The Shwedagon Pagoda and the Zenith Passage of the Sun

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Abstract

Here we discuss the orientation of the Shwedagon Pagoda, the gilded stupa situated on Singuttara Hill in Yangon, Myanmar, and a possible link with the sunrise on the days of the zenith passage of the sun. These days are also linked to the Festival of the Full Moon of the month of Kason, the second month of the traditional Burmese calendar. In Myanmar, this is the festival of the Vesak Day of Buddha.

The Shwedagon Pagoda, also known as the Great Dagon Pagoda or the Golden Pagoda, is a gilded stupa situated on Singuttara Hill, in Yangon, Myanmar. This Pagoda is the most sacred Buddhist temple in Myanmar. Wikipedia tells that historians and archaeologists consider the pagoda built by the Mon people between the 6th and 10th centuries AD [1]. However, a tradition exists which is telling that the Shwedagon Pagoda was constructed more than 2,600 years ago. In this manner, the Golden Pagoda would be the oldest Buddhist stupa in the world [2]. This tradition is described in detail at the web site [3].

As explained in [3], the pagoda's beauty derives from the geometry of its shape and of the surrounding structures and by its golden glow (see Figures 1 and 2). The pagoda rises 99 m on the Singuttara Hill (51 m), above the city. The stupa is plated with solid gold bars. Its tip is set with diamonds, rubies, sapphires, and other gems and golden bells. At the very top, there is a single 76-carat diamond.

Figure 1: The south-eastern side of Shwedagon Pagoda. Image Courtesy: Bjørn Christian Tørrissen.

Figure 2: A monk is walking on the facade. Image Courtesy: Bjørn Christian Tørrissen.

For what concerns the architecture of this temple, Ref.3 is telling that, from an aerial view of it (Figure 3), we can see that the Stupa has four small pagodas "at the 4 cardinal point" [3], 64 pagodas encircling the base, a plinth, terraces and an octagonal base. Actually, as we can see from the figure, the complex is not cardinally oriented.

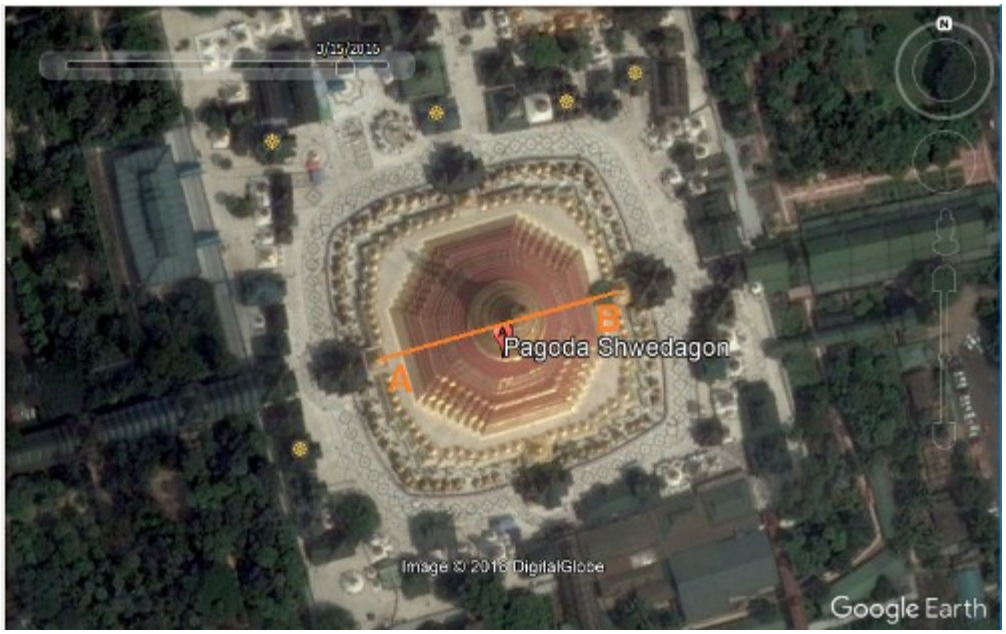

Figure 3: Shwedagon Pagoda in Google Earth.

Wikipedia [4] explains that the temple has four entrances, each leading up a flight of steps to the platform on Singuttara Hill. These entrances are guarded by a pair of giant leogryphs, the chinthe. It is customary to circumnavigate Buddhist stupas in a clockwise direction. "In accordance with this principle, one may begin at the eastern directional shrine, which houses a statue of Kakusandha, the first Buddha of the present kalpa (Sanskrit word meaning an aeon). Next, at the southern directional shrine, is a statue of the second Buddha, Konagamana. Next, at the western directional

shrine, is that of the third Buddha, Kassapa. Finally, at the northern directional shrine, is that of the fourth Buddha, Gautama" [4]. In [5], we can find more details on the temple and the statues and shrines we can find there.

In [3], we read that the many religious festivals linked to the Myanmar lunar calendar are drawing people to pagodas. Among the most important festivals mentioned in [3] we find the Festival on the Full Moon Day of the Myanmar month Tabaung (February-March), and the Myanmar New Year Festival in April. We find also the Buddha Day Festival, known as Kason Festival, in the month of Kason (April-May). The Festival of the Kason Full Moon day is the Vesak Day in Myanmar. During this festival, people "carry earthen pots filled with water and flowers to offer to banyan trees, in memory of the Buddha. Legend goes that the holiday falls on the hottest day of the year. Buddhists in Burma use water to cool off and protect the holy tree, under which the Buddha achieved enlightenment" [6]. Let us note that Kason is popularly called the water-pouring month.The Kason Festival marks the birth, enlightenment and death of Gautama Buddha (Vesak)[7]. This day is more universally known as Vesak, and is celebrated in countries where Buddhism is widely practised, such as India, Sri Lanka, Thailand, Cambodia and Laos.

It is remarkable that, in Myanmar, the Vesak holiday is considered “the hottest day of the year”. However, what is, symbolically, the hottest day of the year? For the tropical zone, we can imagine it as a day of zenith passage of the sun. In some previous papers [8-16], we have discussed that the layout of the architectures of tropics can show some links or even alignments along the directions of sunrise/sunset on the days of the zenith passage of the sun. Therefore, let us consider again the image in the Figure 3, and try to investigate if we can find in this layout of the Shwedagon complex a link to the zenithal sun and, consequently, a link to the “hottest day of the year”, that popularly, in Myanmar is the day of the Kason Festival.

As we have already told, the Shwedagon complex has not the main axes aligned along the north-south and east-west directions. These axes have an angle of about 16 degrees from the cardinal axes. So AB axis in the Figure 3 is not aligned along the direction of sunrise/sunset on equinoxes. It corresponds to a sunrise azimuth of 74 degrees. In Yangon, this is the azimuth of the sunrise on the days from the First of May to May 3 (according to software sollumis.com). From May 3 to May 12, the noon altitude of the sun is greater than 89 degrees.

Using another software, the SunCalc.org software that, like sollumis.com, is an online application which can be used to ascertain the sun movement with an interactive map, we can see that we have the zenith passage of the sun on May 7 (the other day of zenith passage is August 5). So we can tell that AB axis of the Shwedagon temple is aligned along the sunrise of the first day of a period during which the sun has an altitude equal or greater than 89 degrees. That is, symbolically, it could be the first of the hottest days of the year. Now, let us consider the Full Moon Day of Kason. In 2018, it will be on 29 April [17]. Using SunCalc.org, for April 29, we obtain the Figure 4. We see that axis AB in Figure 3 is practically coincident with the direction of the sunrise on the Kason Day 2018 (sunrise azimuth 75 degrees).

In 2017, the Kason Day was on May 10 [18], and in 2016 it was on May 20. Since the Festival is determined by the full moon, its date changes year after year. Of course, the directions of the sunrise on these days are rather different, and therefore, we cannot have a specific alignment according to the Festival. But, since the lore goes that the Full Moon of Kason is linked to “the

hottest day of the year", we can conclude telling that the temple complex of the Shwedagon Pagoda was probably planned with an alignment along the direction of the sunrise on the day which represent the beginning of the period of the hottest days of the year, that is, the period during which we have the zenith passage of the sun.

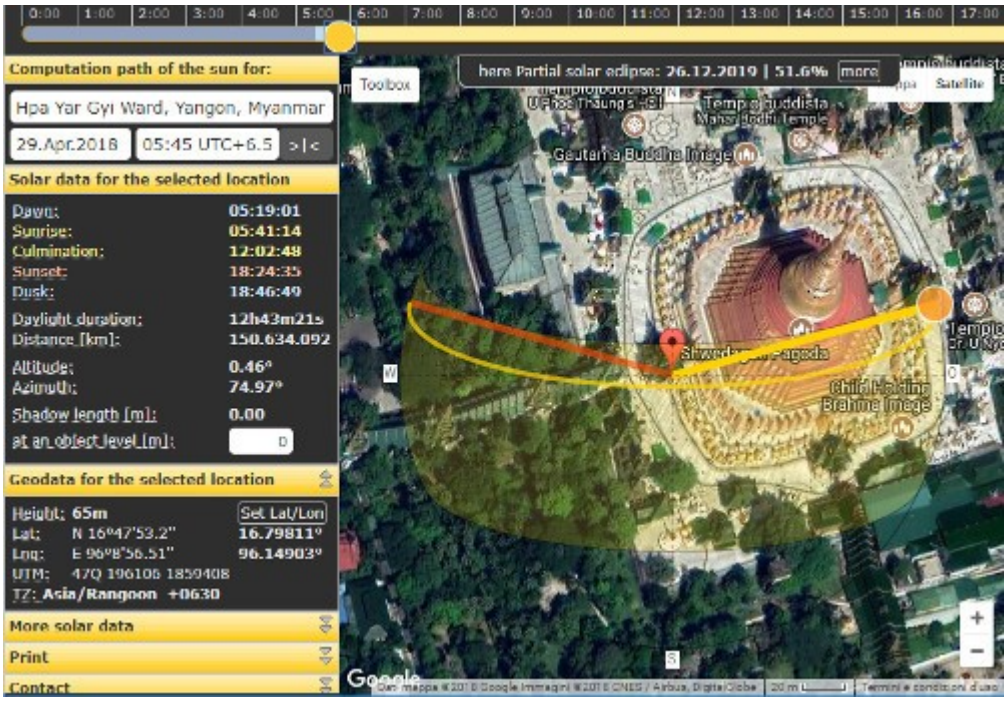

Figure 4: Sunrise direction on the day of the Kason Festival, 29 April 2018 (Courtesy SunCalc.org).

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