness.

So, along similar lines of reasoning, *if religious/spiritual coping enables the sufferer to feel love and acceptance from either a transcendent person (e.g., God) or transcendent power that enables the release of their endogenous opioids, then this would effectively allow the sufferer to experience a more peaceful disposition even in the midst of their pain* — improved pain tolerance without a decrease in pain severity.

The overlap of physical and social pain would also explain why negative religious perceptions in patients (such as feeling anger at or punishment from God, feeling abandoned by God and/or the religious community, or attacked by demonic oppression) would be "uniformly related to negative emotional states such as depression, anxiety, or other distressed states of mind."[514] Feeling rejected by God and/or the religious community would be at least as bad as any

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[512] Matthew D. Lieberman and Naomi I. Eisenberger, "A Pain by Any Other Name (Rejection, Exclusion, Ostracism) Still Hurts the Same: The Role of the Dorsal Anterior Cingulate Cortex in Social and Physical Pain," in *Social Neuroscience: People Thinking About Thinking People* (eds. John T. Cacioppo, Penny S. Visser, and Cynthia L. Pickett; Cambridge, Mass.: MIT Press, 2006), 171.

[513] Lieberman and Eisenberger, "Pain by Any Other Name," 170-171.

[514] Quote from Koenig, King, and Carson, *Handbook*, 97. Wachholtz, Pearce, and Koenig, "Spirituality," 313-314. Tornøe et al., "Power of Consoling Presence," n.p.

other social rejection and understandably heighten pain sensitivity in the dACC of the sufferer, thereby magnifying their pain.

Of course, the world is not simplistically divided into two groups of people: those with positive religious/spiritual coping and those with negative. Rather there is a broad spectrum of belief with many people falling into the category of being ambivalent, agnostic, or atheistic towards religious/spiritual practices of any kind. For these people, as well as those with religious/spiritual beliefs, social support will be a critical influence on the distressing aspect of pain they will experience in their lives.

Besides facilitating the release of naturally occurring opioids in the brain regions of the sufferer, caring visitors help in another way. They listen. At first, this may appear to be an insignificant contribution, but looks are often deceiving. When a person takes the time to listen to someone in physically or socially induced pain, it offers the sufferer an emotionally safe place to try and put their feelings into words. This in turn provides an enormous opportunity for the sufferer to alter the experience of their own pain. How is this the case?

Researchers have discovered that human brains process tensions that can be named (fears) differently than those that remain unidentified and nameless (anxieties). Sources of anxiety that go unnamed are sometimes referred to as *non-symbolic* conflicts by researchers, whereas those fears that can be specifically identified are referred to as *symbolic* conflicts where there is an explicit "focus" represented as the source of the conflict.[515] When the brain processes unnamed anxieties, it tends to activate the dACC as well as the amygdala which plays a role in threat-related responding and is linked with some disorders such as anxiety, depression, post-traumatic stress syndrome, and phobias. But when the sufferers put their feelings into words (*affect labeling*) the right ventrolateral prefrontal cortex (RVLPFC) becomes engaged,

[515] Lieberman and Eisenberger, "Pain by Any Other Name," 168.

causing a corresponding decrease in activity in both the dACC and the amygdala.[516] In fact, "greater [right ventral prefrontal cortex] activity was associated with lower levels of self-reported social distress in response to social exclusion and reduced activity in the dACC."[517] In other words, as neural activity increases in the dACC, the reporting of distressful physical/social pain increases, but as the RVPFC (right ventral prefrontal cortex) becomes activated, it downregulates the dACC which leads to lower reports of distress as well as less dACC activity.[518] Therefore, by offering sufferers the opportunity to name their fears instead of being left with feelings of helpless anxiety, caregivers may be able to measurably alleviate the emotional distress of those in pain.[519] This finding would be anticipated if non-sufferers do indeed have a role to play in the mitigation of suffering in God's creation.

For example, a case study for clinical pastoral education (CPE) emphasized the importance of listening to patients in order to help them articulate their anxieties:[520]

> A married man scheduled for surgery was exhibiting a high degree of anxiousness. After talking to the hospital chaplain for a while, the man realized that it upset him that he had not yet made a will. Once the man made his wishes clear, arrangements were made for

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[516] Matthew D. Lieberman, et al., "Putting Feelings Into Words: Affect Labeling Disrupts Amygdala Activity in Response to Affective Stimuli," *PS* 18 (2007): 421-428. Ahmad R. Hariri, S. Y. Bookheimer, and J. C. Mazziotta, "Modulating Emotional Response: Effects of a Neocortical Network on the Limbic System," *NeuroReport* 11 (2000): 43-48. Kevin N. Ochsner and J. J. Gross, "The Cognitive Control of Emotion," *TCS* 9 (2005): 242-249. Tor D. Wager, et al., "Placebo-Induced Changes in fMRI in the Anticipation and Experience of Pain," *Science* 303 (2004): 1162-1167. Predrag Petrovic and Martin Ingvar, "Imaging Cognitive Modulation of Pain Processing," *Pain* 95 (2002): 1-5. Matthew D. Lieberman, et al., "The Neural Correlates of Placebo Effects: A Disruption Account," *Neuroimage* 22 (2004): 447-455.

[517] Eisenberger, "Why Rejection Hurts," 589.

[518] Naomi I. Eisenberger, "The Neural Basis of Social Pain: Findings and Implications," in *Social Pain: Neuropsychological and Health Implications of Loss and Exclusion* (eds. Geoff MacDonald and Lauri A. Jensen-Campbell; Washington, D.C.: American Psychological Association, 2011), 57-59.

[519] Katharina Kircanski, Matthew D. Lieberman, and Michelle G. Craske, "Feelings Into Words: Contributions of Language to Exposure Therapy," *PS* 23 (2012): 1086-1091.

[520] This case was shared during CPE training at Houston Methodist Hospital — Summer 2014.

> him to write his will and have it witnessed in the hospital. The man was in a much more peaceful frame of mind when he went in for his surgery.

This story illustrates that *good listening skills can help uneasy people discern and speak their fears, thereby lessening the distress associated with uncertainty or illness*. It should be noted, however, that it is unhelpful for listeners to offer contradictory viewpoints to the speaker because it can create an antagonistic situation that amplifies the sufferer's pain. Furthermore, the care-receiver's concerns should not be dismissed, no matter how routine the procedure or qualified the doctors. In the case mentioned above, the married man who made his will died on the operating table. Consequently, a conscientious caregiver will understand that their role is to offer a listening ear to the one they are caring for and show a willingness to follow the conversation wherever it leads.

This section has shown that the neural overlap of physical and social pain enables non-sufferers to lessen the painful emotional distress of sufferers. Therefore, is it reasonable to make the theological claim that empathetic I-Thou relationships are intended to help mitigate pain in God's creation.

Section 5.4.2 The Pain of Social Isolation and the Positive Effects of Empathy

In the previous section, we learned that humans as well as other mammals and birds can mitigate one another's pain through positive social relationships. This section will look more closely at the negative effects of social isolation as well as how the brains of social creatures have developed to offer empathy-induced comfort to one another.

Unfortunately, there are several factors which have been driving Western society away from empathetic I-Thou relationships and towards ever-increasing social isolation and accompanying emotional pain. Robert Putnam has documented such social trends in the U.S. in his book, *Bowling Alone: The*

Collapse and Revival of American Community.[521] He notes that community was traditionally created through informal social occasions and visiting one another.[522] Under normal conditions such as these, activities that facilitate human social bonding like talking, laughter, dancing, and music-making would release endogenous opioids that mitigate pain and increase our happiness.[523] However, as time has passed:[524]

> We spend less time in conversation over meals, we exchange visits less often, we engage less often in leisure activities that encourage casual social interaction, we spend more time watching (admittedly, some of it in the presence of others) and less time doing. We know our neighbors less well, and we see old friends less often. In short, it is not merely "do good" civic activities that engage us less, but also informal connecting.

As informal social networks and family units have broken down, feelings of social isolation in individuals have increased.[525] A recent study in the UK reveals the following statistics:[526]

- More than an eighth of people (13%) reported themselves as having no close friends.
- Two-fifths (40%) of people who have no close friends also said they never or rarely feel good about themselves.

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[521] Robert D. Putnam, *Bowling Alone: The Collapse and Revival of American Community* (New York: Simon & Schuster Paperbacks, 2000).

[522] Putnam, *Bowling Alone*, 93-115.

[523] Robin I. M. Dunbar, et al., "Social Laughter is Correlated with An Elevated Pain Threshold," *PRSBBS* 279 (2012): 1161-1167. Bronwyn Tarr, et al., "Synchrony and Exertion During Dance Independently Raise Pain Threshold and Encourage Social Bonding," *BioLett* 11 (2015): n.p. [cited 30 August 2019]. Online: https://royalsocietypublishing.org/doi/pdf/10.1098/rsbl.2015.0767. Robin I. M. Dunbar, et al., "Performance of Music Elevates Pain Threshold and Positive Affect: Implications for the Evolutionary Function of Music," *EvoPsy* 10 (2012): 688-702. Katerina V. Johnson and Robin I. M. Dunbar, "Pain Tolerance Predicts Human Social Network Size," *SR* 6 (2016): 25267.

[524] Putnam, *Bowling Alone*, 115.

[525] Miller McPherson, Lynn Smith-Lovin, and Matthew E. Brashears, "Social Isolation in America: Changes in Core Discussion Networks over Two Decades," *ASR* 71 (2006): 353-375.

[526] David Marjoribanks and Anna D. Bradley, "You're Not Alone—The Quality of the UK's Social Relationships," Relate website (March 2017): 3-4 [cited 30 Aug 2019]. Online: https://www.relate.org.uk/sites/default/files/the_way_we_are_now_-_youre_not_alone.pdf.

- Almost half (45%) said they feel lonely at least some of the time, and almost a fifth (18%) said they feel lonely often or all of the time.
- Nearly a sixth (17%) of people reported they never or rarely feel loved.
- Younger people (16-35) were less likely to report having "good" quality relationships, and more likely to state they feel lonely "often or all of the time" than older respondents.

Trends in youth unhappiness correlate with societal changes like the decrease in family meal frequency, even though time together at the dinner table has been shown to be a significant contributor to adolescent psychosocial health.[527] Furthermore, it is in adolescence that we develop a healthy sense of identity and self-worth by seeing ourselves through the loving eyes and affectionate regard of people around us.[528] Yet if such relationships are absent, it becomes more difficult for the young person to form the confident sense of themselves they will need in life.

Unfortunately, as social isolation increases across generations and opportunities for close personal engagement with others decrease, this also means that the natural release of endogenous opioids from healthy social interactions are likely to decrease as well, thus leading to an increase in social pain perceived in the dACC of those who feel lonely and unloved. In fact, research shows that pain tolerance positively predicts the size of one's social network. The larger the network, the greater the pain tolerance of the individual; the smaller the network, the lower the pain tolerance of the individual.[529] Additionally, it has been recognized that social isolation can result in long-term declines in physical and mental health.[530] It can also lead to

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[527] Putnam, *Bowling Alone*, 100-101. Marla E. Eisenberg, et al., "Correlations Between Family Meals and Psychosocial Well-Being Among Adolescents," *AMA* 158 (2004): 792-796. Megan E. Harrison, et al., "Systematic Review of the Effects of Family Meal Frequency on Psychosocial Outcomes in Youth," *CFP* 61 (2015): e96-e106.

[528] Lieberman, *Social*, 77-79, 192-194.

[529] Johnson and Dunbar, "Pain Tolerance," 25267.

[530] Naomi I. Eisenberger and Steve W. Cole, "Social Neuroscience and Health: Neurophysiological Mechanisms Linking Social Ties with Physical Health," *NN* 15 (2012): 669-

unhealthy behaviors (e.g., gambling, drug and alcohol abuse, sexual addiction, smoking, over-eating) which stimulate the brain with dopamine in an effort to compensate for the lack of beneficial neurochemicals normally released by healthy social connections.[531] For example, people who have been traumatized by negative social experiences such as child abuse, neglect, rape, or pervasive social isolation are more likely to turn to opiate abuse and other addictions in an effort to alleviate their emotional pain.[532]

However, there are other behaviors which are considered more socially acceptable, like viewing television,[533] playing video games,[534] surfing the internet,[535] and using Smartphones,[536] that can actually encourage a vicious

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674. Julianne Holt-Lunstad, Timothy B. Smith, and J. Bradley Layton, "Social Relationships and Mortality Risk: A Meta-Analytic Review," *PLoS Medicine* 7 (2010): e1000316. Angie S. LeRoy, et al., "Loneliness Predicts Self-Reported Cold Symptoms After a Viral Challenge," *HP* 36 (2017): 512-520. John T. Cacioppo and L. C. Hawkley, "Perceived Social Isolation and Cognition," *TCS* 13 (2009): 447-454.

[531] Jaak Panksepp, *Affective Neuroscience: The Foundations of Human and Animal Emotions* (New York: Oxford University Press, 1998). Howard J. Shaffer, ed., *Overcoming Addiction: Finding an Effective Path Toward Recovery* (Boston, Mass.: Harvard Health Publications, 2017), 7-11.

[532] Eisenberger, "Why Rejection Hurts," 587-588.

[533] Steve Sussman and Meghan B. Moran, "Hidden Addiction: Television," *JBA* 2 (2013): 125-132.

[534] United States Institute of Medicine, "The Neuroscience of Gaming: Workshop in Brief," National Center for Biotechnology Information website [cited 30 August 2019]. Online: https://www.ncbi.nlm.nih.gov/books/NBK274562/. Mark Zastrow, "Is Video Game Addiction Really an Addiction? Adding Video Gaming to the List of Recognized Behavioral Addictions Could Help Millions in Need. It Could Also Pathologize a Normal Behavior and Create a New Stigma," *PNASUSA* 114 (2017): 4268-4272.

[535] Christopher E. Sanders, et al., "The Relationship of Internet Use to Depression and Social Isolation Among Adolescents," *Adolescence* 35 (2000): 237-242. Kira E. Riehm, Kenneth A. Feder, and Kayla N. Tormohlen, "Associations Between Time Spent Using Social Media and Internalizing and Externalizing Problems Among US Youth," *JAMA Psychiatry*, (11 September 2019): 1-9 [cited 14 September 2019]. Online: https://jamanetwork.com/journals/jamapsychiatry/article-abstract/2749480.

[536] Trevor Haynes, "Dopamine, Smartphones & You: A Battle for Your Time," Harvard University website (1 May 2018): n.p. [cited 30 August 2019]. Online: http://sitn.hms.harvard.edu/flash/2018/dopamine-smartphones-battle-time/. Isaac Vaghefi, Liette Lapointe, and Camille Boudreau - Pinsonneault, "A Typology of User Liability to IT Addiction," *Information Systems Journal* 27 (2017): 125-169. Niaz M. Muhammad, et al., "How the Use of iPad and Smartphones Creates Social Isolation," in *Proceedings of the Society for Information Technology and Teacher Education International Conference (18 March 2019), Las Vegas, NV* (ed. K. Graziano; Chesapeake, Va.: Association for the Advancement of Computing in Education, 2019), 1060-1065.

cycle of social isolation as well. This is because they, too, release the pleasure-inducing neurochemical dopamine in the brain which can temporarily smother feelings of social isolation. But since they are activities that are often engaged in alone, they steal time away from human face-to-face encounters that encourage empathetic relationships. Then, because time has not been invested in socializing with others and developing friendships, it is all too easy for emotionally isolated people to spend their free time alone on their screens. This effectively prevents them from facially engaging with others which would then indirectly facilitate the release of endogenous opioids in the lonely person's dACC. In short, a lack of face time leads to a lack of pain relief. These data also strongly suggest that the hedonistic pursuit of self-oriented pleasure can actually lead to increased social isolation and sensitivity to pain in the long-run, whereas self-giving dispositions focused upon developing I-Thou relationships lead to healthy social networks and increased mitigation of both physical and social pain.

Not only are we hardwired in such a way that pain is an evolutionary means of drawing us together socially,[537] but *we are also neurologically equipped and rewarded for responding empathetically to the pain of others*[538] *which assists us in fulfilling the commandment to "love your neighbor as yourself"* (Matt 22:37–39). This finding would be anticipated if self-giving I-Thou relationships are intended to reduce pain in a world created by a love-oriented God. In such a world, it is therefore unsurprising to discover that empathetic caregiving has been hardwired into more highly evolved creatures through the engagement of mirror neurons, the mentalizing system, and the septal area of the brain.

The *mirror system*, which has also been shown to be present in other primates, is found in the premotor cortex of the frontal lobe as well as the

[537] Lieberman, *Social*, 98-100.
[538] Lieberman, *Social*, 131-161.

anterior intraparietal sulcus and inferior parietal lobule.[539] The mirror system 1) plays a significant role in the ability to imitate others and 2) enables us to understand what others are thinking. The *mentalizing system* involves the dorsomedial prefrontal cortex, the temporoparietal junction, the precuneus/posterior cingulate cortex, and the temporal poles.[540] This mentalizing system helps us to understand the intentions behind what someone else is doing.[541] Together, the mirror system *detects* what is happening, and the mentalizing system *interprets* why it is happening.

For example, when we see a young baby yawn across the room, our *mirror system* detects *what* she is doing—she is stretching out her mouth widely as her eyes close. Our *mentalizing system* interprets *why* the baby is yawning—the baby is yawning because she is sleepy. This ability to interpret the actions of others is also known as *mindreading*. If we also feel the urge to yawn along with the baby, we are exhibiting a response known as *affect matching*, which refers to experiencing the same feelings as another.[542] This is also probably why we physically cringe when we see animals being attacked or devoured by other

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[539] Lieberman, *Social*, 135. Marco Iacoboni, et al., "Cortical Mechanisms of Human Imitation," *Science* 286 (1999): 2526-2528. Vittorio Gallese, "The 'Shared Manifold' Hypothesis. From Mirror Neurons to Empathy," *JConS* 8 (2001): 33-50. Michael A. Arbib, "From Mirror Neurons to Complex Imitation in the Evolution of Language and Tool Use," *Annual Review of Anthropology* 40 (2011): 257-273. Vilayanur Ramachandran, "Mirror Neurons and Imitation Learning as the Driving Force Behind the Great Leap Forward in Human Evolution," Edge website (31 May 2000): n.p. [cited 31 August 2019]. Online: https://www.edge.org/conversation/mirror-neurons-and-imitation-learning-as-the-driving-force-behind-the-great-leap-forward-in-human-evolution.

[540] Lieberman, *Social*, 116.

[541] Robin R. Vallacher, and Daniel M.Wegner, "What Do People Think They're Doing? Action Identification and Human Behavior," *PsyRev* 94 (1987): 3-15. Marcel Brass, et al., "Investigating Action Understanding: Inferential Processes versus Action Simulation," *CB* 17 (2007): 2117-2121. Floris P. de Lange, et al., "Complementary Systems for Understanding Action Intentions," *CB* 18 (2008): 454-457. Robert P. Spunt, Ajay B. Satpute, and Matthew D. Lieberman, "Identifying the What, Why, and How of an Observed Action: An fMRI Study of Mentalizing and Mechanizing During Action Observation," *JCN* 23 (2011): 63-74. Robert P. Spunt and Matthew D. Lieberman, "An Integrative Model of the Neural Systems Supporting the Comprehension of Observed Emotional Behavior," *NeuroImage* 59 (2012): 3050-3059. Robert P. Spunt and Matthew D. Lieberman, "Dissociating Modality-Specific and Supramodal Neural Systems for Action Understanding," *JNSci* 32 (2012): 3575-3583.

[542] Lieberman, *Social*, 152-155.

animals during nature documentaries like Blue Planet or National Geographic. This, too, is *affect matching.* When we see others getting hurt, it activates our dACC as well as the anterior insula so that we actually experience the distressing aspect of pain to some degree as well.[543]

Affect matching was demonstrated using functional imaging of the brain in an experiment where women lay inside a scanner as their boyfriends sat nearby.[544] Electrodes were attached to the arms of both the women and the boyfriends, and both were shocked independently of each other. The researchers found that the women's dACC activated with pain both when they themselves received a shock as well as whenever they witnessed their boyfriends being shocked. Since the distressing aspect of pain was activated in the brain regardless of who was actually receiving the electric shocks, it shows that it can be just as painful to watch a loved one in pain as it is to feel physical pain oneself.

This empathetic affect matching is not limited to human beings because it is a trait found in other birds and mammals as well, like geese and mice. Geese equipped with heart rate monitors were surveilled along with their mate. When one bird would get into a fight, the heart of its partner would start racing.[545] This suggests an empathetic response between mated geese similar to that which was demonstrated in human couples separately receiving electric shocks as discussed above.

A similar empathy was observed between mice who lived together. Mice who were cagemates were placed in an environment where one mouse received diluted acetic acid solution to produce a stomach ache while the other

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[543] Alessio Avenanti, et al., "Transcranial Magnetic Stimulation Highlights the Sensorimotor Side of Empathy for Pain," *NN* 8 (2005): 955-960.

[544] Tania Singer, et al., "Empathy for Pain Involves the Affective but Not Sensory Components of Pain," *Science* 303 (2004): 1157-1162.

[545] Waal, *Bonobo*, 6.

mouse could observe the uncomfortable mouse through glass.[546] The mouse with stomach ache would make stretching movements in response to the discomfort. In turn, the pain sensitivity of the mouse watching its distressed cagemate would increase, as though experiencing the other mouse's pain for itself. Interestingly, the observer mouse did *not* exhibit increased pain sensitivity when the distressed mouse was an unfamiliar stranger from another cage. Like the human couples and mated geese, this experiment illustrates that empathetic affect matching occurs among mice when they too are closely familiarized with one another.

Happily, pleasant feelings can be shared through affect matching as easily as distressful feelings, with positive experiences activating the reward system in the ventromedial prefrontal cortex.[547] This is made possible in humans because our faces subtly mirror the expressions of other people we are watching, which helps us to actually "feel" the same emotion as the other person.[548] As it happens, a person who has received Botox injections will have more difficulty identifying the emotions of others because their own facial muscles will be less expressive from paralyzation.[549] However, under normal conditions, *mindreading* (recognizing another's emotions) accompanied by *affect matching* (feeling another's emotions) can ultimately lead to *empathetic motivation* (the desire to help).

The brain region that is associated with empathetic motivation is the *septal area.* It appears that the septal area receives input from the other brain

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[546] Dale J. Langford, et al., "Social Modulation of Pain as Evidence for Empathy in Mice," *Science* 312 (2006): 1967-1970.

[547] Lieberman, *Social*, 157.

[548] Ulf Dimberg, Monika Thunberg, and Kurt Elmehed, "Unconscious Facial Reactions to Emotional Facial Expressions," *PS* 11 (2000): 86-89. Bruno Wicker, et al.,"Both of Us Disgusted in My Insula: The Common Neural Basis of Seeing and Feeling Disgust," *Neuron* 40 (2003): 655-664. Laurie Carr, et al., "Neural Mechanisms of Empathy in Humans: A Relay from Neural Systems for Imitation to Limbic Areas," *PNASUSA* 100 (2003): 5497-5502.

[549] David T. Neal and Tanya L. Chartrand, "Embodied Emotion Perception Amplifying and Dampening Facial Feedback Modulates Emotion Perception Accuracy," *SPPS* 2 (2011): 673-678.

regions associated with empathetic *mindreading* and *affect matching* and "converts them to the urge to be helpful" (*empathetic motivation*).[550] In other words, it appears that human beings as well as other mammals are hardwired to be mutually-supportive.

Researchers developed an fMRI study that captured the neural components of empathy.[551] For two weeks, subjects filled out a daily survey which recorded what they experienced and what they did. The researchers observed that people who demonstrated higher levels of activity in the septal area tended to be the same people who were more helpful to others in their daily lives. It should be noted that the septal region of the brain has a very high density of oxytocin receptors and is also associated with reward processes.[552] Adjacent to the septal region is the ventral striatum and the ventral tegmental areas which scientists believe may induce oxytocin-dopamine social rewards associated with nurturing behaviors.[553] Oxytocin is a social reward neuropeptide[554] which helps mammals overcome feelings of distress and encourages the caregiving of others.[555]

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[550] Lieberman, *Social*, 157.

[551] Sylvia A. Morelli, Lian T. Rameson, and Matthew D. Lieberman, "The Neural Components of Empathy: Predicting Daily Prosocial Behavior," *SCAN* 9 (2014): 39-47.

[552] Lieberman, *Social*, 158-161. Thomas R. Insel, R. Gelhard, and L. E. Shapiro, "The Comparative Distribution of Forebrain Receptors for Neurohypophyseal Peptides in Monogamous and Polygamous Mice," *Neuroscience* 43 (1991): 623-630. James Olds and Peter Milner, "Positive Reinforcement Produced by Electrical Stimulation of Septal Area and Other Regions of Rat Brain," *JCPP* 47 (1954): 419-427. Robert G. Heath, "Pleasure and Brain Activity in Man," *JNMD* 154 (1972): 3-18.

[553] Lieberman, *Social*, 94. D. K. Shahrokh, et al., "Oxytocin-Dopamine Interactions Mediate Variations in Maternal Behavior in the Rat," *Endocrinology* 151 (2010): 2276-86. Marcelo Febo, Michael Numan, and Craig F. Ferris, "Functional Magnetic Resonance Imaging Shows Oxytocin Activates Brain Regions Associated with Mother-Pup Bonding During Suckling," *JNSci* 25 (2005): 11637-11644.

[554] Lin W. Hung, et al., "Gating of Social Reward by Oxytocin in the Ventral Tegmental Area," *Science* 357 (2017): 1406-1411. Joseph V. Brady and Walle J. H. Nauta, "Subcortical Mechanisms in Emotional Behavior: Affective Changes Following Septal Forebrain Lesions in the Albino Rat," *JCPP* 46 (1953): 339-346.

[555] Tristen K. Inagaki and Naomi I. Eisenberger, "Neural Correlates of Giving Support to a Loved One," *PM* 74 (2012): 3-7. Richard A. Depue and Jeannine V. Morrone-Strupinsky, "A Neurobehavioral Model of Affiliative Bonding: Implications for Conceptualizing a Human Trait of Affiliation," *BBS* 28 (2005): 313-395.

A good example of this empathetic caregiving can be illustrated by the chimpanzee community located at Emory University: [556]

> An old female, Peony, spends her days outdoors with other chimpanzees at the Yerkes Primate Center's field station. On bad days, when her arthritis is flaring up, she has trouble walking and climbing, but other females help her out. Peony may be huffing and puffing to get up into the climbing frame in which several apes have gathered for a grooming session. But an unrelated younger female moves behind her, placing both hands on her ample behind to push her up with quite a bit of effort, until Peony has joined the rest.
>
> We have also seen Peony get up and slowly move toward the water spigot, which is at quite a distance. Younger females sometimes run ahead of her, take in some water, then return to Peony and give it to her. At first, we had no idea what was going on, since all we saw was one female placing her mouth close to Peony's, but after a while the pattern became clear: Peony would open her mouth wide, and the younger female would spit a jet of water into it.

Here we see empathetic caregiving being offered by younger females to an older chimpanzee to which they are not related. It is notable that while they do not typically help one another onto the climbing frame, they help Peony because they can 1) see and understand she is having pain and physical difficulty (*mindreading*), 2) understand how it would feel to be left out of the social grooming gathering (*affect matching*), and therefore 3) help Peony to climb up into the frame with the others (*empathetic motivation*). This can also be seen when they help bring her water. They 1) see and understand her physical discomfort covering the distance to the water source (*mindreading*), 2) know how it feels to be thirsty (*affect matching*), and therefore 3) bring the water directly to Peony's mouth from their own mouths (*empathetic motivation*).

In humans, the oxytocin release associated with empathy can help us overcome the urge to avoid situations that may involve unpleasant or

[556] Waal, *Bonobo*, 4-5.

hazardous conditions, like vomit (e.g., a sick child), blood (e.g., an injured victim), or danger (e.g., a burning house) and approach the person(s) in need and help them instead.[557] This effect can be observed in other animals, too, like dolphins who "save companions by biting through harpoon lines or by hauling them out of nets in which they have gotten entangled" and whales who place themselves between their injured companion and a hunter's boat or capsize the boat in order to protect their wounded fellows.[558] Empathetic assistance has even been observed in rats — when faced with the choice between obtaining chocolate chips or freeing a trapped fellow rat, the test rat (usually) frees the ensnared cagemate.[559] In other words, empathy turns understanding of another's pain into a motivation to act even under hazardous circumstances.

Interestingly, it appears that fear for others who are in life-threatening situations can also initiate stress-induced analgesia in empathetic bystanders who are motivated to help. An example of this was observed in a church setting when an older member of the choir collapsed during a concert. A young female pastor ran through the building to return with an Automated External Defibrillator (AED) for the collapsed elderly female. The young woman then left again, racing across the church grounds in order to find the security officer and request that an ambulance be called. It was only when the pastor returned home two hours later and took off her shoes that she discovered she could no longer walk from the sudden pain in her foot. Sometime during the four minutes she had been running around the church campus, she had pulled a ligament on the bottom of her foot so severely that she needed to wear a medical support boot for eight weeks until it healed. Yet, she never felt herself receive the injury while she was running on adrenaline over her concern for the fallen parishioner. This account illustrates that we are

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[557] Lieberman, *Social*, 94. Gareth Leng, Simone L. Meddle, and Alison J. Douglas, "Oxytocin and the Maternal Brain," *GEMDCOP* 8 (2008): 731-734.

[558] Waal, *Good Natured*, 40-41.

[559] Waal, *Bonobo*, 142-143.

not only motivated to act out of empathy when we see someone in danger, but stressed-induced analgesia may even be induced in us when we are in fear for *someone else's* life. Therefore, it appears that nature has equipped us physiologically and neurologically to connect together socially and help our fellows in empathetic love.

Section 5.4.3 The Empathetic Motivation to Ease the Suffering of Others

This evidence undermines claims from some that human beings have evolved to be selfish. In *The Selfish Gene*, Richard Dawkins made the following assertion:[560]

> Be warned that if you wish, as I do, to build a society in which individuals cooperate generously and unselfishly towards a common good, you can expect little help from biological nature. Let us try to teach generosity and altruism, because we are born selfish.

However, evidence coming from multiple areas of research supports the notion that many species including human beings have evolved to cooperate, making Dawkins' assertion unsustainable.[561] Anglican priest, theologian, and philosopher Sarah Coakley and Harvard mathematical biologist Martin A. Nowak point out in *Evolution, Games, and God* that cooperation within a species can actually facilitate its evolutionary success whereas a critical level of selfishness amongst the group can lead towards its failure:[562]

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[560] Richard Dawkins, *The Selfish Gene* (New York: Oxford University Press, 2006), 3.

[561] Oliver S. Curry, Daniel A. Mullins, and Harvey Whitehouse, "Is It Good to Cooperate? Testing the Theory of Morality-as-Cooperation in 60 Societies," *Current Anthropology* 60 (2019): 47-69. Jonathan Haidt, "The Emotional Dog and Its Rational Tail: A Social Intuitionist Approach to Moral Judgment," *PsyRev* 108 (2001): 814-834. Lieberman, *Social*, 71-100. James K. Rilling, et al., "Opposing BOLD Responses to Reciprocated and Unreciprocated Altruism in Putative Reward Pathways," *NeuroReport* 15 (2004): 2539-2543.

[562] Sarah Coakley and Martin A. Nowak, "Why Cooperation Makes a Difference," in *Evolution, Games, and God: The Principle of Cooperation* (eds. Martin A. Nowak and Sarah Coakley; Cambridge, Mass.: Harvard University Press, 2013), 11.

> Among the major achievements of mathematicalized evolutionary theory to date, as we have seen, are the clarification of a variety of circumstances in which cooperation can take a hold in populations over time, despite the apparently overwhelming unlikelihood of such an outcome, and the demonstration, *vice versa*, that a consistent and thoroughgoing manifestation of "defection" [selfishness] in a population leads to that population's evolutionary decline.

The Social Conquest of Earth by biologist and entomologist Edward O. Wilson supports this with data showing that humans as well as other species that cooperate are among the most evolutionarily successful species on the planet, undermining Dawkins' contention that selfishness wins in the evolutionary race. Wilson also counters socio-biologists who use *kin selection* (also known as *inclusive-fitness theory*) to argue that altruistic behaviors are actually genetically self-serving acts in disguise.

Evolutionary biologist William D. Hamilton's inclusive-fitness theory claims that the degree of altruism a creature or person will exhibit is determined by *b* (the benefit to the recipient of the altruism), multiplied by *r* (the degree of genetic kinship the giver has with the recipient), compared to *c* (the cost to the altruist). The contention is that as the product of *rb* becomes greater than *c*, depicted mathematically as $rb > c$, then altruism from the giver becomes more likely. In other words, kin selection is a subtle way of suggesting that altruistic behavior in humans and non-humans is actually a form of selfishness in disguise; the altruistic creature may appear to be making a costly sacrifice, but on a subconscious level, they are simply ensuring that any genetic material similar to their own is successfully passed on to the next generation.

However, Wilson, once an advocate of inclusive-fitness theory, now argues forcefully against it because:[563]

[563] Wilson, *Social Conquest*, 180.

> [It is a] special mathematical approach with so many limitations as to make it inoperable. It is not a general evolutionary theory as widely believed, and it characterizes neither the dynamics of evolution nor the distributions of gene frequencies. In the extreme cases where inclusive-fitness theory might work, biological conditions are required that demonstrably do not exist in nature.

Wilson's criticisms include the observation that "there is no consistent biological concept behind the 'relatedness' parameter [*r*]."[564] He notes that researchers regularly apply different definitions for *r* as needed to make Hamilton's inequality work, effectively making the theory a useless tool for either designing experiments or analyzing data. Wilson further observes that there have been circumstances in the literature where the common possession of a single allele in the DNA sequence – whether it was obtained through pedigree or unrelated mutations – was considered "relatedness." Even more seriously, such an approach has caused the abandonment of the normal procedure of the scientific method where theories are developed to fit the data:[565]

> Unwarranted faith in the central role of kinship in social evolution has led to the reversal of the usual order in which biological research is conducted. The proven best way in evolutionary biology, as in most of science, is to define a problem arising during empirical research, then select or devise the theory that is needed to solve it. Almost all research in inclusive-fitness theory has been the opposite: hypothesize the key roles of kinship and kin selection, then look for evidence to test that hypothesis.

Wilson cites experiments where scientists presented their data as correlative evidence of kin selection, yet neglected to have controls to eliminate the possibility that other factors were contributing to the observed behaviors.[566] He accurately notes that the most serious flaw of this approach is that it eliminates

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[564] Wilson, *Social Conquest*, 173.
[565] Wilson, *Social Conquest*, 175.
[566] Wilson, *Social Conquest*, 176-180.

the consideration of multiple competing hypotheses.[567] Wilson concludes that when interpreting biological data, "standard natural selection is appropriate for all cases, whereas the interpretation by kin selection, although possible in a very few cases, cannot be generalized to cover all situations without stretching the concept of 'relatedness' to the point where it loses meaning."[568] Consequently, upon closer inspection, arguments using *kin selection* or *inclusive-fitness theory* to undermine acts of unselfish altruism in creatures or persons are unlikely to be tenable.

Claims of genetically selfish altruism are further undermined by empirical observations of inter-species altruism where concepts of genetic-relatedness are unwarranted. For example, humpback whales were observed helping a mother gray whale protect her calf from attacking killer whales.[569] Whale researcher Alisa Schulman-Janiger described the humpback whales as being extremely distressed over the situation, even putting themselves in danger by diving right alongside the gray whale mother while her baby was under assault. She noted that humpbacks had also been observed saving a seal from orcas in the Antarctic. Dr. Lori Morino, neuroscientist and expert on animal behavior and intelligence at Emory University explains:[570]

> This is apparently a case of humpback whales trying to help a member of another cetacean species. This shows that they are capable of tremendous behavioral flexibility, giving even more credence to reports of cetaceans coming to the aid of human beings. They seem to have the capacity to generalize from one situation to another and from one kind of being to another. Moreover, they seem to sympathize with members of other species and have the motivation to help.

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[567] Wilson, *Social Conquest*, 175.

[568] Wilson, *Social Conquest*, 174.

[569] Candace Calloway Whiting, "Humpback Whales Intervene in Orca Attack on Gray Whale Calf," *Digital Journal* (8 May 2012): n.p. [cited 31 March 2021]. Online: http://www.digitaljournal.com/article/324348.

[570] Whiting, "Humpback Whales": n.p.

> One reason may be that humpback whales, and many other cetaceans, have specialized cells in their brains called Von Economo neurons ("spindle cells") and these are shared with humans, great apes, and elephants. […]
>
> What is intriguing is that these parts of the mammal brain are thought to be responsible for social organization, empathy, speech, intuition about the feelings of others, and rapid "gut" reactions. So the presence of these cells is neurological support for the idea that cetaceans are capable of empathy and higher-order thinking and feeling.

This cross-species empathetic helping can be observed in other animals as well. Emory primatologist and ethologist Frans de Waal recounts the time he observed a bonobo rescuing a bird that had stunned itself after flying into a glass window.[571] There are many accounts of mother cats adopting puppies[572] and mother dogs adopting kittens.[573] Another example of cross-species empathetic assistance can be seen in an incident which occurred on Marco Island, Florida where a group of dolphins assisted a dog which had fallen off the canal wall into the water.[574] The dog had been in the water for nearly 15 hours and was exhausted with cold. No one knew where the missing dog was until they heard the dolphins raising a cacophony that reached neighbors as far

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[571] Waal, *Bonobo*, 145-146.

[572] Lily Feinn, "Cat Mom Adopts Orphaned Litter of Puppies and Raises Them as Her Own," *Dodo* (4 October 2019): n.p. [cited 31 March 2021]. Online: https://www.thedodo.com/close-to-home/cat-adopts-litter-of-puppies. Nicole Pelletiere, "Orphaned Puppy Adopted by Mother Cat and Litter of Kittens," *ABC News* (25 April 2016): n.p. [cited 31 March 2021]. Online: https://abcnews.go.com/Lifestyle/abandoned-puppy-adopted-mother-cat-litter-kittens/story?id=38652728.

[573] Jenni Julander, "Mother Dog 'Adopts' Litter of 5 Kittens in Need After Their Mom Goes Missing," *Epoch Times* (4 February 2021): n.p. [cited 31 March 2021]. Online: https://www.theepochtimes.com/mother-dog-adopts-litter-of-5-kittens-in-need-after-their-mom-goes-missing_3448126.html. Gabe Trujillo, "Mother Dog 'Adopts' Orphaned Kittens After Losing her Puppies After Birth," *12News* (28 August 2020): n.p. [cited 31 March 2021]. Online: https://www.msn.com/en-us/news/us/mother-dog-adopts-orphaned-kittens-after-losing-her-puppies-after-birth/ar-BB18tOQR.

[574] Louise Bevan, "Dog Falls Into Canal and Can't Get Out, Then These Noisy Dolphins Come to His Rescue," *Epoch Times* (3 November 2019): n.p. [cited 31 March 2021]. Online: https://www.theepochtimes.com/dolphins-rescue-an-exhausted-dog-drowning-in-florida-canal-in-the-most-incredible-way_2943197.html?fbclid=IwAR3yXG-gEFjJYgv2iAEz57HWcfy_obNqpEepOc-XyHR5N9V03eFiaNfIdhw.

as a half-mile away, noisily drawing the attention of people on shore until they rescued the dog. Dolphins have come to the aid of humans as well, such as when a dolphin pod surrounded an injured surfer who had been bitten by a Great White shark in 2007.[575] The bleeding surfer was able to survive because the ring of dolphins protected him from further attacks until he could get back to shore.

Not only do these accounts demonstrate that empathetic responses to distress can occur across species, but that many species help those different from themselves even when there may be physical risk to oneself, as was the case of the humpback whales protecting the baby gray whale and its mother during orca attacks and the dolphin pod who protected the surfer from the Great White shark. In none of these examples was there a genetic benefit to be gained by helping the distressed creature from another species. On the contrary, the more dangerous scenarios *decreased* the likelihood that the protectors would pass their genetics on to their offspring because they could have been killed by either the killer whales or shark. Therefore, these observations undermine kin selection claims that altruism is just genetically self-serving behavior in disguise.

However, when others insinuate that altruistic acts in humans are merely the work of selfishness, it should be noted the neuroscience undercuts these claims as well.[576] For example, Michael Ghiselin, an American biologist who researched sea slugs famously wrote, "Scratch an 'altruist' and watch a 'hypocrite' bleed."[577] Yet researchers have put this to the test, and the claim is found wanting.

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[575] Mike Celizic, "Dolphins Save Surfer from Becoming Shark's Bait," *Today* (8 November 2007): n.p. [cited 31 March 2021]. Online: https://www.today.com/news/dolphins-save-surfer-becoming-sharks-bait-2D80555123.

[576] Lieberman, *Social*, 71-100.

[577] Michael T. Ghiselin, *The Economy of Nature and the Evolution of Sex* (Berkeley, Calif.: University of California Press, 1974), 274.

Psychologist Daniel Batson set up a clever study where one person (the observer) had to watch a stranger (the victim) receive painful electrical shocks:[578]

> The victim was clearly very bothered by the shocks and at one point asked if the shocks could be stopped. The experimenter then asked the observer if he would take the victim's place and receive the remainder of the shocks.

The options given to the observers varied at this point in the experiment:

- Some observers were given the option of either receiving the shocks or continuing to watch the victim being shocked (*switch-or-stay*).
- Other observers were giving the option of either receiving the shocks or going home (*switch-or-leave*).
- The observers who were given the option to *switch-or-stay* were much more likely to switch places with the suffering victim than the observers given the option to *switch-or-leave*.
- This suggests that when people are unable to escape viewing another's suffering, they are more likely to take that pain upon themselves than when there is an easy way to leave the situation.

However, the results changed when "observers had been induced to feel empathy for the victim before the shock procedure began."[579] Like before, observers who were offered the choice to *switch-or-stay* were very likely to take the place of the victim. But unexpectedly, those observers who were offered the chance to escape (*switch-or-leave*) after having developed an empathetic relationship with the victim became the group *most likely to switch places with the suffering victim*, with 91% of this group taking the victim's place. It must be noticed that nothing else changed in this experiment except for the fact that the observers had become empathetically attached to the victim. Therefore, when this group was free to choose between walking away or staying behind and

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[578] Quote from Lieberman, *Social*, 87. Daniel Batson, *The Altruism Question: Toward a Social-Psychological Answer* (Hillsdale, N. J.: Erlbaum, 1991), 109-119.

[579] Lieberman, *Social*, 88.

suffering in the victim's place, they did so because of empathy. That is, their empathetic understanding of another's pain motivated them to act in such a way as to alleviate the pain of the sufferer, even when that meant bearing the cost of that pain themselves, thus countering claims that human beings evolved to be selfish.

Section 5.4.4 The Theological Responsibility of Non-Sufferers to Comfort Sufferers

So, when humans receive empathetic love and supportive words from other persons (whether humans or God), opioid-based pleasure responses are activated in the brain which decrease the distressing aspect of their pain.[580] On the other hand, negative social interactions can amplify the emotional distress of physical pain and would explain why patients who felt God was against them would experience more pain, mental anguish, and poorer health outcomes.[581] This is why the behavior of Job's friends was such a betrayal.

The friends were supposed to share Job's grief to ease his pain so that he might be consoled and find comfort,[582] and the medical evidence demonstrates that their empathetic support *would* have mitigated Job's emotional and physical pain. Instead, they slandered his character, poured scorn and anger upon him, and told him God had rejected him as well. As has been mentioned, when a suffering person believes that God is against them or people despise and abandon them, it *intensifies* their experience of pain. In other words, Job's misguided friends actually succeeded in making his pain worse than what Satan could inflict on his own! It must be observed that at the end of the story, it was not the sufferer Job who needed to atone for his sins, but his healthy

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[580] Lieberman, *Social*, 92-93. Brown et al., "Social Support," 276-283. Issidoros Sarinopoulos et al., "Patient-Centered Interviewing is Associated with Decreased Responses to Painful Stimuli: An Initial fMRI Study," *PEC* 90 (2013): 220-225.

[581] Eisenberger, "Pain of Social Disconnection," 421-434. Kross et al., "Social Rejection," 6270-6275.

[582] Tsevat, "Book of Job," 4. Hartley, *Book of Job*, 85.

friends (Job 42:7–9). Not only did they speak falsely about God and Job, they did not even support Job in his time of need and thereby intensified his pain.

This brings us to the theological purpose of pain in creation. It is true that pain is biologically necessary in order for more highly evolved creatures to survive with longer lifespans. It is also true that pain warns us of both injured bodies and injured relationships with either fellow human beings or God. But ultimately, suffering is a test where the children of God reveal whether they will choose to love, even when it is costly. Yet, suffering is not only a "test" for those who suffer; rather, *the greater test is for those who do not.*

Will *we* love others and mitigate their suffering even when it is costly to us? It is not enough to claim, "I am not hurting anybody…." As the medical evidence shows, when we are physically and emotionally unavailable to others, we leave them to sit alone in their pain. To say it another way, suffering is not caused by pain alone, but by having to endure our pain alone.

It should not go unnoticed that the choice whether or not to care for those who suffer is the criterion that Jesus will use to pass judgment upon the righteous and the condemned (Matt 25:34–46 NIV):

> "Then the King will say to those on his right, 'Come, you who are blessed by my Father; take your inheritance, the kingdom prepared for you since the creation of the world. For I was hungry and you gave me something to eat, I was thirsty and you gave me something to drink, I was a stranger and you invited me in, I needed clothes and you clothed me, I was sick and you looked after me, I was in prison and you came to visit me. […] Truly I tell you, whatever you did for one of the least of these brothers and sisters of mine, you did for me.'
>
> "Then he will say to those on his left, 'Depart from me, you who are cursed, into the eternal fire prepared for the devil and his angels. For I was hungry and you gave me nothing to eat, I was thirsty and you gave me nothing to drink, I was a stranger and you did not invite me in, I needed clothes and you did not clothe me, I was sick and in prison and you did not look after me. […] I tell you

> the truth, whatever you did not do for one of the least of these, you did not do for me.' Then they will go away to eternal punishment, but the righteousness to eternal life."

Similarly, in the story of Lazarus and the rich man *both* men were tested with suffering (Luke 16:19–31). Lazarus lay at the city gate: a poor, helpless, starving man covered in sores. The rich man's fine linen and luxurious purple fabric indicated that his wealth was beyond count,[583] yet as he walked past Lazarus each day, he could not be bothered with the meager cost that feeding and caring for Lazarus would entail. After both men died, it was revealed that Lazarus who endured earthly suffering was taken to heaven, and the rich man who failed to take pity on the sufferer was sent to endure his own suffering in the underworld below. As Jesus warned in Luke 16:10–11 (NIV):

> "Whoever can be trusted with very little can also be trusted with much, and whoever is dishonest with very little will also be dishonest with much. So if you have not been trustworthy in handling worldly wealth, who will trust you with true riches?"

It should be pointed out that the preceding biblical passages are not just referring to the use of material wealth to alleviate suffering, but to all the blessings each person has been given to share, including their time, their presence, and their hearts. Empathetic love offered by the non-sufferer to the sufferer may be the very fruit God seeks from his children, identifying them so they may be separated like wheat from the tares in the day the angels harvest the world (Matt 13:24–30, 36–43).

Section 5.5 Social Connections Comfort Mammals and Birds

Like human beings, mammals and birds experience intense psychological pain when they are socially isolated, but that pain disappears when they are

[583] Craig S. Keener, *The IVP Bible Background Commentary: New Testament* (Downers Grove, Ill.: IVP Academic, 1993), 235-236.

reunited with their fellows.[584] The *brain opioid theory of social attachment* reveals that positive social connections that begin with the caregiver-infant relationship release endogenous opioids that soothe the psychologically distressing aspect of pain in the brain whether that pain is caused by physical injury or social disconnection.[585] A good illustration of the power of comforting presence can be found in an example involving human infants.

Unlike human adults who can often be comforted through conversation, listening, or humor as discussed in the previous passages, human babies cannot be consoled in this manner. Instead, the caregiver usually soothes the infant with gentle words, delicate touch, and cradling movements. However, it has also been discovered that the relational aspect of human singing is an unexpected source of comfort to prematurely born babies.[586] Studies have begun to document the influence of music therapy (MT) on premature babies in the neonatal intensive care unit (NICU) setting. Music therapy can involve music recording, parental voices, and sung lullabies. This caregiver-infant relational behavior has been shown to improve oxygen saturation levels, heart and respiratory rates as well as enhance the sleep, feeding behavior and weight gain in premature infants more than those who have not been exposed to music therapy.[587] Interestingly, lullabies sung to these babies in person had a stronger effect on vital signs and activity level than recordings, suggesting that live vocal contact can improve and sustain longer periods of the healthful quiet-alert state[588]—a finding anticipated in light of *the brain opioid theory of social attachment* which emphasizes the importance of personal interactions. Furthermore,

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[584] Ned H. Kalin, Steven E. Shelton, and Deborah E. Lynn, "Opiate Systems in Mother and Infant Primates Coordinate Intimate Contact During Reunion," *Psychoneuroendocrinology* 20 (1995): 735-742.

[585] Lieberman, *Social*, 39-56.

[586] Jayne M. Standley, "The Role of Music in Pacification/Stimulation of Premature Infants with Low Birthweights," *MTP* 9 (1991): 19-25.

[587] Joanne Loewy, et al., "The Effects of Music Therapy on Vital Signs, Feeding, and Sleep in Premature Infants," *Pediatrics* 131 (2013): 902-918.

[588] Loewy, et al., "Music Therapy," 908.

medical data were analyzed for infants treated in the NICU who were born with low birth weight (<2499 grams) and born before 36 gestation weeks.[589] The infants that received NICU-MT:

- Tended to be "the smallest, lowest birth-weight infants,"
- "Gained more weight/day than did infants not referred for MT,"
- "Were discharged sooner than non-music infants" among the very premature 24-28 gestational week age range.

These findings provide another example of the profound impact relationships have on the physiological well-being of social creatures, and that healthy development begins with the caregiver-infant bond.

Jaak Panksepp describes the universality and importance of this neurophysiological association across mammalian species:[590]

> Even when all their other bodily needs are assured, young animals promptly begin to distress vocalize (DV) when socially isolated and they typically continue to cry till exhaustion unless reunited with key stimuli of their normal social environment. This reaction to separation is immediate, reflex-like and consistent across different animals, and its expression appears to require no previous learning. The response has broad species generality and has been

[589] Jayne M. Standley, "NICU Music Therapy: Post Hoc Analysis of an Early Intervention Clinical Program," *TAP* 38 (2011): 36-40.

[590] Panksepp et al., "Endogenous Opioids," 473.

studied in chickens,[591] guinea pigs[592] and kittens,[593] puppies,[594] monkeys,[595] and humans.[596]

Panksepp's research demonstrated that only endogenous brain opiates (naturally occurring opioids produced by the creature itself) could be responsible for decreasing the distress vocalization (crying) of socially isolated guinea pigs, chicks, and puppies.[597] It was this finding that led him to realize that the administration of morphine could simulate the presence of the mother on a neurochemical level to these infant animals.[598] Additionally, the extremely low dosages required to show a significant change in the animals' distress vocalization indicated their extremely high sensitivity to and need for social relationships.[599] In other words, the mother-infant interaction itself releases powerful and naturally produced opioids in the brain which comfort and pacify the young offspring.

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[591] Gordon Bermant, "Intensity and Rate of Distress Calling in Chicks as a Function of Social Contact," *AnB* 11 (1963): 514-517.

[592] John A. King, "Social Relations of the Domestic Guinea Pig Living Under Semi-Natural Conditions," *Ecology* 37 (1956): 221-228. Terry F. Pettijohn, "Attachment and Separation Distress in the Infant Guinea Pig," *DPsyBio* 12 (1979): 73-81.

[593] H. L. Rheingold and C. O. Eckerman, "Familiar Social and Non-Social Stimuli and the Kitten's Response to a Strange Environment," *DPsyBio* 4 (1971): 71-89. Jay S. Rosenblatt and T. C. Schneirla, "The Behavior of Cats," in *The Behavior of Domestic Animals* (ed. E. S. E. Hafez; London: Balliere, Tendall and Cox, 1962), 455–488.

[594] Orville Elliot, and J. P. Scott, "The Development of Emotional Distress Reactions to Separation in Puppies," *JGP* 99 (1961): 3-22. John P. Scott, "Effects of Psychotropic Drugs on Separation Distress in Dogs," in *Neuropsychopharmacology, Proceedings of the IX Congress, Paris* (Excerpta Medica Amsterdam, 1974), 1060-1065.

[595] Harry F. Harlow and Margaret K. Harlow, "Effect of Various Mother-Infant Relationships on Rhesus Monkey Behavior," in *Determinants of Infant Behavior IV* (ed. B. M. Foss; London: Methuen, 1969), 15-36. Bill Seay and Harry F. Harlow, "Maternal Separation in the Rhesus Monkey," *JNMD* 140 (1965): 434-441.

[596] Silvia M. Bell and Mary D. Salter Ainsworth, "Infant Crying and Maternal Responsiveness," *CD* 43 (1972): 1171-1190. H. L. Rheingold, "The Effects of a Strange Environment on the Behavior of Infants," in *Determinants of Infant Behavior IV* (ed. B. M. Foss; London: Methuen, 1969), 137-166.

[597] Panksepp et al., "Biology," 607-618.

[598] Barbara H. Herman and Jaak Panksepp, "Effects of Morphine and Naloxone on Separation Distress and Approach Attachment: Evidence for Opiate Mediation of Social Affect," *PBB* 9 (1978): 213-220.

[599] Panksepp et al., "Biology," 615-617.

Furthermore, clever studies with chicks and mirrors showed that distress vocalization decreased more when the isolated chicks saw their own image reflected in mirrors (mimicking the presence of other chicks) compared to isolated chicks without mirrors.[600] Researchers also discovered that when brain opioid receptors were blocked (with naloxone) so they were chemically unable to interact with endogenous opioids, these chicks would cry with even greater distress despite remaining in social groups than individually isolated chicks without the brain opioid blockers.[601] These experiments demonstrated that *the social connection between the group members provides endogenous opioid release* and naturally maintains a psychologically-contented state in chicks. In short, fellowship in social groups releases naturally occurring opioids which prevent or soothe psychological distress in animals, whereas social isolation causes psychological pain (usually associated with "loneliness" in humans) due to a lack of opioids being produced from association with one's fellows.

Besides being emotionally dependent upon one another, studies in mice and rats have shown that, like humans, other mammalian species activate bonding and caregiving behaviors through the release of oxytocin.[602] Their brains have been hardwired for social rewarding in the septal area and other brain regions as well.[603] And like human beings, mammals have evolved to engage in and enjoy social play, releasing opioids, endocannabinoids, dopamine, and noradrenaline into the neurotransmitter systems of the brain which encourage the "motivational, pleasurable and cognitive aspects" of social

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[600] Panksepp et al., "Opioid Blockade," 673-683. Matthew W. Feltenstein, et al., "Dissociation of Stress Behaviors in the Chick Social-Separation-Stress Procedure," *Physiology and Behavior* 75 (2002): 675-679.

[601] Panksepp et al., "Opioid Blockade," 673-683.

[602] Febo, Numan, and Ferris, "Mother-Pup Bonding," 11637-11644. Hung, et al., "Gating of Social Reward," 1406-1411. Brady and Nauta, "Subcortical Mechanisms," 339-346. Shahrokh, et al., "Oxytocin-Dopamine Interactions," 2276-86.

[603] Insel, Gelhard, and Shapiro, "Comparative Distribution," 623-630. Olds and Milner, "Positive Reinforcement," 419-427.

interactions.[604] Therefore, just as humans can mitigate the psychologically distressing aspect of one another's pain through empathetic care, the empirical evidence suggests that mammals and birds have been neurologically equipped to do the same,[605] which is precisely what they do.

Whereas humans comfort each other with kind words ("verbal grooming"),[606] ravens respond to the distress of losers after a fight by offering beak-to-beak nudging and friendly preening.[607] Primates groom one another. Distressed Asian elephants comfort one another with vocal communications and direct physical contact.[608] Thousands of cases show that chimpanzees console each other in times of distress with hugging and kissing.[609] Dolphins have been observed supporting wounded companions close to the surface to help them breath and avoid drowning.[610] A blind elephant was witnessed getting around and enjoying a relatively normal life because of the loyal assistance of her "seeing-eye" elephant friend.[611] Pseudorcas (false killer whales) stranded themselves to stay with their dying companion for three days until he passed away — then left swimming out into deeper water emitting doleful high-pitched descending whistles.[612] As a chimpanzee known as Amos was dying of cancer, a female named Daisy "gently took his head to groom the

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[604] Viviana Trezza, Petra J. J. Baarendse, and Louk J. M. J. Vanderschuren, "The Pleasures of Play: Pharmacological Insights into Social Reward Mechanisms," *TPS* 31 (2010): 463-469. Annika S. Reinhold, et al., "Behavioral and Neural Correlates of Hide-and-Seek in Rats," *Science* 365 (2019): 1180-1183.

[605] Takefumi Kikusui, James T. Winslow, and Yuji Mori, "Social Buffering: Relief from Stress and Anxiety," *PTRSB* 361 (2006): 2215-2228.

[606] Tristen K. Inagaki and Naomi I. Eisenberger, "Shared Neural Mechanisms Underlying Social Warmth and Physical Warmth," *PS* 24 (2013): 2272-2280. Robin I. M. Dunbar, "The Social Brain: Mind, Language, and Society in Evolutionary Perspective," *ARA* 32 (2003): 174.

[607] Waal, *Bonobo*, 6.

[608] Joshua M. Plotnik, "Asian Elephants (*Elephas maximus*) Reassure Others in Distress," *PeerJ* 2 (2014): e278.

[609] Waal, *Bonobo*, 5.

[610] Waal, *Good Natured*, 12.

[611] Waal, *Bonobo*, 5.

[612] Waal, *Good Natured*, 42.

soft spot behind his ears."[613] She and another male began offering Amos the wood shavings they used for their beds so he could be more comfortable, even stuffing them between his back and the wall themselves. And in the ten minutes before an elderly female chimpanzee named Pansy died, her fellow apes "groomed or caressed Pansy a dozen times, and Pansy's adult daughter remained with her throughout the night."[614]

If even the other animals of creation share empathetic care to mitigate their fellows' pain, then how much more should human beings who are made in the image of God?

Section 5.6 The Cosmic Mountain, New Creation, and the Children of God

In Section 2.1.4, it was shown that an ANE understanding of Genesis 1 appears to describe the cosmic temple-mountain of God and the ordering of this creation. In God's wisdom, all the living creatures have been created mortal and will eventually die, returning to the dust of the ground (Ps 104:24–30). Regarding the transient nature of this creation, Romans 8:19–22 (NIV) tells us:

> [19]For the creation waits in eager expectation for the children of God to be revealed. [20]For the creation was subjected to frustration, not by its own choice, but by the will of the one who subjected it, in hope [21]that the creation itself will be liberated from its bondage to decay and brought into the freedom and glory of the children of God. [22]We know that the whole creation has been groaning as in the pains of childbirth right up to the present time.

Verses 20–21 in this passage suggest that it was God's will, not the failure of Adam and Eve, which subjected this creation to the decay associated with biological death. The reason for this is disclosed in verses 19 and 22. The

[613] Waal, *Bonobo*, 26-27.
[614] Waal, *Bonobo*, 194-195.

passage appears to state that creation groans because it is in the process of giving birth to the children of God.[615] The children of God are those who love God and neighbor even when it is costly (Luke 10:25–37). As discussed before, if this world is where the children of God reveal themselves by loving even when costly, how could they do so in a world without cost? In the biblical worldview, the pains of childbirth are a necessary part of the labor process and are worth being endured for the sake of the new Life that is being born. By the same token, the creation in this passage is like a mother giving birth. She groans with her labor pains, but at the same time she also "waits in eager expectation for the children of God to be revealed."

The plans of God in Romans 8:19–22 are fulfilled as the Book of Revelation concludes with the judgment of the dead as well as the revelation of those whose names are written in the Book of Life (Rev 20:11-15; Dan 12:1–2; Ps 69:27–28; Luke 10:20; Phil 4:3). This is followed by the coming of God's holy temple-mountain and the ordering of a new creation without predation, suffering, or death (Rev 21–22). Isaiah 11:6–9 (NIV) reveals that in this new creation:

> The wolf will live with the lamb,
> the leopard will lie down with the goat,
> the calf and the lion and the yearling together;
> and a little child will lead them.
> The cow will feed with the bear,
> their young will lie down together,
> and the lion will eat straw like the ox.
> The infant will play near the cobra's den,
> and the young child will put its hand into the viper's nest.
> They will neither harm nor destroy

[615] Ruben V. Soengas, "Heavenly Creation: Redefining the Eschatological Hope for the Believer in Romans 8:19-22," Academia website [cited 10 January 2020]. Online: https://www.academia.edu/30012832/HEAVENLY_CREATION_REDEFINING_THE_ESCHATOLOGICAL_HOPE_FOR_THE_BELIEVER_IN_ROMANS_8_19_22. Jonathan Moo, "Romans 8.19–22 and Isaiah's Cosmic Covenant," *New Testament Studies* 54 (2008): 82, 84-85. It should be noted that most interpretations of Romans 8:19-22 depend upon an Augustinian Fall paradigm as described in Section 2.1.4.

> on all my holy mountain,
> for the earth will be filled with the knowledge of the Lord
> as the waters cover the sea.

Consequently, while suffering has been allowed and is a necessary part of this creation, it will not be so in the new creation (Rev 21:4–5a ESV):

> "[God] will wipe away every tear from their eyes, and death shall be no more, neither shall there be mourning, nor crying, nor pain anymore, for the former things have passed away." And he who was seated on the throne said, "Behold, I am making all things new."

But until that time comes to pass, creation groans until the children of God are revealed.

Section 5.7 Summary

After the philosophical, theological, and scientific analysis of Chapters 3–5, the following conclusions may be drawn:

(1) Rather than hedonistic utilitarianism, the value system of the Judeo-Christian God is one of costly love where love of God and his values, as well as the mutually interdependent social nature created within mammals, encourage human beings to love their neighbors as themselves.

(2) Empathetic love motivates human beings to make themselves physically and emotionally available to sufferers, thereby mitigating the distressing aspect of the sufferer's pain.

(3) According to Scripture, non-sufferers are asked to bear the responsibility of loving and caring for sufferers, thereby decreasing their pain.

(4) In the long-term, self-giving people who invest their time in I-Thou relationships and healthy social networks would be expected to have a higher tolerance for pain than hedonistic people whose self-oriented behaviors would tend to lead to more social isolation and less tolerance for pain.

(5) The natural order favors cooperation within social species, and selfishness that permeates throughout a population can actually lead to its decline.

(6) Human beings, as well as mammals and birds, all share the ability to experience the pain mitigation associated with the *brain opioid theory of social attachment.*

(7) There is ample evidence that non-human animals comfort one another through touching, grooming, vocalizing, and other affectionate behaviors which reduce the pain of their fellow creatures through the release of their endogenous opioids.

(8) Pain has purposes which are both biological and theological. It warns creatures of both injured tissues and injured relationships. Thus, on the one hand, pain is evolution's means of drawing human and non-human creatures together socially with their fellows. On the other hand, our ability to respond empathetically to the pain of others allows the children of God to be revealed (Rom 8:19–22). Theologically, *the absence of pain would permit the loss of a greater good — the existence of significantly free creatures who choose to love others even when costly*.

Together, these points greatly diminish Rowe's theological premise (2) — *an omniscient, wholly good being would prevent the occurrence of any suffering it could, unless it could not do so without thereby losing some greater good or permitting some evil equally bad or worse.*

As the preceding chapters have demonstrated, when a *providential care defense* (Chapters 3 and 4) is combined with a *theodicy of social attachment and empathetic love* (Chapter 5) and added to a *nomic regularity*, *kenosis*, and *animal afterlife theodicy* (Section 2.1.7) it provides a response to human and non-human suffering that:

1) Acknowledges that the existence of animal pain is credible and that animals are theologically significant to God.

2) Acknowledges God's omnipotence, omniscience, and responsibility for suffering in the created order.

3) Appeals to the natural laws widely accepted in science.

4) Emphasizes the benefits of order and regularity that are empirically observable in the cosmos.

5) Notes the advantages of dynamic over static ecosystems.

6) Lessens notions of wastefulness in nature.

7) Points to empirically observable life/death/life cycles found in nature.

8) Recognizes death of one creature creates opportunity for life of another.

9) Recognizes the same neurocognitive ability to perceive pain enables a creature to perceive pleasure.

10) Depicts a God who cares for and is near to all creatures that suffer.

11) Depicts a loving God who reduces the suffering of individual creatures in this life through the providentially established pain-mitigating phenomena found in the created order.

12) Offers an account of the God of the Judeo-Christian Scriptures which helps to better understand the purpose of suffering in this life.

13) Offers theological as well as biological explanations of why suffering has been allowed for both human and non-human creatures in the natural order.

14) Offers a scripturally sound narrative of restoration and compensation in the New Creation for the suffering experienced by humans and non-humans.

This combined approach to creaturely suffering offers a theodicy which successfully:

- Affirms the existence of animal pain
- Affirms God's concern for animals
- Affirms God's omnipotence
- Affirms God's responsibility for the existence of pain
- Affirms God's loving care of creatures
- Affirms God's existence

Therefore, this interdisciplinary study will conclude its philosophical investigation by reassessing Rowe's Evidential Problem of Natural Evil and using inference to the best explanation to determine whether the Judeo-Christian worldview can offer a scientifically tenable explanation of suffering in a Neo-Darwinian world which makes the Hypothesis of Theism more probable than the Hypothesis of Indifference.

6. Conclusion

As stated in the introduction, many thinkers believe that theistic Judeo-Christian belief is compellingly undermined by scientific evidence. In "The Problem of Evil and Some Varieties of Atheism," William Rowe asserted that theists would no longer be rationally justified in holding to theism if they were better acquainted with the findings of science.[616] Rowe and others who share his assumptions about God and suffering often treat their position as unquestionably sound. However, as seen in the analyses summarized in Sections 4.5 and 5.7, many of their assumptions have been mistaken in several crucial ways: 1) pain perception is neither unnecessary nor widespread across species, 2) endogenous opioids mitigate pain in animals under attack as well as those empathetically comforted by their fellows, and 3) God's values prioritize empathetic love over pleasure and biological success. So, after careful review of the scientific literature, a plausible rebuttal of Rowe's claims has been offered. In fact, the intellectually sophisticated theist can cite the evidence presented in Chapters 3 and 4 to show that atheists have often misunderstood and misrepresented the ecosystems they have criticized as unnecessarily cruel. Therefore, the remainder of this chapter will focus upon re-evaluating Rowe's Evidential Problem of Natural Evil and using *inference to the best explanation* to weigh Paul Draper's Hypothesis of Indifference against the Judeo-Christian Hypothesis of Theism.

Section 6.1 Revisiting Rowe's Evidential Problem of Natural Evil

In premise (1) of Rowe's famous evidential argument,[617] he claimed there exists evidence of widespread and unnecessary suffering in nature (Section 1.3).

[616] Rowe, "Problem of Evil," 340.
[617] Rowe, "Problem of Evil," 336.

However, Part One — *A Providential Care Defense* — demonstrated that less than 1% of species have the neurocognitive capacity to experience suffering. For those species, endogenous opioids released from the fight-or-flight response during predator attack produce stress-induced analgesia, suppressing the perception of pain. Furthermore, animals which have been severely injured and experience either hemorrhagic/hypovolaemic shock (from blood loss), neurogenic shock (from spinal damage), or septic shock (from severe infection) will also activate the neuroendocrine and endogenous opiate systems, producing analgesia for the critically ill creature. Part Two — *A Theodicy of Social Attachment and Empathetic Love* — demonstrated that non-life-threatening pain can also be mitigated by endogenous opioid release linked to empathetic social interactions: a phenomenon associated with the *brain opioid theory of social attachment.* Consequently, the scientific literature does not support Rowe's assertion in premise (1) that there is widespread and unnecessary suffering in nature.

In premise (2) Rowe claimed an omniscient, wholly good being would prevent unnecessary suffering in nature. This is another widely shared assumption among non-theists regarding the purposes of God, but it too is vulnerable to serious critique. First, the evidence from Part One — *A Providential Care Defense* — suggests that unnecessary suffering in nature *has* been prevented. Second, Rowe as well as Draper incorrectly imagine that an omniscient, wholly good being would adopt their value system of hedonistic utilitarianism which assumes pleasure and biological success are the greatest goods while pain and biological failure are the greatest harms. Instead, the omniscient, wholly good Judeo-Christian God of the Bible teaches a value system of costly love. Therefore, a world that allows suffering is necessary so that the children of God, who love God and others even when costly, can be revealed. Consequently, Rowe's premise (2) that asserts that an omniscient, wholly good being would not allow suffering is incorrect.

Therefore, since premises (1) and (2) are faulty, Rowe's conclusion (3) that "there does not exist an omnipotent, omniscient, wholly good being" is unsound.

Section 6.2 Seeking the Best Explanation

In this section, Draper's comparative approach using *inference to the best explanation* will be used to evaluate the Hypothesis of Indifference[618] against the Judeo-Christian Hypothesis of Theism to determine which is more probable (Section 1.4). In other words, "Does the Judeo-Christian Hypothesis of Theism have more or less explanatory and predictive power than the Hypothesis of Indifference?" For this comparison, the two philosophical hypotheses will be evaluated as scientific hypotheses are, according to which: 1) deals with the most evidence, 2) has the greater explanatory power, and 3) correctly anticipates outcomes.

The Judeo-Christian Hypothesis of Theism:

- Anticipates a finely tuned and *ordered* cosmos that can be defined by natural laws and described with mathematical precision. The concept of an ordered universe is conveyed in ANE understandings of Genesis 1 as well as the rhetoric found in texts like Proverbs 8:12-31, Psalm l04 and Job 38:1–18.
- Anticipates a *telos* in the universe which would enable life to evolve from non-life so that creatures could have fellowship with God. While all creatures exist to have relationship with God (Genesis 1), this worldview also explains why only those most highly evolved (humans made in the image of God, Gen 1:26–27) would have the capacity to comprehend the order found in the universe.
- Anticipates and explains why human beings would have an innate sense of *morality*.
- Anticipates and explains why human beings would have desire for relationship with the divine through *religion* and/or other spiritual practices.

[618] Draper, "Pain," 331-350.

- Anticipates that a loving God would minimize unnecessary *suffering* amongst creatures in the natural order.
- Anticipates and explains why *empathetic love* would reduce suffering amongst creatures that feel pain.

In contrast, the Hypothesis of Indifference states that "neither the nature nor the condition of sentient beings on earth is the result of benevolent or malevolent actions performed by non-human persons."[619] What does this hypothesis anticipate? Nothing. What does it explain? Nothing. This "hypothesis" is the statement of a negative which cannot be tested. Even if one is supposed to assume that by "indifference" 50/50 random chance is meant, such a hypothesis would predict that an ordered universe was as likely as a disordered universe. Evolutionary existence would be as probable as non-existence. The hypothesis of an indifferent universe would anticipate sentience with equal probability as non-sentience. In fact, the Hypothesis of Indifference can predict and explain… nothing at all.

The truth is that atheism's greatest strength has been that Western theism, based upon Greco-Roman interpretations of Genesis 1–3, was incompatible with Neo-Darwinian evolution and Earth's geological history.[620] However, since alternative interpretations of Genesis 1–3 are available which incorporate ANE insights and remove purported conflicts between science and the Genesis text (Section 2.1.4), Judeo-Christian theism is wholly compatible with Neo-Darwinian evolution and atheism is exposed as the intellectually-empty metaphysical worldview it is. In short, the Judeo-Christian worldview can offer a scientifically tenable explanation of suffering in a Neo-Darwinian world that makes the Hypothesis of Theism more probable than the Hypothesis of Indifference.

[619] Draper, "Pain," 332.
[620] Plantinga, *Conflict*, 3-63.

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Appendix A: Guide to Hebraic—Sumerian—Akkadian—English Translations

Section A.1 Sumero-Hebraic Translation Methodology

The evidence presented in Sections 5.3.1 and 5.3.2 suggests that Sumerian may have influenced the Hebrew found in the Book of Job. Sumerian is a language isolate and an agglutinative rather than a fusional language, where different morphemes are "glued together" even as each individual morpheme retains its own meaning(s). After Semitic-speaking peoples (the Akkadians) settled in the Shinar plain and intermarried with the Sumerian populace (Gen 11:1-2), a cultural Sumerian-Akkadian symbiosis created what linguists call a *sprachbund*.[621] This led to widespread bilingualism as the two languages influenced one another.[622] Therefore, a Semitic-influenced Sumerian language may have been familiar to Terah and Abram when they left Ur in the Shinar plain for the Semitic-speaking regions of Harran and Canaan (11:27-31).

The following are the linguistic details and assumptions that were used to translate Hebrew words with primitive roots that appear to have originated from ancient Sumerian. It is important to state that all Sumerian translations presented in this thesis and its appendices were obtained using both the

[621] Christopher Woods, "Bilingualism, Scribal Learning, and the Death of Sumerian," in *Margins of Writing, Origins of Cultures: New Approaches to Writing and Reading in the Ancient Near East* (ed. Sarite Sanders; Chicago, Ill.: Oriental Institute of the University of Chicago, 2006), 91-120. Lambert, *Babylonian Wisdom Literature*, 8-9. Postgate, *Early Mesopotamia*, 35-40. Crawford, *Sumer*, 12-13. Mieroop, *History of the Ancient Near East*, 51. Dietz O. Edzard, *Sumerian Grammar* (HdOr 71; Atlanta, Ga.: Society of Biblical Literature, 2003), 1-5.

[622] Guy Deutscher, *Syntactic Change in Akkadian: The Evolution of Sentential Complementation* (Oxford: Oxford University Press, 2000), 20-21.

Electronic Pennsylvania Sumerian Dictionary (ePSD)[623] as well as John Halloran's *Sumerian Lexicon*[624] as recommended by Nicholas Postgate.[625]

- "Linguists describe the [Sumerian] language as agglutinative; each fundamental idea, nominal or verbal, is expressed by a single unchanging syllable (or polysyllable) which may be modified by a series of prefixes or postfixes, somewhat as in modern Turkish."[626] [e.g., a, 'water' + šed$_{12}$, 'cool' = a-šed$_{12}$, 'cool water'; an, 'heaven' + ki, 'earth' = an-ki, 'heaven and earth; universe'][627]
- Consequently, once Sumerian words and names are translated, they often appear as "short sentences with a recognizable meaning."[628]
- "[…] in general one cannot classify Sumerian names (as Akkadian names) according to their presumed speaker, since the great majority of Sumerian names are cast 'objectively,' stating a fact or a concept of a general character without reference to a speaking subject. So too, except for a very few name-patterns, Sumerian names are indifferently applied to men and women, without a distinction in gender."[629]
- "Sumerian language uses only four vowels: a, e, i, u; two half vowels: w and y; and the following consonants: b, d, g, k, l, m, n, p, r, s, t, z, ḫ, ĝ, š."[630]
- "The vowels may be pronounced as follows: *a* as in *father*, *u* as in *pull*, *e* as in *peg*, and *i* as in *hip*. Of the special consonants, *ĝ* is pronounced like *ng* in *rang*, *ḫ* is pronounced like *ch* in German *buch* or Scottish *loch*, and *š* is pronounced like *sh* in *dash*."[631]
- Linguists have discerned the phonics of Sumerian from Akkadian. However, since Akkadian did not have the "o"-vowel, linguists have not been able to reconstruct its presence in Sumerian.[632] Therefore, when

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[623] Electronic Pennsylvania Sumerian Dictionary (ePSD) website [cited 28 October 2018]. Online: http://psd.museum.upenn.edu/epsd/nepsd-frame.html.

[624] John A. Halloran, *Sumerian Lexicon: A Dictionary Guide to the Ancient Sumerian Language* (Los Angeles, Ca.: Logogram, 2006).

[625] Postgate, review of Halloran, *Sumerian Lexicon,* 255-257.

[626] Quote from C. B. F. Walker, *Cuneiform* (Reading the Past 3. Berkeley, Calif.: University of California Press, 1990), 15. Deutscher, *Syntactic Change,* 20-21.

[627] Halloran, *Sumerian Lexicon*, 7, 20.

[628] Quote from Mieroop, *History of the Ancient Near East,* 51. Di Vito, *Sumerian and Akkadian Personal Names.* Edzard, *Sumerian Grammar*, 1-2.

[629] Di Vito, *Sumerian and Akkadian Personal Names*, 21.

[630] Quote from Walker, *Cuneiform*, 16. John L. Hayes, *A Manual of Sumerian Grammar and Texts* (Malibu, Calif.: Undena, 2000 [2nd edn]), 22-26.

[631] Halloran, *Sumerian Lexicon*, iii.

[632] Edzard, *Sumerian Grammar*, 7. Hayes, *Sumerian Grammar and Texts*, 22-25. Walker, *Cuneiform*, 16.

translating from Sumerian, the vowel "o" in Hebrew is usually assumed to have been spoken/written as another vowel such as "u."

- Sumerian and Akkadian (under the influence of Sumerian) only used *ḫ*.[633] However, other Semitic languages used *ḫ*, *ḥ*, and *h*. The Hebrew language may have emerged from these ancestral language influences to have both the *h* and *ḫ* (pronounced like *ch* in German *buch* or Scottish *loch*) which are written according to the *SBL Handbook of Style* as *h* (*he*) and *ḥ* (*khet*), respectively.[634]
- Sumerian *ĝ* (pronounced *ng*) became *g* in Akkadian.[635]
- "When Sumerian words are borrowed into Akkadian, *d* becomes *t*."[636]
- For the purposes of translation, the "v" sound in Hebrew is assumed to have come from the "ph" sound associated with the consonant "p." Both "v" and "ph" are produced with labiodental fricative articulation (the former is voiced, the latter is voiceless), so it is not unreasonable to assume they would share a common origin. Therefore, wherever "v" is found in the Hebrew, it is assumed that the original consonant in Sumerian was "p."
- Hebrew script was originally transmitted through the generations as a wholly consonantal text, with the vocalization of vowels and accents only being added later by the Masoretes sometime in the sixth or seventh centuries CE.[637] The consonantal writing system retained the linguistic flexibility for Sumero-Hebraic wordplay that is easily conveyed orally but with more difficulty when written.
- Regarding the syllabic structure of Sumerian words, "at least the following syllable types occur: V, VC, CV, and CVC. […] There are no syllables of the type CCV or VCC."[638] This means that Hebrew words with a double consonant (e.g., HEB *ḥawwâ*) would be assumed to have had a vowel in between the consonants. A reduplicated consonant-vowel combination was often assumed in these translations (SUM ḫa$_2$-a-pa$_3$-pa$_{1,5,6}$).
- "Combining a syllable formed of a consonant + vowel (like gu) with one formed from vowel + consonant (like ud) allows you to make a closed

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[633] Walker, *Cuneiform*, 16.

[634] Society of Biblical Literature, *The SBL Handbook of Style* (Atlanta, Ga.: SBL Press, 2014 [2nd edn]), 56.

[635] Walker, *Cuneiform*, 16.

[636] Quote from note on taḫ/daḫ in Halloran, *Sumerian Lexicon*, 273. Hayes, *Sumerian Grammar and Texts*, 26. Walker, *Cuneiform*, 16. Edzard, *Sumerian Grammar*, 8.

[637] Angel Sáenz-Badillos, *A History of the Hebrew Language* (trans. John Elwolde; New York: Cambridge University Press, 2004), 76-79.

[638] Hayes, *Sumerian Grammar and Texts*, 27.

syllable, gu-ud [gud]."[639] In this way, many vowel and consonant combinations are possible as long as two consonants are not put together.

- "The principle of using several signs to represent the same sound (gu) is called homophony, and giving one sign several values (like KA) is called polyphony. Both principles are fundamental features of cuneiform writing throughout its 3,000 year history." Capital letters indicate the written sign (e.g., KA) whereas small case letters indicate how the sign may be spoken (e.g., KA may be spoken as ka[KA], 'mouth' or gu_3[KA], 'voice; noise, sound').[640]
- Transliteration subscripts (e.g., u, u_2, u_3, u_4, etc.) are called "indices" or "diacritics" and indicate the frequency of sign usage based upon Akkadian texts (not Sumerian texts since Akkadian was deciphered before Sumerian.) This system allows signs which are pronounced alike but have different meanings (homophones) to be differentiated in transliteration.[641]
- Determinatives are transliterated as superscript letters, such as ^{d}an, eridug^{ki}, suḫur-maš$_2$^{ku6}, and ^{na4}kišib.[642] Superscript 'd' indicates divinity, 'ki' indicates location, 'ku_6' indicates fish, and 'na_4' indicates stone.

[639] Walker, *Cuneiform*, 12.
[640] Walker, *Cuneiform*, 12. Halloran, *Sumerian Lexicon*, 88, 131.
[641] Hayes, *Sumerian Grammar and Texts*, 19.
[642] Hayes, *Sumerian Grammar and Texts*, 20.

Section A.2 Understanding Translation Tables

Table A.1 Guide to Hebrew-Sumerian-Akkadian-English translation tables.

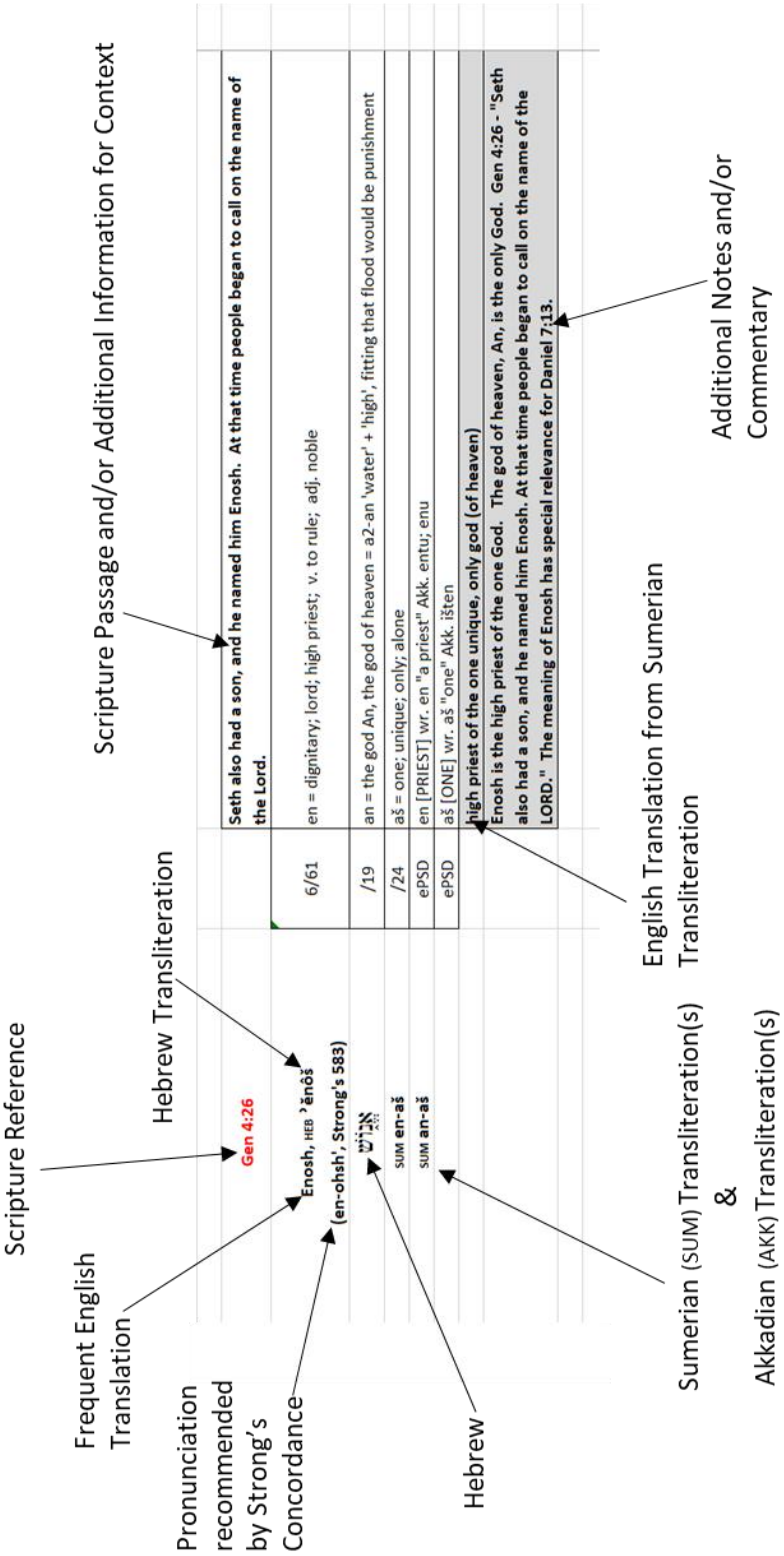
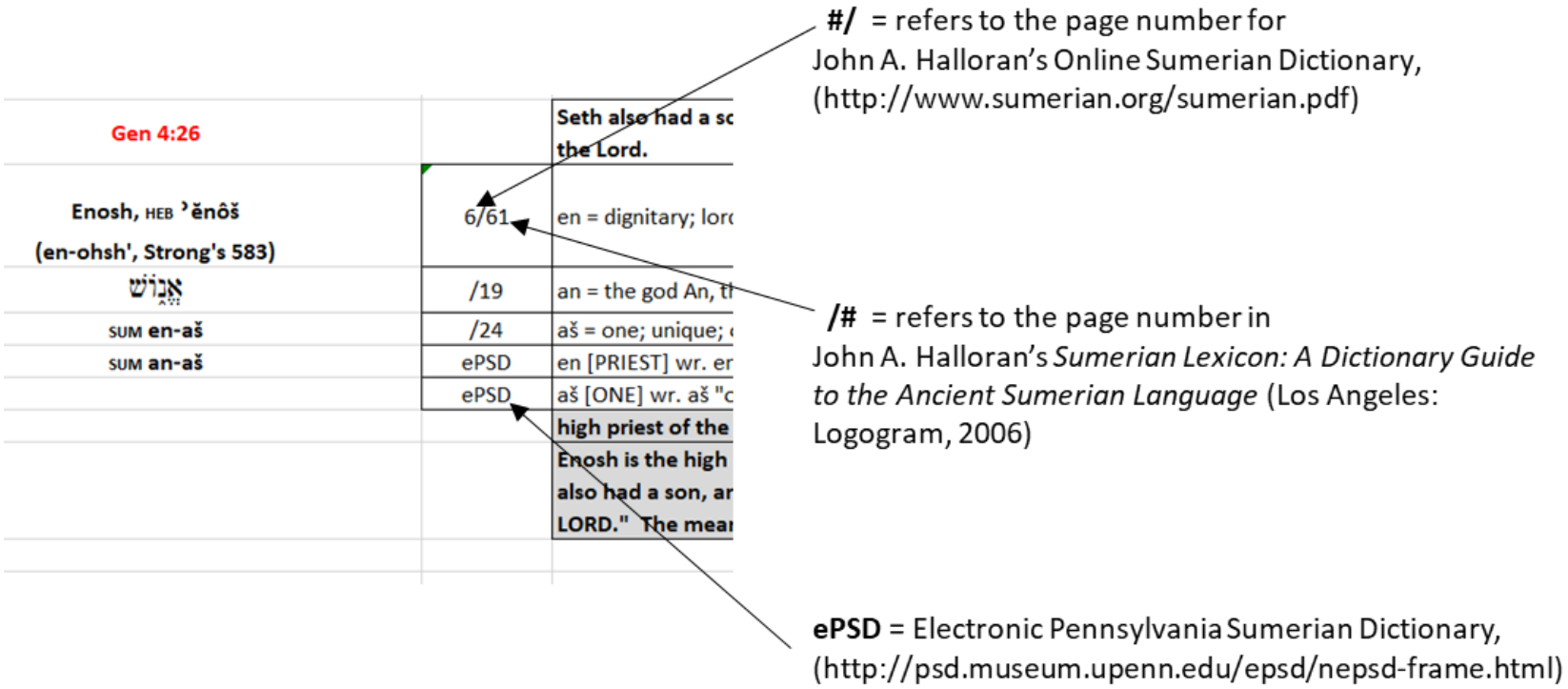


Table A.2 Understanding reference resource notation.



Appendix B: Heavenly Concepts Translations

Names of God		
Eloah, HEB ʾĕlôah, ʾĕlōah (el-o'-w-ha, el-o'-ha, Strong's 433)		**Name of God in Deut. 32:15,17; Job 4:9; Job 5:17; Nehemiah 9:13-17**
אֱלוֹהַּ	3/1	e_4 = father (of the household)
אֱלֹהַּ	/157	li = to be happy ; to rejoice; to sing
SUM e_4-li-aḫ$_3$	29/155	aḫ$_3$ [UD], laḫ = (v.) to sparkle, shine; to dry out [seems to imply cleanliness; something made clean]
	ePSD	e [HOUSE] wr. e_2; ĝa$_2$; e_4 "house; temple; (temple) household; station (of the moon)?; room; house-lot; estate" Akk. bītu [NOTE: house, households, estates easily associated with a patriarch, so father is likely implied]
	ePSD	lib [RICH] "(to be) rich, well-off; high quality; (to be) happy" Akk. hadû; hidiātu; râšu; rāšû; rīšātu
	ePSD	ah [DRY] wr. ah$_3$ "(to be) dried (out), dry; to dry" Akk. abālu; šābulu
		father who rejoices over the purified
SUM e_4-lu-aḫ$_3$	3/1	e_4 = father (of the household)
	12/159	lu = (n.) many, much; man, men, people; sheep
	29/155	aḫ$_3$ [UD] = (v.) to sparkle, shine; to dry out [seems to imply cleanliness; something made clean]
	ePSD	e [HOUSE] wr. e_2; ĝa$_2$; e_4 "house; temple; (temple) household; station (of the moon)?; room; house-lot; estate" Akk. bītu [NOTE: house, households, estates easily associated with a patriarch, so father is likely implied]
	ePSD	lib [RICH] "(to be) rich, well-off; high quality; (to be) happy" Akk. hadû; hidiātu; râšu; rāšû; rīšātu
	ePSD	ah [DRY] wr. ah$_3$ "(to be) dried (out), dry; to dry" Akk. abālu; šābulu
		father of purified multitudes
SUM $e_{2,4}$-la-ḫe$_2$	3/1	e_4 = father (of the household)
	3/55	e_2 = house, household
	12/154	la = bliss, happiness; youthful freshness and beauty; abundance, luxury, wealth
	11/111	ḫe$_2$ = abundant; abundance
	ePSD	e [HOUSE] wr. e_2; ĝa$_2$; e_4 "house; temple; (temple) household; station (of the moon)?; room; house-lot; estate" Akk. bītu, [NOTE: house, households, estates easily associated with a patriarch, so father is likely implied]
	ePSD	lala [PLENTY] wr. la-la; a-la; la "plenty, happiness, lust" Akk. lalû
	ePSD	heĝal [PLENTY] wr. he$_2$-ĝal$_2$ "plenty" Akk. hengallu
		father's house of abundant bliss, youth, beauty, luxury and wealth
		Notice the purification of God's people, which may explain the meaning of the spirit of God, ru-aḫ$_3$, meaning "to pour out (the gift of) purification". Also notice that the blessed in Sheol (ša$_3$-ul) are referred to as "shining" which is associated with purified, sparkle (cleansed) in the Sumerian morpheme, aḫ$_3$. It may be relevant that Jesus follows his teaching on the Beatitudes, "Blessed are the...," with comparing those who are blessed to a light that shines in the darkness: "You are the light of the world. A town built on a hill cannot be hidden. Neither do people light a lamp and put it under a bowl. Instead they put it on its stand, and it gives light to everyone in the house. In the same way, let your light shine before others, that they may see your good deeds and glorify your Father in heaven." (Matthew 5:1-16)
Gen 1:2c		**...and the spirit of God moved on the face of the waters.**
Spirit (of God), HEB rûaḥ (roo'-akh, Strong's 7307)	14/219	ru = (n.) present, gift, offering; (v.) to blow; to give; to offer; to pour out; to send; to inflict
רוּחַ	29/16,155	aḫ$_3$ [UD], uḫ = laḫ = (v.) to sparkle, shine; to dry out; to dry out [seems to imply something that has been cleansed, made pure, shiny]
SUM ru-aḫ$_3$	ePSD	a ru [DEDICATE] wr. a ru "to dedicate" Akk. šarāku
	ePSD	ah [DRY] wr. ah$_3$ "(to be) dried (out), dry; to dry" Akk. abālu; šābulu
		to send, offer, pour out, present (the gift of) purification
wind, spirit, breath (word association)		**Dina Katz_Death they Dispensed to Mankind_The Funerary World of Ancient Mesopotamia_62: "The term employed for 'spirit' is 'wind', Sumerian IM and an Akkadian gloss has *šāru* ."**
SUM IM	19,36/124, 282	IM = tu$_{15}$, tumu, tum$_9$ = wind; cardinal point, direction [ta, 'from' + mu$_2$, 'to blow']
SUM lil$_2$	32/158	lil$_2$ = (n.) wind, breeze; breath; phantom, ghost
SUM sig$_3$-sig$_3$	ePSD	im [RAIN] wr. im; me-er "rain, rain storm" Akk. zunnu; šāru [ePSD includes IM under the category "wind"]
	ePSD	lil [GHOST] wr. lil$_2$ "wind, breeze; ghost" Akk. zīqīqu
	ePSD	sisig [BREEZE] wr. sig-sig; ^{tumu}si-si-ig; si-si-ga; sig$_3$-sig$_3$ "ghost?; storm; breeze, wind" Akk. mehû; zīqīqu?; šāru
		the concepts of wind, spirit, breath were associated with one another in the Sumerian worldview

Gen 1:1

Elohim, HEB ʾĕlōhîm
(el-o-heem', Strong's 430)
אֱלֹהִים

SUM **$e_{2,4}$-li-ḫ-eme**
SUM **$e_{2,4}$-li-ḫa$_2$-eme**

3/1	e_4 = father
3/55	e_2 = temple; house; household
/157	li = to be happy; to rejoice; to sing
11/108	ḫ = many (see note on *ḫa, fish)
11/109	ḫa$_2$ = numerous; diverse; assorted; mixed
11/111	ḫe$_2$ = abundant; abundance
19/60	eme = tongue; speech
ePSD	e [HOUSE] wr. e_2; ĝa$_2$; e_4 "house; temple; (temple) household; station (of the moon)?; room; house-lot; estate" Akk. bītu, [NOTE: house, households, estates easily associated with a patriarch, so father is likely implied]
ePSD	lib [RICH] "(to be) rich, well-off; high quality; (to be) happy" Akk. hadû; hidiātu; râšu; rāšû; rīšātu
ePSD	lala [PLENTY] wr. la-la; a-la; la "plenty, happiness, lust" Akk. lalû
ePSD	heĝal [PLENTY] wr. he$_2$-ĝal$_2$ "plenty" Akk. hengallu
ePSD	eme [TONGUE] wr. eme "tongue; language" Akk. lišānu
	father's temple household of many rejoicing tongues (heavenly beings in the household of God)
	This would seem to suggest the father (God) and his family (heavenly beings)
	See John 14:2-3 - "I go to prepare a place for you. In my father's house there are many rooms."
	See Rev. 21:1-8, 21:1-22:5 - multitudes of many tongues and nations praise the Lord
	God is the "Lord of Hosts" (e.g. 1 Samuel 1:3, the phrase being used 261x in OT)
	Household of God's heavenly family: Psalm 82:1; Job 38:1-7; Luke 20:35-36; Luke 15:10; Matthew 22:30; Rev 14:13

Anunnaki

SUM **an-un-na-ki**

6/19	an = heaven, sky; grain ear
18/298, 296	un = uĝa$_3$,uĝ$_3$ = population; people; crowd
13/184	na = (n.) human being
12/137	ki = (n.) place; area; location
ePSD	an [SKY] wr. an "sky, heaven; upper; crown (of a tree)" Akk. šamû
ePSD	uĝ [PEOPLE] wr. uĝ$_3$ "people" Akk. nišu
9/37	na [MAN] wr. na "man" Akk. amēlu
12/155	ki [PLACE] wr. ki "place; ground, earth, land; toward; underworld; land, country; lower, down below" Akk. ašru; erṣetu; mātu; qaqqaru; šaplû
	population of human beings in heavenly place

For the purposes of translation, the 'v'sound in Hebrew is assumed to have come from the 'ph' sound associated with the consonant 'p'. Both 'v' and 'ph' are produced with labiodental fricative articulation (the former is voiced, the latter is voiceless), so it is not unreasonable to assume they would share a common origin. Therefore, wherever 'v' is found in Hebrew, it is assumed that the original consonant in Sumerian was 'p'.

Gen 2:4

YHWH, HEB yəhwâ
(yeh-vaw', Strong's 3068)
יְהוָה

SUM **u-a-PA.E$_2$**
SUM **u-e$_4$-PA.E$_2$**

6/283,61	u = Emesal dialect for en and lugal, 'lord, master; king'
3/1	a, e_4 = father
/213	PA.É = PA.E$_2$ = šabra$_x$
66/247	šabra [PA.É], šabra$_x$ = manager, administrator of a temple or royal household
ePSD	en [LORD] wr. en; u$_3$-mu-un; umun "lord; master; ruler" Akk. bēlu
ePSD	lugal [KING] wr. lugal; lu$_2$-gal "lord; master; owner; king; a quality designation" Akk. bēlu; šarru
ePSD	aya [FATHER] wr. a-a; aya$_2$; a-ia "father" Akk. abu
ePSD	e [HOUSE] wr. e_2; ĝa$_2$; e_4 "house; temple; (temple) household; station (of the moon)?; room; house-lot; estate" Akk. bītu
ePSD	šabra [ADMINISTRATOR] wr. šabra; šabra$_2$; ša$_3$-ab-ra "chief administrator of a temple or other household" Akk. šabrû
	Lord Father in charge of the temple household (see Elohim = father's temple household of many rejoicing tongues)

SUM **u-a-pa$_{5,6}$-a**
SUM **u-e$_4$-pa$_{5,6}$-a**

6/283,61	u = Emesal dialect for en and lugal, 'lord, master; king'
3/1	a, e_4 = father
14/213	pa$_{4,5,6\ par}$ = irrigation ditch (pa$_4$); small canal (pa$_5$)
3/1	a = water
ePSD	en [LORD] wr. en; u$_3$-mu-un; umun "lord; master; ruler" Akk. bēlu
ePSD	lugal [KING] wr. lugal; lu$_2$-gal "lord; master; owner; king; a quality designation" Akk. bēlu; šarru
ePSD	aya [FATHER] wr. a-a; aya$_2$; a-ia "father" Akk. abu
ePSD	par [CANAL] wr. pa$_5$; pa$_6$ "(small) canal, irrigation ditch" Akk. atappu; palgu; pattu
ePSD	a [WATER] wr. a "water; semen; progeny" Akk. mû; rihûtu
	Lord Father with streams of (living) water [see abundant water (chay) and chayvah]

SUM **u-a-pa-a**	6/283,61	u = Emesal dialect for en and lugal, 'lord, master; king'
SUM **u-e_4-pa-a**	3/1	a, e_4 = father
	14/212	pa = branch; leaf, bud, sprout
	3/1	a = offspring
	ePSD	en [LORD] wr. en; u_3-mu-un; umun "lord; master; ruler" Akk. bēlu
	ePSD	lugal [KING] wr. lugal; lu_2-gal "lord; master; owner; king; a quality designation" Akk. bēlu; šarru
	ePSD	aya [FATHER] wr. a-a; aya_2; a-ia "father" Akk. abu
	ePSD	pa [BRANCH] wr. pa; pa_9 "wing; branch, frond" Akk. agappu; aru; kappu
	ePSD	a [WATER] wr. a "water; semen; progeny" Akk. mû; rihûtu
		Lord Father with branches of offspring (Lord Father of those who choose to be his children - [see tree of life (chay) and chayvah])
		Notice the association of Life with a Tree with many branches, and many streams of living Water. So to have both connotations associated with Lord Father would be the equivalent of the Lord Father of Life. Likely has connection with the menorah: u_4-An + $pa_{5,6}$-a = "the light of An" (light + wisdom, 'me') + "budding branches of almond tree" (offspring) = God's wisdom + offspring with abundant life in Netherworld; six branches because six "days" fulfilling me commands are fulfilled to produce the last day (branch) which is God resting enthroned in creation. Once creation is ordered with the wisdom of the cosmic ordinances which provide the natural laws of the cosmos, as well as how humans begins are to relate to one another in ways that are just, creation waits for the children of God to be revealed by whether they will love God and others even when it is costly or whether they make their own desires their god and source of moral authority, and live lives of selfishness.
SUM **u-a-pa-e_3**	6/283,61	u = Emesal dialect for en and lugal, 'lord, master; king'
SUM **u-e_4-pa-e_3**	3/1	a, e_4 = father
	24/213	pa...e_3 = to show; to make appear; to manifest; to let shine; to make resplendent
	ePSD	en [LORD] wr. en; u_3-mu-un; umun "lord; master; ruler" Akk. bēlu
	ePSD	lugal [KING] wr. lugal; lu_2-gal "lord; master; owner; king; a quality designation" Akk. bēlu; šarru
	ePSD	aya [FATHER] wr. a-a; aya_2; a-ia "father" Akk. abu
	ePSD	pa e [APPEAR] wr. pa e_3 "to cause to appear" Akk. šupû
		Lord Father who manifests himself in shining, resplendent appearance
SUM **u-a-pa$_3$**	6/283,61	u = Emesal dialect for en and lugal, 'lord, master; king'
SUM **u-e_4-pa$_3$**	3/1	a, e_4 = father
	24/214	pa_3 [IGI.RU], pad_3 = to show, reveal; to choose, call, appoint; to seek; to find; to remember; to declare; to swear, take an oath; to choose out of
	ePSD	en [LORD] wr. en; u_3-mu-un; umun "lord; master; ruler" Akk. bēlu
	ePSD	lugal [KING] wr. lugal; lu_2-gal "lord; master; owner; king; a quality designation" Akk. bēlu; šarru
	ePSD	aya [FATHER] wr. a-a; aya_2; a-ia "father" Akk. abu
	ePSD	pad [FIND] wr. pad_3 "to find, discover; to name, nominate" Akk. atû; nabû
		Lord Father who reveals himself, swears by himself, seeks and finds, speaks, and appoints the chosen and called
		Lord's Prayer - "This, then, is how you should pray: 'Our Father in heaven...'" (Matt. 6:9)
		Father's House - "My Father's house has many rooms; if that were not so, would I have told you that I am going there to prepare a place for you?" (John 14:2)
		The Father - "I and the Father are one." (John 10:30)
		The Father - "Anyone who has seen me has seen the Father." (John 14:9)
		The Father - "The LORD is like a father to his children, tender and compassionate to those who fear him." (Psalm 103:13)
		[See Sumerian names = God is my father...]
		Parable of the Lost Son - Luke 15:11-32
		Parable of the Lost Sheep - Luke 15:3-7

Gen. 17:1 35:11

El Shaddai, HEB ʾēl-šadday (shad-dah'-ee, Strong's 7706)

אֵל

שַׁדָּי

	[El Shaddai = Sprachbund name] See Aage Westenholz in *Mesopotamien: Akkade-Zeit und Ur III-Zeit* (OBO 160.3; Freiburg, Schweiz: Universitatsverlag, 1999), 79, 84: "The Akkadian god Il or Ilum refered to 'a specific but unnamed god' who was presumably a high, universal deity, similar to the Sumerian god of heaven, An. From ED IIIb onward, the name of Il could be written with the sign AN." See Soden, Ancient Orient, 177. See Frank Moore Cross, *Yahweh and the God of the Patriarchs.*
ePSD	Akk. eli = SUM dirig [EXCEED] wr. diri; RI "(to be) very great, supreme, excellent; more than; (to be) powerful, competent; (to be) big, huge; (to be) abundant; on, over, above; against; radiance; to project, stick up, build high; (to be) surplus" Akk. atru; eli; rabû; kapāšu; zaqāru; šarūru; šūturu; lē'û
ePSD	Akk. šadu = SUM kur [MOUNTAIN] wr. kur; kir_5 "underworld; land, country; mountain(s); east; easterner; east wind" Akk. erṣetu; mātu; šadû; šadû

SUM-AKK eli-šadu-$du_{7,11}$

10/46	du_7 = to be suitable, fitting; to be perfect complete

SUM-AKK eli-šadu-di

25/49	du_{11} = (n.) speech; promise; (v.) to command; to promise; to converse with

SUM-AKK il-šadu-$du_{7,11}$

ePSD	du [SUITABLE] wr. du_7 "(to be) fitting, suitable" Akk. asāmu; naṭû

SUM-AKK il-šadu-di

ePSD	di [SPEAK] wr. di "non-finite imperfect stem of dug[to speak]" Akk. atwû; dabābu; qabû
ePSD	dug [SPEAK] wr. dug_4 "to speak, talk, say; to order; to do, perform; to negotiate" Akk. atwû; dabābu; epēšu; qabû
ePSD	Akk. ilu [GOD] wr. ilu "god" Akk. ilu
	(God of Heaven) the supreme, excellent, radiant, abundant, powerful one who speaks from the mountain [kur]

Angels

Job 1:6

children, HEB bənê (bane, Strong's 1121)

בְּנֵי

SUM be_2-ni_2

	Now there was a day when the children (bĕnê) of God's household (ʾĕlōhîm) came to present themselves before the Lord Father (yĕhvâ), and Satan also came among them.
14/32	$be_{3,4,6}$ = to tear, cut; to tear off; to diminish, lessen
/195	ni_2 = self; body
ePSD	be [DIMINISH] wr. be_4; be_6 "to deduct, remove; to diminish, reduce; to withdraw, receive (as an allotment)" Akk. našāru
ePSD	ni [SELF] wr. ni_2 "self" Akk. ramānu
	to tear off (a little piece) of oneself
	It is noteworthy that this word does not imply a particular gender. The term be_2-ni_2 is inclusive to both genders.

Gen. 3:24

the Cherubim go forth and become visible

HEB ʾet-hakkərubîm, (Strong's 3742)

אֶת־הַכְּרֻבִים

SUM ed_2-HA.A-aka_4-ka_2-ru_2-ub-IM

	Cherubim (plural of cherub) guard the Garden of Eden from Adam and descendants
5/58	et = ed_2 = to go out, to come out, emerge; to send forth; to become visible
5/58	ed_3 = to exit; to rise; to descend; to bring down (or up)
/273	[when Sumerian words are borrowed into Akkadian, 'd' becomes 't']
29/108, 311	HA.A = $zaḫ_2$ = secrecy [implies secret]; (v.) = to hide; to be lost
50/16	aka_4, $akan_2$, kan_4 [KA_2] = door-frame, lintel [implies threshold]
11/134	ka_2 = gate
9-10/219, 46	ru_2 = du_3 = to do, perform; to build, make; to set up
4/292	ub = one of the four (cardinal) directions; corner, angle, nook
19,36/124, 282	IM = tu_{15} [IM], tumu = wind; cardinal point, direction [ta, 'from' + mu_2, 'to blow']
ePSD	ed [ASCEND] wr. ed_3; |UD×U+U+U.DU| "to go up or down; to demolish; to scratch; to rage, be rabid" Akk. arādu; elû; naqāru; šegû
ePSD	zah [DISAPPEAR] wr. zah_3; zah_2 "to disappear; to move away, withdraw; to stay away; (to be) lost; (to be) fugitive" Akk. duppuru; halāqu; nābutu; šerû
ePSD	kan [GATE] wr. kan_4; KA "gate, door" Akk. bābu
ePSD	du [BUILD] wr. du_3 "to build, make; to do, perform" Akk. banû; epēšu
ePSD	ub [CORNER] wr. ub; ib; ib-bi "corner, recess" Akk. tubqu
ePSD	tumu [WIND] wr. tumu "wind"
ePSD	im [RAIN] wr. im; me-er "rain, rain storm" Akk. zunnu; šāru
ePSD	anubda [QUARTER] wr. an-ub-da; ub-da "a cosmographic or geographic term; quarter (of the universe)" Akk. kibrat arbatu
ePSD	limmu [FOUR] wr. $limmu_2$; $limmu_5$; limmu; $limmu_3$; $limmu_4$ "four"
	to come forth from the secret (invisible) threshold to act as gates (guardians) in each of the four cardinal directions
	Reference to the the four corners/cardinal directions implies the world or the universe (Postgate_Early Mesopotamia_42); Cherubim act as "gates" - see Wiggerman, *Mesopotamian Protective Spirits: The Ritual Texts* , 71, 79. See S. R. Driver, The Book of Genesis, 60-61.

SUM ed_2-HA.A-aka_4

	to come forth from the secret threshold

SUM ka_2-ru_2-ub

	Cherub (singular) = to act as a gate (guard) in one of the four cardinal directions

SUM ka_2-ru_2-ub-IM

	Cherubim (plural) = four cherubs act as gates (guards) in each of the four cardinal directions (Gen 3:24)
	Cherubim (plural) = gatekeepers of the universe guarding doorway between heaven and earth (general definition)

Appendix C: Job Translations

Job 1:1		**<u>Job 1:1</u> - In the land of Uz there lived a man whose name was Job.**
Uz, HEB ʿûṣ (oots, Strong's 5780) עוּץ	8/293	uz_3, uzud, ud_5, ut_5 = she-goat, nanny goat
	ePSD	uzud [GOAT] wr. uzud "(female) goat" Akk. enzu
SUM uz_3	ePSD	uzudga [GOAT] wr. uzud-ga "milk goat"
		nanny goats (female goats that can produce milk)
		In the land of goats, there lived a man whose name was Job.
Job, HEB ʾîyôb (ee-yobe', Strong's 347)		**<u>Job 1:2-3</u> - He had seven sons and three daughters, and he owned seven thousand sheep, three thousand camels, five hundred yoke of oxen and five hundred donkeys, and had a large number of servants. He was the greatest man among all the people of the East.**
אִיּוֹב	4,11,102/117	ia_3-ab_2 = fat of cows, cream
SUM ia_3-ab_2	ePSD	i'ab [GHEE] wr. i_3-ab_2 "ghee, clarified butter"
		fat of cows, cream (implies wealth) - see Job 29:6
SUM u_2-a-ab	150/238	u_2-a = caretaker, provider, provisioner
	76/13	ab [AB] = father; elder; high-ranking official
	ePSD	ua [PROVISIONER] wr. u_2-a; ux(PA)-a "provisioner" Akk. zāninu
	ePSD	abba [FATHER] wr. ab; ab-ba; $abba_2$ "old (person); witness; father; elder; an official" Akk. abu; šību
		important high-ranking elder who cared for the poor and vulnerable - see Job 29:7-17
		<u>Job 1:4-5</u> - His sons used to hold feasts in their homes on their birthdays, and they would invite their three sisters to eat and drink with them. When a period of feasting had run its course, Job would make arrangements for them to be purified. Early in the morning he would sacrifice a burnt offering for each of them, thinking, "Perhaps my children have sinned and cursed God in their hearts." This was Job's regular custom.
SUM u_5-e-ab	4/291	u_5 = to raise high
	5/53	e = (n.) speaking; prayer; (v.) to speak, say
	76/13	ab [AB] = father; elder; high-ranking official
	ePSD	a'u [WATER] wr. a-u_2; a-u_3; a-u_5; u_3; u_5 "high water" [u_3, u_5 = "raised, elevated, high"]
	ePSD	e [SPEAK] wr. e; na-be_2-a; be_2; ne; da-me; na-be_2; e_7 "perfect plural and imperfect stem of dug[to speak]" Akk. atwû; dabābu; qabû
	ePSD	abba [FATHER] wr. ab; ab-ba; $abba_2$ "old (person); witness; father; elder; an official" Akk. abu; šību
		father who lifts up prayers
		<u>Job 1:20</u> - [After the reports of stolen animals, dead animals and servants, and the sudden accident that caused the death of his children...] Job got up and tore his robe and shaved his head.
SUM $u_{3,4}$-a-ab	4,3/286	u_3-a = interjection, woe!; alas!
	4/283	$u_{2,3,4,8}$ = an expression of protest; cries, screams
	3/1	a, e_4 = tears
	76/13	ab [AB] = father; elder; high-ranking official
	ePSD	u [BELLOW] wr. u_4 "to bray, bellow, bawl; voice, cry, noise" Akk. nagāgu; rigmu
	ePSD	e [INTERJECTION] wr. e "a vocative interjection"
	ePSD	abba [FATHER] wr. ab; ab-ba; $abba_2$ "old (person); witness; father; elder; an official" Akk. abu; šību
		lamenting father
		<u>Job 2:7-8; 3:1; 3:24</u> - So Satan went out from the presence of the Lord and afflicted Job with painful sores from the soles of his feet to the crown of his head. Then Job took a piece of broken pottery and scraped himself with it as he sat among the ashes. [...] After this, Job opened his mouth and cursed the day of his birth. [...] "For sighing has become my daily food; my groans pour out like water."
SUM i-ab	4/116	i = cry of pain; to cry out, wail
	76/13	ab [AB] = father; elder; high-ranking official
	ePSD	i [HEY!] wr. i "(vocative exclamation), hey!"
	ePSD	abba [FATHER] wr. ab; ab-ba; $abba_2$ "old (person); witness; father; elder; an official" Akk. abu; šību
		elder father crying in pain

Job 1:6

Now there was a day when the children (bĕnê) of God's household (ʾĕlōhîm) came to present themselves before the LORD Father (yĕhvâ), and Satan (śāṭān) also came among them.

children, HEB bənê
(bane, Strong's 1121)
בְּנֵי
SUM be_2-ni_2

14/32	$be_{3,4,6}$ = to tear, cut; to tear off; to diminish, lessen
13/195	ni_2 = self; body
ePSD	be [DIMINISH] wr. be_4; be_6 "to deduct, remove; to diminish, reduce; to withdraw, receive (as an allotment)" Akk. našāru
ePSD	ni [SELF] wr. ni_2 "self" Akk. ramānu
	to tear off (a little piece) of oneself
	It is noteworthy that this word does not imply a particular gender. The term be_2-ni_2 is inclusive to both genders.

Elohim, HEB ʾĕlōhîm
(el-o-heem', Strong's 430)
אֱלֹהִים
SUM $e_{2,4}$-li-ḫ-eme
SUM $e_{2,4}$-li-ḫa_2-eme

3/1	e_4 = father
3/55	e_2 = temple; house; household
/157	li = to be happy; to rejoice; to sing
11/108	ḫ = many (see note on *ḫa, fish)
11/109	ḫa_2 = numerous; diverse; assorted; mixed
11/111	ḫe_2 = abundant; abundance
19/60	eme = tongue; speech
ePSD	e [HOUSE] wr. e_2; ĝa_2; e_4 "house; temple; (temple) household; station (of the moon)?; room; house-lot; estate" Akk. bītu, [NOTE: house, households, estates easily associated with a patriarch, so father is likely implied]
ePSD	lib [RICH] "(to be) rich, well-off; high quality; (to be) happy" Akk. hadû; hidiātu; râšu; rāšû; rīšātu
ePSD	lala [PLENTY] wr. la-la; a-la; la "plenty, happiness, lust" Akk. lalû
ePSD	heĝal [PLENTY] wr. he$_2$-ĝal$_2$ "plenty" Akk. hengallu
ePSD	eme [TONGUE] wr. eme "tongue; language" Akk. lišānu
	father's temple household of many rejoicing tongues (heavenly beings in the household of God)
	This would seem to suggest the father (God) and his family (the children of God - heavenly beings)
	bĕnê ʾĕlōhîm = the children of the household of God

For the purposes of translation, the 'v'sound in Hebrew is assumed to have come from the 'ph' sound associated with the consonant 'p'. Both 'v' and 'ph' are produced with labiodental fricative articulation (the former is voiced, the latter is voiceless), so it is not unreasonable to assume they would share a common origin. Therefore, wherever 'v' is found in Hebrew, it is assumed that the original consonant in Sumerian was 'p'.

YHWH, HEB yəhvâ
(yeh-vaw', Strong's 3068)
יְהוָה
SUM u-a-PA.E_2
SUM u-e_4-PA.E_2

6/283,61	u = Emesal dialect for en and lugal, 'lord, master; king'
3/1	a, e_4 = father
/213	PA.É = PA.E_2 = šabra$_x$
66/247	šabra [PA.É], šabra$_x$ = manager, administrator of a temple or royal household
ePSD	en [LORD] wr. en; u_3-mu-un; umun "lord; master; ruler" Akk. bēlu
ePSD	lugal [KING] wr. lugal; lu_2-gal "lord; master; owner; king; a quality designation" Akk. bēlu; šarru
ePSD	aya [FATHER] wr. a-a; aya$_2$; a-ia "father" Akk. abu
ePSD	e [HOUSE] wr. e_2; ĝa_2; e_4 "house; temple; (temple) household; station (of the moon)?; room; house-lot; estate" Akk. bītu
ePSD	šabra [ADMINISTRATOR] wr. šabra; šabra$_2$; $ša_3$-ab-ra "chief administrator of a temple or other household" Akk. šabrû
	lord father in charge of the temple household (see Elohim = father's temple household of many rejoicing tongues)

Satan, HEB śāṭān
(saw-tawn', Strong's 7854)
שָׂטָן
SUM sa_2-ta-An

14/221	sa_2 = (v.) to approach or equal in value; to attain, reach; to compare with; to be zealous, competitive
16/272	ta = nature, character
6/19	An = god of heaven
ePSD	sa [EQUAL] wr. sa_2; sax(ZAG); se_3 "to equal, compare, compete, be equal to, rival" Akk. kašādu; mašālu; šanānu
ePSD	ta'am [EACH] wr. ta-am_3 "each" = [ta, 'nature, character' + am_3, 'to be']
ePSD	an [SKY] wr. an "sky, heaven; upper; crown (of a tree)" Akk. šamû
	(one who) competes to be equal in nature to God
	Satan appears to be excluded from those who are considered the "children of God" because rather than treat God as his wise superior or Father, Satan will speak to God as an equal by contradicting him and giving God his own advice (in Job 1:8-11).

		Then the Lord said to Satan, "Have you considered my servant Job? There is no one on earth like him; he is blameless and upright, a man who fears God and shuns evil." **"Does Job fear God for nothing?" Satan replied. "Have you not put a hedge around him and his household and everything he has? You have blessed the work of his hands, so that his flocks and herds are spread throughout the land. But now stretch out your hand and strike everything he has, and he will surely curse you to your face." [...]** **Then the Lord said to Satan, "Have you considered my servant Job? There is no one on earth like him; he is blameless and upright, a man who fears God and shuns evil. And he still maintains his integrity, though you incited me against him to ruin him without any reason."** **"Skin for skin!" Satan replied. "A man will give all he has for his own life. But now stretch out your hand and strike his flesh and bones, and he will surely curse you to your face."**
Job 1:8-11; 2:3-5		
Satan, HEB śāṭān (saw-tawn', Strong's 7854) שָׂטָן **SUM sa_2-ta_6-An**	14/221	sa_2 = (n.) advice, counsel
	30/273	ta_6, $taka_4$, tak_4 = to leave; to abandon; to disregard, neglect; to set aside
	6/19	An = god of heaven
	ePSD	sa [ADVICE] wr. sa_2 "advice, counsel; resolution, intelligence" Akk. milku
	ePSD	taka [ABANDON] wr. tak_4 "to set aside, leave behind; to save, keep back, hold back" Akk. ezēbu; uhhuru; šêtu
	ePSD	an [SKY] wr. an "sky, heaven; upper; crown (of a tree)" Akk. šamû
		(one who) abandons the counsel (wisdom) of God
Job 1:12-22; 2:6-10		**Satan afflicts Job by killing his children, seizing his possessions, and giving him a painful illness.**
SUM sa_{12}-ta_3-an	28/223	sa_{12}, saĝ = (n.) head; leader; servant of a god or king; person; individual; (adj.) first, prime
	30/273	ta_3, taga, tag = to attack; to afflict
	6/19	an = (n.) sky, heaven
	ePSD	saĝ [HEAD] wr. saĝ "head; person; capital" Akk. qaqqadu; rēšu
	ePSD	tag [TOUCH] wr. tag "to touch, take hold of; to bind; to attack" Akk. lapātu; rakāsu
	ePSD	an [SKY] wr. an "sky, heaven; upper; crown (of a tree)" Akk. šamû
		(highest?) servant of God who afflicts from heaven
Job 3:4		**<u>Job 1:8</u> - Then the Lord said to Satan, "Have you considered my servant Job? There is no one on earth like him; he is blameless and upright, a man who fears God and shuns evil."**
Elohah, HEB ʾĕlôhah (el-o'-ah, Strong's 433) אֱלוֹהַּ **SUM e_4-li-$ḫa_2$-$aḫ_3$**	3/1	e_4 = father (of the household)
	/157	li = to be happy ; to rejoice; to sing
	11/109	$ḫa_2$ = numerous; diverse; assorted; mixed
	11/111	he_2 = abundant; abundance
	29/155	$aḫ_3$ [UD] = (v.) to sparkle, shine; to dry out seems to imply cleanliness; something made clean]
	ePSD	e [HOUSE] wr. e_2; $ĝa_2$; e_4 "house; temple; (temple) household; station (of the moon)?; room; house-lot; estate" Akk. bītu [NOTE: house, households, estates easily associated with a patriarch, so father is likely implied]
	ePSD	lib [RICH] "(to be) rich, well-off; high quality; (to be) happy" Akk. hadû; hidiātu; râšu; rāšû; rīšātu
	ePSD	heĝal [PLENTY] wr. he_2-$ĝal_2$ "plenty" Akk. hengallu
	ePSD	ah [DRY] wr. ah_3 "(to be) dried (out), dry; to dry" Akk. abālu; šābulu
		father who rejoices over the cleansed/purified multitudes (of his household and Job)
		Notice the purification of God's people, which may explain the meaning of the spirit of God, ru-aḫ3, meaning "to pour out (the gift of) purification".
Job 36:27 (Gen 2:6)		**...an (ʿēd) rose up from the ground and watered the whole surface of the ground.**
mist, HEB ʿēd (ade, Strong's 108) אֵד **SUM e_4-$ed_{2,3}$** **SUM a-de_2** **SUM a...de_2**	3/1	e_4 = water
	5/58	ed_2 [UD.DU], e_3; i = to go out, come out, emerge; to send forth; to issue
	5/58	ed_3 = to exit; to rise; to drain = aquifer referred to in Gen 2:5,6
	71/2	a-de_2 = fresh [a, 'water' + de_2, 'to pour']
	71/2	a...de_2 = to pour out water; to irrigate the fields; to flood, overflow [a, 'water' + de_2, 'to pour']
	3/1	a = water
	9/41	de_2 [UMUN$_2$ x KASKAL] = to pour; to water; to libate; to fill, increase, be full
	ePSD	a [WATER] wr. a "water; semen; progeny" Akk. mû; rihûtu
	ePSD	ed [ASCEND] wr. ed_3; |UD×U+U+U.DU| "to go up or down; to demolish; to scratch; to rage, be rabid" Akk. arādu; elû; naqāru; šegû
	ePSD	a de [IRRIGATE] wr. a de_2 "to irrigate (by flooding)" Akk. šaqû ša eqli
		water issues forth (from the ground), overflows and drains
		Likely refers to a water outlet from the underground Dibdibba aquifer beneath region of Basra, located at the ancient convergence of the 4 rivers that flowed into Eden. At this time (6000 years BP), the water table was higher due to a moist period of the Holocene Epoch. This would not be unlike the San Marcos Springs and Barton Springs outlets of the Edwards Aquifer found in central Texas today: http://www.edwardsaquifer.net/intro.html, accessed 14 June 2018.

Job 2:11

When three of Job's friends heard of the tragedy he had suffered, they got together and traveled from their homes to comfort and console him. Their names were Eliphaz the Temanite, Bildad the Shuhite, and Zophar the Naamathite.

Job 5:17-18

Eliphaz, HEB **ʾĕlîpaz**
(el-ee-faz', Strong's 464)
אֱלִיפַז
SUM **e-li-pa-azu**

[Eliphaz] "Blessed is the one whom God (ʾĕlôha) corrects; so do not despise the discipline of the Almighty. For he wounds, but he also binds up; he injures, but his hands also heal."

(Note that ʾĕlôha = SUM **e_4-li-aḫ$_3$ = "father who rejoices over the purified")**

5/53	e = (v.) to speak, say; (n.) speaking
/157	li = to be happy ; to rejoice; to sing
14/212	pa = (n.) branch
21/25	azu = doctor, healer
ePSD	e [SPEAK] wr. e; na-be$_2$-a; be$_2$; ne; da-me; na-be$_2$; e$_7$ "perfect plural and imperfect stem of dug [to speak]" Akk. atwû; dabābu; qabû
ePSD	lib [RICH] "(to be) rich, well-off; high quality; (to be) happy" Akk. hadû; hidiātu; râšu; rāšû; rīšātu
ePSD	pa [BRANCH] wr. pa; pa$_9$ "wing; branch, frond" Akk. agappu; aru; kappu
ePSD	azu [DOCTOR] wr. a-zu; a-zu$_5$; azu "doctor" Akk. asû

["Eliphaz's" Advice to Job] - "says to be happy with the branch (of discipline) and the healer"

Proverbs 13:24 - Whoever spares the rod hates their children, but the one who loves their children is careful to discipline them.

the Temanite, HEB **hattêmānî**
(tay-maw-nee', Strong's 8489)
הַתֵּימָנִי
SUM **at-te-ma$_3$-ni$_2$**

/273	when Sumerian words are borrowed into Akkadian, d becomes t
18/15	at = ad, ada [AD] = (n.) father
17/274	te, teĝ$_3$ = (v.) to approach, reach, meet
12,97/168, 95	ma$_3$ = Emesal dialect for ĝa$_2$-e = "I, myself"
13/195	ni$_2$; neg [LIL$_3$] = fear; respect; fearsomeness; awe
ePSD	adda [FATHER] wr. ad-da; ad "father" Akk. abu
ePSD	teĝ [APPROACH] wr. teĝ$_3$; teĝ$_4$ "(to be) near to; to approach" Akk. ţehû
ePSD	ĝae [I] wr. ĝa$_2$-e; ĝe$_{26}$ "I"
ePSD	ni [FEAR] wr. ni$_2$; e; ne$_4$ "fear, aura" Akk. puluhtu

["The Temanite" Theological Approach] - "I approach the Father with fear and respect (piety)"

In the first speech of Elipaz the Temanite, he emphasizes putting confidence in piety (4:6), that man suffers discipline because he is less righteous than God (4:17-19), and that evil that perishes before God (8:9). In his second speech, he unfairly admonishes Job for undermining piety and hindering devotion to God (15:4), that the sin of Job's own mouth has brought suffering on him (15:5-6), and claims that mortals are born impure, unrighteous, and untrustworthy (15:14-16). In his third speech, Eliphaz the Temanite confidently states that Job's suffering is due to his lack of piety (22:4-5) and then proceeds to falsely accuse him of wickedness (22:6-11) even though the audience knows that God has elevated Job as an example of a truly pious man "who fears God and shuns evil" (1:8).

Implies the pious man has nothing to fear, and emphasizes respect and devotion (piety) towards God. [Theological Emphasis: PIETY]

Job 8:3-6

[Bildad] "Does God (ʾēl) pervert justice? Does the Almighty (ʾēl-šadday) pervert what is right? When your children sinned against him, he gave them over to the penalty of sin. But if you will seek God earnestly and plead with the Almighty, if you are pure and upright, even now he will rouse himself on your behalf and restore you to your prosperous state."

ʾēl šadday = SUM-AKK **il-šadu-di = "God of heaven who speaks from the mountain"**

Bildad, HEB **bildad**
(bil-dad', Strong's 1085)
בִּלְדַּד
SUM **bil$_{2,3}$-da$_6$-ad**

30/33	bil$_{2,3}$ = son; sprout, shoot
30/38, 273	da$_6$ = tag, taka = to strike, hit, push; to attack; to afflict; to touch, hold
18/15	ad, ada [AD] = (n.) father
ePSD	gibil [SPROUT] wr. ^{ĝeš}gibil "sprout, offshoot" Akk. pirʾu
ePSD	tag [TOUCH] wr. tag "to touch, take hold of; to bind; to attack" Akk. lapātu; rakāsu
ePSD	adda [FATHER] wr. ad-da; ad "father" Akk. abu

["Bildad's" Advice to Job] - "the son should submit to the Father's beatings" (submit to Justice of God)

the Shuhite, HEB **haššûḥî**
(shoo-khee', Strong's 7747)
הַשּׁוּחִי
SUM **aš-šu-ḫi**

7/24	aš = one; only; alone; unique
16/262	šu = (n.) hand(s); share, portion
11/112	ḫi = (v.) to mix
ePSD	aš [ONE] wr. aš "one" Akk. išten
ePSD	šu [HAND] wr. šu; sum$_5$; šu-x "hand" Akk. qātu
ePSD	hi [MIX] wr. hi "to mix (up); process (skin; wool, in the latter possibly a stage between combing and spinning); alloy" Akk. balālu

["The Shuhite" Theological Approach] - "(life is) one mixed portion"

Job 8:7 - [Bildad] "Your beginnings will seem humble, so prosperous will your future be." - Bildad seems to be describing the tragic losses of Job's children and posessions as only the beginning of an otherwise wonderful future, perhaps alluding to the phrase "one mixed portion" (aššûḥî).

Implies God will provide compensation to the pure and upright, and emphasizes God's justice which does not punish the innocent (Job 8:3-7). [Theological Emphasis: JUSTICE]

		[Zophar] "Oh, how I wish that God (ʾĕlôha) would speak, that he would open his lips against you and disclose to you the secrets of wisdom, for true wisdom has two sides: sound wisdom and when God sees less of your sin. Can you fathom the mysteries of God? Can you probe the limits of the Almighty? They are higher than the heavens above - what can you do? They are deeper than the depths below - what can you know? [...] Yet if you devote your heart to him and stretch out your hands to him, if you put away the sin that is in your hand and allow no evil to dwell in your tent, then, free of fault, you will lift up your face; you will stand firm and without fear."
Job 11:5-8,13-15		
Zophar, HEB ṣôpar (tso-far', Strong's 6691) צוֹפַר		**(Note that ʾĕlôha = SUM e_4-li-aḫ$_3$ = "father who rejoices over the purified")**
SUM zu-par$_6$	17/316	zu = (n.) wisdom, knowledge; (v.) to know; to understand; to experience; to be familiar with; to inform, teach
	52/31	par$_6$, para$_{10}$, bar$_2$, bara$_2$, barag; bara$_{5,6}$ = (n.) throne dais; sanctuary, chapel, shrine; sackcloth, penitential robe
	ePSD	zu [KNOW] wr. zu "to know; to learn" Akk. edû; lamādu
	ePSD	barag [DAIS] wr. barag; bara$_{10}$; bara$_6$; bara$_7$; bara$_8$ "ruler, king; dais, seat" Akk. parakku; šarru; šubtu
	ePSD	barag [SACK] wr. barag; bar; bar$_2$-ra; bara$_9$; bur$_2$ "sack; a part of an animal's body" Akk. bašamu
		["Zophar's" Advice to Job] - "wisdom comes from penitence and the throne of God"
the Naamathite, HEB hannaʿămātî (nah-am-aw-thee', Strong's 5284) הַנַּעֲמָתִי	6/19	an = (n.) heaven, sky
SUM an-na-a-ma-ti	/184	na = (n.) advice
	3/1	a = (n.) father
	11/165, 95	ma = Emesal dialect for ĝa$_2$ = house; shrine
	33/277	ti, til$_3$ = (n.) life; to live; to keep alive; to dwell
	ePSD	an [SKY] wr. an "sky, heaven; upper; crown (of a tree)" Akk. šamû
	ePSD	na deg [CLEAR] wr. na degx(RI); ša di; ša di-di; ša di-di$_5$; ša di$_5$ "to make clear, explain; to consecrate, purify; to separate; to clear out, cut out" Akk. ašāru; elēlu; hasāsu
	ePSD	aya [FATHER] wr. a-a; aya$_2$; a-ia "father" Akk. abu
	ePSD	ĝa [HOUSE] wr. ĝa$_2$; ma "house" Akk. bītu
	ePSD	til [LIVE] wr. til$_3$ "to live; to sit (down); to dwell" Akk. ašābu; balāṭu
		["The Naamathite" Theological Approach] - "heavenly knowledge (is necessary) to dwell in the house of the Father"
		Implies lack of wisdom causes sinfulness and punishment, so only repentance and the acceptance of sound teaching will ensure a life without fear. - [Theological Emphasis: WISDOM]
Gen 15: 15; Job 5:24; 15:21; 21:9; 25:2		
peace, HEB šālôm שָׁלוֹם	27/247	ša$_3$ = (n.) heart; interior; (prep.) in; within
(shaw-lome', Strong's 7965)	34/164	lum = (v.) = to be satiated, full; to grow luxuriantly, thrive; to be productive; to bear fruit
SUM ša$_3$-lum	ePSD	šag [HEART] wr. šag$_4$; ša; ša$_3$-ab "inner body; heart; in, inside" Akk. libbu
	ePSD	lum [FRUIT] wr. lum "(to be) full, replete, satisfied (with); (to be) grown (tall); to fruit; (to be) fructified; to shine" Akk. enēbu; unnubu; namāru; šebû; šihu
		to be satisfied, contented, and flourish within the heart
		šālôm, Strong's 7965 = completeness, soundness, welfare, peace
Job 42:5-6		**My ears had heard of You, but now my eyes have seen You. Consequently the fetter of goods (ʿemʾas), the ending of life's payment in assorted goods, the approach of the most awesome God, and the inward refreshment of abundance (niḥamtî) are revealed in the midst of dust and ashes (death). [God's presence brings peace and abundance within - shalom.]**
to despise, HEB ʾemʿas (ehm-as', Strong's 3988) אֶמְאָס	28/60, 197	em$_3$, im$_3$ [AĜA$_2$] = Emesal dialect for niĝ$_2$, "goods, property"
SUM em$_3$-as	20/25	as, az = cage; fetter; bear
	ePSD	niĝ [THING] wr. niĝ$_2$; aĝ$_2$ "thing, possesion; something" Akk. bušu; mimma
	ePSD	az [BEAR] wr. az; ^{ĝeš}az "bear; ~ figurine" Akk. asu
	ePSD	azla [CAGE] wr. az-la$_2$ "a cage" Akk. nabāru
	ePSD	azgu [NECK-STOCK] wr. az-gu$_2$ "type of neck-stock"
	ePSD	gu [NECK] wr. gu$_2$ "bank, side; neck" Akk. ahu; kišādu; tikku
		to be fettered/caged by goods/property

to repent, HEB niḥamtî
(nee-hahm-tee, Strong's 5162)
נִחַמְתִּי
SUM ni$_2$-ḫe$_2$-am$_2$-ti

13/195	ni$_2$, ne$_4$ [LIL$_5$]= fear; respect; awesomeness; awe
11/111	ḫe$_2$ = abundance; abundant
18/16	am$_2$, aĝa$_2$, aĝ$_2$, aka$_2$= to pay out; to measure
17/274	ti, tiĝ$_4$; teĝ$_3$, te, de$_4$ = to approach, reach, meet (someone: dative)
ePSD	ni [FEAR] wr. ni$_2$; e; ne$_4$ "fear, aura" Akk. puluhtu
ePSD	heĝal [PLENTY] wr. he$_2$-ĝal$_2$ "plenty" Akk. hengallu
ePSD	aĝ [MEASURE] wr. aĝ$_2$ "to measure" Akk. madādu
ePSD	teĝ [APPROACH] wr. teĝ$_3$; teĝ$_4$ "(to be) near to; to approach" Akk. ţehû
	to approach someone (God) and pay out abundant awe and respect

SUM ni$_3$-ḫa$_2$-am$_2$-ti

28/197	ni$_3$, niĝ$_2$ = property, goods, treasure, valuables, assets, material, stock, equipment, articles; everything
11/109	ḫa$_2$ = numerous; diverse; assorted; mixed
18/16	am$_2$, aĝa$_2$, aĝ$_2$, aka$_2$= to pay out; to measure
33/276	til, til$_3$ [TI]= to be ripe, complete; to make complete; to perform required service; to finish paying off a contract, complete a transaction; to put an end to, spend, exhaust, finish; to pluck; to cease, perish
ePSD	ni [FEAR] wr. ni$_2$; e; ne$_4$ "fear, aura" Akk. puluhtu
ePSD	hala [SHARE] wr. ha-la; hal "inheritance share" Akk. zittu
ePSD	aĝ [MEASURE] wr. aĝ$_2$ "to measure" Akk. madādu
ePSD	til [COMPLETE] wr. til; til$_3$ "(to be) complete(d); (to be) old, long-lasting; to end" Akk. gamāru; labāru; qatû
	to cease payment of assorted goods

SUM ni$_2$-ḫe$_2$-am$_3$-te

126/197, 195, 275	ni$_2$...te(-en) = to rest; to refresh oneself; to calm down; to cool down
11/111	ḫe$_2$ = abundance; abundant
6/18	am$_3$ = Sumerian 3.sg. Enclitic copula, "to be"
ePSD	ni [SELF] wr. ni$_2$ "self" Akk. ramānu
ePSD	ni ten [COOL] wr. ni$_2$ te-en "to cool off" Akk. ?
ePSD	heĝal [PLENTY] wr. he$_2$-ĝal$_2$ "plenty" Akk. hengallu
ePSD	me [BE] wr. me; em; am3 "to be"
	to refresh oneself with abundance (within)

Job 42:13-15

And he also had seven sons and three daughters. The first daughter he named Jemimah, the second Keziah and the third Keren-Happuch. Nowhere in all the land were there found women as beautiful as Job's daughters, and their father granted them an inheritance along with their brothers.

Jemimah, HEB yəmîmâ
(yem-ee-maw', Strong's 3224)
יְמִימָה
SUM u$_6$-e$_4$-mi$_2$-mah

5/294	u$_6$, ug$_6$ [IGI.E$_2$] = (adj.) astonishing; (v.) to be impressed; to look at; stare at, gaze; (n.) amazement; gaze
3/1	e$_4$, a = offspring; seminal fluid; water; father
13/175	mi$_2$ [SAL]; munus; min$_2$; mu$_{10}$ = (n.) woman; female
29/168	mah = (adj.) splendid, sublime, foremost, lofty
ePSD	u [ADMIRATION] wr. u$_6$ "admiration"
ePSD	a [WATER] wr. a "water; semen; progeny" Akk. mû; rihûtu
ePSD	munus [WOMAN] wr. munus; nu-nus "woman; female" Akk. sinništu
ePSD	mah [GREAT] wr. mah; mah$_2$ "(to be) great" Akk. kabtu; mādu; rabû; şīru
	to be impressed by splendid female offspring

Keziah, HEB qəṣî'â
(kets-ee-aw', Strong's 7103)
קְצִיעָה
SUM ka$_9$-zi-a

46/136	ka$_9$, kas$_7$ = settlement of accounts; possession
24-25/315	zi, zid = (adj.) good; righteous, just; faithful; honest; true, correct
3/1	a = father
ePSD	zid [RIGHT] wr. zid "right; to be right, true, loyal"
ePSD	aya [FATHER] wr. a-a; aya$_2$; a-ia "father" Akk. abu
	settlement of accounts for the good and faithful father

Keren-Happuch, HEB qeren happûk
(keh'-ren hap-pook', Strong's 7163)
קֶרֶן הַפּוּךְ
SUM kar$_2$-en$_{2,3}$-ha$_2$-pu$_2$-pu$_3$-uku$_{2,5}$

42/135	kar$_2$ = to be bright (of light, day); to (make) shine
6/62	en$_{2,3}$ = (n.) time
11/109	ha$_2$ = numerous
14/217	pu$_2$ = irrigated fruit orchard; well, cistern, reservoir; pool; fountain
40/217,36	pu$_3$ = bu$_3$, bur$_{12}$ = to tear, cut off; to uproot
69/296	uku$_{2.5}$, ukur$_{3,4}$ = poor man, pauper; poverty
ePSD	kar [BLOW] wr. kar$_2$-kar$_2$; kar$_2$ "to blow; to light up, shine; to rise" Akk. napāhu
ePSD	enše [UP TILL NOW] wr. en$_3$-še$_3$ "up till now" Akk. adi matīma
ePSD	pu [ORCHARD] wr. pu$_2$ "fruit orchard" Akk. şippatu
ePSD	pu [WELL] wr. pu$_2$ "lower course, footing; cistern, well; fish pond; source (of river); hole, pit; depth" Akk. asurrû; būrtu; šuplu
ePSD	ukur [POOR] wr. ukur$_3$ "(to be) poor; pauper" Akk. lapnu
	a time of brightness - numerous lush orchards for the uprooted poor man