

## Some obelisks in Rome and a print of Piranesi

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J. L. Heilbron's book "The Sun in the Church" aroused my interest in the meridian lines in churches, and showed how accurate and important measurements of the motion of the Sun were made with these instruments for the calendrical calculations of the date of Easter. Lately I have happened to visit Italy quite frequently, so I have had the opportunity to study and photograph a few of the largest *meridianae* (Florence, Rome, Bologna, Milan, Palermo, Trieste). I have given several lectures on them, and because a meridian can be seen as a sundial which shows the exact time once a day (contrary to a broken watch, which shows it twice), I was invited to the VIII Meeting of the Hungarian Sundial Society in Eger, in 2012. I accepted it gladly, as it offered an opportunity to study the Eger meridian, which is the only one in Hungary. At this meeting I was told that there is a meridian line also in St Peter's Square in the Vatican, north of the obelisk, with markers of the zodiacal signs, so next time I went I studied and photographed it in detail.



The Montecitorio obelisk and its meridian, in front of the Italian Chamber of Deputies

Church *meridianae* can be considered as a case of "camera obscura" (a small opening in the side walls or on the ceiling makes on the floor a bright solar image, which transits through the meridian), while the obelisks are natural shadow sticks for a horizontal sundial. According to Wikipedia, Rome has the largest number of obelisks anywhere. Only after the conquest of Egypt eight of them were transported to the city, so naturally next to some of them meridians were constructed. In Piazza Montecitorio stands an obelisk, which was taken by Augustus from Heliopolis in 10 B.C., and was originally erected in Campo Marzio as a sundial. It was transferred to its present place in front of the Montecitorio palace in 1792 by pope Pius VI. On this meridian not only the zodiacal signs are shown (practically the Sun's ecliptical longitude by every 30 degrees), but there is a mark by every 1/4 sign (7.5 degrees), i.e. very nearly weekly. On the metallic markers we can see also the civil time of the solar meridian transit for the given day. The companion of this obelisk was also taken by Augustus to Rome,



The Montecitorio meridian. Equinox marker, with the times of the meridian transit of the Sun

and stands now in the Piazza del Popolo, without a meridian, although according to the internet there are some plans for a complete sundial around it.

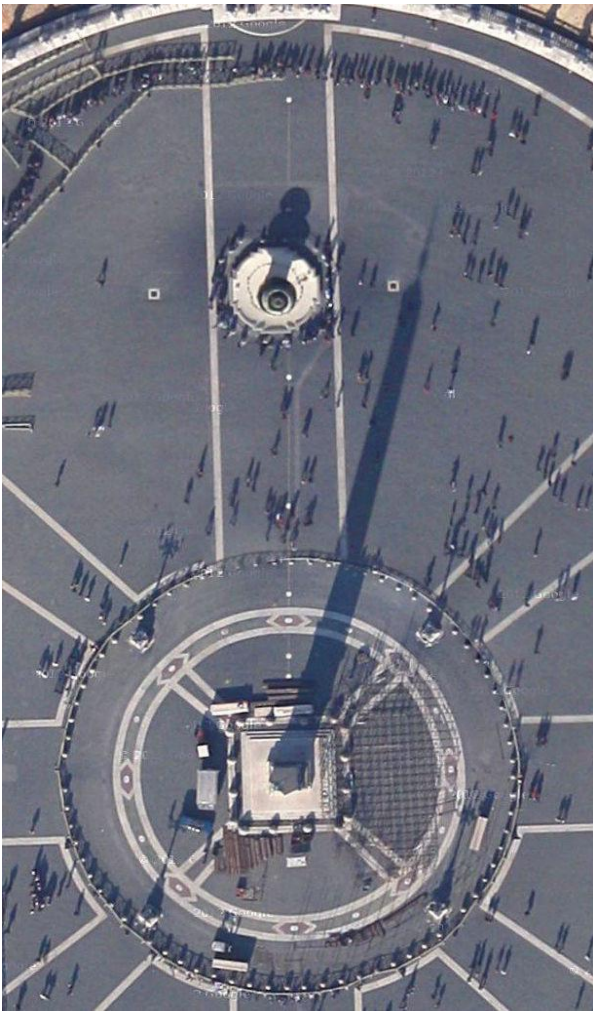
St. Peter's Square in the Vatican, in front of the basilica, is one of the most beautiful squares in the world. The old basilica, begun by the order of Emperor Constantine above the tomb of the first pope, St. Peter, was in ruins already to the XV century. So on its place pope Julius II wanted to build the most magnificent temple of Christendom (with his own sepulchre in it, made by Michelangelo). Donato Bramante, among other renowned architects, was commissioned to build it in 1505. The process of the building, however, proceeded slowly; some of the builders (Raffaello among them) died during the process, so finally in 1547 the old (already in his seventies) Michelangelo became the



The stone marker of the equinoxes on the meridian of St. Peter's Square (Aries - Libra)



The obelisk on St. Peter's Square, and its meridian line to the Pisces - Scorpius stone marker



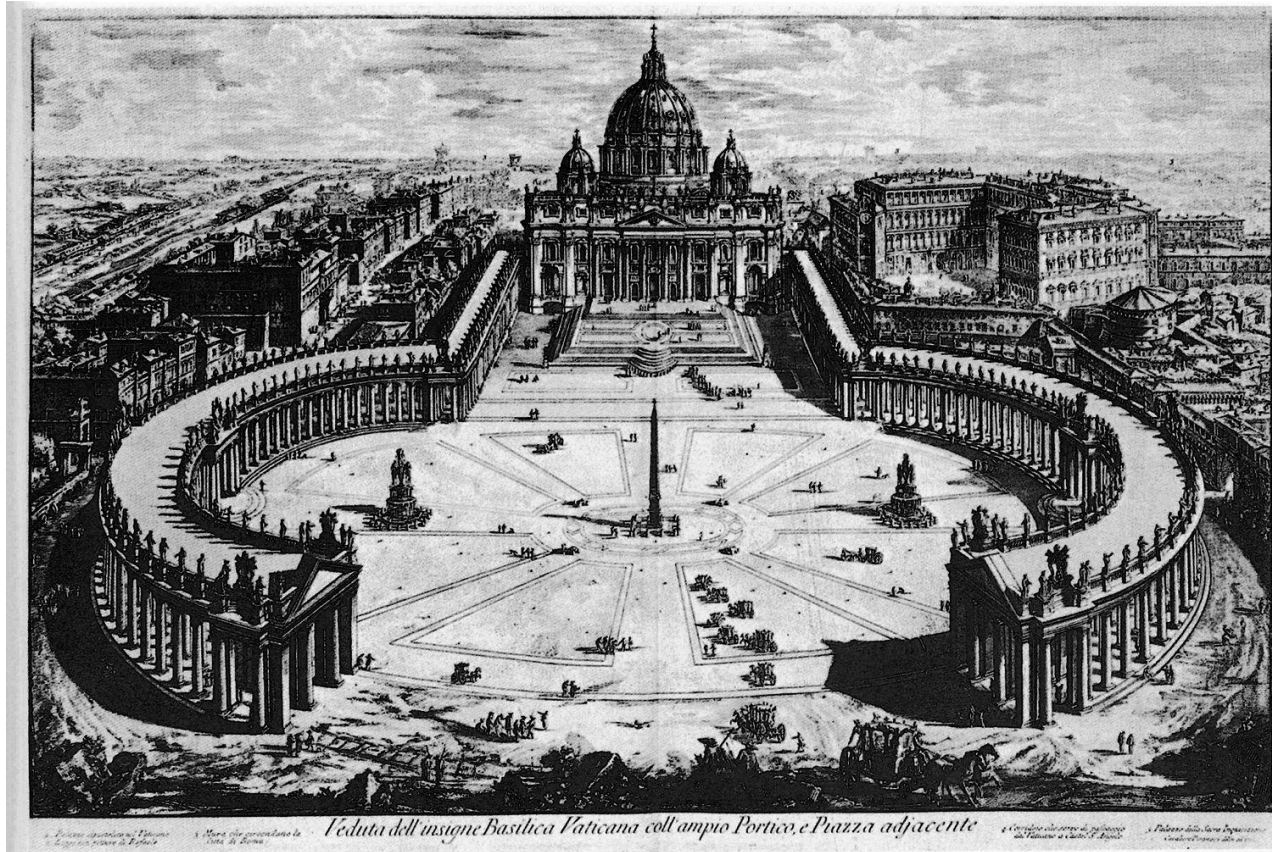
The obelisk of St. Peter's Square in Google Earth. The meridian line and markers are well visible, (and the slight inclination of the axis of the square to the East-West direction), also the 16 markers of the compass rose, with the wind directions



Stone of the northern direction and northern wind

superintendent of the building. The present form of the basilica, especially the huge dome was built according to his plans. The demolition of the old basilica and the moving of the tombs and other artifacts began in 1605, the main nave of the new St. Peter's basilica was completed in 1615. The entrances of both the old and the new St Peter's basilica, according to early Christian traditions, were to the East, the main nave is along the East-West direction.

The arrangement of the square in front of the basilica began already during the construction. At the beginning the Vatican obelisk was erected in its centerline. Originally this then ca. 2400 years old obelisk belonged to an unknown pharaoh in Heliopolis, it was transferred to the main square of Alexandria by emperor Augustus after the conquest of Egypt around 30. B.C. In 37 A.D. emperor Caligula brought it to Rome, where it was erected near the Circus of Nero, here it was witness of the persecution of Christians and the death of St. Peter. Therefore the old St. Peter's basilica was built next to it. The obelisk was moved to its present place by order of pope Sixtus V by the supervision of Domenico Fontana during more, than a year, completed on 28 September 1586. This is the only Roman obelisk which never fell during its more than four thousand years history, and survived its three transfers. In the same line, parallel to the facade of the basilica a large granite fountain, made by Carlo Maderno was placed on one side. The final arrangement of the square was executed by Lorenzo Bernini between 1656 and 1675. The axis of the square is also oriented East-West (to be exact, it has a slight angle of 1.6 degrees to Northeast). Just in front of the basilica it has a narrowing trapezoidal form, then it opens to a giant oval, with the 41 m high obelisk in the center, and two fountains in its foci, the second was installed by Bernini, symmetrically to Maderno's one. For a long time one could reach the square only through little, narrow streets, finally to be surprised by the magnificent view. These old streets and houses were demolished in 1936-37 by Mussolini, giving place to Via della



Print of Piranesi's "Vedute di Roma", with shadows in the wrong direction

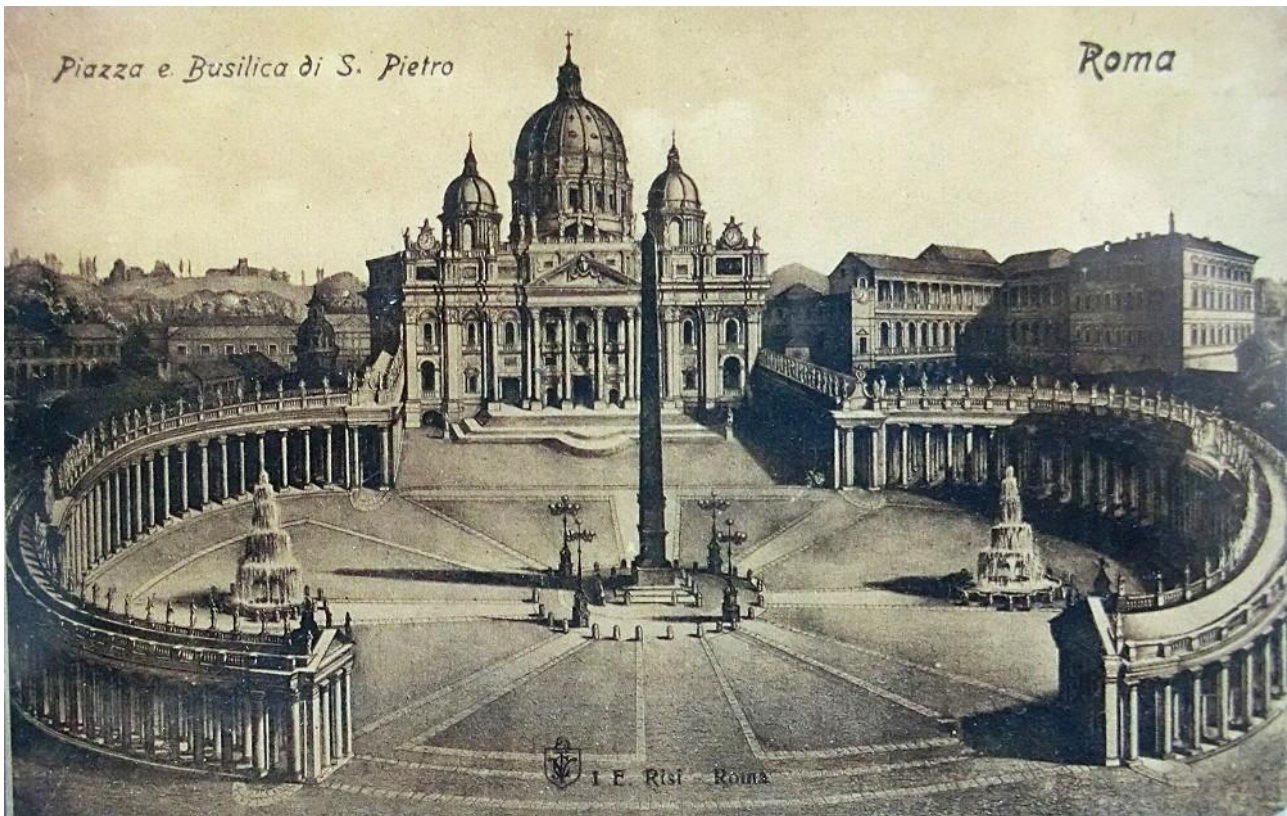


St. Peter's Square on a contemporary postcard

Conciliazione (Road of the Conciliation), finished by 1950, so opening up the square to Castel Sant'Angelo.

In the square, to the north of the obelisk, a not very sophisticated meridian line was inserted in the pavement in 1817. On this, the end of the shadow of the obelisk is marked with round stone markers on the days, when the Sun enters a new zodiacal sign, i.e. every 30 degrees of ecliptical longitude (ca. around 21st of every month). There is also a stone circle around the obelisk with 16 wind markers of the directions of the compass rose.

And now a few words about Piranesi. Giovanni Battista Piranesi (1720-1778) was a famous Italian artist; his fame was due to a long series of etchings, "Vedute di Roma" showing the ancient and contemporary buildings and places of Rome. Another famous series by him is "Carceri d'Invenzione", a surrealist vision, showing enormous underground prison vaults and



An old "photographic" postcard, also with retouched wrong shadows

refined methods of torture. In 2012 I had the opportunity to see an exhibition of various graphic works in Győr (Hungary), including Piranesi's, containing the image of St. Peter's square among others. As I knew the orientation of the square well, due to my studies of the meridian, it struck me promptly, that this could not be real: in the picture the Sun shines from the North! After that, I began to look up systematically drawings and paintings showing St. Peter's Square, and in quite a few cases I found impossible shadows, directed to the South of the obelisk. The most amusing case was a purported photographic postcard from the beginnings of 1900s; it was heavily retouched probably. Lesson: aesthetics (?) sometimes overrules reality.

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