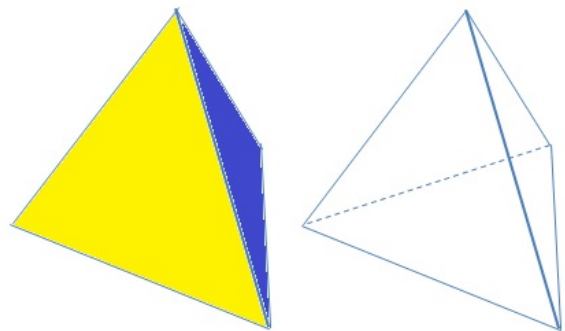


earthquakes and hail

Many Western engineers know who ‘Bucky’ is. R.Buckminster Fuller, known also as Bucky Fuller, was a 20th century leader for modern ‘design science’ and his innovations were many. Bucky’s patent on the geodesic dome and other early innovations for housing were remarkable in their day. Bucky hypothesized a very stable C_{60} molecule to exist in nature with a shape reminiscent of his domes – it has been found and named after him. But Bucky later moved away from friendly, low-lying stable structures suited to garden settings in favour of high-density structures for mankind’s increasing urbanity. I had to wonder whether he had lost the thread of helping people to live well. I do not know where he looked for survivable design parameters, but the later urban designs lack the robustness of the geodesic or the buckyball, and show no ability to cope with the design parameters our Master YESU warned us about in the Book of Revelation. Severe earthquakes and severe hail will be experienced together. This dual design requirement is of growing importance as the Great Day approaches. Few structures will test well in the event and even remain standing, let alone inhabitable.

Let us first consider a severe earthquake. As early as the sixth chapter of Revelation we find a global earthquake – one where all mountains and islands are moved from their places. There has never been such a global earthquake but it seems no longer so far away. We have modern building codes with their graded seismic zones and structural criteria based upon recent history with no allowance for the prophesied future we see before us. What little we know of structural and material failures tells us to avoid stress concentration, overly rigid materials and inflexible connections. Pliant flexibility is important to ultimate survival but we have instead rectangular buildings and rooms; brick and stone; cement and mortar. In an earthquake we want as little weight above our heads as possible, and yet many rooms and homes are capped with concrete slabs, other floors, attics stuffed with heavy boxes and so forth. Buildings like these will be flattened when a global earthquake hits. Insurance companies will be insolvent. Calling the emergency response numbers will be to no avail. You will either have a different plan for yourself in place, or you will deal in shock with the consequences of the day should you survive to see another sunrise. There are plenty of people selling “prepper” solutions.¹ Don’t be hastily led down their paths. What you need by way of advice on water and food and first aid can be had for free if you will seek out those free sources, as the ones they charge for are lower quality than the best freebies out there. Note also that not even one of them I have seen discuss the topic of this essay. You must continue in your prayers to learn what is right for your specific situation, and to walk ever more closely with the HOLY SPIRIT, our TEACHER.

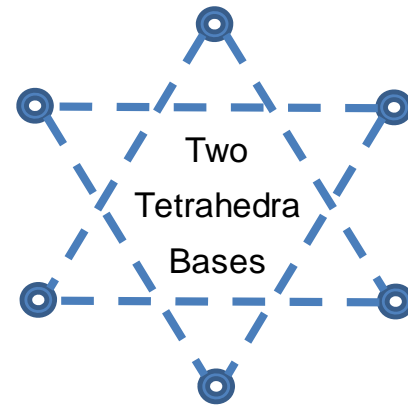
Shall we turn to nature for lessons about stability? Rectangular shapes like so many of our modern abodes are few in nature. But consider the tetrahedron, the most stable of structural forms. Many crystals formed in nature have six edges and four faces.² As you might imagine, a wind strong enough to blow down a rectangular structure, or at least to rip off its overhung roof, might blow right over and around a naturally-braced shape like the tetrahedron. An earthquake that would devastate the normal rectangular box home would find our compact tetrahedron has nearly all its weight near the bottom with only a teeny point at the top giving little mass to accelerate back and forth. Yes, the tetrahedron does have something to offer us for the sake of structural stability. But would you really like to live in one? Maybe you would feel better with a few modifications...



¹ there are many website for “preppers” in our day, too many for quick commercial gain from those who are panicking in their early stages. One site that presents a thoughtful forum for concerned Christians is <http://preparedchristian.net/> and it has links to many free resources on the internet. No matter how quickly you might obtain someone else’s ‘for-sale’ ideas, they all take time to read, to sink in, to absorb and to apply to your own situation. I suggest gathering free materials first, then invest time to read and develop your own approach.

² see <http://mathworld.wolfram.com/topics/Tetrahedra.html> for more, with the shape here being a “regular tetrahedron”. The link <http://mathworld.wolfram.com/pdf/Tetrahedron.pdf> provides a sheet to print so you can cut out and fold tetrahedral paper solids. This will enable you to easily visualize structural building blocks.

If we overlap two tetrahedral bases as shown here, but aim to still have one point at the top, we begin to approach the frame of a Native American tee-pee which has a long and distinguished history of good service. The nomads of Mongolia have a variation which has more of a domed roof. The 5/8 fly's-eye dome of Bucky Fuller is well known and in some ways akin to both. While there are commercially available as kits, none of them come in the heavy-duty version I looked for. So let us get back to the simple two-tetra bottom figure shown here.



If we took six trees and stood them at these six points – rather like a Star of David - you could lash them together at the top and quickly have a significantly stabilized structure with some redundancy. What do I mean by this? If one of the six columns was damaged somehow, the other five would continue to keep the structure habitable in large measure while one column is repaired. If two columns were badly damaged, but the two were not adjacent to one another, then the other four could again keep the structure habitable in large measure. The advantage of having two tetras in this design is a robustness that can make the difference between a habitable and an inhabitable structure after the first global earthquake occurs. My own version of this is a little different, and includes bracing between the several columns about halfway up. This does two things namely (a) it reduces the *slenderness ratio* of the long columns making for a stronger structure and (b) it allows me an elevated platform within the structure for storage or sleeping off the ground. I consider this a far better starting point within a stand of trees than any rectangular box or domed shapes I have examined through the years. I can build a robust frame in a forest in less than a day with little more than a stone axe, adequate cordage, and perhaps eight trees. It is not hard to lash a few “A-frames” together on the ground, brace one standing, erect the other two, and lash them all with a few cross-pieces for sleeping off the ground. Mind you, the larger the structure, the more help you might need. Try a small model –*a mock up*- with a knife, some twigs, and some string and you will see what I mean.

So far, so good, right? That depends. Don't we need to cover the whole frame with thick steel plate? You see, once we survive the first global earthquake, we are on our way to chapter eight of Revelation, and find something different. This time there is a great earthquake followed by hail and fire mixed with blood. They are next mentioned together in chapter 11. They then appear together again in chapter 16. By then, we have an earthquake so immensely terrifying that the cities of the nations collapse and even Jerusalem is split into three parts. The mountains are no longer lofty heights and many islands have vanished. As if this was not already terrifying enough, the hailstones that follow weigh about a talent each. An enthusiastic aeronautical engineer took the time to consider the matter and placed a few particulars concerning these hailstones on the internet for us.³ In summary, the stones will be about half a meter in diameter, weigh 35 kilograms each, and be travelling at a terminal velocity of some 600 kilometers per hour. Even a compact version of my structure with heavy bracing and steel plate cover could get pounded partway into the ground by such hailstones in minutes.

So how about building underground to start with? Even if we were to build a heavily reinforced concrete bunker with lots of curvature and flexible joints to prevent stress concentrations, there is no history we can use to judge the forces that will result from a quake larger than any ever recorded. We will have no idea what kind of ground waves or heaving and crashing of land will occur when the mountains collapse and the islands vanish. An underground structure may prove to be no more than an expensively constructed coffin. But, of course, there is no guarantee apart from GOD that we would be in the right place to duck inside our shelter at the very hour when such deadly hail is imminent.

Does this mean we should give up on making preparations? No, not at all. We should duly consider all that GOD has graced us with concerning his Revelations to humanity. We should be of

³ see <http://www.arksearch.com/nahstone.htm> which is a sober treatment of the event and hosted along with materials on the ever-fascinating story of the searches for the Ark of our forefather Noah

sober mind and seek HIS help. And we should do our part to make what preparations are sane and reasonable for our own particular circumstances. Know that there are people who are spending huge sums to improve their chances of surviving some vague impending calamity, and their consultants might even advise them about earthquakes and hail as described here. But there is no amount of money and smarts that will assure survival for any of them or for their offspring. Simply put, that is in the hands of the Judge of heaven and earth, YESU the Righteous. We are assured that even those with multi-million-dollar well-stocked bunkers will not make it the whole distance if they so much as offend YESU.⁴ HE is not returning to earth to give some kind of friendly sermon. HE is coming to rule for a thousand years with a rod or iron. Apart from HIM, there is no survival. There is no escape from eternal justice. Men who survive to the end shall be scarcer than gold,⁵ but there shall be survivors.⁶ Rest in blessed assurance about that. What is important for your own particular case is, as always, a matter between you and GOD. We should not think HE will put food on the table if we fail to do what is within our own strength. So is it too much to ask that we prepare sturdy abodes, or at least hardened places within our abodes, so that GOD might bless a worthy family member or two to survive and see the reign of YESU begin? Is it too much to ask that we discipline ourselves to not value comfortable places and fleeting status beyond their worth, and to never break faith with HIM?

Let us move on for a moment to a nice afternoon when the Great Day has already passed. In the aftermath of it all, who will wish to have a heavy and hardened structure for an abode? Surely, I would head quickly toward open tent structures once again. Did GOD ever ask anyone for a stone house?⁷ No, HE specified a Tabernacle.⁸ HE also said to Israel “**I will cause you again to live in tents.**”⁹ Asif, an annual festival of ingathering, calls for all of Israel to live outside in sukkot for a week enjoying themselves after the harvest. We can be quite sure that GOD likes tents as dwelling places, both for HIMSELF and for us too. There is nothing quite like living in lightweight tents for mobility and flexibility. And while they do not possess the hardened nature we might want during some times of trouble, their mobility and flexibility do have a rightful place in survival plans.

GOD, in HIS Great Wisdom, gives fair warning to the inhabitants of the earth. I look forward to a time when men will be able to dwell in simple tents and tend to gardening the way GOD wanted when HE Designed and gave Life to our forefather Adam. But between now and that fine day of YESU’s Reign? I like to think that it is possible for a close relative or friend to live and see YESU return to the earth in Glory. To make it through to the end means preparing oneself to be found still alive down here, without the mark of eternal destruction,¹⁰ and otherwise worthy to continue on. Abodes need a significant degree of robustness and hardness, even if only our safe rooms within, but we must also be ready to move out, to leave behind, and to make do apart from our modern urban centres with their fragile support systems and dangerous masses so estranged from our CREATOR and HIS Ways. Are you already being sober and vigilant? Will GOD find you or one of your own dear ones good enough to preserve as the last days of this era unfold? About individuals with clean hands and a pure heart,¹¹ I remain ever optimistic!

a migrant labourer

searching for stout trees in a forest of SouthEast Asia

April, 2013

*** this posting is part of the book ...Delta... updated slightly for issue in 2015 with ... Three Briefs ...



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⁴ Matthew 13:41 assures us that only those found worthy will survive that purge

⁵ see Isaiah 13:9-12

⁶ see Zechariah 14:16-19

⁷ see Isaiah 66:1

⁸ see Exodus chapter 26

⁹ see Hosea 12:9

¹⁰ read chapter 14 of Revelation

¹¹ see Psalm 24:3-6