The Redemption of Nature in Romans 8

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CHAPTER I

INTRODUCTION

In his quest to understand the world about him, man, no matter what his method of approach, reaches one conclusion about the physical realm. The atheistic biologist, Julian Huxley, observed of the inorganic realm, "It is impelled from behind by blind physical forces, a gigantic and chaotic jazzy dance of particles and radiations, in which the only over-all tendency we have so far been able to detect is the tendency is to run down."[1] Another scientist states it in more clinical terms: "In all cases observed in nature there is a tendency for processes to proceed toward a state of greater disorder."[2] A man of letters, Matthias Claudius wrote it in a poem,

Truly we here in a land inhabit,
Where iron is the meat of rust,
Whether in cottage or in palace,
All things are dust.

Where we all uncertain wander,
And walk in mist and night,
In madness and illusion acting,
And never see the light.

Where in the dark we taste the sweet and bitter,
While round us ever and again.
All things, all however they may glitter,
Empty are and vain.[3]

Godet, the biblical commentator, quotes Reuss's pronouncement: "Everywhere," says M. Reuss, "our eyes meet images of death and decay; the scourge of barrenness, the fury of the elements, the destructive instincts of beasts, the very laws which govern vegetation, everything gives nature a

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[1] Quoted. by John C. Greene, *Darwin and the Modern World View* (New York: New American Library,1953), pp. 70-71.

[2] David Halliday and Robert Resnick. *Physics For Students of Science and Engineering* (New York: John Wiley and Sons, 1960), p. 5.51.

[3] Quoted by Karl Helm, *The World.: Its Creation and Consummation* (London and Edinburgh: Oliver and Boyd, 1962). p. 551.

sombre hue."[4] "All the voices of nature are in the minor key."[5] Henry Morris of The *Genesis Flood* fame concisely sums up the conclusion, "Physical systems, left to themselves, run down and stop; biological organisms grow old and die; societies isolated from uplifting influences deteriorate and vanish away.[6]" The physical realm, according to the academicians, is under a law of decay and dissolution.

The scriptures make the same observation of nature. The whole book of Ecclesiastes in its timeless view of man and the world. could be summed up in a word "vanity." This theme of the vanity of the physical realm runs throughout the Bible but is summarized by the prophet Isaiah, "Lift up your eyes to the heavens, and look upon the earth beneath: for the heavens shall vanish away like smoke, and the earth shall wax old like a garment and they that dwell therein shall die in like manner . . ." [Isaiah 51:6]. The heavens, the earth, and living creatures are all subject to wear, decay, and dissolution or death. Man is but a wisp upon this fading, cosmic panorama. "For all flesh is as grass, and all the glory of man is as the flower of grass. The grass withereth and the flower thereof falleth away" [I Peter 1:21]. "All go unto one place; all are of the dust. and all turn to dust again" [Ecclesiastes 3:20]. The scriptures agree with human knowledge that the universe and everything in it is subject to a universal law of corruption and death.

However, the Word of God adds two features to this law of decay and. death: (1) a *terminus a quo*, a beginning, and (2) a *terminus ad quem,* an end. There was a beginning of this present law and there will be a termination of it. All of this is best expressed in four verses which Paul penned in his epistle to the Romans. Romans 8:19-22 points to a past subjection of nature to the bondage of corruption, the present state of nature under the law of decay, and the future redemption of nature from this bondage.

Using Romans 8:19-22, this thesis focuses on this bondage of corruption of nature with special emphasis on its redemption from the bondage. However, the future redemption is meaningless without an adequate understanding of the past and present status of nature. Therefore, the three major divisions of the thesis are temporal: (1) the *terminus a quo*, the time when the law was instituted, (2) the present state of nature, and (3) the *terminus ad quem*, the time when the law will be terminated, nature's redemption point. Each of these major divisions consists of three subdivisions: (1) an exegesis of the one or two relevant verses with the emphasis on word studies and syntax, (2) the theological significance of the verses in the light of the rest of scripture, and (3) the scientific implications of the verses.

The major premise of this thesis is that this bondage of corruption (past, present, and future) upon nature is directly related to man and his sin. Such a premise falls into the sphere of metaphysics. Science, the study of the physical realm, says nothing about ultimate causes and only works at the material level. These verses in Romans, however, relate physical laws and their

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[4] Fredrick Louis Godet, *Commentary on St. Paul's Epistle to the Romans* (2 vols.: New York: Funk and Wagnall, 1883. I, 90.

[5] James Stifler, *The Epistle to the Romans* (New York: Fleming H. Revell, 1897), p. 152.

[6] Henry Morris, *The Twilight of Evolution* (Grand Rapids: Baker Book House, 1963), p. 41.

ultimate causes to the spiritual realm which involves such non-material concepts as God, redemption, and sin. If Paul is correct here in Romans, then the whole work of the Renaissance to segregate metaphysics into theology and science was in vain. Here in Romans 8:19-22 We have a cosmic physica1 phenomenon as the direct result of spiritual interaction. W. H. Griffith Thomas captured the premise of this thesis.

> This is one of the most striking passages in St. Pau1's writings. It suggests to us some of the most wonderful lessons connected with the universe. Science, philosophy, and Christianity all unite in testifying to the essential unity of the universe, with man as the crown and culrninat1on, and there seems no reason to doubt that the fact of sin has in some way affected the entire constitution of things created. How this has come about, and what precisely is involved, it is of course impossible to say with definiteness and completeness; but the more we realize the oneness of the universe the more we shall come to the conclusion that everything is somehow involved in human sin.[7]

Few portions of scripture affect as many planes of human knowledge as deeply as do these verses. Science cannot escape the grip of this law of decay because its whole field of study, the physical realm, is under the law's sway. Philosophy can only evade the impact of the law by taking a route of escapism from reality. The remarks of Schelling the poet exemplify the problem with escapism: "On the loveliest spring day, while nature is displaying all her charms, does not the heart, when drinking in admiration, imbibe a poison of gnawing melancholy?[8] Theology hardly has an area that is not affected from theology proper to eschatology. The net effect of the law of corruption is a confrontation with the reality of vanity and death under which nature and men function. Ibsen the playwright accentuates this harsh reality: "Death is the rostrum of life. When we speak from there, we shall be understood."[9] Only one hope alleviates the pessimism of this law which affects every area of thinking, and that is nature's, along with man's, future redemption from vanity.

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[7] William H. Griffith Thomas, *St. Paul's Epistle to the Romans* (Grand Rapids: Wm. B. Eerdman's Publishing Co., 1947). p. 220.

[8] George L. Rogers, *Studies in Paul's Epistle to the Romans* (Los Angeles, Calif: Geo. L. Rogers, 1936), p. 581.

[9] Heim, *The World*, p. 132. A quote in the second part of Ibsen's drama *Brand*.

CHAPTER II

THE PAST SUBJECTION OF NATURE

Exegetical Analysis

Verse twenty in Romans 8 deals basically with the past subjection of the creation to futility. Exegetically, three words or phrases are critical to the understanding of the verse. First, there is *κτίσις*. Since this is the subject of this thesis, what does it specifically refer to? Second, there is the phrase *οὐχ ἑκοῦσα*. What does it mean, and is this a figurative description of nature? Third, there are the two uses of the root verb ὑποτάσσω, *ὑπετάγη*, and *ὑποτάξαντα*. What types of aorist are they? Who is the antecedent of *ὑποτάξαντα*?

The meaning of *κτίσις*

Κτίσις, a feminine noun, is used in the New Testament in two ways: (1) the creative act (Romans 1:20), and (2) created things (Mark 10:6; Colossians 1:15; II Peter 3:4). Of the nineteen times it is used, only Romans 1:20 is a clear reference to a creative act. The other eighteen usages refer to created things, either nature or the new man in Christ. In these passages in Romans 8, the word is used four times and refers to created things. There are seven possibilities that commentators and theologians have chosen to specify these created things. The possibilities are (1) the whole rational and irrational, animate and inanimate, creation, including angels (Theodoret), (2) the whole creation, excluding angels but including irrational animals and man (Heim, Barth, Kollner), (3) the whole irrational material creation, animate and inanimate (Irenaeus, Haldane, Rogers, Wolf, Alford, Hodge, Shedd, Neander, Meyer, Godet, and the majority of commentators), (4) the inanimate creation only (Chrysostom, Calvin, Beza, Luther), (5) the whole human race (Origen, Olshausen), (6) the heathen world, not believers; all unbelievers (Augustine), unbelieving Gentiles, yet unconverted (Locke, Lightfoot, Hammond), or yet unconverted Jews (Cramer, Garsdorf), (7) the body of believers (LeClerc, Barth).

This field of possibilities is fairly easily narrowed. *κτίσις* cannot include angels because all indications of scripture are that angels have no redemption and no earnest expectation to be freed from bondage. The evil angels that are under chains and bound have no eager expectation in the future, but expect the day of judgement which awaits them (II Peter 2:4, Jude 6). Satan and the free evil angels have no brighter expectation; the lake of fire, not freedom, awaits them (Matthew 25:41, Revelation 20:10). The angels of God, on the other hand, though expectant of the revealing of the sons of God, are not under the bondage of corruption and do not expect to be freed. The first possibility, everything except God, would then be eliminated because it includes angels.

Likewise the created things cannot include humans. First, humans, as rational and willful beings, are willingly subject to the consequences of sin; whereas, the irrational creation is not in its state by an act of its will. Second, the elect cannot be intended because the elect are contrasted with *κτίσις* in verse twenty-three: *οὐ μόνον δέ, ἀλλὰ καὶ αὐτοι. . . .ἡμεῖς* (and not only *the creation*,

but we ourselves also). Verse twenty-three delineates the *we* (*ἡμεῖς*) as those who are the redeemed (receive the redemption of their bodies). Paul later, in verse thirty, further specifies this group as the elect (foreordained). Third, neither can the non-elect humanity be included in *κτίσις* because they have no earnest expectation of freedom from bondage. Their only expectation is the opposite of freedom from corruption, a corruptive condemnation, "For their worm shall not die, neither shall their fire be quenched" [Isaiah 66:24 (A.S.V.)]. Since rational material beings, the elect and non-elect cannot be included in *κτίσις*, possibilities two, five, six and seven are eliminated.

The only possibilities left are: (3) the whole irrational, material creation, animate and inanimate, and (4) inanimate creation only. Inanimate creation is just a subdivision of the whole irrational material realm. Is there any reason to limit this just to the plant and inorganic. realm? Neither from this portion of scripture, nor from the rest of scripture, nor from a study of the material realm does this seem necessary. The animal kingdom seems to be subject to the same vanity and death as the plant kingdom and inorganic matter[10]. Consequently, *κτίσις* in the context of Romans 8 refers to the whole irrational material creation, animate and inanimate.

The meaning of *οὐχ ἑκοῦσα*

ἑκοῦσα is a feminine adjective, meaning *of one's own free will*. It is used only one other place in the New Testament, I Corinthians 9:17 (*ἑκὼν*). Here in Romans 8:20 it modifies *κτίσις*, also feminine and indicates that the irrational creation has a will. Haldane considers this a poetic personification of nature: "As men earnestly desire what is good, and, on the contrary, groan and sigh in their sufferings, the like emotions of joy and sorrow are here ascribed to the inanimate and unintelligent creation."[11] Sanday and Headlam also attribute it to "the poetic and penetrating imagination of St. Paul.")[12] The Old Testament has an abundance of this type of personification which attributes to nature, intellect, volition, and emotion (Deuteronomy 32:1; Job 12:7, 9; Psalms 68:8, 16; 148:3-10; Isaiah 55:12). Paul in like manner personifies nature as though it had a will (*οὐχ ἑκοῦσα*), intellect (*ἀποκαραδοκία*, an intelligent realization of the manifestation of the sons of God); and emotions (*συστενάζει*, *συνωδίνει*) in these verses, Romans 8:19-22. In conclusion *ἑκοῦσα*, the adjective with the negative *οὐχ*, modifies *κτίσις*, attributing an unwillingness to nature, and represents a Pauline personification of the irrational creation.

The significance of *ὑπετάγη* and *ὑποτάξαντα*

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[10] See Henry Morris and John C. Whitcomb, Jr., *The Genesis Flood* (Philadelphia: The Presbyterian and Reformed Co., 1965), pp. 458-461.

[11] Robert Haldane, *Exposition of the Epistle to the Romans* (New York: Robert Carter, 1847), p. 377.

[12] William Sanday and Arthur Headlam, *A Critical and.Exegetical Commentary on the Epistle to the Romans* (Edinburgh: T. & T. Clark, 1898), p. 207.

Both words come from the root word, ὑποτάσσω which means *to subject*, or *to subordinate*. Both words are also in the aorist tense. *Ὑπετάγη* is the second aorist passive indicative of ὑποτάσσω. It has *κτίσις* as the subject. A good translation is, "the irrational creation was subjected." The aorist is here understood as a historical or ingressive aorist because the subjugation began at a point in the past[13]. This would mean that the creation was subjected to this vanity and bondage of corruption at an inception in past time. Before this inception in time, it was not subject, but then by the will of the *ὑποτάξαντα* it was subjected. Hodge wants to take *ὑπετάγη* in a middle sense, contrary to Shedd,[14] as though the creation were submitting itself. "By giving *ὑπετάγη* a middle sense, and connecting *ἐφ' ἐλπίδι* therewith, we have the beautiful idea, that the creature submitted to the yoke of bondage in hope of ultimate deliverance.[15]" However, this willful submitting seems to be contrary to the unwillfulness of the creation (*οὐχ ἑκοῦσα*) to this subjection. Even Hodge admits, "It was the will of God, not of the creature, which caused the creature to be subject to vanity.[16]" Consequently, *ὑπετάγη* indicates an inceptive subjection of the unwilling creation at some past point in time.

Ὑποτάξαντα, an aorist active participle, is the agent of the subjection since *ὑπετάγη* is passive and *κτίσις* is the subjected one. Who is this agent? This question has four possible answers: (1) man in general, (2) Adam, (3) Satan, or (4) God. Since *ὑποτάξαντα* is the object of the preposition δια the argument for each of these views rests on the meaning of δια. Δια with the accusative object usually can mean (1) of place, *through*, or (2) to indicate the reason, *because of*, *for the sake of*[17]. In either case *ὑποτάξαντα* is the effective agent or cause by which the *κτίσις* was subjected.

Mankind in general had no means to subject nature at some point in the past. The other three views have a number of supporters. Chrysostom believed that Adam was the effective cause, but "does not *ὑποτάξαντα* imply a *conscious act of intentional* subjugation, and not merely an *unconscious occasioning of the subjugation*?"[18] The subjecting agent refers to the "originating cause

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[13] F. W. Blass and A. Debrunner, *A Greek Grammar of the New Testament and Other Early Christian Literature* (Chicago: The University of Chicago Press, 1961), p. 171.

[14] William Shedd, *A Critical and Doctrinal Commentary Upon the Epistle of St. Paul to the Romans* (New York: Charles Scribner's Sons, 1879), p. 253.

[15] Charles Hodge, *A Commentary on the Epistle to the Romans* (Grand Rapids: Louis Kregel, 1882), pp. 430-431.

[16] Ibid., p. 43l.

[17] F. W. Gingrich, *Shorter Lexicon of the Greek New Testament* (Chicago and London: The University of Chicago Preas: 1957). p. 48.

[18] Henry Alford, *The Greek New Testament* (4 vols., Chicago: Moody Press, 1950), II, 394.

of subjection, not the efficient means to it."[19] Adam did not have the power to subject all of nature, although he may have been the reason that God subjected nature to vanity. Also Adam, if he were the subjector, had no means to give nature any hope (ἐφ' ἐλπίδι). The same arguments could be used against Satan as the *ὑποτάξαντα*. Lenski sums up the argument for God as being the *ὑποτάξαντα*.

> So it is man's sin that caused this entire frustration of and derangement in nature, but it was not the ultimate cause. God is the one who subjected the creation to this vainness, but for his great ulterior purposes. The agent of the second passive *ὑπετάγη* must be the agent of the active *τὸν ὑποτάξαντα* and the agent of the future passive *ἐλευθερωθήσεται* (v. 21) . It is impossible to make man the agent; God made subject, God will liberate. It is argued that the participle must refer to man: "because of him who made it subject," i.e. man; but then man would also have to be the subject of the two passive verbs, which is unlikely. The argument that God could not be the reason or cause (δια with the accusative) overlooks the fact that God's act is the reason, for the participle predicates this act. And that disposes of another objection, that God is not the opposite of "not willingly," and that *ἀλλα*. demands an opposite. Certainly *God* is not the opposite, but God's *act* is: not by an act of the creature – on the contrary, by an act of God. Nor does the phrase "because of him that made it subject" reproduce the phrase of Genesis 3:17 "for thy sake," i.e. because of Adam; Paul's phrase reproduces the whole of Genesis 3:17, the entire curse by which the creation was subjected.[20]

God, and not man or Adam or Satan, is the active subjector (*ὑποτάξαντα*) in the passive subjection of *κτίσις* (*ὑπετάγη*).

Theological Significance

From a theological consideration, this past subjection has become a knotty problem in the last century. What was the occasion for this subjugation? When and why did it take place? The traditional interpretation, the fall of man in Genesis 3, was universally held until a little over a century ago. Since then archeology and geology have caused many to harmonize the Bible with science. In this section the traditional view is developed from the scriptures and then the various modern deviations are presented. The next section will then deal with the scientific aspects of each of the approaches presented here.

The exegetical section showed that the irrational creation was subjected at some point in the past by God. What scriptural evidence do we have to indicate the time and occasion of such an

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[19] R. C. H. Lenski, *The Interpretation of St. Paul's Epistle to the Romans* (Columbus, Ohio: Lutheran Book Concern, 1936), pp 539-540.

[20] Ibid., pp. 539-540.

event? In Genesis 1 in the successive creative days, God saw each creation that "it was good" (5 times) and concludes in verse thirty-one, "And God saw everything that he had made, and, behold, it was *very good*.[21]" So, after the days of creation the irrational creation is not under the bondage of corruption and decay but, on the contrary, is exceedingly excellent. Isaiah 45:18 reinforces the idea that the earth was not created subject to vanity under the bondage of corruption. "For this saith Jehovah that created the heavens, the God that formed the earth and made it, that established it and created it not a waste [in vain] . . ."[22]l

> Therefore, we conclude that the Bible teaches that, originally, there was no disorder, no decay, no aging process, no suffering and above all, no death, in the world when the creation was completed. All was "very good."[23]

Only two biblical events stand out as possibilities as to when nature was subjected to corruption after being created in Genesis 1 without this bondage of corruption: (1) the fall of man in Genesis 3. and (2) the aftermath of the flood in Genesis 9. The change of natural order by God in Genesis 9 does not involve a subjection of the irrational creation to a bondage of corruption. The four basic changes in the natural order after the flood were: (1) the rainbow as the sign of God's pledge never to destroy the earth with water (Genesis 9:8-17), (2) the fear that was put in the animals for man (Genesis 9:2), (3) the allowance of man to eat meat as well as vegetables (Genesis 9:3), and (4) the decline of man's age from about 920 years to 120 years (Genesis *5,* 6:3). Only the last one seems to be related remotely to a corruptive curse and it is upon man and not upon the earth. Consequently, the flood and its aftermath do not resemble the subjection of nature to a bondage of corruption.

The other possibility is the fall of Adam in the garden of Eden as recorded in Genesis 3. As a result of man's sin, judgments were addressed to the serpent (Satan, Revelation 20:3), the woman, and Adam by God. The pronouncements against Adam include a curse upon the earth (Heb: אדמה, ground, earth).

> And unto Adam he said, Because thou has hearkened unto the voice of thy wife, and hast eaten of the tree, of which I commanded thee, saying, Thou shalt not eat of it: cursed is the ground for thy sake; in toil shalt thou eat of it all the days of thy life; Thorns also and thistles shall it bring forth to thee; and thou shalt eat the herb of the field; in the sweat of thy brow shalt thou eat bread, till thou return unto the ground; for out of it wast thou taken: for dust thou art, and unto dust shalt thou return. [Genesis 3:17-19 (A.S.V.)]

> With the fall of man, a new order of things ensued, not only in God's spiritual

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[21] Italics mine (A.S.V.)

[22] Parenthetical comments mine (A.S.V.).

[23] Morris and Whitcomb, *The Genesis Flood*, p. 37. See also Stifler, p. 151; Rogers, p. 570; and Haldane, p. 380.

> economy with respect to man but also with respect to the earth itself, which was "cursed for man's sake" (Genesis 3:17, 5:29). The whole creation was delivered into bondage of corruption (i.e. "decay"), groaning and travailing in pain together (Romans 8:21, 22).[24]

Lamech, the tenth man after Adam, recognized God's curse upon the earth which subjected everything to vanity and he saw his son Noah as the comforter from this curse.[25] Here in Genesis 3 we have the only scripturally recorded event whereby the active agent, God, subjected an unwilling and undeserving nature, the irrational creature,[26] to a bondage of corruption and vanity. Genesis 3, the fall of man, is the point at which "the creation was subjected to vanity, not of its own will, but by reason of his [God] who subjected lt." [Romans 8:20 (A.S.V)] This is the almost unanimous opinion of the exegetes throughout history.[27]

Since the rise of modern geology, biology, and archeology, conservative, as well as liberal, scholars have modified the grammatical interpretation and implications of Genesis. The theories of evolution and uniformitarianism postulate long periods of time in which life evolved upward leaving its record in the sedimentary rock layers. These "scientific" evidences and theories are quite contrary to a six day creation about 4100 B.C. as recorded in Genesis 2[28]. Consequently, to resolve the conflict, most biblical scholars chose to harmonize the Bible with science. The historical grammatical approach to Genesis was abandoned and the historical narrative of Genesis 1-11 was allegorized, symbolized, and demythologized at the interpreter's whim.

The fall of man and the subsequent curse upon the earth in Genesis 3 as a result of the fall have been twisted, ignored, and added to, even in strong evangelical circles. Three basic deviations have resulted. In the first deviation, the fall and the subsequent curse upon nature are seen as limited to Adam in the garden only. Death and decay were a part of the "good" creation (Genesis 1:31) outside of the garden of Eden, and Adam, after his fall, was simply forced to leave the garden and to go into the decaying world. Ramm states the position well.

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[24] Morris and Whitcomb, *The Genesis Flood*, p . 215.

[25] Genesis 5:29 .

[26] Morris and Whitcomb (*The Genesis Flood*) show that the curse extended to both the plant kingdom (pp. 466-71) and the animal kingdom (pp. 458-64) as well as the inorganic earth. Compare: Hodge, p. 427; Haldane, p. 380; A. J. Gordon, p. 303; Rogers, p. 574.

[27] The analysis of Thiessen is typical. After quoting Genesis 3:17-19 and before linking it to Romans 8:20-22, he says "Here even inanimate nature is represented as suffering the curse of man's sin" (*Systematic Theology* p. 258). A few of the other prominent scholars who support this position are Nygren, Hodge, Alford, G. Thoma.s, Lenski, Calvin, Luther, Shedd, Sanday, and Headlam, A. .J. Gordon, West, Haldane, Rogers.

[28] The numbers of years vary slightly from Archbishop Ussher's date of 4004 B. C. to more modern dates of about 4120 B.C. to 4150 B.C.

> Outside of the Garden of Eden were death, disease, weeds, thistles, thorns, carnivores, deadly serpents, and intemperate weather. To think otherwise is to run counter to an immense avalanche of fact. Part of the blessedness of man was that he was spared all of these things in his Paradise and part of the judgment of man was that he had to forsake such a Paradise and enter the world as it was outside of the Garden, where thistles grew and weeds were abundant and where wild animals roamed and where life was only possible by the sweat of man's brow.[29]

According to this view, God created the earth with death, and this would relegate the Romans 8 passage to a subjection of nature at the time of creation. The big problems with this first position are threefold. One, the creation of Genesis 1 would have to be "very good" or "the best of all possible "worlds," while subject to the bondage of corruption from the first. Two, the curse on nature in Genesis 3 is not explained, unless the garden is viewed as cursed, because the outside world could not be cursed any worse than this view has it immediately after the creation. Three, the view is based on no scriptural evidence, contrary to the following statements of Capron and Hitchcock. "The Bible, both impliedly and expressly, asserts that physical death was in the world before Adam's Fa1l.[30]" "We have in scripture the same kind of proof that plants were subject to decay and death before the fall as we have in respect to animals.[31]" Neither uses any scripture to verify his blanket generalization. This first deviation scripturally fails totally to verify its view that the creation was subject to decay and death before man's fall and that the curse on nature was only limited in extent. It is built purely upon "scientific" evidence and not upon scripture.

The second deviation attributes the present state of vanity in nature to the fall of Satan and his angels and their present dominion over the earth. This would make the subjection prior to Genesis 3 and the fall of man. Heim elaborates: "Thus here the view is expressed that the dominion which death exercised in the whole creation even before the creation of man is due to the fact that the Satanic rebellion against the omnipotence of God has been in force in the whole creation even before the rise of man.[32]" This position, however, totally lacks a scriptural basis as Ramm points out.

> Certainly the Scriptures do not teach that *death entered the world through Satan*! There is not one clear, unequivocal, unambiguous line in the entire Bible which would enable us to point to the vast array of fossil life and state that all the death

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[29] Bernard Ramm, *The Christian View of Science and Scripture* (Grand Rapids: Eerdman's Publishing Company. 1955). p. 335).

[30] Edward Hitchcock. *The Religion of Geology and Its "Connected Sciences* (Boson: Phillip, Sampson & Company. 1852).

[31] Hugh Capron. *The Conflict of Truth* (London: Hodder and Stoughton. 1902). p. 304.

[32] Helm. *The World*. p. 124.

here involved is by reason of the sin and fall of Satan.[33]

Attributing the vanity of nature to the fall of Satan fails to find credence in scripture, in contradistinction to the Genesis 3 view.

The third and last deviation is somewhat like the second and finds a wide following in certain fundamentalist groups. Satan's fall resulted in the curse and condemnation of a creation before Genesis 1:1 or in a gap between Genesis 1:1 and 1:2. The days of creation are then taken as a recreation account and the present curse upon nature is then a second curse under which nature groans and travails. Barnhouse rather completely explains the version of this view where the original creation and curse occur in the gap between Genesis 1:1 and 1:2.

> "In the beginning God created the (first) Heaven and the (first) earth" (Genesis 1:1). It was perfect, and mirrored the perfect creation which inhabited it. Then sin entered and God blasted the universe. "The earth was without form and void," or, as it would be more correctly translated, "The world became a wreck and a ruin."
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> The R.S.V. correctly translates Isaiah 45:18 to say, 'He created it not a chaos.' How long the world existed in that wrecked condition we do not know. There are evidences from geology that it may have been for several million years. Continents rose and fell, glaciers crept down toward the equator and receded again, leaving the tell-tale scars of their passage written deep in the skin of the earth. Giant beasts roamed the earth, and the descendants of the beings that followed Lucifer in his fall left their trail across the crust of earth. Then, suddenly, God brought light unto the dark of that sinister creation and in a few brief days brought a covering of perfection to His creation. Like snow that covers a garbage dump and makes all things clean for a moment, so Adam's world was beautiful for the moments of his walk with God. Then with the rebellion of man came the words of condemning judgment, "Cursed be the ground for thy sake . . . thorns also and thistles shall it bring forth to thee" (Genesis 3:17, 18). This is the earth on which we live. The scars of the past are beneath our feet, and the death of judgment is all around us.[34]

Thiessen agrees: "It is not improbable, therefore, that the sins of angels had something to do with the ruination of the original creation in Genesis 1."[35] Others believe that there was an original creation before Genesis 1:1 which was ruined by the fall of Satan and that the Genesis 1 account is one of a recreation. The arguments for this view are (1) "in the beginning" can be taken as "when beginning," (2) "created" (bara') does not necessarily mean creation *ex nihilo*, (3) the *tohu* and *bohu*

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[33] Ramm, *The Christian View,* pp. 334-335.

[34] Donald Grey Barnhouse, *Exposition of Bible Doctrines., Taking the Epistle of Romans as a Point of Departure* (7 vols.; Grand Rapids: Eerdrnans Publishing Company, 1963). VII, 127.

[35] Henry C. Thiessen, *Lectures in Systematic Theology* (Grand Rapids: Eerdmans Publishing Company, 1949, p. 196.

condition in Genesis 1:2, linked with *tohu* of Isaiah 45:18, shows that this was not the original creation, (4) the existence of "darkness" in Genesis 1:4, linked with the fact that there is no darkness in God (I John 1:5), shows that before the six day creation the universe must have been contaminated with darkness by Satan's sin, and (5) the problem of locating the time and results of Satan's fall in the traditional view. The whole weakness of this deviation is the same as the previous deviation. It has absolutely no scriptural evidence to indicate a judicial curse or judgment upon the earth because of Satan's sin or even the occurrence of a previous creation with a subsequent recreation. This view would not, however, conflict with equating the past subjection of the creation in Romans 8 with the curse in Genesis 3 in contrast with the other two deviations. The error of this view is an additive interpolation to the traditional view of Genesis 1-3.

In conclusion, the past subjection of nature in Romans 8 occurred at the fall of Adam in Genesis 3.

> The original creation is considered as having been free from sin and its effects. There were no destructive forces at work; no disease, no sudden death, no animals preying upon others, no violent storms or destructive floods. The destructive forces which we see in nature are in the Bible traced back to the fall of Adam. It is because of the sin of man that nature has become disruptive.[36]

This biblical position is the explicit statement of scripture and the deviations from it involve either faulty exegesis or interpolation of the text. In light of the subjection of the irrational creation because of man's fall, one theological question is raised. Why should an irrational, amoral creation suffer corruption because of man's sin? Those with a low view of scriptural inspiration would say that the Hebrews created this myth to explain sin, mortality, and vanity in the world. Those with a high view of the Scriptures, as well as of the sovereignty of God, would appeal to Ephesians 1:11b, "according to the purpose of him who worked all things after the counsel of his will." (A S.V.) Some of these would need no other explanation, saying that God's ways and purposes are not for us to understand[37]. However, others. seeking an explanation, see the curse upon nature because of the fall due to the close ties between man and his estate, the irrational creation. Winchester says, for instance: " . . . we must observe that there always has been a correspondence between man and his habitation."[38] Haldane points out that nature shares its lord's fate.

> When the creation was brought into existence, God bestowed. on it his blessing, and pronounced everything that he had made very good. Viewing that admirable palace which he had provided, he appointed man to reign in it, commanding all creation to

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[36] John Clover Monsuma *The Evidence of God in an Expanding; Universe* (New York: G. P. Putnam's Sons, 1950), p. 42.

[37] Psalm 40:5; Isaiah 55:8, 9.

[38] Elhanan Winchester. *A Course of Lectures on the Prophecies Which Remain to be Fulfilled* (Cincinnati: E. Morgan and Company, 1851), p. 593.

be subject to him whom he had made in his own image. But when sin entered, then in a certain sense, it may be said that all things had become evil, and were diverted from their proper end. The creatures by their nature were appointed for the service of the friends of their Creator, but since the entrance of sin, they have become subservient to his enemies.[39]

Rogers fortifies this assertion and then illustrates it with history.

> Creation was once "very good" and perfectly suited to the sinless character of its lord. He was told to subdue the earth, and to have dominion over all other creatures (Genesis 1:28). Adam, like the last Adam, was the head of the creation which was given to him as his allotment. He was bound by indissoluble ties to his estate. He was a part of it , and its gains or losses with him, sharing his fortunes and his destiny . . . Adam held the fate of creation as well as the fate of humanity in his hands. If he, the lord of creation, should sin and die, then creation shall suffer with him. If the first man and his posterity are doomed to pass away and give place to the second Man and the new humanity, then the creation must pass away also, and give place to a new and better one.[40]

> Science and revelation agree that there is an essential unity of all creation. The creation was not only subjected to vanity for man's sake at the Eden judgment, but it suffers at other great judgment eras also. It seem to respond to mankind's great moral crises. The deluge involved not only the cosmos but beasts, creeping things, and birds of the heavens. "All flesh ceased to breathe that moved on the earth, of birds, and of tame beasts, and of wild beasts, and of all the swarming things that swarm upon the earth" (Genesis 6:7; 7:21-2)). The plagues visited on Egypt smote the waters and animal life as well as men. The earth opened its mouth and swallowed up all that appertained to Korah (Numbers 16:)2). The holy land was blessed or desolated as the sons of Israel were obedient or disobedient (Leviticus 25:21; II Chronicles 36:21). The earth shuddered at the horror of the murder of the Son of God (Matthew 27:51-53). Again the premillennial judgments fall upon the land and sea, the rivers and the sun. The progress of the man of sin is marked by an increasing severity in the plagues inflicted, climaxing in a great heaven also. And finally, the post-millennial judgment will be precipitated by the great revolt at the loosing of Satan. From the presence of Him Who sits on the great white throne earth and heaven will flee. This sin-infected creation that has survived so many shocks and desolations shall at length pass away.[41]

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[39] Haldane, *Exposition of Epistle to Romans*, p. 378.

[40] George L. Rogers, *Studies in Paul's Epistle to the Romans* (Los Angeles, California: George L. Rogers, 1936), p. 570.

[41] Ibid., pp . 576-7.

The Roman Catholic position also makes the link between man's fall and his corrupted domain but attributes the eventual restoration of nature to man's increasing spirituality by a much less Calvinistic process.

> The account of creation in Genesis is another indication that the material world was meant to serve man. Man was made lord of creation by God . . . . By the Fall he lost the gift of integrity and the fact that he is now mortal and subject to disease means that there has been some indirect influence of his sin on nature . . . . Only man fell; creation below man, animate and inanimate, did not sin. But because of his subjection to concupiscence, the world and the flesh are instruments of the devil and occasions of sin . . . . With the coming of Christ and His conquest of sin at the Resurrection there began the gradual restoration of the lost ascendancy of man over the rest of creation . . . . This process is continued by the Church, a human and divine society, and by the sacramental system whereby spiritual benefits are conferred by and through matter. At the last day complete integrity will be restored to man when his body rises, and it is hard to see how this cannot but have an effect on the rest of the material universe.[42]

In conclusion the whole course of nature seems to be inseparably linked to man and his spirituality so that with man's fall, nature, man's domain, also was subjugated to a curse.

Scientific Implications

Scientifically, two facts are pertinent: (l) the divine curse upon the earth resulted in the irrational creation being placed under a law of corruption and vanity, and (2) the second law of thermodynamics is a universal law of corruption and decay to which the whole cosmos is subject[43]. Because the bondage of corruption and the second law are identical on almost every point and are the supreme laws over nature, it is easy to conclude with Morris that they are one and the same.

> Creation (or what biologists imply by "evolution") actually has been accomplished by means of creative processes, which are now replaced by the deteriorative processes implicit in the second law. The latter are probably a part of the "curse" placed upon) the earth as a result of the entrance of sin (Genesis 3:17), the "Bondage

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[42] M. E. Williams, "End of the world," *New Catholic encyclopedia* (16 vols.; New York: McGraw-Hill Company, l967), V, 342.

[43] Note Clark's conclusion, "It is fair then to conclude that science strongly favors the view that nature contains its own seeds of decay." *The Christian Stake in Science* (Chicago: Moody Press, 1967), p. 130.

of decay" to which it as been "subjected" by God for the present age.[44]

They both are the law of corruption and decay which condemn the present natural realm to vanity.

From a purely scientific outlook the origin of the second law (1) could have come into existence at the creation of the universe or (2) could have come into existence subsequent to creation by supernatural invention.[45]

Death and decay would therefore not have been prevalent in the pre-fall creation. Fossils, evidence of death, coal beds, and geological layers containing fossils could not have been produced *during or after* the "very good"creation of Genesis 1 *and before* the fall of man. Either they were produced in an original creation as a result of Satan's fall, (Genesis 1 being a recreation) which has no scriptural support or they were produced after the fall, probably in the Noahic flood. Almost all the rest of the scriptural cosmology would fall into place under the following scheme: (1) an original six day creation about 4100 B.C., (2) the fall of man and the imposition of the curse, (3) a lush but cursed earth with giants in it, watered by subterranean waters, but no rain, (4) the Noahic flood inundating the earth by the waters above the earth, a canopy, and by the fountains of the deep, subterranean waters, (5) the deposit of fossils, geological layers, and coal beds during the flood, (6) man's decline in longevity and the extinction of some of the animals by natural selection in the present climate and earth after the flood, and (7) death and decay reigning supreme in nature and civilizations until now.

In conclusion, the Bible, through an exegesis of Romans 8:20, a correlation with other scriptures, and a comparison with science, reveals that God imposed the second law of thermodynamics upon the cosmos as a result of Adam's sin in the Garden of Eden, at the fall of man. Such a conclusion is startling: the most universal law of science, the second law of thermodynamics, is the result of man's sin. Such a conclusion would constitute metaphysics and would completely undo the Renaissance's segregation of metaphysics into theology and science. Here we have a physical law resulting directly from spiritual interaction, man's sin and God's judgment.

The why of this law of decay is unknown to science. Science only seeks to understand and utilize the law but is silent when it comes to origins. The Bible in Roman 8:19-22 and Genesis 3 is much more explicit.

> Not only does the Bible tell us the *fact* of decay in the creation, but it also gives us the explanation for it, something which thermodynamics has not been able to do. The universal validity of the second law of thermodynamics is demonstrated, but no one knows why it is true . . . The Biblical explanation is that it is involved in the curse of God upon this world and its whole system because of Adam's sin.[46]

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[44] Morris and Whitcomb, *The Genesis Flood*, pp. 224-5.

[45] See pp. 47-49 of the appendix.

[46] Henry Morris, *The Twilight of Evolution* (Grand Rapids: Baker Book House, 1963), p. 37.

CHAPTER III

THE PRESENT STATE OF NATURE

Exegetical Analysis

Verse twenty-two of Romans 8 portrays the present state of nature. The key words in this passage are *συστενάζει* and *συνωδίνει*. The meanings of these words are closely linked to *φθορᾶς*, *ματαιότητι*, and their synonyms, because nature's present vanity and corruption are the reason for nature's present sorrows.

Συστενάζει and *συνωδίνει*

Both of these words are used only once in the New Testament and that is in this passage. Both are compound words of *συν* (*with)* and a root word, although *τενάζω* is not found as a separate verb in either classical or koine Greek. *Συστενάζω* simply means *to lament* or *groan together*[47]. *Συνωδίνω* is somewhat more picturesque and comes from the root *ωδίνω* (*to have the pains* or *throes of childbirth*, to *be in travail or labor*[48]). It pictures nature as going through childbirth pains and being about to conceive a new creation Its vanity will not result ultimately in death (the conclusion of science[49]) but in the conception of a new creation. Lenski says:

This is not only pain and woe, but travail, i.e. pains that end by bringing forth something, like a woman giving birth to a child. In John 16:21 Jesus uses this figure in an elaborate form. The groaning is not to end by subsiding when death sets in, but to end when out of it comes a new condition.[50]

The present state of nature, then, is one of travailing and being on the verge of bringing forth a new creation. "After sorrow comes the joy of a new existence[51]." The *συν* prefix gives the action of both verbs a collective sense as if all the parts of creation are groaning and travailing together. So in the

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[47] William Arndt and F. Wilbur Gingrich, *A Greek-English Lexicon of the New Testament and Other Early Christian Literature* (Chicago: The University of Chicago Press, 1963, p. 802.

[48] Henry G. Liddell and Robert Scott, *A Greek-English Lexicon* (New Edition: Oxford: Oxford. at the Clarendon Press, 1940), p . 2030.

[49] See p. 47 of the Appendix.

[50] R. C. H. Lenski, *The Interpretation of St. Paul's Epistle to the Romans* (Columbus, Ohio: Luthern Book Concern, 1936), p. 544.

[51] Charles Hodge, *A Commentary on the Epistle to the Romans* (Grand Rapids: Louis Krege1, 1882), p. 275.

meantime, until the conception of a new creation, every part of the creation groans and travails in symphony with the others to play its melancholy concert in a minor key, but looks forward to its triumphal finale.

Ματαιότητι, φθορᾶς, and synonyms

Ματαιότητι is the dative or locative of sphere from *ματαιότης*. Nature was subjugated into the sphere of influence of vanity. *Ματαιότης* is a noun derived from the adjective μάταιος[52] (used by LXX and early church fathers). Μάταιος means *vain* and differs from its synonym κενός (empty) as Trench explains.

> The first, κενός, is "empty" the second, μάταιος, "vain". . . . In the first is characterized the hollowness, in the second the aimlessness, or if we may use the word , the resultlessness . . .[53]

Consequently, μάταιος and *ματαιότης* mean *futility*, *purposelessness, aimlessness*, or *transitoriness.*

Ματαιότης is used three times in the New Testament and has a twofold thrust: (1) futility in a moral or spiritual sense, *futile things* (Eph. 4:17); *vain words* (II Pet. 2:18), and (2) deterioration and dissolution in nature, *frustration* (Rom. 8:21). In this passage, Romans 8:21, therefore, it implies that nature's processes and activities have only futility, purposelessness, and vanity as their end. This, of course, only describes its present state, *ματαιότης*, not its future freedom from this state.

Φθορά is roughly the equivalent of *ματαιότης*.[54] However, "the term φθορά, *corruption*, *putrescence*, is more forcible than the word *vanity,* and serves to define it more exactly."[55] Φθορα is used as the appositional genitive of *bondage*. "It is more natural to take *τῆς φθορᾶς* as in apposition, the bondage which consists in corruption, just as the opposite, *τὴν ἐλευθερίαν τῆς δόξης*, should be interpreted."[56] These two phrases, the *liberty* and the *bondage,* are parallel in structure but opposite in meaning; Lenski explains:

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[52] See A. T. Robertson, *A Grammar of the Greek New TestAment in the Light of Historical Research* (Nashville, Term: Broddman Press, 1934), p. 156. It is formed by dropping the *-της* and adding *-ς*.

[53] Richard C. Trench, *Synonyms of the New Testament*. (Grand Rapids: Eerdmans Publishing Company, 1963), p. 180.

[54] William Shedd, *A Critical and Doctrinal Commentary Upon the Epistle of Paul to the Romans* (New York: Charles Scribner's Sons, 1879), p. 253.

[55] Fredrick Louis Godet, *Commentary on .St. Paul's Epistle to the Romans* (N e w York: Funk and Wagna1s:, 1883), p. 92.

[56] John Murray, *The Epistle to the Romans* (Grand Rapids: Eerdmans Publishing Company, 1959, p. 304.

> "Vainness" = "the slavery of the corruption," its opposite is "The liberty of the glory," all of the terms articulated because all of them are most definite, – not some slavery, etc., but the specific universal one of which Paul is speaking. "Slavery" is this subjection to vainness, slavery indeed; "liberty" is its opposite. The genitives, "of the corruption" and "of the glory" must be appositional, the one defining the slavery, the other defining the liberty.[57]

From the use of *φθορᾶς* as a genitive in parallel to *δόξης*, its opposite,[58] we get a more exact meaning of vanity (*ματαιότης*) as corruption. *Ματαιότης* refers to futility. Φθορά more exactly gives this futility an even more negative aspect, destuction, dissolution, and deterioration. Not only is the activity of nature subject to futility but it is at the same time destroying itself. This, contrasted with the liberty of glory which is undefiled, is not subject to vanity, and is incorruptible.

In conclusion, we see the present creation groaning and travailing as a woman about to bring forth a new creation (at its future redemption). In the mean time it is subject to futility or purposelessness and to destructive corruption. It has been in this state from the time of its subjugation, the fall of man in Genesiss 3, *ἄχρι τοῦ νῦν* (until now), and will remain so until its liberation from vanity *ματαιότητι* and the bondage of corruption (*φθορᾶς*)

Theological Significance

The Scriptures are full of references to the vanity and corruptibility of the whole universe. The most inclusive passage is Isaiah 51:6. "Lift up your eyes to the heaven, and look upon the earth beneath; for the heavens shall vanish away like smoke, and the earth shall wax old like a garment; and they that dwell therein shall die in like manner; . . ." [Isaiah 51:6 (A.S.V.)]. This includes the whole universe (heavens, earth, and inhabitants) and pronounces them all as nothing but a transitory creation. Psalms 102:25, 26 makes the same conclusion,

> Of old hast thou laid the foundation of the earth: and the heavens are the work of thy hands. They shall perish, but thou shalt endure: yea, all of them shall wax old like a garment; as a vesture shalt thou change them, and they shall be changed. [Ps. 102:25]

Here, however, at a future event the present state of creation is seen as being changed as a man does a vesture.

This corruption and vanity, according to the Scripture, is imposed on everything in the cosmos. It applies to its lord, man, along with all flesh, is considered to be like grass, here today and

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[57] Lenski, *Interpretation to Romans*, p. 541.

[58] Hodge speaks about both *vanity* and *corruption*: "The idea here expressed is antithetical to that expressed by the word *glory*." *A Commentary on Romans*, p. 430.

gone tomorrow (Isa. 40:6-8; I Pet. 1:24). The animals are, as a part of the creation, subject to futility and death (Eccles. 3:19, 20; Rom. 1:23) in contrast to God who is incorruptible and undefiled. The inanimate creation is also subject to the bondage of corruption. Clothes are moth-eaten (Luke 12:33. James 5: 2-3) and grow old (Ps. 102 :25, 26). Silver and gold, the least corruptible of the inorganic realm, are corruptible (I Pet. 1:18) and rust away (James 5:2,3). The book of Ecclesiastes relegates everything under the sun to vanity. Nowhere does the Scripture describe the present state of any of the material, non-rational creation, between past subjection and the future liberation, as being incorruptible and not subject to vanity. Everything in the heavens and the earth is subject to vanity, according to the scriptural testimony.

Scientific Implications

There is no area of science that is not dominated by the second law of thermodynamics, the most absolute of our physical laws. It relegates all matter and energy to dissolution. All the inorganic realm is constantly running down. Man manufactures and synthesizes products only to have wear and decay come out the ultimate victor. All life is condemned to death. Even to survive before its death, each animal must constantly consume food to stay alive. This entails preying on other living creatures. Observing such violence, terror, and vanity in nature has caused some philosophers to question the goodness of nature and , implicitly, the existence and character of natures creator.

> The beauty of earth and sky and sea is converted to darkness and desolation by storm, raging flood, and long-continued drought. Ancient writers have dwelt on the arrangements which make one zone torrid and another frigid, on the extent of barren heaths and rocks, of sands and seas, on the abundance of noxious herbs and animals, as evidences that the earth was faultily and ill made, and could not be the work of a divine intelligence.
>
> Mr. J. S. Mill brings the charge against what he calls "nature" that "the things which men are hanged and imprisoned for doing to one another are nature's everyday performances. She kills and tortures with apparent wantonness. Everything which the worst men commit against life or property is perpetrated on a larger scale by natural agents . . . . All of which people are accustomed to deprecate as 'disorder' and its consequences is precisely a counterpart of nature's ways. Anarchy and the Reign of Terror are overmatched in injustice, ruin and death, by a hurricane and a pestilence."[59]

The false premise of Mill is that the creation is at its best, and his false conclusion is that nature's defects destroy an argument for the existence of nature's designer.

Nature is not at its best but is under the domain of the second law of thermodynamics. So

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[59] George L. Rogers, *Studies in Paul's Epistle to theRomans* (Los Angeles: George L. Bogers, 1936), pp. 575-6.

there can be nothing but death and decay in nature. The question for men living today is not "*Does* nature travail and groan under the bondage of corruption, the second law?" Rather, "*Why* is nature in such a state?" Science does not know why, it only seeks to work under the sovereignty of this curse. It only proclaims that the second law is and then gives a definition of it. Science agrees with Paul that the material realm is in bondage to decay and all energy and mass in the cosmos are subject in every case to vanity. Each action is inefficient and futile, the degree of futility depending on its overall efficiency. But what scientist would ever recognize that the inefficiency of his refrigerator is a consequence of his ancestor's (Adam's) sin? For that matter, what scientist believes in Adam? However, even if science does not recognize the origin of the second law, it must work within its domain, according to the judgment of God.

CHAPTER IV

THE FUTURE REDEMPTION OF NATURE

Exegetical Analysis

The two previous chapters lead up to the most important relationship of nature to its bondage of decay, namely its future redemption. Verses nineteen and twenty-one provide the exegetical bases for this redemption. Verse nineteen portrays nature as having an eager expectation (*ἀποκαραδοκία*) for the manifestation (*ἀποκάλυψιν*) of the children of God. Verse twenty-one explains that nature has this expectation because it shall be freed (*ἐλευθερωθήσεται*) at (*εἰς*) the liberty (*ἐλευθερίαν*) of the glory of the children of God.

Verse nineteen

In this verse Paul emphasizes the intensity of nature's expectancy of its future redemption by his use of intensive Greek words. Notice the parallel analyses of the two terms (*ἀποκαραδοκία* and *ἀπεκδέχεται*) of Godet and Lenski.

> The Greek term which we have translated by the word *expectation* is one of those admirable words which the Greek language easily forms. It is composed of three elements καρα, *the head*; δοκέω, δοκάω, *to wait for*, *espy*; and ἀπο, *from*, *from afar* so: "to wait with the head raised, and the eye fixed on that point of the horizon from which the expected object is to come." What a plastic representation! An artist might make a statue of hope out of this Greek term. The verb *ἀπεκδέχεται*, which we have translated by *longeth for* is not less remarkable; it is composed of the simple verb δέκομαι, *to receive*, and two prepositions ἐκ, *out of the hands of* and ἀπο, *from*, *from afar*; so: "to receive something from the hands of one who extends it to you from afar."[60]
>
> The translation is awkward, because the Greek words contain so much. Here we have three terms compounded with ἀπο in one short sentence.*'Απο* plus καρα (head) plus δοκέω (in Ioniain "to watch") = watching with head stretched away from (ἀπο) the body, like one leaning far out to get the first glimpse of something coming into sight. Then ἀπο plus ἐκ plus δέκομαι the second preposition making the verb mean "to wait it out" (Thayer), i.e. to keep waiting and never tiring or desisting till the

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[60] Fredrick Louis Godet, *A Commentary on St. Paul's Epistle to the Romans* (New York: Funk & Wagnalls, 1883). p. 88.

thing waited for comes.[61]

What, then, is this thing (*ἀποκάλυψιν τῶν υἱῶν τοῦ θεοῦ*) that the creation waits and longs for? Arndt and Gingrich list three basic meaning: for *ἀποκάλυψιν* (1) a revelation of truth, (2) a revelation of a particular kind, as through visions, and (3) in an eschatological sense of the disclosure of secrets belonging to the last day[62]. This revelation is yet future, is the anticipation of nature, and, as we shall see later, takes place at the time at which nature shall be freed from its bondage of corruption. Consequently, it is more than a general revelation of truth or a particular visionary revelation. It is a future event at which the creation will be transformed in the end times. Therefore, the revelation of the sons of God is an eschatological event linked to nature's redemption for which the creation longs.

Verse twenty-one

Verses nineteen and twenty-one are tied together. First, the *expectation* of creation is toward a future event in verse nineteen and the *hope* (*ἐλπίδι*) of creation is a future event in verse twenty-one. In both verses, the creation anticipates a future event. Second, the substance of this future event is identical in each case. The parallel phrases, *τῶν υἱῶν τοῦ θεοῦ* and *τῶν τέκνων τοῦ θεοῦ*, indicate this. The sons of God and the children of God refer to the same group of people (elect believers) and they both modify, as objective genitives, this future event, the revealing (v. 19) and the liberty (v. 21). Third, the anticipation of the creation at this future event is the same in both cases, freedom from vanity and corruption ("longs for . . . because the creation was subjected to *vanity*," v. 19; "hope *ὅτι*[63] . . . the creation shall be freed from the bondage of *corruption,*" v. 21).

Εἰς in the above discussion of which *ἐλευθερίαν* is the object was assumed to mean *at*. This is because the verb is temporal (*ἐλευθερωθήσεται* – future passive indicative) and in a temporal sense *εἰς* with the accusative can easily be translated "at the time of."[64] Also, *πυνχτιλιαρ* was translated as "liberty." *Freedom* and *liberty* are the basic meanings of *ἐλευθερίαν* and perfectly fit the context when *ἐλευθερίαν* (liberty) is contrasted with *δουλείας* (bondage). This "liberty" or "freedom" was assumed to be an event rather than a process because of its link to the punctiliar revelation of the sons of God. In this case it could best be translated as "liberation," the event at which the freedom

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[61] R. C. H. Lenski, *The Interpretation of St. Paul's Epistle to the Romans* (Columbus, Ohio: Lutheran Book Concern, 1936), p. 536.

[62] William P. Arndt and F. Wilbur Gingrich, *A Greek-English Lexicon of the New Testament and Other Early Christian Literature* (Chicago: The University of Chicago Press, 1959) , pp. 91-2.

[63] *ὅτι* can be taken elther as *because* (where it gives the reason for the hope) or as *namely* (where it explains the content of the hope).

[64] Arndt and Gingrich, *Greek-English Lexicon*, pp. 22?-8.

came about. The emphasis in this passage is on the temporal point at which this liberty begins, although the resulting state is also in mind. This punctiliar event, the glorious liberation of the children of God, is the time at which the creation will be freed from its slavery to vanity.

In conclusion the exegesis of verses nineteen and twenty-one reveals that creation intensely anticipates its future liberty from its bondage to corruption at the time of the revelation and liberation of the sons of God.

Theological Significance

Theologically, the first and predominant question is: When does this redemption or liberation take place? How does it fit into the eschatological chronology? The second question is closely related. What type of liberty will it be, or, in other words, what changes will take place at this liberation?

The amillennialist has no trouble with either of these questions. All his eschatology takes place at the return of Jesus Christ. The battle of Armageddon, the resurrection of all men, the final judgment of all men, and the institution of the eternal state occur at the *parousia* of Christ to the earth. The changes that take place in the material creation may be either a renovation of the present one or a destruction of the present one and the creation of a new one (Revelation 21:1 – 22:5). Such a simplification requires the spiritualization or elimination of hundreds of prophetic passages[65]. An amillennial view, which does not seriously try to deal with scripture by a historical, grammatical approach, is of little value in solving these two questions.

The postmillennialist is closely akin to the amillennialist in eschatology except that he places a church millennium before the return of Christ. In it will reign peace, animals will be at peace with one another, and men will decrease in their sin because Satan is no longer free to tempt men. How nature is restored to the millennial condition described in the Scriptures is not dealt with except in a spiritualizing way. The basic means for changing nature is man's technology and scientific advance. This utopian terrestrial kingdom was the hope of many before the turn of the century, including many conservative Christians. The first world war, the depression, the second world war, and the continued cold war crushed that false, unbiblical hope for most people. Postmillennialism, like amillennialism, offers no valid spiritual approach for determining when the manifestation of the sons of God and the liberation of nature will take place.

Premillennialism, on the other hand, seriously tries to explain the liberation of nature by a grammatical, historical hermeneutic of the prophetic passages. Two avenues exist for determining the time of the creation's liberation from corruption: (1) determine the time of the manifestation (ἀποκάλυψιν) and liberty (ἐλευθερίαν) of the sons or children of God because the redemption of nature occurs at the same time, and (2) determine the point at which nature loses the bondage of corruption and the effects of the curse in the eschatological chronology. Using both of the methods, one can solve the *when* and the *what* questions of nature's future freedom.

When will the sons of God be revealed and when will the children of God have the glorious

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[65] See Dwight Pentecost, *Things to Come* (Grand Rapids: Dunham Publishing Company, 1958), pp. 78-81, 86, 372, 387-390, 392-395 for a refutation of amillennialism's spiritualization.

liberty? *The sons of God* refers to all elect people as Paul argues in Romans 9:24-26, both Jews and Gentiles, all whom God has called. This term, "sons of God," seems to be used interchangeably with "children of God.," just as *sons* and *children* of a father are synonymous. But at the present time there is no indication to the world who are the sons of God and only a definite scriptural event,"[66] in the future will reveal them. Haldane explains the magnitude of this event:

> Believers are even now the sons of God, but the world knows them not, 1 John 3:1. In this respect they are not seen. Their bodies, as well as their spirits, have been purchased by Christ, and they are become his members. Their bodies have, however, no marks of this divine relation, but, like those of other men, are subject to disease, to death, and corruption. And although they have been regenerated by the Spirit of God, there is still a law in their members warning against the law of their mind. But the period approaches when their soul shall be freed from every remainder of corruption, and their bodies shall be made like unto the glorious body of the son of God. Then this corruptible shall put on incorruption, and then shall they shine forth as the sun in the kingdom of their father. It is then that they shall be manifested in their true character, as the sons of God, seated upon thrones, and conspicuous in robes of light and glory.[67]

This will take place, according to Colossians 3:4, when Christ is manifest. "When Christ, our life, shall be manifested, then ye also shall be manifested with him in glory" [Colossians 3:4]. Likewise, 1 John 3:2 indicates that this transformation or the revealing of the sons of God will take place when Christ will be manifested or in other words, at his appearing.

Unfortunately, the appearing or manifestation of Christ (παρουσία, *ἀποκάλυψιν*, and ἐπιφάνεια) can refer to four events in history: (1) the first coming of Christ (1 Timothy 1:10), (2) the rapture (2 Timothy 4:8, 1 Thessalonians 2:19), (3) the second advent (1 Thessalonians 2:8), and (4) the final judgment at the end of the millennium (2 Timothy 4:1). Obviously, the manifestation of the sons of God is future (I John 3:1l, 2; I Timothy 6:14), so it cannot he associated with Christ's first coming which is past. Also, the manifestation of the sons of God and freedom of nature from corruption cannot be associated with the appearing of Christ at a pretribulational rapture. The earth is anything but free from destruction and corruption during the successive tribulation period. Consequently, the liberation of nature and the sons of God will be manifested at the appearing of Christ at the beginning of the millennium or at the appearing of Christ at the beginning of the eternal state at the end of the millennium. Arguments can be made for the manifestation of the sons of God either at the end of the tribulation or at the end of the millennium. Those arguing for the premillennial manifestation of the sons of God emphasize that Christ comes with an army in white (Revelation 19:14) who are saints (I Thessalonians 3:14) for the battle of Armageddon and the marriage feast of the Lamb at the end of the tribulation. Therefore, the children of God are

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[66] Charles Hodge, *A Commentary on the Epistle to the Romans* (Grand Rapids: Louis Kregel, 1882), p. 425.

[67] Robert Haldane, *Exposition of the Epistle to the Romans* (Grand Rapids: Lewis Kregel, 1882), p. 425.

manifested with Christ in glory at this time and nature is redeemed from its bondage of corruption in the millennium. Those arguing for a postmillennial manifestation of the sons of God, on the other hand, argue that the sons of God who are born during the millennium are indeed not manifested until the end when Satan is loosed (Revelation 20:7-9). Also the sons of God are not in the glorious liberty until the eternal state when all the enemies are subjected. Our first avenue of attack, to set the time of creation's liberation by determining the time of the revelation and liberty of the sons of God at Christ's appearing, has lead us to two alternatives (1) the beginning of the millennium and (2) the beginning of the eternal state.

The second avenue of determining the event at which creation is freed centers on determining at what period of history the whole creation exhibits conditions free from vanity and corruption. Up until the second advent at the end of the tribulation, there is little question whether nature is subject to vanity. This reduces the possible periods of freedom from corruption again to two periods, the millennium and the eternal state.

To solve this problem it is necessary to compare and contrast the conditions of the millennium and the eternal state, especially in the area of the irrational, material creation. The Old Testament creates a few problems here. Just as it places the first and the second comings of the Messiah together without an intervening period and also describes a general resurrection instead of several (Daniel 12:2), it also mixes the new heavens and the new earth with millennial passages (Isaiah 65:17, 66:22). Likewise it describes the millennial conditions as lasting forever (Joel 3 :20, Isaiah 55:3), as if there were no distinction between the millennium and eternity. However, the New Testament does make some sharp differences between the two dispensations. The millennium has a sea (Isaiah 47:6-20) , sun and moon (Isaiah 30:26), day and night (Isaiah 4:5), a temple (Ezekiel 40-48), and the city of Jerusalem which is ten miles on a side (Ezekiel 48:30-35). But the eternal state has no sea (Revelation 21:1), no sun or moon (Reve1ation 2l:33), no night (Revelation 21:25), no temple (Revelation 21:22), and [has] the city of Jerusalem which is 1500 miles on a side (Revelation 21:16). Also there are critical differences between the millennium and the eternal state in reference to their subjugation to corruption. In the millennium the effects of the curse are greatly reduced. Nature has abundant productivity (Psalm 72:16; Amos 9:13-14; Zech. 3:10; 8:12). Instead of thorns and thistles (Genesis 3:18) the earth brings forth fruit and beautiful plants (Isaiah 55:13). Animals will lose their venom and ferocity (Isaiah 11:6-9; Isaiah 65:25). Longevity in man will be restored (Isaiah 65:20, 22). But there is no indication that the most serious part of the curse, death, is removed from man or nature (Isaiah 65:20; 2 Corinthians 15:25-26; Revelation 20:14). Neither is its cause, sin, removed from the cosmos (Isaiah 65:20, Revelation 20:7-9). In fact judicial punishment is ministered upon those who sin (Zachariah 14:17-19). The curse and its effects are diminished but not removed. In contrast the eternal state, the new heavens and the new earth (2 Peter 3:13), Revelation 21:1-22:5), in which righteousness dwells (2 Peter 3:l3), have neither sin and sinners (Revelation 21:8, 27) nor. death (Revelation 20:14; 21:4), the consequence of sin (1 Corinthians
15:54-56). Explicitly in the eternal state "there shall be no more curse . . ."") [Revelation 22:3 parentheses R. S. V.)]. Thus it appears on a comparative basis that the curse is diminished under the righteous rule of Christ in the millennium but the curse is not removed until the eternal state. the new heavens and new earth.

Adam, the first man, made the universe, as well as himself, a slave of corruption. The second man, Jesus Christ, redeemed the creation along with man from the bondage of corruption.

> So is it also with the redemption of creation. On the Cross Christ purchased this whole universe, but He is holding back the actual deliverance of creation until the day when the sons of God will be revealed (Romans 8:18-25).[68]

Adam, creation's first lord, failed to obtain his dominion over nature because of his sin, but Christ by his righteousness at the cross obtained lordship over all creation (Ephesians 1:20-21). However, the actual deliverance from the consequences of sin, the bondage of corruption, will not take place until the corruptible perishes and becomes incorruptible. With man, he dies corruptible but is resurrected incorruptible. With the creation. it must be destroyed (2 Peter 3:7-12) as corruptible but then made again incorruptible[69]. The creation is only renovated at the second advent and the curse is not removed. The first heaven and earth must be consumed by fire so that it is no more (Revelation 21:1; Isaiah 65:17) and a new incorruptible one conceived (Isaiah 65:17; 66:22; Revelation 21:1) in its place. This is the new heavens and the new earth which the present creation travails in childbirth to bring forth, so that the creation will no longer be under the bondage of corruption. It will share in the same glorious, incorruptible. and eternal freedom in which the elect share (Romans 8:23).

In conclusion, the creation, on the basis of a scriptural comparison of millennial with eternal conditions, will not be freed until the end of the millennium. All of the sons of God will not be fully manifest nor will they share in the glorious liberty until the eternal state, when the elect inhabitants of the millennium can be considered sons of God. Then they will all be incorruptible, will live in an incorruptible creation, and will have fellowship with the incorruptible God who lives in their presence. Before this time, sin and the bondage of corruption are affecting either some of the sons of God or their habitation, the creation, even in the millennium.

> Creation itself shall enter *into the freedom of the glory of the children of God*, but complete freedom will not he attained in the old creation. The resurrected patriarchs with the saved of Israel, the Pentecostal church with its proselytes from the nations, will live again on this earth. They will be the ruling class. David will reign and the twelve apostles will judge the tribes of Israel. Their glorification will bring a large measure of freedom to this groaning creation, but emancipation will not be complete. Doom will be meted out to all openly rebellious men during the kingdom eon. Plague and drought will be inflicted on those families of the earth who do not go up

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[68] Henry C. Thiessen, *Lectures in Systematic Theology* (Grand Rapids: Eerdmans publishing company, 1949), p. 294.

[69] Many commentators make one of two errors. They either relegate the new creation to an immaterial, ethereal existence, or they say that the new creation is just a renovation of the old. The first fails to recognize the material but spiritual nature of the new heavens and earth (Revelation 21:1-22:5). The second fails to reckon with the radical difference in substance between the new creation the old. It is more than a transformation of substance; the new consists of transparent gold in which dwell people with bodies like the resurrected Christ (able to penetrate other). Neither of these are properties of our present matter. The transformation is one of substance and not just of form.

> to Jerusalem to worship the King" (Zech. 14:17-18). In spite of the brief renovation and Renaissance of this old creation, it is doomed to destruction. Abiding freedom from the bondage of corruption belongs only to the new creation, in which there will. be no doom . . . . The new creation will never be subjected to vanity or know the slavery of corruption.[70]

At the final judgment Christ will bring everything into subjection to himself, sin shall be judged, and the creation with elect men shall be freed from the consequences of sin, vanity and the bondage of corruption. Consequently, the point of liberation for the creation then will be after the great white throne judgment (the present earth and heavens flee away, Rev. 20:11) at the end of the millennium, when it becomes new and incorruptible (Rev. 21:1).

Scientific Implications

The eschatology of science demands that the universe, under the second law of thermodynamics, ultimately die a heat death. The degradation of matter and energy into more and more chaotic states cannot continue indefinitely. Eventually, the universe will maximize its chaos and there will be irrevocable stagnation. In this state there can be no life, no light, and no useful energy.

> The tendency of all natural processes such as heat flow, mixing, diffusion, etc. is to bring about a uniformity of temperature, pressure, composition, etc., at all points. One may visualize a distant future in which, as a consequence of these processes, the entire universe has attained a state of absolute uniformity throughout. When and if such a state is reached, although there would have been no change in the energy of the universe, all physical, chemical, and presumably biologjcal processses, would have to cease. This goal toward which we appear headed has been described as the "heat death" of the universe.[71]

Unfortunately, there is no way for the universe to avoid this destiny and there is no way for it to escape, once it has reached this destiny. Such an outlook is indeed pessimistic and the only reconciliation is that this end may not be in the immediate future. But that is little comfort because progress is meaningless in light of ultimate dissolution and because our own lives are subject to futile effort in the meantime. Friction and corrosion wear out everything we work so hard to own. Heat in the summertime robs us of hard earned money by continuously taking away the cooling output of air-conditioners. Cold in the winter robs us of our furnace heat. The elements attack our edifices of civilization, weeds and wether rob our crops. Nature itself is subject to this same law.

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[70] George L. Rogers, *Studies in Paul's Epistle to the Rom*ans (2 vols. Los Angeles, California: George L. Rogers, 1936), p. 578.

[71] F. W. Sears and M. W. Zermonsky, *University Physics* (3rd. Ed.; New York: John Wiley and Sons, 1963) p. 441.

"Rocks weather and crumble; iron rusts; people grow old."[72] The sun is the only force that keeps this terrestrial machine going. However, it is burning itself up to do it and will eventually die itself. Science's brightest hope is to extend the time of the final demise; but, even then, it would not win an acquittal from the verdict of the second law. Death is the end for man, his civilizations, his earth, and his universe.

The redemption of the creation from this law to a perfectly organized and perpetual cosmos is inconceivable to science. This would require a supernatural intervention which is unthinkable in the present mental climate. To take the universe to perfect order would require not only a violation of thermodynamics but also a violation of statistical mathematics (abstract concepts). To sustain the universe in this state is equal to making it a perpetual motion machine in which all processes are one hundred percent efficient. Again this is a practical violation of the second law. So any redemption of the natural realm from the law of corruption and decay, the second law of thermodynamics, will be purely supernatural and beyond the realm of science.

Science, however, could predict some interesting phenomena in such a perpetual cosmos just by assuming that the second law is done away. There would be no death because there would be no decaying and no aging. Also living systems would not have to sustain their lives. There could he no radiating bodies like the sun and stars because they would have to consume themselves to produce such light. Likewise, any light would remain constant in color and quantity for all time. Bodies and machines set in motion would remain in motion forever unless someone intervened. Nothing would wear out. Dust would not collect. Such an ultimate utopia with eternal life and no work has been the hope of man from the beginning but can never be achieved by natural means. Science can only speculate on a universe without the second law but it can never achieve it.

The Scriptures offer us such a hope, through the cross of Christ, in sharp contrast with the black pessimism of science, with one added feature, the presence of the living God in our midst. The creation may groan now, as it has since Adam's sin, but its travail is not toward dissolution but toward a future redemption.

> Creation bears in her bosom the germs of a new· universe that shall be brought forth and grow to full maturity and to an unblemished perfection. Her pains are not those of dissolution, but the more acute pains of birth. Creation has sorrow and pain, yet whenever that which she expects shall have come, she no longer remembers the affliction because of the joy that a new creation is brought into existence. From the time of subjection *until now* seems to be an unduly long period of travail, but it will cease and seem but a brief hour in comparison with the unending duration of the new universe.[73]

It causes a man who shares such a hope with the creation to join in the hallelujah chorus as expressed by the hymn writer:

When we've been there ten thousand years,

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[72] "Sears and Zermonsky, *University Physics*, p. 431.

[73] Rogers, *Studies in Romans*, pp. 581-2.

Bright shining as the sun,
We've no less days to sing His praise,
Than when we first begun.

CHAPTER V

CONCLUSION

The conclusions of this thesis from an exegesis of Romans 8 and a correlation with other Scripture and science are threefold. First, the creation was subjected at the fall of man to vanity, the bondage of corruption, by God's judgment. Second, since this curse in Genesis 3, the creation travails under this bondage which is identical to the second law of thermodynamics. This travailing is not one of despair, but of hope, the hope of childbirth, the bringing forth of a new incorruptible creation. Third, this redemption of nature, comparable to the redemption of men to an incorruptible body and existence, will occur at the end of the millennium. Only then will it be new and entirely free from the bondage of corruption, which is not the case in the millennium. This new creation is the one for which the creation presently travails in childbirth to bring forth.

The underlying premise of this thesis assumes that the creation's destiny is closely linked to man's destiny. Man was originally told to have dominion over the creation, but he sinned. The creation shared in the curse upon its lord, and became subject to vanity and corruption. Since the fall of Adam, it has shared with man the consequences of God's judgment on sin. Throughout history nature has responded in an adverse way in a direct proportion to man's sin. On the other hand, nature also shares in the redemption worked at the cross. It was freed from the tyranny of its present prince, Satan. Therefore, the creation along with redeemed men will also share in a liberation from the curse, a consequence of man's fall. It will become incorruptible and eternal in perfect harmony with and subjection to the living God. From the beginning God evidently intended man and the creation to have a unity of destiny.

APPENDIX

APPENDIX

THE TWO LAWS OF THERMODYNAMICS

THEIR IMPLICATIONS IN THE ORIGINS AND DESTINIES

OF THE UNIVERSE AND LIFE

Introduction

This appendix will go somewhat beyond the scope and subject of this thesis, namely the subjection and redemption of nature. However as a matter of completeness this will be necessary. The author hopes that no reader of this section will get disturbed by some little point, legitimate or otherwise, and therefore miss the whole thrust. It will be a real travesty of the their pursuit for truth. A critical mind is necessary if the truth is to be found and most thinkers build their thinking on presuppositions which are assumed but never critically examined. For example, the evolutionist Kerkut explains that most people accept evolution as a fact when it really is not.

> Most students become acquainted with many of the current concepts in biology while still in school and at an age when most people are, on the whole, uncritical. Then when they come to study the subject in more detail, they have in their minds several half truths and misconceptions which tend to prevent them from coming to a fresh appraisal of the situation. In addition, with the uniform pattern of education most students tend to have the same sort of educational background and so in conversation and discussion they accept common fallacies and agree on matters based on these fallacies.[74]

The same process applies to every area of knowledge. This appendix critically strikes at the bases of widely accepted theories and the reader must approach the evidence presented here with an open and critical mind to evaluate it accurately.

There are essentially three scientific views of the progress of the universe in time and space. These are: (1) evolution, natural and theistic, (2) catastrophism, natural and theistic, and (3) creationism. By *natural* we mean that the events take place by blind fate and coincidence; there is no intelligent supernatural agent. On the other hand, by *theistic* we mean a supernatural course, guided by an intelligent transcendental agent. These three views are plotted as complexity in life forms and cosmic structure versus time.

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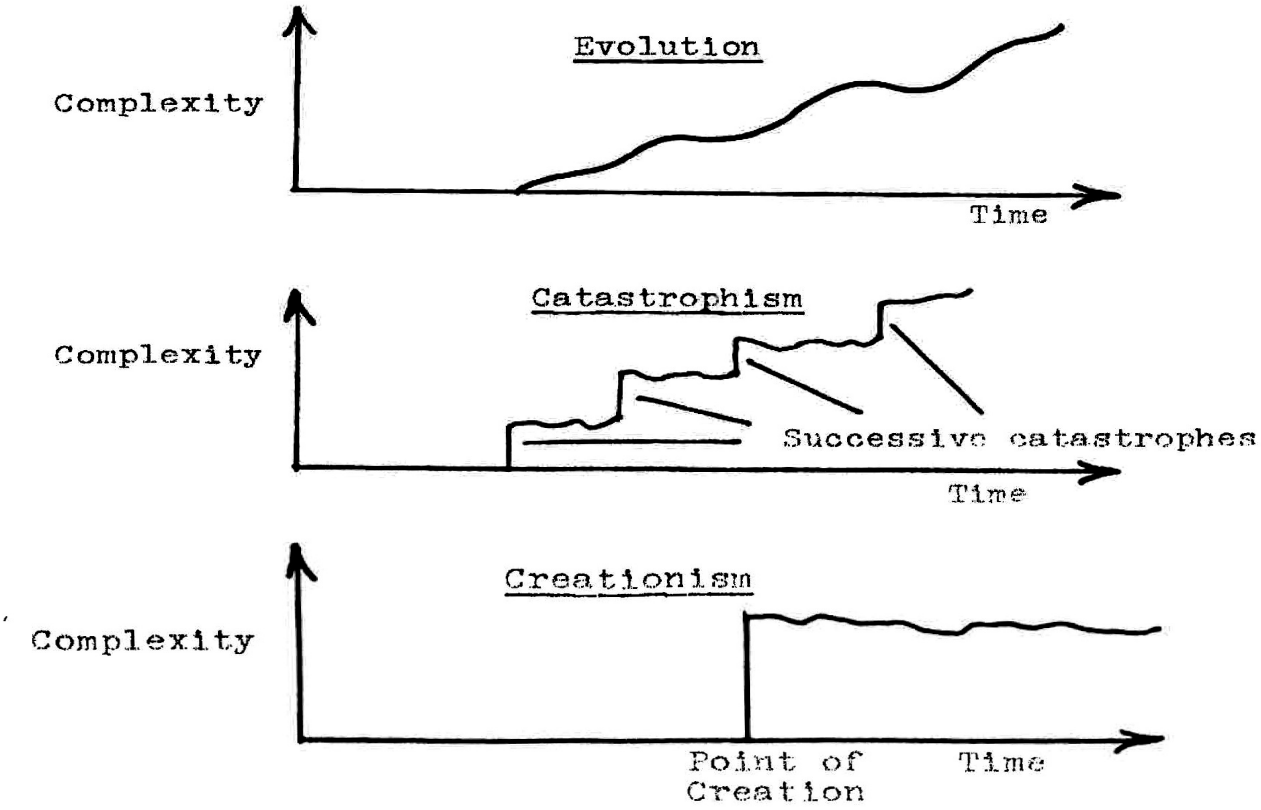
[74] G. A. Kerkut, *Implications of Evolution* (Oxford: Pergamon Press, 1960), p. 156.



Each of these theories hypothesizes the progression of the mass and energy of the universe through time and space. However, the theories are constrained by the laws that define mass and energy relationships, the laws of physics.

It is the purpose of this treatise to present the two most basic laws of physics, the laws of thermodynamics. Involved in these laws are certain explicit implications about the origin and destiny of the universe and of life. The three theories of the temporal progress of the universe and life can then be evaluated. Certain of the cosmological and biological views, as will he seen, are wholly untenable in the light of these laws of physics.

Explanation of the Two Laws of Thermodynamics

These two laws determine the most basic relationships of mass and energy. There is nothing in the universe not defined by the laws because everything is either mass or energy in the material or nonspirttua1 realm. Every other law and theory of physics and science is subject to these laws, including relativity and gravity. Science has a hierarchy of laws with the most universal and most absolute at the top and progressing downward through laws, strongly attested theories, and untested theories to the frontiers of our present research. At the apex of the laws of science are the two laws of thermodynamics, the most absolute and universal of all of man's knowledge.

Consider the statements of several scientists about these laws, particularly the second law.

The two laws of thermodynamics are, I suppose, accepted by physicists as perhaps the most secure generalizations from experience that we have. The physicist does not hesitate to apply the two laws to any concrete physical situation in the confidence that nature will not let him down.[75]

It is not too much to say that these two laws provide the very foundation upon which the great superstructure of modern science and technology has been erected. All the various geological processes as well as other physical and biological processes operate in accordance with these principles.[76]

Indeed, no less a physicist than Sir Arthur Eddington called this law [the second law] the most certain and best grounded of all the laws of physics. Emile Meyerson, an eminent student of physical theory, wrote that it "is a fact, and by far the most important fact of all science."[77]

Chwolson speaks of the discovery of this law by Clausias and Thompson with great enthusiasm. He says: "I maintain that the discovery of this law is the highest achievement of the human mind in any department of knowledge and understanding hitherto . . . . Mankind can be prouder of this law, which is impressed with the stamp of absolute truth, than of all its other attainments and achievements. For almost everything else is either controversial or only true to a limited extent. Among the eternal truths of reality which mankind has succeeded in grasping, the law of entropy stands preeminent." "The law of entropy is incomparably the mightiest instrument which physics possess for the investigation of the most secret undreamt of laws controlling physical phenomena."[78]

It is difficult to conceive of circumstances that would invalidate the statistical proof of the Second Law. Fundamentally there are fewer empirical elements in this law than in any other law of physics . . . . I might say further that the Second Law is not just any empirical law. In fact it can be derived from principles so basic that it would be difficult to conceive of circumstances so different that the law would be no

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[75] P. W. Bridgeman, "Reflection on Thermodynamics," *American Scientist*, vol. 41 (October 1953). p. 549.

[76] Henry Morris and John C. Whitcomb, *The Genesis Flood* (Philadelphia: The Presbyterian and Reformed Publishing Co., 1965), p. 222.

[77] P. J. McLaughlin, *Modern Science and God* (New York Philosophical Library, 1954), p. 67.

[78] Karl Heim, *The World: It's Creation and Consummation* (London and Edinburgh: Oliver and Boyd, 1962), p. 88.

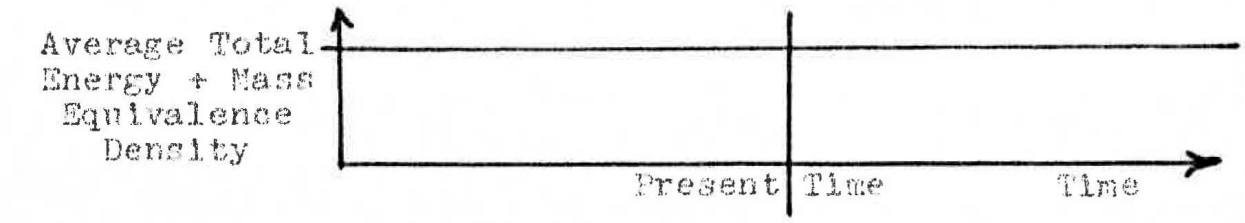
longer valid.[79]

The preceding quotes were accumulated lest the reader should be tempted to adhere to his low hierarchy theory and reject the overriding laws.

The two laws of thermodynamics are quite simple; the first deals with the *quantity* of energy and mass, while the second deals with the *quality* of energy and mass. Incidentally, mass and energy are related by Einstein's famous equation, $E=MC^2$. Mass can change to energy and back again but the conversion is always in a definite proportion, defined by the equation, just as energy also changes forms but always in definite proportions. Mass can be treated as just another form of energy.

The first law of thermodynamics

The first law states that quantitatively mass and energy are conserved; nothing is gained or lost in transformations. If the universe is a closed or finite system, as Einstein and others thought, then the total amount of energy and mass equivalent of energy ($E=MC^2$) in the universe is constant for all time. However if the universe is an open or infinite system, then this law must be viewed as an average energy density (energy and mass equivalent per unit volume) over the whole universe. In this case the average energy density over the whole universe would be constant for all time because the energy that one volume loses, the adjacent volume gains, and the average remains finite and constant. This energy density concept can apply to a finite universe as well. The first law can therefore be plotted as a graph of average energy density versus time.



The universe has the same amount of energy today as it had a thousand years ago and as it will have a thousand years from today according to the first law of thermodynamics. The *quantity* of energy, including mass equivalence, is observed.

The second law of thermodynamics

The second law is understood today in three ways: (1) the classical or work-heat approach, (2) the statistical or kinetical theory approach, and (3) the information theory approach. The unifying factor of all these approaches is the qualitative disordering of a system. A closed system,

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[79] Ibid., pp. 92, 95.

one with an impregnable boundary, will go from ordered states to disordered states, unless order is injected into the system from the outside. In the classical approach, work is just ordered or useful energy, and in a closed system, according to the second law, work will go to heat, disordered or unuseful energy. In the statistical approach, a closed system will statistically go in any interaction from a less probable state, order, to its more probable state, disorder. In the information theory approach, information in any closed system will, in any interaction or transmission, become more random or disordered.

The second law says that the entropy of a closed system always increases. The word, entropy, "is a compound from the Greek *en* (= in) and *trepen* (= to turn, fear, give direction to). Entropy accordingly means 'being directed inwards'[80]." Entropy thus gives the internal direction that the closed system goes, and that is toward greater randomness. It is what Eddington called *time's arrow*, that is, a pointer of the drift of natural processes. "Entropy is the measure of randomness,"[81] an randomness is always increasing. Harold Blum, a Princeton evolutionary biologist, capsulized the concept of entropy.

> A major consequence of the second law of thermodynamics is that all real processes go toward a condition of greater probability. The probability function generally used in thermodynamics is *entropy* . . . . Thus, orderliness is associated with low entropy; randomness with high entropy . . . . The second law of thermodynamics says that left to itself any isolated system will go toward greater entropy, which also means toward greater randomness and greater likelihood.[82]

Increasing entropy, the second law, is simply increasing disorder of a closed system.

However, two methods exist whereby order can be produced out of disorder within the limits of this law. They are: (1) chance and time whereby the improbable state will come about and (2) an agent and a degradable energy supply. In the second method, the agent must have a minimum amount of complexity or order equal to or greater than the order to be produced. Also the energy supplied must be degraded to greater disorder such that the degradation of order is equal to or greater than the increase in order produced by an agent. (Therefore there may be local decreases of entropy as bodies interact with each other, but every decrease is more than balanced by an increase of entropy elsewhere so that the total entropy of the system increases."[83]

An illustration clarifies the difference between the two methods of producing order. Take a watch apart and throw the parts into a bag. Now we can produce order, the reassembled watch,

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[80] Karl Heim, *The World: Its Creation and Consummation*, (London: Oliver and Boyd, 1962). P. 88.

[81] Lincoln Barnett, *The Universe and Dr. Einstein*, (2nd ed., New York: Bantam Books, 1968). P. 102. With a Forward by Albert Einstein.

[82] Morris and Whitcomb, *The Genesis Flood*, p. 223.

[83] Uno Ingard and William Kraushaar, *Introduction to Mechanics, Matter, and Waves* (Reading, Mass.: Addison-Wesley Publishing Co., 1960), pp. 541-2.

by (1) shaking the bag, allowing chance and enough time, or (2) placing watchmaker in the bag and giving him enough energy in the form of food. In the first, time and chance could produce the watch, but in the second, the agent and degradable energy supply achieve the order. Likewise, a fertilized egg can become a human being as long as it has its agent, DNA (the genetic molecule), and an energy supply, food. Take either a way and it is left only to time and chance to produce a human, an impossible feat in anything short of eternity, infinity of time.

Specific applications of the second law

More specifically what is the significance of entropy from the classical, work-heat approach?

> The term "entropy" used in this law is of a rather curious and negative character. It indicates the degree of randomness or disorder in the constituent particles of any substance or, alternatively, it may be said to indicate the degree to which energy becomes converted from a useful into a useless form. The second law of thermodynamics is in fact a physical law of irreversibility, since it states that in any physical or chemical process the amount of available energy must at the end of the process either remain exactly what it was at the beginning or, alternatively, must decrease. Such a decrease of available energy is an increase in Entropy.[84]

The available, useful (non-random) energy always decreases in a closed system. Entropy can be expressed mathematically as

$$S = \oint \frac{dQ}{T}$$

where S = entropy of the system, dQ = increments of heat energy, T = temperature, and where the integration is carried out over a cyclic process of the system. The entropy will always be equal to or greater than 0 in such a cyclic process or in mathematical terms, $S \geq 0$. In simple terms work energy (useful, ordered) is turned into heat energy (unuseful, random). In reference to the universe as a whole "the entropy of the universe increases in an irreversible process."[85]

> Since all processes in nature are irreversible . . . , it follows that the universe continuously runs toward higher and higher entropy, that heat is degraded as it is transferred from regions of high temperature to regions of low temperature and that entropy is a measure of this degradation.[86]

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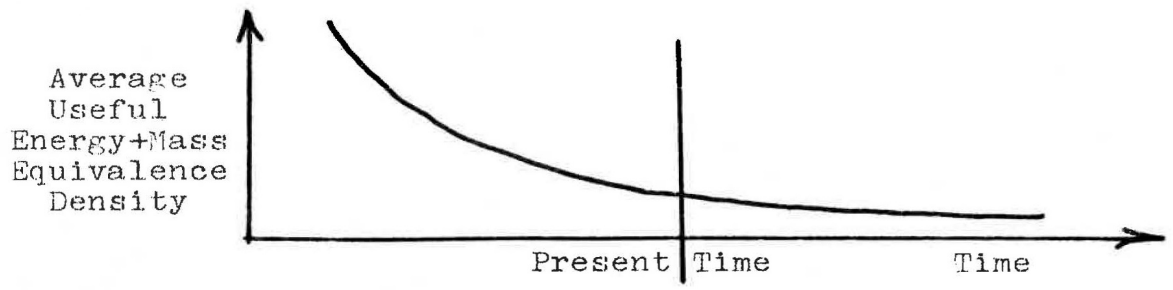
[84] Arthur Smethhurst, *Modern Science and Christian Beliefs* (New York: Abingdon Press, 1955), pp. 90-1.

[85] Ingard and Kraushaar, *Mechanics, Matter, Waves*, p. 539.

[86] *Ibid*., p. 541.

This increasing of unavailable energy can be graphed as the average useful energy density over the whole universe versus time.



This will be an exponential decay because the greater the temperature differences in the universe, the faster the potential to do work is lost through expansion of gases and irreversible heat transfers. "The greater the irreversibility, the higher is the probability that the process will take place[87]." So the rate of decay will be faster at first then toward the end where it is asymptotically reaches zero.

What is the significance of entropy in the statistical or kinetical theory approach?

> *In all cases observed in nature there is a tendency for processes to proceed toward a state of greater disorder*. We have already seen that natural processes tend toward a state of greater entropy so that we expect a connection between the thermodynamic concept of entropy and the statistical mechanics that the connection is given by the relation
>
> $$S = k \ln w \qquad (25\text{-}13)$$
>
> Here, k is Boltzmann's constant, S is the entropy of the system, and w is the probability that the system will exist in the state it is in relation to all the possible states it could be in. Hence, Eq. 25-13 connects the thermodynamic or macroscopic quantity, the entropy, with a statistical or microscopic quantity, the probability.[88]

This approach to entropy gives the second law a mathematical rather than an empirical basis. Using quantum physics and Boltzmann's distribution, the second law can be developed on a purely mathematical (statistical) basis completely devoid of empirical observations as presuppositions.

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[87] *Ibid*., p. 550.

[88] David Halliday and Robert Resnick, *Physics for Students of Science and Engineering* (New York: John Wiley and Sons, Inc., 1960), p. 551.

"The reason the papers on some desks most frequently seem to be in a disordered state is simply that there are so many combinations of the papers which are disordered, and so few which are ordered[89]." The same is true of matter and energy.

The information approach is similar to the statistical mechanics approach.

> We measured the information content of a message in any given ensemble of messages by the logarithm of the probability of its occurrence. This way of defining information has an earlier precedent in statistical mechanics where the measure of entropy is identical in form with that of information.[90]

Information becomes disordered in interaction just as energy does according to the classical approach. An example of this is the transmission of a television picture down a wire. The picture is reduced to a sequence of electrical impulses which present highly ordered information. As the impulses of electrical information travels along the wire, the impulses are disordered by the random molecular motion in the wire. If ths information were sent through enough wire, it wou1d only produce a completely snowy picture which did not contain the highly ordered information of a clear picture but only random information like noise or static. Information decreases as entropy increases in a system.

A distinction between the first and second laws

Scientists, biologists, and chemists, not to mention the laymen, make a serious mistake when they fail to distinguish between the first and second laws. Historically, many misunderstandings would have been prevented if this distinction were made. Many have thought the two laws are contradictions.

> But soon after Mayer had formulated the principle of energy (conservation of energy) two other scientists, Clausius (1850) and Thomson (laid down a second principle, which did not abolish Mayer's law of energy, as Hackel mistakenly thought, but amplified and supplemented it particularly in a certain direction. This is the so-called second principle of thermodynamics, or the law of entropy.[91]

The usual question is, How can energy be conserved (the first law), if it is degenerating (the second law)? The fact that the amount of energy never alters does not mean that energy is always available. As stated earlier, the first law states that the *quantity* of energy, including the mass equivalent, is conserved, while the second law states that the *quality* of this conserved quantity is continuously

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[89] Ingard and Kraushaar, *Mechanics, Matter, and Waves*, p. 550.

[90] Jagjit Singh, *Great Ideas in Information Theory, Language and Cybernetics* (New York: Dover Publications, Inc., 1966), p. 73.

[91] Heim, *The World*, p. 87.

degraded.

Likewise, evolutionists have tried to attribute the increase of organization, a decrease of entropy , in the upward evolution of living systems to energy supplied by the sun. They point out that earth is not a closed system and that the sun injects the energy needed for evolution from the outside. Blum, for instance, says,

> Where must we look for the increase in entropy that would compensate that represented by this increase in organization? We have to go all the way to the sun, which we must include in our isolated system. For the source of the energy utilized in reproducing the microorganisms stems from nuclear reactions in the sun, which have entailed increase in randomness. In all three instances [examples of reversed entropy], the latter of which corresponds very closely to the case of living organisms as a whole, we see increase in total organization only when we view a restricted part of the universe. If we enlarge our system enough to treat it as a thermodynamically isolated one, we find sooner or later an increase in randomness. When we think of high organization of living organisms, we need to remember that we deal with a small part of a much greater whole.[92]

Blum fails to differentiate the two laws. Quantity can never make up for quality in evolving highly organized systems. The sun supplies an influx of negentropy (inverse of entropy) in waves and particles but the entropic value of this influx is negligible compared to the negentropy needed to order random atoms into living systems. The sun only supplies *the degradeable energy* for evolution, but it does not supply *the agent* to utilize this energy in producing highly organized life forms. Even Blum admits in the new chapter of his revised edition,

> Although the increase in negentropy [negative entropy] is always dependant in one way or another upon the expenditure of energy, the two things are not measurable in the same terms and cannot be equated. For example how would one set about relating number of bits [the degree of complexity in a computer] to energy supplied to the computer? Yet sometimes the terms "entropy" and "negentropy" are confused with "energy" and this may lead to *very wrong conclusions*.[93]

Another evolutionist, Isaac Asimov, admits the need to distinguish between *quantity* (the first law) and *quality* (the second law).

> To some cosmic observer , watching the vast increase of entropy represented by the nuclear processes that feed the sun's radiation, the small jiggle of decreasing entropy introduced by life on earth (like a drop of spray shooting upward while Niagara plummets downward) would be completely unnoticeable.

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[92] Harold Blum, *Time's Arrow and Evolution* (Princeton, N.J.: Princeton University Press, 1968), p. 191.

[93] *Ibid*., p. 206. Parenthetical comments and italics are mine.

> And yet sheer quantity is not all. The complexity and versatility of life enforces a respect that cannot be elicited by raw sun power alone.[94]

Quantity can never make up for quality in the evolution of life. Yet biologists, while recognizing that apples and pears cannot be equated, fail to recognize that quantity (the first law) and quality (the second law) cannot be equated and still assert that the sun somehow is a force which by its energy drives evolution ever onward and upward in complexity.

In conclusion, the relationship between these two laws of thermodynamics is best allegorized by the physicist Sommerfeld.

> As a student, I read with advantage a small book by F. Wald entitled *The Mistress of the World and Her Shadow*. These meant energy and entropy. In the course of advancing knowledge the two seem to me to have exchanged places. In the huge manufactory of natural processes, the principle of entropy occupies the position of manager, for it dictates the manner and method of the whole business, whilst the principle of energy merely does the bookkeeping, balancing the credits and debits.[95]

This difference becomes apparent when a rock is thrown into a lake. The rock, right before it lands in the lake, has energy which is useful and can be used for work. However, it strikes the surface, sends out waves, and settles to the bottom. Eventually the waves die down and the peaceful lake returns to its quiet Walden Pond state. But, what happens to the energy that the rock used to have? It is conserved according to the first law: the energy is dissipated into the random motion of the water molecules in the lake. The work energy became heat energy, and the temperature of the lake is slightly higher. The books are balanced (the first law, energy). Some questions remain: why cannot the reverse event take place where the water molecules would develop into waves, pick up the rock, and throw the rock back at the boy who disturbed its tranquility? Could not the books be balanced in such a reverse event, the vengeance of the lake? Yes, they could be balanced for the reverse event (the first law), but the manager (the second law) says no, because it would require random energy (heat) to become an ordered energy (work). No, says the manager, my bookkeeper must always balance the books, but I have the sole right to dictate how the debits and the credits are dispensed; things go my way, in the direction of increasing entropy.

Cosmological implication of thermodynamics

The first law, as we saw earlier on a cosmological scale, is graphed is follows:

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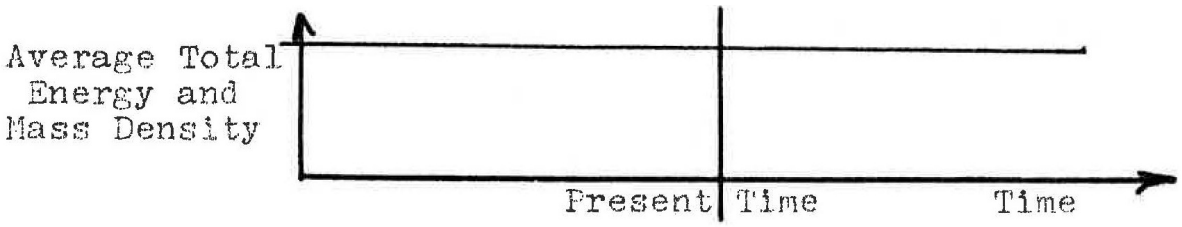
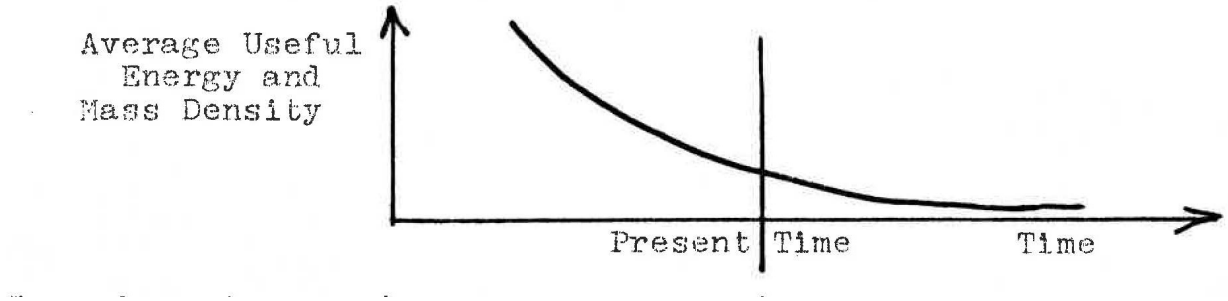
[94] Isaac Asomov, *Life and Energy* (New York, Toronto, Londin: Bantam Books, 1962), p. 365.

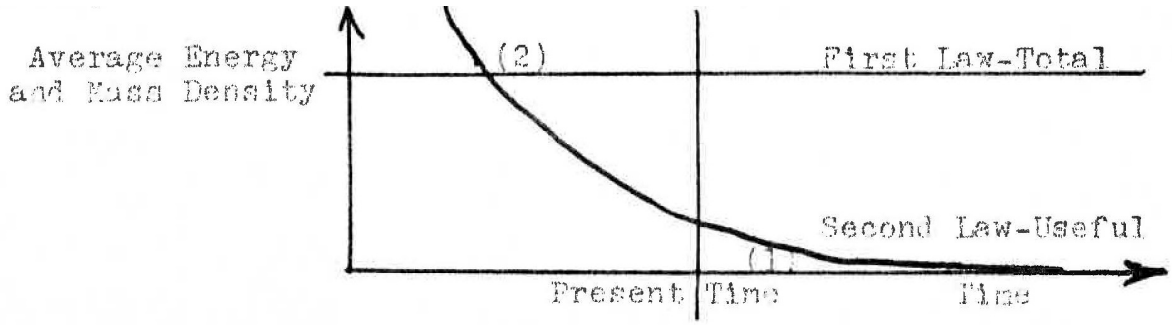
[95] Arnold Somerfeld, *Thermodynamics and Statistical Mechanics* (New York and London: Academic Press, 1964) p. 41.



The average total energy density is conserved and therefore constant with time. The second law on the cosmic scale is also graphed, but as follows:



When these two graphs are superimposed, a valid step because the units on both scales are equivalent, the following graph results:



Two unique points exist on this graph: (1) where the useful energy approaches zero at some time in the future, and (2) where the useful energy equals the total energy in the universe at some point in the past.

The scientific eschatology of the universe

At point (1) on the graph on page 43 the useful energy in the universe asymptotically approaches zero. In other words, the universe will slowly approach maximum entropy or zero useful

energy. What are the implications of this destiny of the universe? Lincoln Barnett, in a popular presentation of modern physics for which Albert Einstein wrote the preface, states the implications clearly.

> The universe is thus progressing toward an ultimate "heat-death," or as it is technically defined, a condition of "maximum entropy." When the universe reaches the state some billions of years from now all the processes of nature will cease. All space will be at the same temperature. No energy can be used because all of it will be uniformly distributed through the cosmos. There will be no light, no life, no warmth – nothing but perpetual and irrevocable stagnation. Time itself will come to an end. For entropy points the direction of time. Entropy is the measure of randomness. When all system and order in the universe have vanished, when randomness is at its maximum, and entropy cannot be increased, when there no longer is any sequence of cause and effect, in short when the universe is run down, there will be no direction to time – there will be no time. And there is no way of avoiding this destiny. For the fateful principle known as the second law of thermodynamics which stands today as the principal pillar of classical physics left intact by the march of science, proclaims that the fundamental processes of nature are irreversible. Nature moves just one way.[96]

Smethurst also concludes,

> The entropy of the whole universe can only increase and never diminish; and therefore the available energy of the whole universe must similarly decrease. This law of increasing entropy seems to exclude the possibility of any cyclic world process. In accordance with this principle, the universe must have begun in a condition of minimum entropy, i.e., maximum available energy, and must ultimately end in a condition of maximum entropy, i.e., minimum available energy. In other words the whole universe is running down and must always run down. Eventually it will attain its state of maximum entropy when all bodies will be at the same temperature and all activity will have ended.[97]

Heim in summarizing the scientific destiny of the universe says,

> Let us look once more at this summary account of the attitude of modern scientists

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[96] Lincoln Barnett, *The Universe and Dr. Einstein* (New York, Toronto, London: Bantam Books, 1968), pp. 102-3. Einstein said of this book in the forward, "Lincoln Barnett's book represents a valuable contribution to popular scientific writing. The main ideas of the theory of relativity are extremely well presented. Moreover, the present state of our knowledge in physics is aptly characterized."

[97] Smethhurst, *Modern Science and Beliefs*, pp. 91-2.

> to the question of the decline of the universe, and let us briefly summarize the results which have emerged. That the universe is faced with a heat-death cannot indeed be proved with mathematical certainty, but so much is sure: It is altogether improbable that the cosmos will escape this fate. It is just as improbable, for example, as that red ink, poured into a glass of water, shou1d remain apart from the water, and rise at one side of the wall of the vessel while at the other side the water should remain unmixed. Or, to take another analogy, that the universe should be saved from heat-death is just as improbable as that a quantity of water put on a fire should freeze to ice. All such improbable possibilities are indeed physically conceivable, but in real practical life, according to the views of any person, they are absolutely out of the question. It is just as much out of the question that the universe should escape heat-death.[98]

The destiny of the universe, then, is eventually a slow, irreversible heat-death. We do not know how long it will be before the effect will begin to take place, because we do not know enough about the rate of decay or how far along the process is. Most scientists, however are presumptuous enough to say, as does Barnett, that it is yet billions of years in the future, but this is based on the assumption that the process has been going on for billions of years and that we are about half way through the process.

Some scientists have tried to get around the implications of the second law.

> At the same time it must be remarked that several physicists have attempted to escape from this obvious implication of the principle of entropy by suggesting that our present thermodynamics may be a peculiarity of an expanding universe and may be reversible under other conditions. Thus Thomas has formulated a scheme of relativistic thermodynamics in which the second law is reversed in a contracting universe. Energy would then become more and more available . . .[99]

> Mention must be made of the theories recently advanced by Fred Hoyle of Cambridge and others, according to which the expansion of the universe is counteracted by the continuous creation of matter . . . . In answer to the question, "where does this continuously created material come from?" Hoyle rather naively remarks that it does not come from anywhere. "Matter," he says, "simply appears. It is created."[100]

Hoyle's theory is a violation of the first law of thermodynamics because matter is created and therefore is not conserved. Hoyle, since the time of the above statement, has indeed rejected his own theory. Barnett in commenting on such theories as Hoyle's says,

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98 Heim, *The World*, p. 97.

99 Smethhurst, *Moderrn Science and Beliefs,* pp. 93-4.

100 *Ibid*., pp. 94-5.

> Presupposing the possibilities of such events as these, one might arrive ultimately at the concept of a pulsating universe, renewing its cycles of formation and dissolution, light and darkness, order and disorder, heat and cold, expansion and contraction, through never-ending eons of time. And yet this picture has not been widely accepted because no definitive evidence has been found to support it . . . . Nothing in all inanimate nature can be unmistakenly identified as a pure creative process.[101]

Such attempts to avoid or annul the "heat death" amount to nothing less than a denial of either or both of the two laws of thermodynamics. This is a step of faith based upon no experimental or theoretical evidence and in fact it is a step of faith *contrary* to all experimental as well as mathematical formulations of physics. "Everything, indeed everything visible in nature or established in theory, suggests that the universe is implacably progressing toward final darkness and decay[102]." "Theories of continuous creation are gratuitous and have no foundation or support in science – we foresee a final condition of absolute stagnation."[103]

Other scientists such as Asimov tried to relegate the cosmic implications of the second law to some nineteenth century theory which is no longer in vogue.

> Clearly, if the quantity of energy in the universe is finite and if entropy continues to increase, it must eventually reach a maximum where there is no longer any temperature difference at all. All the energy becomes unavailable; no process is left that can be spontaneous; no net changes can take place. This picture is that of the "heat-death" of the universe, a point of view that grew to be popular in the latter part of the nineteenth century.[104]

Such a snub of the "heat-death" view is naive. Just because it is not in vogue does not mean the theory is any less valid. Time and progress in science have only fortified the conclusion, not weakened it. The only time any conclusion, law, or theory can be discarded is when it is proven invalid. A conclusion, even as pessimistic as this one, will not become any less consequential just by ignoring it and hoping that it will go away.

Some other writers and thinkers still see hope, against the heat-death of the universe, in the form of future scientific development of new energy sources.

> The accepted theory of yesterday was, that cold rather than heat, would he the cause of the destruction of life throughout the universe, since it is the tendency of all other forms of energy :o change into the form called heat, which itself gets lost by radiation into space. There being no known cause which could make up for this

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101 Barnett, *The Universe,* p. 104-5.

102 *Ibid*., p. 105.

103 McLaughlin, *Modern Science and God*, p. 66.

104 Asimov, *Life and Energy*, p. 60.

> constant loss of heat from the sun, the radiating center of our solar system, it was inferred that the life which depends upon heat must gradually disappear from our earth. Today it seems likely that this hypothesis will have to be considerably modified in consequence of the recognition of the stores of energy in the chemical elements, and of the varieties of radiant energy to which attention has been prominently directed by the discovery of radium.[105]

But unfortunately scientific exploration of nuclear sources will end because they also are subject to the second law of thermodynamics and will, eventually, no longer contain any useful energy.

> Every closed system on earth, excepting only long-lived radio-active matter, reaches this state within observable time. That the course of events on earth continues at all is possibly only because there is a constant influx of energy in the rays of the sun – in other words, only because the earth is not a closed system. But given enough time, no structure in the universe should be able to escape heat death. It is conceivable, of course, that certain forms of energy, such as the energy of atomic nuclei or the kinetic energy of stellar bodies moving in empty space would never be converted into heat at all. But even then, there would be in the end no longer any conversion of energy.[106]

Hope in scientific utilization of energy sources is without warrant.

> Thus all such attempts to escape heat-death remain futile. The only thlng which can delude us into forgetting this dreary prospect is the thought that, if it is a matter of fifty million years away, then the world has still some time to develop and we need not be too much afraid of this prospect . . . . Even the length of time of the reprieve which has been given to the cosmos does not deceive us about the real situation of the universe. It is llke the situation of a man condemned to death, who still has a fair interval of time between the verdict and the execution. This by no means alters the real situation, if the forecast made by leading scientists about the future of the world is correct.[107]

<u>The scientific origin of the universe</u>

At (2) on the graph on page 43, there is the interesting point at some time in the past when the useful amount of energy in the universe just equaled the total cosmic energy. The universe

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[105] Wilber M. Smith, *The Biblical Doctrine of Heaven* (Chicago: Moody Press, 1968), p. 234.

[106] Heim, *The World*, p. 91. Quote from Weizsacher, *Die Geshichte der Natur*.

[107] *Ibid*, p. 98.

could. not have existed before this point in time under the present laws because the useful energy before this point in time would have been greater than the total energy. This would require the useful energy to be greater than its possible maximum total. Consequently three possible views exist about the meaning of this temporal point: (1) the universe existed in a perfect state of order and useful energy from eternity past and then a finite time ago began its present downward course, (2) the universe was in a state of total randomness and unuseful energy, then by some means jumped up to perfect order and useful energy and then began its downward course to unusefulness and randomness, and (3) the universe came into being a finite time ago and started its present downward course. Each of these views, however, represents a violation of the present scientific laws and, thereby, requires a supernatural event. In view (1) supernatural intervention is required to maintain the universe in a highly ordered state against statistical disordering or, conversely, a supernatural intervention might have suddenly imposed this law of decay upon a perfect universe (cf. Gen. 3:17-19; Rom. 8:20). In view (2) a supernatural intervention would be required to take the universe from chaos to order against the second thermodynamic law. In view (3) the supernatural intervention would have created the matter and energy *ex nihilo* and then given it the high order and useful energy from which it degraded. The agent required to bring about these supernatural events in each of these views must have been, according to the second law, (1) able to violate the physical laws, (2) able to have access to every part of the universe to give each part its order, and (3) more complex than every part of the universe in order to impart order to it.

Most scientific thinkers reject the first two views in favor of the third. Barnett, for instance, concludes,

> For if the universe is running down and nature's processes are proceeding in just one direction, the inescapable inference is that everything had a *beginning*: somehow and sometime the cosmic processes were started, the stellar fires ignited, and the whole vast pageant of the universe brought into being.[108]

Sullivan develops the third view and excludes the first two from a more statistical mechanics approach.

> But the fact that the energy of the universe will be more disorganized tomorrow than it is today implies, of course, the fact that the energy of the universe is more highly organized today than it will be tomorrow, and that it was more highly organized yesterday than it is today. Following the process backwards we find a more and more highly organized universe. This backward tracing in time cannot be continued indefinitely. Organization cannot, as it were, mount up and up without limit. There is a definite maximum, and this definite maximum must have been evolved from some perfect state. Nor is it possible that the universe could have persisted for eternity in that state of perfect organization and then suddenly, a finite time ago, have begun to pursue its present path. Thus the accepted laws of nature lead us to a definite beginning of the universe in time. We are to suppose, on this reasoning, that, at some particular moment in the past, a perfectly organized universe sprang

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[108] Barnett, *The Universe*, pp. 105-6.

> suddenly into being, and has been steadily becoming more and more degraded ever since.[109]

McLaughlin pictures it more graphically.

> It seems quite clear from the Second Law of Thermodynamics that the physical world, so well known to us through the labours of the men of science, is something which not only will have an end, but is something which had a beginning. If the universe is running down like a clock, the clock must have been wound up at a definite date. If the world is to have an end in time, it must have begun in time. This follows strictly from the fact that the law of entropy is irreversible. A clock which is running down and is never re-wound cannot have been going forever.[110]

Consequently, science based on the first and second laws of thermodynamics concludes that the universe has an inception in time out of nothing.

In the first part of the appendix three views about the progress of the universe in time and space were presented: (1) evolution, slowly progressing upward in complexity, (2) catastrophism sudden upward progressions, followed by passive periods:, and (3) creationism. The first two views are direct contradictions to the second law if the upward progress is natural and inherent in the universe. The universe is running down and degrading, not moving upward in complexity. On the cosmic level there is no evidence that, even by divine intervention, things are progressing upward. Also the ceationist's view of a once-for-all inception of the highly ordered universe in time is strongly supported by non-religious scientific thinkers.

Biological Implications of Thermodynamics

What can physical laws have to say about biology? The biology of life fundamentally reduces to chemistry. Living matter consists of elements, molecules, and compounds interacting according to chemical equilibriums and defined by chemical reactions. This study of biology from a chemical view point is called biochemistry. Chemistry and chemical reactions, however, reduce to physics, the study of mass and energy interactions. Chemical reactions are constrained to take place in accordance with physical laws. Thus biology, understood at its most fundamental level, is essentially a study in physics, defined by physical laws. What constraints, then, does physics place on biology?

Thermodynamics, the basis of physics, limits the possible views of biology about the origin and destiny of life. Life, just as the universe, can only progress in accordance with the laws of physics, excepting of course supernatural interventions. The following two subsections outline a physical approach to life, its origin and destiny.

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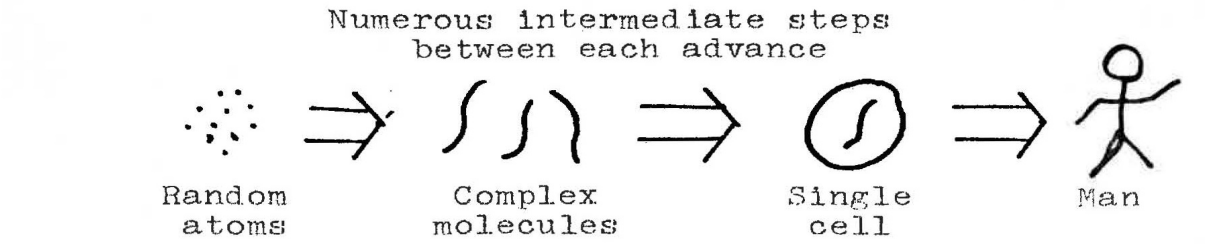
[109] J. W. N. Sullivan, *The Limitations of Science*, (New York: the new American Library, 1933), p. 24.

[110] McLaughlin, *Modern Science and God*, p. 67.

The origin of life

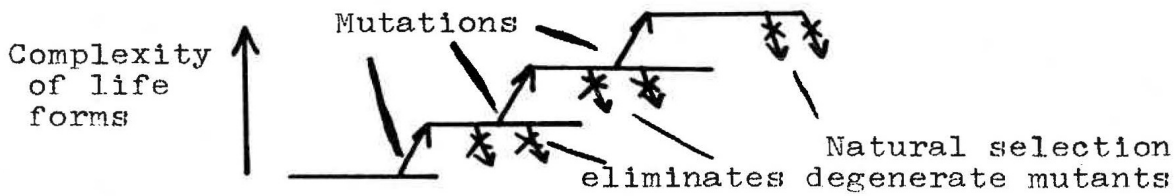
Three views exist that explain life's origin: (1) evolution, (2) catastrophism, and (3) creationism. By far the most popular is evolution, although catastrophism is gaining force under the leadership of Immanuel Velikovsky. Of these two views, the theistic approaches (God is the ordering agent, like the watchmaker in the box) are largely not accepted, but rather the natural chance processes (the chance and time process of producing the watch in the box) are accepted. Consequently, only the natural evolution, as taught in most schools, and the natural catastrophism approaches are dealt with here. The theistic approaches cannot be dealt with by these non-supernatural laws of physics; deity is not constrained by such mundane laws. Deity can intervene and violate the natural laws of science. Therefore, such supernatural theistic acts are above and beyond any constraint by physical laws.

Natural evolution and catastrophism in their understanding of the origin of life differ only in the rates at which they think the upward progress took place. Evolution stretches the progress over a long time in gradual ways. catastrophism has this progress in spurts interspersed with passive periods. Sudden cosmic or planetary events sparked these spurts. Evolution and catastrophism both involve the ordering of highly complex life forms from random atoms through a number of steps. The net effect is that order arises out of disorder.



The two basic ingredients for this process are (1) mutations , and (2) natural selection. Make a sharp distinction between the two. Mutations produce new forms. Natural selection on the other hand eliminates the bad mutations, but *it cannot produce new species*, only mutations can. Graphically the process might be seen:

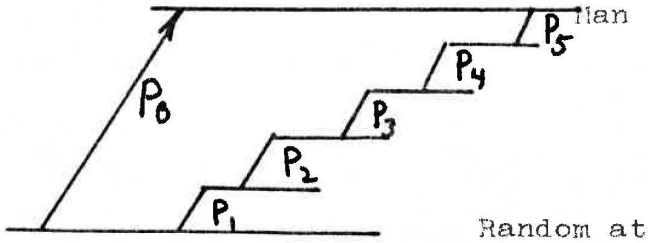
The mutations (not natural selection) take the process up to the next level, if the right mutant occurs; then the natural selection helps keep the good mutants from degenerating by eliminating the successive bad mutants. The mutants occur purely by chance and the natural selection weeds out the bad ones.



Therefore, natural evolution and catastrophism depend on the statistical probability of mutants defined by the second law. The problem is, how probable doe s the second law say that these processes are? George Bernard Shaw, in defense of evolution by chance, once said that if he had a million monkeys and gave them long enough they could type a play of Shakespear by chance. Consider how probable this is. Take the play of *Othello*, which begins with four words of four letters each. Assume we have one million monkeys typing randomly at about one hundred words per minute on a key board of forty keys. What is the length of time before the probability becomes one that somewhere in the typing these monkeys typed the first word of four letters? The time figures out to be twelve seconds. How long for two words of eight letters? The time is five days. Let us jump up to four words and sixteen. letters, what now is the time? It would take the monkeys typing by chance day and night one hundred billion years!! The probability goes up exponentially with the complexity of the system. No wonder watches are not put together by shaking bags, and plays are not written by monkeys. The second law constrains natural processes by chance and time to an exact probability function.

One of the arguments that life could have progressed from random atoms and molecules in spite of the second law is the spark chamber production of amino acids. Elements thought to be in the primordial atmosphere are placed in an enclosed chamber and sparked by an electrical discharge for a week. At the end of this time amino acids are present which proves that ordered organic molecules can be derived by chance out of inorganic molecules. Therefore, goes the argument, given enough time and the whole universe, proteins, living cells, and eventually man could evolve by chance.

Let us make some assumptions to test out this argument. First, assume that (1) perfect natural selection holds true: if the mutant occurs, it always survives, (2) one out of every two collisions of any atom is the right combination to produce a mutant to further the progress of evolution (this more than takes into account selective affinities that certain atoms have for each other) , (3) there are 10^{1000} atoms in the universe , whereas astronomers assume 10^{80} , and (4) there are 10^{100} collisions per atom per year, whereas 10^{20} is more likely. Second, the atomic order of complexity to a life and eventually man is as follows: amino acids, 20 atoms; proteins, 10^{4} atoms; DNA (human), 10^{10} atoms; one cell, 10^{15} atoms; human, 10^{24} atoms. The probability to reach any level of complexity from random atoms is solely dependent on the complexity of the system, or its end state, *not* upon the process by which it comes about. For instance, the probability of a man evolving from random atoms over a long gradual process is the same as the spontaneous materialization of a man out of random atoms. The product of the probabilities of the gradual evolution is the same as the probability of the spontaneous event.



$$P_0 = \sum_{n=1}^{5} P_n$$

Since entropy is only a measure of the end state, S = K ln W, then the probability of the event does not depend on the process.

Now let us do some calculating for the argument of amino acids and eventually of life by chance. What would be the length of time needed to produce an amino acid in a cubic foot spark chamber where one out of every two collisions is beneficial to produce the amino acid sequence? It would require only one-millionth of a second. Therefore according to the statistics of the second law, we should expect to get amino acids in a week by chance. In fact they should be produced at the rate of one million per second. However, let us jump to a human being; what time would be required using the 10^{1000} particle universe to produce a man? The time required for the probability to become one that this event will take place is a huge number, in the ballpark of a googolplex ($10^{10^{100}}$). Just to write the number of years *not* to count them, writing at the rate of one billion zeroes a second, it would take a trillion years to write the number. By contrast to write the commonly estimated age of the universe, it would require, writing at only one zero a second, only ten seconds.

Lecomte DuNouy carried out the calculations for the chance evolution of only one protein. Statistically, he says, it would be so highly improbable in the age of the universe that it is for all practical purposes an impossible event. And if it did happen he says:

> However if this happened and we maintained our confidence in the calculus of probabilities it would be equivalent to admitting a miracle, and the result would be: ONE SINGLE MOLECULE, or at most two or three.
>
> Life itself is not even in question but merely one of the substances which constitute living beings. Now, one molecule is no use. Hundreds of millions of *identical* ones are necessary.[111]

He concludes:

> Thus we are actually confronted with a dilemma. Either we have absolute confidence in our science and in the mathematical and other reasonings which enable us to give a satisfactory explanation of the phenomena surrounding us – in which case we are forced to recognize that certain fundamental problems escape us and that their explanation amounts to admitting a miracle – or else we doubt the universality of our science and the possibility of explaining all natural phenomena by chance alone; and we fall back on a miracle or a hyper-scientific intervention.
>
> In both cases we are brought to the conclusion that, actually, it is *totally impossible* to account scientifically for all phenomena pertaining to Life, its development and progressive evolution, and that, unless the foundations of modern science are

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[111] Lecomte Du Nouy, *Human Destiny* (New York and Toronto: The New American Library, 1947), p. 36.

overthrown, they are unexplainable.[112]

However, natural evolutionists have tried to escape the dilemma of this conflict between the second law of thermodynamics and natural evolution. First of all, as mentioned before. they try to attribute the increasing upward complexity to the sun.

> The theory of evolution is very much in vogue today, and students and the general public are told over and over that its acceptance as a fact is practically unanimous among men of science. It follows from this that the evolutionists have been able to convince themselves that the theory of evolution is not contrary to this view. They do this by saying that there really is no contradiction because all the energy needed to bring about evolution has been supplied abundantly by an eternal source, namely the sun.[113]

However, as we pointed out earlier, *quantity* of energy will not supply *quality* of energy such as needed to order the complex life forms. After citing a number of cases of increasing complexity in life and nature, such *as* fertilized eggs becoming complex animals, Davidheiser concludes:

> Thus more complex arrangements of matter can be produced from simpler or from random arrangements. In each of the examples given here, the energy required can be traced to an outside source, the sun. But in each case this energy was not enough. Such things as intelligence, skill, instinct, and genetic constitution were also required.[114]

In other words, not only is an external energy needed but also an agent at least as complex as the system to be produced (the DNA in the case of the egg). The sun alone cannot produce the order needed to produce the complex life forms. A second way sought to redeem natural evolution is by evoking Maxwell's demon, an imaginary character that can sort out atoms and so reverse the second law. However, Jagjit Singh counters against such magic.

> The longish detour we have followed in exorcizing Maxwell's demon, rather than denying outright the existence of such a molecular homunculus capable of sorting and ordering, has a purpose. It points to a novel way of reconciling an apparent conflict between the second law of thermodynamics and the process of biological evolution. For the latter, with its continual emergence of ever new forms of life from inanimate matter *via* the "subvital" autocatalytic particle of protein all the way up to man as an increasingly complex crescendo of self-sustained chemical reactions, does

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[112] *Ibid*., pp. 36-7.

[113] Bolton Davidheiser, *Evolution and Christian Faith* (Philadelphia: Presbyterian and Rerformed Publications Co., 1969), p 221.

[114] *Ibid*., p. 222.

> seem to tend towards increasing organization and "Patternedness" of matter. On the other hand, according to the second law of thermodynamics, matter continues to drift toward a state of increasing chaos and "mixed-upness."[115]

Singh continues and points out how the physicist and biologist try to eliminate this conflict and points out their failure to synthesize the antitheses.

> The physicist claims that the conflict is illusory . . . the biologist, as a student of patterns, cannot but say that there is more order and organization in the well-arranged crystal than in its homogeneous mother liquor. No possible conflict between thermodynamical order and biological organization can therefore arise, as the two concepts are quite different and incommensurable . . . .
>
> Both points of view, however, though valid, seem to skirt the paradox rather than resolve it. The difficulty is not one of proving that there is available a vast reservoir of free energy in the form of sunlight, a small proportion of which serves as the ultimate motive power of all life on earth. It is rather *how* any given assembly of molecules which is expected when left to itself to be more and more shuffled and disordered does under certain circumstances begin to exhibit greater pattern and organization even though it is of an altogether different kind from that envisioned by the physicist. In other words, the riddle of biophysics is to discover how the fortuitous concourse of hyroids of blind and chaotic molecules while obeying the law of physics and chemistry become at the same time integrated into organic wholes capable of entropy-decreasing animated activity.[116]

Even if man is able by biochemistry to synthesize life and even a man, this would not prove natural evolution because it is not by blind chance; rather, man would be the ordering agent in such a process. Consequently, neither solar energy, Maxwell demons, nor semantic sabotage of terms provide the natural evolutionists with a means to resolve conflict between evolution by chance and the second law.

The laws of thermodynamics do not allow for evolution or catastrophism to take place by chance. Some highly organized supernatural agent is the only possible explanation for the evolutionary or catastrophic processes. Theistic evolution and catastrophism and creationism remain the three possible alternatives according to the second law of thermodynamics. All three are supernatural. However the events by which life actually arose are not a matter of personal speculation. The events only happened one way and, as with the whole course of past history, are not subject to change. The biblicist believes that God revealed the actual course of events in the Scriptures, and therefore, he is limited by a historical-grammatical approach to creationism. The theistic evolutionist and catastrophist reject the biblical account and try to piece the process together from geology and archeology. But whatever approach is chosen, it must be kept in mind, it only

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[115] Singh, *Great Ideas*, p. 70.

[116] Ibid, pp. 79-80.

happened one way. Also thermodynamics cannot limit it to one of these three theistic approaches it only eliminates chance and natural courses for the origin of life.

The destiny of life

What implications do these laws of thermodynamics have in the area of the destiny of life? First of all because of the second law, every living system is subject to death as well as the inorganic realm.

> The fact remains that not only we human beings and all animals, but also the whole inorganic world, is faced with the fate of total annihilation. The whole reaction is like a wood, through which the forester has gone with axe in hand, making with a stroke every tree which is to be felled in the approaching deforestation. So every man, however young and healthy he may be, is already marked for death, and has a precisely predetermined time still to live, before it is his turn in the universal death which pervades the whole creation.[117]

Not only does the second law subject man to death but it also reduces all his labor and effort in the earth to total vanity. He builds houses, machines, great cities, and great civilizations but the second law decays and dissolves everything to nothing. Animals and plants in the same way are destined but to bloom for a while and then to die never to rise again.

The most tragic sense about the scientific eschatological end of life is the ultimate nothingness.

> Do you remember the end of that *Song of the Wild Cock* which Leopardi wrote in prose – the despairing Leopardi, the victim of reason, who never succeeded in achieving belief? "A time will come," he says, "when this Universe and Nature itself will be extinguished. And just as of the grandest kingdoms and empires of mankind and the marvelous things achieved therein, very famous in their own time, no vestige or memory remains to-day, so, in like manner, of the entire world and of the vicissitudes and calamities of all created things there will remain not a single trace, but a naked silence, and a most profound stillness will fill the immensity of space. And so before ever it has been uttered or understood, this admirable and fearful secret of universal existence will be obliterated and lost." And this they now describe by a scientific and very rationalistic term – namely, entropia. Very pretty, is it not? Spencer invented the notion of a primordial homogeneity, from which it is impossible to conceive how any heterogeneity could originate. Well now, this entropia is a kind of ultimate homogeneity, a state of perfect equilibrium. For a soul

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[117] Heim, *The World,* p. 100.

avid of life, it is the most like nothingness that the mind can conceive.[118]

In light of this end, progress is meaningless because ultimately all life and progress (technologically and culturally) will fade into oblivion and chaos.

> Long before the process comes to an end, man will have vanished from the scene, and the rest of the performance will take place in the unthinkable night of the absence of all consciousness. This revelation is startling. It is still more startling, almost incredible, when we reflect that this amazing panorama sprang suddenly into existence a finite time ago. It emerged full-armed, as it were, out of nothing, apparently for the sole purpose of blazing its way to an eternal death. This is the scientific account. It seems to be true as far as it goes, but we cannot believe that it is the whole truth. We prefer to believe that the present scientific method has its limitations.[119]

Thus science, built upon thermodynamics, relegates each individual life as well as ultimately all life forms to decay and death.

> The result of this scientific conclusion upon modem thinking has been devastating.
>
> It was Clausius who, in 1863, first ventured to take the eventful and perhaps fateful step, and exalted the law of entropy to a universal law. *Since then there has lowered over mankind like a dark thundercloud which will one day shed its load, the picture of "the death of the universe*." Since then there is talk of ''ice death" or "heat-death" that is of the final state in which the whole sum of energy in the universe will have dissolved into masses with equal temperatures and equal radiation. According to Dubois-Reymond too, *"Scientific eschatology"* consists in the expectation of the point in time, to which the world relentlessly draws near, in which all life of the mind and with it all knowledge will be extinguished, all ideas will be annihilated, along with all works of art and cultural achievements.[120]

Some have been given a false hope against the pessimism of this thermodynamic eschatology.

> One further point, however, continued to bother many people. In time, scientists said, the universe was doomed to an entropic heat-death. Though far off, this

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[118] Miguel Unamuno, *Tragic Sense of Life* (New York: Dover Publications, Inc., 1954), pp. 123-4.

[119] Robert F. D. Clark, *The Christian Stake in Science* (Chicago: Moody Press, 1967), p. 39.

[120] Heim. *The World*, pp. 89-90.

> possibility grated against the exuberant optimism of the day. It seemed too much like an unpleasant maggot at the bottom of the jam-pot, so people listened eagerly to those public men who, being quite ignorant of thermodynamic theory, felt competent to assure their hearers that the law of entropy had no cosmic relevance.[121]

Heim illustrates the falseness of this hope with a parable.

> We should have expected that this attitude of radical hopelessness and despair toward life would have extended to the whole of mankind since the discovery of the law of entropy. Why has this nevertheless not occurred? The reason is quite simple. There is a hindrance which prevents the sight of the abyss of imminent total destruction from having its full effect. What then is the nature of this hindrance? We can best express it in a metaphor. In the mountains it often happens that the path passes close by the edge of a deep chasm. Any clumsy step may cause the traveler, if he is not immune from giddiness, to fall over the precipice. But now there is something there which prevents him from seeing the bottomless depth. A thick mist has spread over the chasm, which veils and hides from the traveler the immense depth beneath him, and so gives him an illusory sense of security.[122]

However, Heim shows that the world wars, like a sobering wind, have blown away this blinding facade from the thinking person's mind.

> Any thinking person, once he has clearly realized the fate of the world inexorably presented to us by the second law of thermodynamics, cannot avoid a certain feeling of melancholy which involuntarily comes over us at this prospect. This melancholy feeling about the utter hopelessness and aimlessness of life and of the world then leads inevitably to the nihilism of J. P. Sartre, which is the prevailing philosophy of our time. Regarded from this point of view, the whole universe with its nature and history is nothing original and nothing conclusive, but only a transient episode, which has arisen out of the night of absolute nothingness in a moment of the past, and will disappear at some future moment into absolute nothingness, leaving not a trace behind.[123]

The second law leaves no hope for the idealist, the optimist, the existentialist, the evolutionist, or the materialist because life is totally and ultimately subject to vanity and nothingness by this law.

In light of the ultimate destiny of life, death, man has only two options. "The first is the radical hopelessness of nihilism, for which the whole course of the present world is merely an

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[121] Robert F. D. Clark, *The Christian Stake in Science* (Chicago: Moody Press, 1967), p. 39.

[122] Heim, *The World*, p. 131.

[123] *Ibid*., p. 130.

episode, which appears out of nothingness and disappears again into nothingness, leaving not a trace behind[124]." Under this option the only feasible approach to life is hedonism ("let us eat and drink, for tomorrow we die," I Cor. 15:32). At least it takes into account the fact that we are doomed to ultimate dissolution and seeks to glean some type of pleasure in the meantime. Unfortunately, it does not stave off death and ultimate meaninglessness. Do-gooders and other optimists are absolutely foolish because they fail to see that good works and progress that try to produce a better world are doomed by the second law. They make sacrifices to produce these transient, but failing, ends and so lose out in the meantime as well as in the future.

The second option is the only option that has any hope, and it is a hope in eternal life based on the resurrection of Christ. Eternal life is the only hope that stands out against a decaying and meaningless cosmos; life has no meaning apart from eternal life.

> Only because the Apostle Paul spoke of these things with divine authority can we dare to make the attempt to reproduce them in the language of our time. Perhaps this is better than if we enter into the abstractions of existentialist philosophy. The new and fundamental conception that Paul brought us, and the only thing which delivers us from nihilism, is the conviction that the resurrection of Christ is not merely a miracle which happened to a particular individual, but the beginning of a total transformation of the whole cosmos.[125]

This hope of eternal life in a transformation of the cosmos is based upon the resurrection of Christ, because through his death our sins are forgiven and through his resurrection we are given eternal life. If Christ did not rise, then this hope is in vain, as Paul explains.

> For if the dead are not raised, neither has Christ been raised; and if Christ has not been raised, your faith is in vain; ye are yet in your sins. Then they also that are fallen asleep in Christ have perished. If we have only hope in Christ in this life, we are of all men most pitiable [1 Corinthians 15:16-19 (A. S. V.)].

However Paul points out that this is not just another cause of wishful thinking. He bases this hope in Christ's resurrection on the fact that the event was prophesied by the Scriptures, and that Christ was seen after the resurrection by Peter and the apostles, five hundred others and even by himself.

Without this hope of eternal life through Christ's resurrection we have only the pessimistic option as Paul explains. "If the dead are not raised, then let us eat and drink, for tomorrow we die" [1 Corinthians 15:32b (A. S. V.)]. This hope of eternal life[126] presents the only optimistic and

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[124] *Ibid*., p. 149.

[125] *Ibid*., p. 137.

[126] Obtained by personal faith in Christ for the forgiveness of sins and not by one's good works. ("For by grace are you saved through faith; and that not of yourselves; it is the gift of God; not of works, lest any man should boast) Ephesians 2:8-9). For if a man is made right with God by his own goodness and so obtain eternal life in Christ died in vain.

meaningful option to life because it is "an inheritance, *incorruptible* and *undefiled*, and that fadeth not away, reserved in heaven for you'' [I Peter 1:4]. The prophet of old, Isaiah, brings this salvation into sharp contrast with a corrupted fading universe.

> Lift up your eyes to the heavens, and look upon the earth beneath: for the heavens shall vanish like smoke, and the earth shall wax old like a garment, and they that dwell therein shall die in like manner; but my salvation shall be forever, and my righteousness shall not be abolished [Isaiah 51:6].

Nothing else in life is incorruptible, permanent or meaningful because the second law of thermodynamics subjects all life to decay, corruption, and dissolution.

In conclusion the destiny of life, like the cosmos, is doomed to decay and ultimate dissolution, death. The philosophical options in light of this are (1) a false hope and ignorance of the reality of entropy, (2) a radical hopelessness of nihilism, or (3) a hope in eternal life obtained by personal faith in Jesus Christ.

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