

The New Jerusalem (An Engineering Feasibility Study)

(appropriate for mid-schoolers or older)

60 minutes - Michael R. Daily November 2005

Tonight we are going to look a little bit at what life in heaven is like. In order to do a comprehensive study of what the Bible has to say about heaven would require looking at over 50 passages of scripture and would take about 4 hours. Since we don't have that much time tonight we are just going to nick a sliver of what the Bible says about heaven.

II Peter 3:10-13

But the day of the Lord will come like a thief, in which the heavens will pass away with a roar and the elements will be destroyed with intense heat, and the earth and its works will be burned up. 11Since all these things are to be destroyed in this way, what sort of people ought you to be in holy conduct and godliness, 12looking for and hastening the coming of the day of God, because of which the heavens will be destroyed by burning, and the elements will melt with intense heat! 13But according to His promise we are looking for new heavens and a new earth, in which righteousness dwells.

The heavens and the Earth are going to be destroyed with fire and intense heat – but God promises a new heaven and a new earth for us.

Revelation 21:1-2

1Then I saw a new heaven and a new earth; for the first heaven and the first earth passed away, and there is no longer any sea. 2And I saw the holy city, New Jerusalem, coming down out of heaven from God, made ready as a bride adorned for her husband.

At the end of the age God is going to destroy the present Earth and the present Heaven or Universe. He is going to create a new heaven (new universe), a new Earth, and a New Jerusalem. The Bible claims that the New Jerusalem is the home of all believer's (Christians and old testament believers) for eternity. The new heaven is the new universe outside of the gates of the New Jerusalem – we don't know much about it except that Hell is there.

Luke 16:24-26

24" And he cried out and said, 'Father Abraham, have mercy on me, and send Lazarus so that he may dip the tip of his finger in water and cool off my tongue, for I am in agony in this flame.' 25" But Abraham said, 'Child, remember that during your life you received your good things, and likewise Lazarus bad things; but now he is being comforted here, and you are in agony. 26' And besides all this, between us and you there is a great chasm fixed, so that those who wish to come over from here to you will not be able, and that none may cross over from there to us.'

There are probably other things there as well but the bible does not say. It does say that the gates of the city are always open so you can come and go if you wish. Not much is said about the new earth. But the bible does say quite a bit about the New Jerusalem – a city like no other.

I Corinthians 2:9

9but just as it is written,

**"THINGS WHICH EYE HAS NOT SEEN AND EAR HAS NOT HEARD,
AND which HAVE NOT ENTERED THE HEART OF MAN,
ALL THAT GOD HAS PREPARED FOR THOSE WHO LOVE HIM."**

This verse says that anything we have seen or heard or anything that we can imagine will always be less than what heaven is really like. Tonight we are looking at the city of New Jerusalem. At the end of our study we have to finish by coming back to this verse and reminding ourselves that once we have a picture in our mind of what heaven is like based on our bible studies we have to remember – its not that – its better than that.

Do any of you know who George Lucas is? Creator of Star Wars. In terms of future cities what kinds of visions have entered the heart of George Lucas? Yet because of this verse we know that the heavenly city far surpasses anything that has entered the heart of George Lucas.

Claims of the New Jerusalem

All believers from the old testament as well as all Christians for all time will dwell in the New Jerusalem as their home.

Hebrews 11:13-16

13 All these died in faith, without receiving the promises, but having seen them and having welcomed them from a distance, and having confessed that they were strangers and exiles on the earth. 14 For those who say such things make it clear that they are seeking a country of their own. 15 And indeed if they had been thinking of that country from which they went out, they would have had opportunity to return. 16 But as it is, they desire a better country, that is, a heavenly one. Therefore God is not ashamed to be called their God; for He has prepared a city for them.

Hebrews 12:22-23

22 But you have come to Mount Zion and to the city of the living God, the heavenly Jerusalem, and to myriads of angels, 23 to the general assembly and church of the firstborn who are enrolled in heaven, and to God, the Judge of all, and to the spirits of the righteous made perfect

Revelation 3:11, 12

11 I am coming quickly; hold fast what you have, so that no one will take your crown. 12 He who overcomes, I will make him a pillar in the temple of My God, and he will not go out from it anymore; and I will write on him the name of My God, and the name of the city of My God, the new Jerusalem, which comes down out of heaven from My God, and My new name.

Luke 24:36-43 (We will dwell in the New Jerusalem in glorified physical bodies)

36 While they were telling these things, He Himself stood in their midst and said to them, "Peace be to you." 37 But they were startled and frightened and thought that they were seeing a spirit. 38 And He said to them, "Why are you troubled, and why do doubts arise in your hearts? 39 See My hands and My feet, that it is I Myself; touch Me and see, for a spirit does not have flesh and bones as you see that I have." 40 And when He had said this, He showed them His hands and His feet. 41 While they still could not believe it because of their joy and amazement, He said to them, "Have you anything here to eat?" 42 They gave Him a piece of a broiled fish; 43 and He took it and ate it before them.

Our glorified bodies will have flesh and bones and we will be able to eat food.

John 14:1-3 (It is a place with many mansions)

1 "Do not let your heart be troubled; believe in God, believe also in Me. 2 In My Father's house are many dwelling places; if it were not so, I would have told you; for I go to prepare a place for you. 3 If I go and prepare a place for you, I will come again and receive you to Myself, that where I am, there you may be also.

Luke 23:42,43 (It is Paradise)

42 And he was saying, "Jesus, remember me when You come in Your kingdom!" 43 And He said to him, "Truly I say to you, today you shall be with Me in Paradise."

II Corinthians 12:2-4

I know a man in Christ who fourteen years ago--whether in the body I do not know, or out of the body I do not know, God knows--such a man was caught up to the third heaven. 3 And I know how such a man--whether in the body or apart from the body I do not know, God knows-- 4 was caught up into Paradise and heard inexpressible words, which a man is not permitted to speak.

Lets look at a detailed description of the New Jerusalem.

Revelation 21:1-9

Then I saw a new heaven and a new earth; for the first heaven and the first earth passed away, and there is no longer any sea. 2And I saw the holy city, new Jerusalem, coming down out of heaven from God, made ready as a bride adorned for her husband. 3And I heard a loud voice from the throne, saying, "Behold, the tabernacle of God is among men, and He will dwell among them, and they shall be His people, and God Himself will be among them, 4and He will wipe away every tear from their eyes; and there will no longer be any death; there will no longer be any mourning, or crying, or pain; the first things have passed away." 5And He who sits on the throne said, "Behold, I am making all things new " And He said, "Write, for these words are faithful and true." 6Then He said to me, "It is done I am the Alpha and the Omega, the beginning and the end I will give to the one who thirsts from the spring of the water of life without cost. 7"He who overcomes will inherit these things, and I will be his God and he will be My son. 8"But for the cowardly and unbelieving and abominable and murderers and immoral persons and sorcerers and idolaters and all liars, their part will be in the lake that burns with fire and brimstone, which is the second death." 9Then one of the seven angels who had the seven bowls full of the seven last plagues came and spoke with me, saying, "Come here, I will show you the bride, the wife of the Lamb."

One of the things we notice about the New Jerusalem and the New Earth is that there is no sea. Unlike today's Earth whose surface is mostly sea.

Revelation 21:10-14

10And he carried me away in the Spirit to a great and high mountain, and showed me the holy city, Jerusalem, coming down out of heaven from God, 11having the glory of God Her brilliance was like a very costly stone, as a stone of crystal-clear jasper. 12It had a great and high wall, with twelve gates, and at the gates twelve angels; and names were written on them, which are the names of the twelve tribes of the sons of Israel. 13There were three gates on the east and three gates on the north and three gates on the south and three gates on the west. 14And the wall of the city had twelve foundation stones, and on them were the twelve names of the twelve apostles of the Lamb.

Draw an outline of the city (a square) showing the gates.

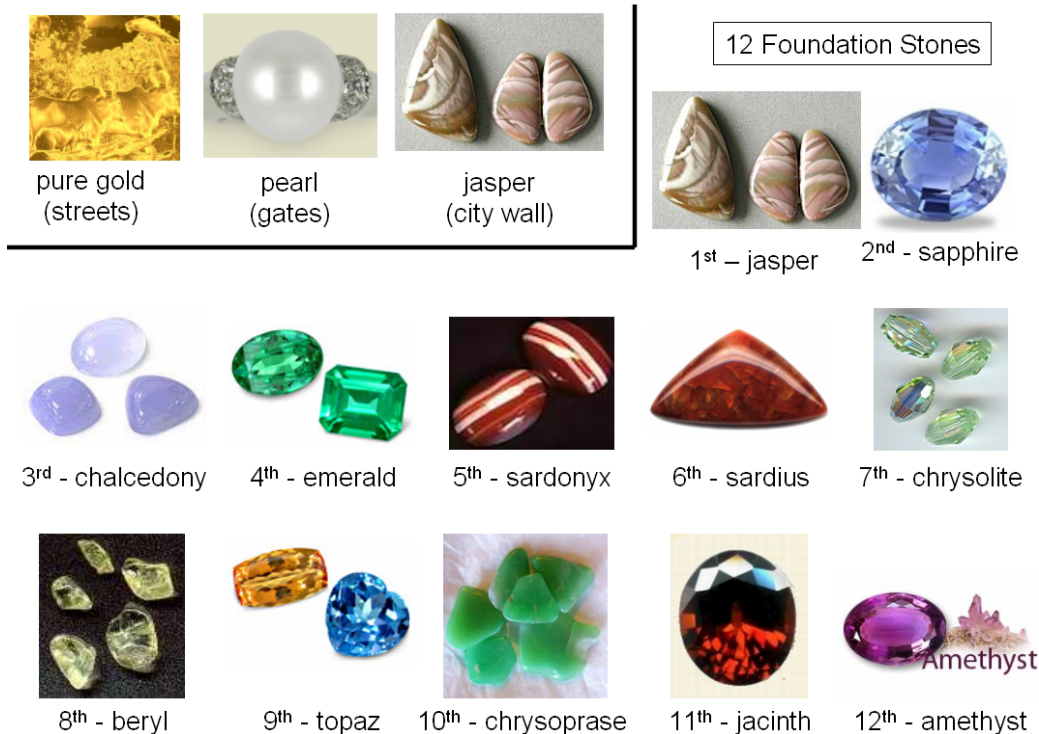
Revelation 21:18-27

The material of the wall was jasper; and the city was pure gold, like clear glass. 19The foundation stones of the city wall were adorned with every kind of precious stone The first foundation stone was jasper; the second, sapphire; the third, chalcedony; the fourth, emerald; 20the fifth, sardonyx; the sixth, sardius; the seventh, chrysolite; the eighth, beryl; the ninth, topaz; the tenth, chrysoprase; the eleventh, jacinth; the twelfth, amethyst. 21And the twelve gates were twelve pearls; each one of the gates was a single pearl And the street of the city was pure gold, like transparent glass. 22I saw no temple in it, for the Lord God the Almighty and the Lamb are its temple. 23And the city has no need of the sun or of the moon to shine on it, for the glory of God has illumined it, and its lamp is the Lamb. 24The nations will walk by its light, and the kings of the earth will bring their glory into it. 25In the daytime (for there will be no night there) its gates will never be closed; 26and they will bring the glory and the honor of the nations into it; 27and nothing unclean, and no one who practices abomination and lying, shall ever come into it, but only those whose names are written in the Lamb's book of life.

Note that the 12 gates of the city are always open so you can come and go as you wish and although the bible says little about the new earth and the rest of the new universe you can probably visit other places outside the new Jerusalem. Kind of like today – if you want to go visit the moon go ahead, God doesn't mind – but the Earth was designed to be your home. That is where you will be most comfortable. That is where you will enjoy yourself the most. In the same way you can visit other parts of the new heavens (universe) but the New Jerusalem is designed to be your home – that is where you will be the most comfortable and will enjoy yourself the most.

The wall is described as jasper and yet as being crystal clear. But jasper is not clear (see picture below). Except for John we have never seen crystal clear jasper. We can look at the picture and imagine that the walls might be a sort of crystal clear, smooth, wavy diamond material but we have never seen it. Each gate is described as being a single pearl. Have you ever seen a pearl larger than a person? Each pearl would have to be larger than a man in order to be a gate. We can imagine what that might be like but, except for John, we have never seen it. The foundation stones of the city wall were adorned with every kind of precious stone as shown.

The New Jerusalem (Revelation 21)



The city is described as pure gold, like transparent glass. Have you ever seen gold that is transparent glass? We have seen pure gold and we have also seen transparent glass that is gold but, except for John we have not seen gold that is transparent glass. Where have we seen transparent glass that is gold?



<http://www.voanews.com/english/2005-08-06-voa30.cfm>

The astronaut's visor is made out of transparent glass that is gold. The gold is hard to see because the visor has such an extremely high reflectivity that most of what you are seeing is the reflection of other things in the visor (you can even see the other astronaut who is taking the picture).

Except for John we have never seen gold that is transparent glass but we can look at pure gold and we can look at transparent glass that is gold and we can try to imagine what gold that is transparent glass might look like – but we have never seen it.

Estimate Number of Believer's in the City if the World Ended Tomorrow.

Let's start with the number of believers that have lived from Adam to today – assuming the world ended tomorrow. Secular estimates assuming an evolutionary model put the total number of people who ever lived on the earth at 106 billion. Estimates using a creationist model and the biblical timelines given in the old testament put the number at 51 billion. But let's be conservative and add another 9 billion people to compensate for any errors in birth and death rate estimates, abortions, etc. That brings us to a total of 60 billion people who have lived on the Earth.

Keep in mind that at the time the Bible was written the total population of the earth was about 300 million people. We reached 1 billion in 1800, 6 billion in 2000 and should reach 12 billion in 2055.

Based on a survey done a few years ago by National Geographic Magazine about 1/3 of the Earth's population identify themselves as Christian. Many of these people are not really Christians but let's assume for now that if they say they are a Christian then they are – this is also a conservative estimate. If we assume that a similar ratio has been in effect through most of history that would put the total number of people that would inhabit the New Jerusalem at about 20 billion people!

So you are going to be living in a city for all eternity with 20 billion other people. How do you feel about that? Does it sound like a good deal to you? It sounds a little crowded to me.

Fortunately, God has given us the engineering dimensions of the New Jerusalem so we can do an engineering feasibility study to see if the biblical claims about the New Jerusalem are reasonable. An engineering feasibility study is a way of getting a better feel for a new idea to see if the claims it makes are reasonable. You take what limited information that you are given and you apply known laws of science, mathematics, historical records, and conservative assumptions from which you can derive an estimate of how reasonable a new idea is. The New Jerusalem claims to be able to provide the experience of paradise for eternity for at least 20 billion people. Let's do an analysis to see how crowded the New Jerusalem will be – in other words what will the population density (people per square mile) be in the New Jerusalem?

Revelation 21:15-17

The one who spoke with me had a gold measuring rod to measure the city, and its gates and its wall. 16The city is laid out as a square, and its length is as great as the width; and he measured the city with the rod, fifteen hundred miles; its length and width and height are equal. 17And he measured its wall, seventy-two yards, according to human measurements, which are also angelic measurements.

According to verse 17 what kind of measurements do angels use? Same as humans. This is a significant verse because it tells us that the measurements the angel is making are real dimensions – this is not figurative language.

What shape is the city? It is a 3 dimensional cube (Its height is the same as its width and length). Have you ever seen a city in the shape of a cube? What is the length of each side of the cube? The measurement is 12,000 stadia. One issue is that there were 3 different lengths, all of which were referred to as "stadia", at the time the bible was written. One definition is about the same as a modern furlong which is 1/8 of a mile. That would mean that 12,000 stadia (or furlongs) equals 1500 miles (the other two definitions give a result of over 1300 miles and over 1400 miles respectively)! So God has told us the size of the heavenly city. It is a 3 dimensional cube that is 1500 miles long on each side. Is this good or bad? Can't say – its just some numbers and humans don't relate well to numbers – but they are very good at comparing something new to something they are very familiar with.

If you are an American you are familiar with the map of the continental United States. You probably have a feel for the size of this land area since you have walked around on it, driven cars around on it, and perhaps flown around it in airplanes.

If we take the footprint of the New Jerusalem (1500 miles by 1500 miles) and overlay that on top of the continental United States we get the result below.



<http://www.nationalatlas.gov/printable/reference.html>

This thing is massive! It covers over half of the continental United States! As John saw the New Jerusalem coming down out of heaven it would have completely filled the sky from the northern horizon to the southern and from the eastern horizon to the western.

The area of the footprint is $1500 \times 1500 = 2,250,000$ square miles.

But the city is unlike anything we have ever seen because it is also 1500 miles vertical as well! So, how are we going to deal with this vertical dimension? Since we have never seen such a cubic city we do not know exactly how it is constructed and the bible does not tell us. But we are not trying to figure out the details of how it is designed (we don't have enough information to do that), we are just trying to see if the claims of the New Jerusalem are reasonable or not by relating it to things we understand.

With that in mind how do people usually deal with building in the vertical direction? We usually use structures with floors or levels when we build in the vertical direction. So, if we were to assume a thickness for each level what thickness or height would make sense? 10 feet? 100 feet? Remember the New Jerusalem makes the claim that it can provide the experience of paradise. I'm sorry but I'm going to need more than 100 feet!

Let me make a proposal. Imagine that you are taking an airplane trip. You pack and head to your car. It is a dark, stormy day and as you drive to the airport the sky is black and the rain comes down steadily and heavily. You get to the airport, check your bags and board the plane. As the plane taxi's down the runway the rain beats against your window. As you lift off the ground the plane steadily climbs – all the while the dark sky continues to beat rain against your airplane window.

Soon you have entered the clouds, it is even darker and the rain streaks past your window. You bump through the clouds as you continue to climb and then, all of a sudden, your plane breaks through the clouds and climbs to 35,000 feet. What is it like up there? At that altitude the sky is clear and blue, the clouds are below you - all the weather is below you. Based on this experience we know that if God wanted to He could replicate a human experience of Earth in a thickness of 35,000 feet which is less than 7 miles. So, in order to relate the New Jerusalem to things we are familiar with and using this experience, if the New Jerusalem was built in levels with a thickness of 7 miles per level that would not be unreasonable.

The number of 7 mile thick levels that could fit in the New Jerusalem is: 1500 miles divided by 7 = 214 levels.

Total square miles of earth-like land in the city would be: $214 \times 2,250,000 = 481,500,000$ square miles.

So, we can estimate the population density of the New Jerusalem as:

$20,000,000,000 \text{ people} / 481,500,000 \text{ square miles} = \underline{41.5 \text{ people per square mile.}}$

Is this good or bad? Can't tell. People don't relate well to numbers. But if we can find something familiar to relate it to that would help. According to historical records 41.5 people per square mile is about the same as the population density of Hawaii in the year 1920 – at that time Hawaii was considered a pristine paradise.

So, what do you think so far – are the claims of the New Jerusalem reasonable or unreasonable?

But the end of time has not yet occurred so what will happen as people continue to be born before the end of the age? The current population density of the United States is 76 people per square mile. If we assume the population density of the City grows to be similar to that of the US how many more people would that accommodate?

$76 \times 481,500,000 = 36.6 \text{ billion}$

$36.6 - 20 = 16.6 \text{ billion more Christians (or } 16.6 \times 3 = 49.8 \text{ billion more people born on the earth.)}$

But wait! – population in the US is concentrated in urban and suburban areas. In fact the vast majority of Americans live in these areas which are only 5% of the land area of the US. 95% of the land area of the US is either wilderness or farmland. The reason people cram together into cities is that we want to be able to go to work and run errands without having to drive thousands of miles. If we didn't live together in high concentrations it would take too much time and money to travel around to get our errands done.

In the new city, transportation will likely be instantaneous so we can all spread out as much as we want. Therefore, the capacity of the New Jerusalem to provide an experience of paradise for large numbers of people is actually far greater than the very conservative engineering estimate we have done tonight.

Conclusion: The dimensions of the New Jerusalem are consistent with its claims.

Don't forget. Before we close out this study go back to I Corinthians 2:9

I Corinthians 2:9

but just as it is written, "THINGS WHICH EYE HAS NOT SEEN AND EAR HAS NOT HEARD, AND which HAVE NOT ENTERED THE HEART OF MAN, ALL THAT GOD HAS PREPARED FOR THOSE WHO LOVE HIM."

Other population densities (people per square mile):

Canada	9
Monaco	43000 (32,000 people in $\frac{3}{4}$ of a square mile)
Bangladesh	2200
Mongolia	4
Australia	6
North America	32
Hawaii (today)	190

QUIET TIMES ALONE WITH GOD

JEREMIAH 15:16

THEME: *The New Jerusalem*

PASSAGE FOR MEDITATION: *II Peter 3:10-13, Revelation 21:1-2*

How does this passage relate to the theme?

When I reflect on this passage, does it primarily convict, encourage or challenge me? Explain why:

How will I apply this passage to my life in the coming week and is there anything I can do today to make this passage a part of my Christian life?

PASSAGE FOR MEDITATION: *Luke 16:24-26, I Corinthians 2:9*

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PASSAGE FOR MEDITATION: *Hebrews 11:13-16, Hebrews 12:22-23*

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PASSAGE FOR MEDITATION: *Revelation 3:11-12, John 14:1-3*

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PASSAGE FOR MEDITATION: *Luke 24:36-43*

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PASSAGE FOR MEDITATION: *Luke 23:42-43, II Corinthians 12:2-4*

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