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# The Architectures of Paradise 

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#### Abstract

The Biblical earthly paradise is a garden, the Garden of Eden. The Garden of Eden was watered by four rivers; the Pison, the Gihon, the Hiddekel and the Euphrates. The rivers meander though Eden in no fixed pattern; Eden appears to be an asymmetric, bountiful wildness where nature prevails. This is in contrast to the celestial Jerusalem, described in the Revelation of John the Divine, which is symmetrical in its shape and design. It is described as being cubic in shape with entrances on the north, south, east and west; all these sides are symmetric and identical. The foundations of the city were gems; the streets were made of gold and the gates carved from massive pearls. The garden of the celestial Jerusalem is the tree of life symmetrical place within the city - symmetry prevails. However, the celestial city of Revelation is not the only architecture for Paradise in the Christian tradition. In early Irish literature there are seven Heavens, but the city of God is still highly planned, with its architecture described in Gaelic verse, such as 'Saltair na Rann'. In the 'Divine Comedy' Dante does not describe a city but his Paradise is housed in a closed, symmetric and fourth-dimensional universe. This paper examines some of the differences and similarities of the architectures of Paradise.


Keywords: Utopian Cities, Symmetry, Architecture, Paradise

THIS PAPER FIRST considers the structure, dimensions, symmetry and source of the Celestial city, the New Jerusalem in Revelation of the New Testament. It then examines Cantos I and II of a Gaelic poem from the eighth century, Saltair na Rann. In the first Canto, a highly structured cosmology is defined, and in the second Canto, the city of God, the city of the Riched, is described in detail. Although it is clear that the author was familiar with Revelation, the architecture of this Paradise differs distinctly from the New Jerusalem. The paper will consider the plan and architecture of these two Cantos. Finally, the paper turns to the Paradise in Dante's Divine Comedy. Dante attempted to create a universe that could be drawn with a straight edge and compass, but he inadvertently created a fourth-dimensional universe that was beyond the understanding of his time. The paper examines this structure that Dante unintentionally created in his Paradise.

The Biblical earthly paradise is a garden, the Garden of Eden. Eden was planted by God and was a place of plenty, innocence and tranquillity. The garden was watered by four rivers; the Pison, the Gihon, the Hiddekel and the Euphrates. ${ }^{1}$
The rivers meander though Eden in no fixed pattern; Eden appears to be an asymmetric, bountiful
wildness where nature prevails, its only boundaries are the divisions of the river and the garden appear to have had no defined borders. Although Philo (c20BC-c50AD) claimed that Eden was "represented in the east" since "the rising sun fills the darkness of the air with light, $" 2$ no real boundaries appear until after the expulsion of Adam and Eve from the Eden. Then God "...placed at the east of the Garden of Eden Cherubim, and a flaming sword which turned everyway, to keep the way of the tree of life. ${ }^{33}$ Eden became closed, however, it is perceived as an illusive goal, as "a model of bliss," ${ }^{4}$ which humanity wishes to return to.

Early Jewish apocalyptic writers of the Old Testament, such as Ezekiel and Isaiah, considered that out of the desert, desolation and destruction that existed, the Garden of Eden would arise at the end of time. According to Ezekiel this desolation "...is becoming like the Garden of Eden; and the waste and desolate and ruined cities are became fenced, and are inhabited." ${ }^{, 5}$ Eden was the 'Garden of God, ${ }^{6}$ however, the bountiful and boundary less garden from the beginning of time had become fenced.

In the New Testament the end of the time brings about the creation of the heavenly paradise, a city the New Jerusalem. It has a highly elaborate symmetrical design, which was in stark contrast to the mean-

[^0]dering and asymmetric wildness of the Garden of Eden. From the Biblical perspective, in the beginning of time paradise was created it was unplanned in its design, with the emphasis being on natural abundance. At the end of time the same creator created paradise as a highly planned city with an emphasis on symmetry, order and richly built.

In last book of the New Testament, 'The Revelation of John the Divine', John described an apocalyptic vision in which he heard a voice calling him to 'come up hither,' he saw the throne of God and God was jasper-like, from the throne came flashes of lightning and peels of thunder. John saw Babylon the Earthly city of vice and corruption that was symbolized by a woman. ${ }^{7}$ God sent down seven angels with seven plagues to clear the Earth. Babylon fell and only the blessed were saved. John saw "....a new heaven and a new earth; for the first heaven and the first earth were passed away... ${ }^{8}$ He saw a holy city, a New Jerusalem "coming down from God out of heaven, prepared as a bride adorned for her husband." An angel came to John and it was "one of the seven angels which had the seven vials full of the seven last plagues" ${ }^{10}$ that cleared the earth. The angel carried the spirit of John to a great and high mountain where he saw the holy Jerusalem descending out of heaven from God. The city was clear as crystal, high walls with twelve gates three on the east, three gates on the north, three gates on the south and three gates on the west.

The angels gave John a golden reed "...to measure the city, and the gates thereof, and the wall thereof. And the city lieth foursquare: and he measured the city with the reed, twelve thousand furlongs. The length and the breadth and the height of it are equal, ${ }^{, 11}$ he also measured the wall of the city to be hundred and forty-four cubits.

The basic plan of the city is that of a cube, the height, length and breadth is twelve thousand furlongs, which equals fifteen hundred miles $(24,135$ Kilometers). ${ }^{12}$ The walls of this massive city were a hundred and forty-four cubits, this equal approximately two hundred and sixteen feet ( 65.88 metres). ${ }^{13}$ However, it is not stated whether this is the height or the width. Both would appear to be unsatisfactory;
if it is the height it would seem inadequate for a city twelve thousand furlongs high and if the walls were hundred and forty-four cubits wide the foundation would be inadequate. It is perhaps likely that these measurement were picked for their numerical quality, rather than there architectural features.

Twice John is given a reed by an angel to go and measure with, the first time he is given the reed during the clearing of the earth, the angel orders John to go and measure the temple of God on earth, the altar and all these that worship in it. ${ }^{14}$ Zechariah, in the Old Testament, is commanded by an angel to measure the breadth and length of Jerusalem. ${ }^{15}$ In both cases no measurements are given, but both cases imply that the process of measuring entails protection for all that is measured and exposure of all that is not measured. The second time John measures is after the apocalypse, he measures the New Jerusalem and the two measurements given are multiples of the symbolic number twelve.

The city is symmetric there are three gate on each of the four walls, each gate has a name of one of the tribes of Israel and each gate is guarded by an angel. The number twelve dominated the design of the city; twelve gates, twelve angles, twelve tribes of Israel, twelve foundations, and twelve apostles. The measurements of the city being multiples of twelve fit in with this pattern.

John looked into this cubic city and saw 'no temple therein: for the Lord God Almighty and the Lamb are the temple of it." ${ }^{, 16}$ The cubic city, housed God and the Lamb, to John this was indeed the most Holy city. The period the Revelation was written when neo-Platonic philosophy was extremely influential. Although a cube is a Platonic solid, a perfect shape that was constructed of twelve triangles, which would fits into schema of twelve of the city, the cube as the shape of the Holy of Holies has a precedent in the Scriptures. A cube was used to house the Covenant of the Ark, in the Temple of Solomon.
The Temple is described in I Kings 6-8 and Ezekiel 40-42 and from this description a floor plan can be sketched of the temple. The interior length was sixty cubits, the breadth twenty cubits and the height thirty cubits; the porch was twenty cubits and

[^1]the breadth ten cubits. ${ }^{17}$ The interior of the temple was divided into two rooms, the holy place and the oracle, the holy of holies that housed the Ark of the Convent. The holy place was twenty cubits in length, forty cubits wide and thirty cubits high, while the oracle twenty cubits in length, width and height, a perfect cube. ${ }^{18}$
Both the Temple of Solomon and the New Jerusalem were linked by their geometry. Although it is extremely probable that John would have been influenced by the descriptions in the Old Testament, this would have been strengthened by the influence of neo-Platonic philosophy of his time, which revered numbers and geometry.
The fabric of the city is described as being made of gold not an earthly gold but one that is translucent as crystal. ${ }^{19}$ The foundations of the wall of the city were garnished with all manner of precious stones. ${ }^{20}$ This city of perfect symmetry, designed with scared numbers, built of translucent gold and jewelled foundation, this city of cosmic and divine connections has captured the imagination of medieval and renaissance artists, builders and writers.
The image and design of the New Jerusalem, which had its roots in the Old Testament, became a significant part of Christian iconography it was the ultimate utopian city. However, despite its popularity it was not the only plan of a Christian Paradise.
The Saltair na Rann or Psalter of the Verses is considered the most important religious poem of ancient Ireland. ${ }^{21}$ There is only one ancient copy and the poem has been dated to the late eighth century, the author is anonymous and the poem is not known outside of Ireland. It consists of hundred and sixtytwo cantos and 8392 lines. The first canto contains a description the creation of the universe, the second canto details the form of the celestial city, and the third canto describes nine levels of the angles. In cantos III the nine levels of angels follows the order recited by Gregory the Great and this differs from
the original order give in the work of Pseudo-Dionysius, ${ }^{22}$ possibly due to error of memory. The remaining hundred and fifty-nine cantos consist of apocryphal accounts from the Old Testament and New Testament, the fall of Lucifer, fall and penance of Adam and Eve and the death of Adam. This paper only considers cantos I and II, which are the most interesting of the entire poem.

Although the first canto's description of the cosmos parallels that of Genesis 1 it also contains a collection of Irish and classical cosmological lore. However canto II, with the exception of a few references to Revelation near the end of the canto, stands out from the other cantos of the poem because of its lack of Biblical references. The description of the celestial city is detailed and the structure of the city is unique. The city appears to have no literary precedence.

Canto I describes how the cosmos was formed from a shapeless mass and God created the world as a "the globe, fashioned liked a goodly apple, truly round. ${ }^{23}$ The poem goes on to describe the physical structure of cosmos (see Figure 1). The distances are clearly prescribed. The distance between the earth and the moon is 126 miles; between the moon and the sun 252 miles; between the sun and the firmament 1134 miles; thus the distance between the earth and the firmament is 1512 miles. From the Firmament to the abode of the noble Lord, or the Riched, is 1512 miles, thus the distance from earth to the Riched is 3024 miles. Furthermore, the diameter of the earth is 1512 miles. This would seem to be a very straight forward plan, except the distance of the earth's surface to the depths of hell is 3024 miles, the same as the distance from the earth to the Riched. The author described a spherical cosmos since the earth is like an apple and the firmament is to earth 'its shell around an egg, ${ }^{24}$ the firmament is a "perfect, enduring sphere, which moves like a mill wheel, ${ }^{, 25}$ but a flat earth cosmology lingers on in the measurements.

[^2]

Figure 1: The Physical Structure of the Cosmos of Saltair na Rann

There are seven heavens from the earth to the Riched. The space from the earth to the moon is the heaven of Air, and from the moon to the sun is the heaven of ether. Both air and ether can be clearly linked to classical science. From the sun to the Firmament is the heaven of Olympus. The heaven of Olympus has strong pagan roots but the mystic of Olympus was carried into the Christian era. The Firmament is the middle heaven. The Firmament comes from Genesis 1, God created the firmament to divide the waters under to Firmament and those above the Firmament and God called the Firmament Heaven. ${ }^{26}$ In the Saltair na Rann the Firmament is divided into five zones. The width of the sphere of the Firmament is not mentioned but its five zones indicates that it is extensive. However, despite its size it is uninhabited, for it "is not the fair abode of the angelic host." ${ }^{27}$ The Firmament is perfect and untouched since Creation. The first heaven is the heaven of water and the sixth is the heaven of the pure angles. The final and the seventh heaven is the abode of the "bright noble Lord ${ }^{28}$ the sphere of the Riched.

The concept of multi heavens is mentions in the both the Old and New Testaments. From the Old Testament; "Praise him, ye heavens of heavens, and ye water that be above the heavens., ${ }^{29}$ In II Corinthians, Paul claims to have visited a third heaven. ${ }^{30}$ The visit to the third heaven was expanded upon in the Apocalypse of Paul, ${ }^{31}$ written in the fourth century, it describes in detail Paul's visited to the heavens and to hell. Paul goes to the abode of Christ and sees

David playing a harp, Paul asks an angle, why is Paul alone playing and singing, the angel replies "David shall sing praises before him in the seventh heaven: and as it is done in heaven, so likewise is it below., 32 Despite the precedence of multi heavens the origin of the concept of seven heavens in Irish literature is obscure and disputed. ${ }^{33}$

The abode of the noble Lord is "filled with songs for the wondrous host of the archangels. ${ }^{34}$ The citadel or stronghold is ten times the size of the earth. It is perfectly symmetrical with four chief doorways each a mile wide and connected by a long path. Each one of the chief doorways has a courtyard, each courtyard is the size of the earth and enclosed by a wall of silver. There are eight porches set side by side around the stronghold. The porches and the walls of the courtyards have three doorways each, their doorways with the addition of the four chief doorways make forty doorways in the abode of the Riched. Furthermore there are twelve walls "bright divisions" of the porches and the courtyards. ${ }^{35}$ The entire city is encircled by three walls: the outer wall is of green glass; the middle wall is of purple glass and the inner wall that surrounds the stronghold is made of gold. ${ }^{36}$ The width of the ramparts of the the distance of the earth to the moon, 126 miles and the height of the walls of the courtyard are the distance of the earth to the sun, 378 miles. The height of the inner wall is the distance from the earth to the firmament, 1512 miles, and each of the walls surpasses the next by a third, the middle wall being 3024 miles

[^3]in height and the outer wall 4536 miles in height. ${ }^{37}$ Again the measurements indicate the remains of a flat earth theory.

The ground plan of this city is complex, the number of walls and doorways are clearly specified, and the geometry harmonious is in beautiful proportion. However, the four chief doorways are described as being 'side by side, ${ }^{38}$ and with each courtyard being the size of the earth. ${ }^{39}$ Since the entire city is ten times the size of the earth and symmetrical, making the total area of the courtyard 40 percent of the area of the city, the only placement of the chief doorways side by side around the stronghold like the eight porches, which are described as been "set side by side, until they meet going around the stronghold."

With this interpretation the city's plan falls into place (see Figure 2), with the one curiosity that the three outer walls have no entrances, but although the main gates to the city might have been assumed the author failed to mention any.

This plan of the city bears no resemblance to the New Jerusalem in Revelation. Although there are clear references to Revelation at the end of the Canto, including the tree of life, ${ }^{40}$ the author has ignored the description of the city in Revelation and planned a unique celestial city. Not only was this celestial city unlike the city of Revelation, which the author was familiar with, but it was also unlike any eighth century Irish architecture.


Figure 2: Plan of the City of the Riched

There is very little existing evidence of early Irish Christian architecture. Circular banks of earth, which enclosed some of the monasteries, are often the only surviving feature of early Irish Christian architecture, which has lead to the assumption that the early churches were made of wood. ${ }^{41}$ Folio 202v, The Temptation of Christ, of the Book of Kells, early ninth century, shows Christ on the pinnacle of the temple being tempted by the devil; the building is a single story with a steep shingled roof. Although the exterior of the building is ornately decorated and has dragon-head finials, the structure of the building is very minimal and is a style that was repeated in later
simple stone churches doted around the Irish countryside. From the evidence of the eighth century Irish ecclesiastical architecture it would appear that the author of Saltair na Rann took his influence of the abode of the noble Lord with an exterior source.

The sources of the Cosmology of the Saltair na Rann come for a range of material that would have been available to an eighth century Irish author. ${ }^{42}$ John Carey has suggested that the cosmology is based on a lost cosmological tract written in the first half of the eight century, which was itself drawn up from a wide range of sources, ie Pliny, pseudoIsidore and Isidore of Seville. ${ }^{43}$ This later explanation

[^4]is strengthened by the flat earth memories left in the poem, surely if the author could comprehend the scope of the sources used in Saltair na Rann these memories would not be there. However, the architecture sources are not so straight forward.

One book of ecclesiastical architecture that was available in Ireland in the eight century was Adamnan's De Locis Sanctis. It is thought that De Locis Sanctis was written in 683-6. ${ }^{44}$ Bede explained that Arculf, a bishop of Gaul, had travelled to Jerusalem, Damascus, Constantinople, Alexandria and many islands, and on his returned he was shipwrecked at Iona. Here he met Adamnan, who after listening to stories of his travels, committed to writing everything Arculf had seen in the Holy Land. ${ }^{45}$ Arculf described to Adamnan the buildings of the Holy Land, and while the recorded descriptions of the building are sketchy, they nevertheless outline the pattern of the buildings in the second half of the seventh century in the Holy Land. Adamnan had travelled around Ireland on his mission to persuade the Irish Church to accept the Roman way of calculating Easter and he continued travelling around Ireland for ten years after he had written the De Locis Sanctis. Furthermore, Adamnan presented Arculf a copy of the book which must have become known in Anglo-Saxon circles since it had a wide early circulation on the Continent. ${ }^{46}$ This description is repeated in Bede's The Ecclesiastical History of the English People. ${ }^{47}$ However, the descriptions of the buildings are very minimal, with the Holy Sepulchre described as having three surrounding walls, but this is the only similarity with the description provided in Saltair na Rann.

Other possible source could be the Temple compound described in Ezekiel. In the wall of the outer ${ }^{48}$ and inner ${ }^{49}$ court of the temple of Solomon there were three gateways for each court. Each gateway had three chambers, possibly guard houses, on both sides of the gate, six chambers to each gateway. The description of the gateway in Ezekiel is similar to the surviving gate at Meggido, ${ }^{50}$ called Solomon's Gate. Although the gateway is dated to the ninth century BC, a hundred years after Solomon, it is a distinctive design repeated in the sixth century BC writings of Ezekiel. There are three gateways in the wall of each of the courtyard ${ }^{51}$ in Saltair na Rann, and each of the doors to the courtyard that leads into
the abode is silver; however, the distinct pattern of the chambers is not mentioned in the plan of the Riched in Saltair na Rann. If the three gateways to the courtyard of Saltair na Rann, where inspired by the description of Ezekiel it would have been likely that the six chambers for each gateway would also been repeated particularly given the prominence they are given in Ezekiel 40.

In the Apocalypse of Paul, the abode of Christ is made of gold with twelve walls encompassing it each with a tower, and each wall is higher that the proceeding wall. ${ }^{52}$ Although there are only three walls, one of purple glass, one of green glass and one of gold, in the Saltair na Rann, they are also each higher that the proceeding wall. In Herodotus' Historica, he described of the city of Ecbatana, ${ }^{53}$ as having seven concentric walls each successive wall being higher than the proceeding one, the first five outer walls are coloured in order: white, black, crimson, blue, orange plated silver and the seventh wall was plated gold. The walls are the only feature described in the city of Christ in the Apocalypse of Paul, there is no plan to the city. In contrast the city of the Riched in Saltair na Rann is a highly complex and integrated plan.

Although there are individual elements in Saltair na Rann that have some similarity to Apocalypse of Paul, De Locis Sanctis and Historia Ecclesiatica, it is questionable that they are direct sources of the plan for the city of the Riched. The city is an integrated plan of complex geometry and ratios, it is not a composite of elements from several sources. The author had a holistic and clear plan to the city. The detail and complexity imply that there is some precedence to this plan. That the plan was not the author's invention is borne out by the city walls having no gates - a strange oversight, but not one that would have been made by the designer of this complex plan. Unfortunately, no precedence has survived.

Both Cantos I and II standout from the remains of the poem, they are only 656 lines out of a poem of 8392 lines - a small fraction of the entire poem. Both indicate the existence of lost knowledge; Canto I, a lost cosmology and Canto II, the source of the plan of the celestial city. At the end of Canto II it begins to paraphrase Revelation; the twenty-four white saints from Revelation 4:4; the Lamb with his Flock upon the mountain from Revelation 14:1-2 and the

[^5]tree of life from Revelation 22:2 are all retained in the poem, yet, the city differs in everyway. Furthermore, the city has no Biblical precedence. Although Saltair na Rann had no impact outside of Ireland it has significance beyond its initial impact since it is the most detailed plan of the celestial city in early Christianity.

Another view or plan of Paradise is in Dante's Paradise, the third book of the Divine Comedy. This massive poem was written nearly 700 years ago and for much of that time it has been closely examined and scrutinised across many different levels: the sources, the meaning, the linguistic structure of the poem, the hidden subtexts, the influences, the analogies and the numerology of the poem have all been analysed in detail. However, a totally neglected area of the great work is the architecture of the universe that Dante creates, particularly the architecture of Paradise.

The structure of the universe in Saltair na Rann shows traces of a flat earth with the distance with distance of the earth's surface to the depths of hell is 3024 miles the same as from the earth to the Riched contradicting a spherical universe. However, Dante's universe is well structured and the geometry fits together like a magnificent Divine puzzle. The Divine architect working with compass and straight edge to create the perfect design, an idea promulgated by Plato in the Timaeus, ${ }^{54}$ was adopted by Christianity and strongly defended by the Roman Church well into the scientific revolution of the seventeenth century. In the time of Dante the plan had the earth was in the centre, surrounded by the perfect spheres of the seven visible planets, the firmament the sphere of the fixed stars, Primum Mobile followed by the Empyrean. The first eight spheres were visible and the ninth sphere, the Primum Mobile, was first introduces by Ptolemy in the second century to explain the movement in the sphere of the fixed stars. It was later adapted by Christianity as being the most spiritual of the sphere - the closest God. Past the Primum Mobile is the Empyrean, the home of God. This plan of ten spheres was perfect, concentric, geometric and
simple. However, although the first nine spheres were generally accepted, the structure of the Empyrean was an extremely complex matter.

The traditional Christian view of the late Middle Ages of Heaven is the Empyrean, the sphere beyond all the celestial spheres, it is infinite, it has no boundaries but simply opens out to infinity. It was not only God's abode but also the nine levels of angels, as described by pseudo-Dionysus and St Gregory. The Empyrean was a 'place' that was "both everywhere and nowhere, both timeless and eternal. ${ }^{55}$ The depiction, or indeed understanding, of the beatific vision was a concept that many artists, poets, philosophers and theologians struggled with. However, Dante attempted to make sense of the Empyrean as he constructed an Empyrean that was not an endless tenth sphere, but a perfect structure that was concentric and fitting for the Divine architect.

The universe of the Divine Comedy consisted of the divisions Hell, Purgatory, Paradise and the Empyrean. All have nine levels, which open into each other. When Satan fell from Heaven to Earth, he fell though Jerusalem to the centre of the Earth and created an enormous nine-level pit, which became the inferno, Hell. The mountain of Purgatory arose in the middle of the Southern Hemisphere opposite to Jerusalem. The material that Hell displaced was pushed upwards and created the nine-level mountain of Purgatory. The height of the mountain was equal to the depth of Hell (Figure 3). Then there were the nine levels of the material universe, the spheres of the seven planets, the fixed stars and the Premiun Mobile. The Moon has the smallest, dimmest light and the slowest obit of all the spheres. ${ }^{56}$ The larger the obits of the planets the brighter and faster the revolution of the orbit becomes. From the Premiun Mobile Dante and Beatrice proceed to the nine Angelic spheres of the Empyrean. The speed and brightness of the Empyrean's spheres is the reverse of the material spheres, the larger the obit of the Angelic spheres the dimmer the light and slower its revolution. This curious universe has a completely closed structure.

[^6]

Figure 3: Earth, Hell and Purgatory

However, this universe becomes curious on closer examination. Both the material universe and the Angelic universe make perfect sense in their geometrical structure if examined individually. It is at the union of these worlds that goes far beyond Dante's geometric understanding, or indeed the scientific understanding, for the next 600 years. In Canto 27 of the Paradise Dante reached the Primum Mobile
the last, largest, brightest and fastest of the material spheres. He looks down ${ }^{57}$ to see back through the spheres that he has travelled through and in Canto 28 Dante saw that Beatrice's eyes where bright with the radiant light of the centre of the Empyrean, Dante turned around to look up to see a radiant point in the centre of the Empyrean.


Figure 4: The Material and the Angelic Spheres

Contemplating the material and the Angelic universes Dante realised that "the model and the copy are at odds, ${ }^{, 58}$ the model being the Angelic spheres and the copy being the material spheres (Figure 4). The material spheres are ordered in importance from the slowest, dimmest and smallest sphere of the Moon to the largest, brightest, fastest and most important sphere of the Primum Mobile. The Angelic spheres are ordered in importance from the slowest, dimmest and largest sphere of the Angels to the smallest, brightest, fastest and the most important sphere of the Seraphim. Both the material and the Angelic
spheres have height, breath, depth and are ranked in their 'supremacy' by their speed and brightness. Speed and brightness are intrinsically linked, the faster the spheres become the brighter they become. This introduced a fourth dimension to the universe of the Divine Comedy that of speed and brightness. A four-dimensional universe is a geometrical structure that makes possible things that are impossible in the third-dimension.

Dante stood at a point where two spherical universes could be viewed. From the fastest and brightest material sphere he turned around to look

[^7]up through the slowest and dimmest to the fastest and brightest of the Angelical spheres. In a third dimensional universe to turn around to look behind is the normal angle of viewing. Dante did not turn around and look up, if this was the case why would he have needed to turn around at all. Furthermore, Beatrice's eyes reflected the brightness of the point in the centre of the Empyrean required that Dante was facing Beatrice to see this reflection. Dante turned around to look up into the centre of the Empyrean. This concept of 'up' could only exist in a four-dimensional universe, ${ }^{59}$ which Dante had inadvertently created. An extra dimension makes possible things that appear impossible from a dimension lower. ${ }^{60}$

Dante makes the Empyrean a separate set of spheres, so that Paradise consists of two sets of concentric spheres; the corporeal and the incorporable, and infinite is represented by one radiant point, God, in the centre of the Empyrean. In isolation Dante's Empyrean could be constructed with a straight edge and compass, it is only at the union of the corporeal and incorporeal that the geometry of the Divine

Comedy goes beyond the understanding of fourteenth century geometry. Dante must have understood that to turned around to look up was impossible, but perhaps he just wanted to make the Empyrean just that little more mysterious.

The New Jerusalem described in the Revelation of John of Divine is one of the most quoted of all the passages in the Bible. It has made an impact on literature, ${ }^{61}$ and art and architecture throughout time. Yet, despite its popularity, Paradise has many forms and shapes, but the one continuous feature is geometry. At the beginning of time it is an unordered garden at the end of time it is an ordered structure of perfect geometry.

There are many more plans of Paradise than the three mentioned in this paper. These three and many others, attempt the impossible of describing the immaterial in term of a physical structure. In the early Christian and Medieval era Paradise is perceived to be the idea utopia, designed by the Divine architect with compass and straight edge (see Figure 5), where geometry and symmetry prevails.


Figure 5: Frontispiece of the Bibles Moralisees, Thirteenth Century

[^8]
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## About the Author

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My academic background is in art, mathematics and philosophy. A move to the School of Architecture last year has reinvigorate an interest in the philosophies behind the geometric structure of cities and my current research is examining the geometry and philosophy behind the architectural structures of cities in utopian literature from the ancient era to the modern times. I am also also a practising artist in computer graphics and printmaking. In recent years she has exhibited in France, Italy, England, Scotland, Canada, Belgium, China, Korea, Turkey, Spain, Poland, Romania, and throughout Australia.

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[^0]:    ${ }^{1}$ Genesis 2:11-14
    ${ }^{2}$ Philo, "On the Creation," in The Works of Philo, ed. Philo (New York: Hendrickson Publishers, 2004),XIV:45.
    ${ }^{3}$ Genesis 3:24
    ${ }^{4}$ William Alexander McClung, The Architecture of Paradise: Survival of Eden and Jerusalem (Berkeley: University of California Press, 1983).
    ${ }^{5}$ Ezekiel 36:35
    ${ }^{6}$ Ezekiel 28:13

[^1]:    ${ }_{8}^{7}$ Revelation 17:5
    ${ }^{8}$ Revelation 21:1
    ${ }^{9}$ Revelation 21:2
    ${ }^{10}$ Revelation 21:9
    ${ }^{11}$ Revelation 21:15-16
    ${ }^{12}$ Paul S Minear, New Testament Apocalyptic (Nashville: Abingdon Press, 1981).: Robert D Russell, ""a Similitude of Paradise": The City as Image of the City," in The Iconography of Heaven, ed. Clifford Davidson (Kalamazoo: Medieval Institute Publications, 1994).: W. Shaw Caldecott, Solomon's Temple: Its History and Its Structure (London: The Religious Tract Society, 1908).
    ${ }^{13}$ A cubit is approximately 18 inchs (? Centimeters) see Caldecott, Solomon's Temple: Its History and Its Structure.
    ${ }^{14}$ Revelation 11:1-2
    ${ }^{15}$ Zechariah 2:2
    ${ }^{16}$ Revelation 21:22

[^2]:    ${ }^{17}$ I Kings 6:2-3
    ${ }^{18}$ I Kings 6: 2, 17 and 20
    ${ }^{19}$ Revelation 21: 18
    ${ }^{20}$ Revelation 21:19-21
    ${ }^{21}$ Eleanor Hull, "The Saltair Na Rann, or Psalter of the Verses," in The Poem-Book of the Gael, ed. Eleanor Hull (London: Chatto \& Windus, 1913).
    ${ }^{22}$ Pseudo-Dionysius, Pseudo-Dionysius: The Complete Works, trans. Colm Luibheid (Mahwah: Paulist Press, 1987).
    ${ }^{23}$ Hull, "The Saltair Na Rann, or Psalter of the Verses." Lines 35-36.
    ${ }^{24}$ John Carey, "Saltair Na Rann, Cantos I-Iii," in King of Mysteries: Early Irish Religious Writing, ed. John Carey (Dulin: Four Courts Press, 1998). Line 164
    ${ }^{25}$ Ibid. Lines 198-200

[^3]:    ${ }^{26}$ Genesis 1:6-8
    ${ }^{27}$ Carey, "Saltair Na Rann, Cantos I-Iii." Line 197
    ${ }^{28}$ Ibid. Line 636
    ${ }^{29}$ Psalms 148: 4.
    ${ }^{30}$ Corinthians 12: 2.
    31 Anonymous, "Apocalypse of Paul," in The Apocryphal New Testament (London: Oxford University Press, 1972).
    ${ }^{32}$ Ibid. p. 541
    ${ }^{33}$ See John Carey, "Cosmology in Saltair Na Rann," Celtica XVII (1984). p. 42
    ${ }^{34}$ Carey, "Saltair Na Rann, Cantos I-Iii." Lines 339-340.
    ${ }^{35}$ Ibid. Lines 345-408
    ${ }^{36}$ Ibid. Lines 345-352

[^4]:    ${ }^{37}$ Ibid. Lines 427-428
    ${ }^{38}$ Ibid. Line 359
    ${ }^{39}$ Ibid. Lines 374-376
    ${ }^{40}$ Lines 518-620 parallels Revelation, twenty-four white saints mentioned is taken from Revelation 4:4; the Lamb with his Flock upon the mountain from Revelation 14:1-2 and the tree of life from Revelation 22:2.
    ${ }^{41}$ Peter Harbison, Homan Potterton, and Jeanne Sheehy, Irish Art and Architecture (London: Thames and Hudson, 1978).
    ${ }^{42}$ Pliny's Historia Naturalis, Herodotus', Historia, Macrobius' Somniva Scipionis, pseudo-Isidore's De Ordine Creaturarum and Isidore of Seville's Etymologlarvm
    ${ }^{43}$ Carey, "Cosmology in Saltair Na Rann." p. 52

[^5]:    ${ }^{44}$ Denis Meehan, Introduction (Dublin: The Dublin Institute for Advanced Studied, 1958).
    ${ }^{45}$ Bede, The Ecclesiastical History of the English People (Oxford: Oxford University Press, 1999).
    ${ }^{46}$ Meehan, Introduction.
    ${ }^{47}$ Bede, The Ecclesiastical History of the English People.
    ${ }^{48}$ The eastern gateway Ezekiel 40: 5-17, the northern and southern Ezekiel 40:20-27.
    ${ }^{49}$ The three gateways to the inner court 40: 28-37
    ${ }^{50}$ Baruch Halpern, Israel Finkelstein, and David Ussiskkin, Megiddo Iii, Set: The 1992-1996 Season (Tel Aviv: Institute of Archaeology, 2000).
    ${ }_{52}^{51}$ Carey, "Cosmology in Saltair Na Rann." Line 403
    ${ }^{52}$ Anonymous, "Apocalypse of Paul." 23 \& 29
    ${ }^{53}$ Herodotus, The Histories, trans. Aubrey de Selincount (Harmondsworth: Penguin Book Inc, 1973).

[^6]:    ${ }_{55}^{54}$ Plato, Timaeus, trans. R. G. Bury (London: William Heinemanns, 1952).
    ${ }_{56}$ Jeffrey Burton Russell, A History of Heaven: The Singing Silence (Princeton: Princeton University Press, 1999). p. 123.
    ${ }^{56}$ Dante, The Divine Comedy Vol.Iii: Paradise, trans. Mark Musa (New York: Penguin Books, 1986). III, 51.

[^7]:    ${ }^{57}$ Ibid. XXVII, 76
    ${ }^{58}$ Ibid. XXVIII 56

[^8]:    $\overline{{ }^{59} \text { To the modern mind }}$ the fourth dimension is the time-space continuum. However, this is a physical dimension, of an infinite universe that can only be understood in terms of non-Euclidean geometry - this is a very modern concept. Dante's universe is a closed, finite, and the dimensions of that universe can only be explained in terms of mathematical dimensions. For every mathematical dimension a $90^{\circ}$ extension is inserted form each existing plane. For example,
    
    a). one dimension is a line. b). two dimensions is a plane. C). an example of three dimensions is a cube. However, the geometry of four dimensions is impossible to draw or imagine is its totality - from each plane of a three-dimensional object insert a $90^{\circ}$ extension, now there are more than four $90^{\circ}$ s to a 'circle'. The notion of 'circle' and the angle of 'up' has a different meaning in the fourth dimension - now it is possible to turn around to look up. In some translations of the Divine Comedy the two universes are shown not as concentric spheres, which Dante describes, but each universe is depicted as two-dimensional concentric circles and the universes are at right-angles to each other (Figure d). This strange two-dimensional configuration of the universes may be to visually explain the concept of turning around to look up into the centre of the Empyrean. However, Dante clearly describes two spherical universes, which mirror each other with the ex${ }_{60}$ ception of speed and brightness of the order of the spheres.
    ${ }^{60}$ The idea of living in a 2-dimensional world and moving into multi-dimensional spaces is explored by Edwin A Abbott in Flatland: A Romance of Many Dimensions.
    ${ }^{61}$ See the anonymous $14^{\text {th }}$ century poem, P. M. Kean, The Pearl: An Interpretation (London: Rouledge \& Kegan, 1967), the $17^{\text {th }}$ century Pilgrim's Progress by John Bunyan

