

Inventive Ways of Displaying the Moon

*‘Three Moons in a Fountain...’**



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The moon has featured prominently in the entire history of mechanical horology, making its appearance on the Antikythera mechanism of antiquity, to perpetual-calendar watches selling for millions of pounds today, via medieval clocks of central Europe and British painted-dial longcases of the eighteenth and nineteenth centuries.

Whether or not one *needs* to know what the moon is up to at any given moment, there is a ready supply of watches that offer this iconic and ancient astronomical function. Watch companies relish telling us the degree of precision in their particular flavour of lunar display.

For the wearer, it is perhaps less a useful feature than a reassuring ‘always-on’ manifestation of the high craft of which he or she has become a patron.

Why was knowledge of the moon’s phase important enough to warrant its near-universal inclusion in domestic timepieces? I’ve often heard the reason given that agricultural societies needed to plan their activities around the moon’s phase. Whether this is true or not, I prefer the more prosaic explanation that for much of history there simply was no public outdoor lighting. If you were hosting a banquet or some event, for example, it would certainly warrant planning it for a bright night.

It often catches me by surprise how bright moonlight is. On a clear night, the moon will cast a pronounced shadow, making for much safer walking outdoors than with a torch, and more than once have I grumpily got out of bed in the wee hours to remonstrate with ‘that streetlight’ keeping me awake, only to realise that the particular *lumière* is in fact about 130,000 miles away...

I am reminded of the ancient tradition in the British Parliament, where Palace officials call out ‘Who goes home?’ when the house rises at the end of a hard day’s debate. The capital’s dark alleys and byways harboured all sorts of sinister figures, dangerous to lone travellers on a moonless night. The nation’s parliamentarians, feeling safety in numbers, travelled home in groups, wisely also staying abreast of the moon’s comings and goings.

With so many hundreds of years of the moon appearing on clocks and watches, there is surprisingly little variety in the way the information is displayed on a dial. Here I present three quite novel ways by different watch companies to display the phases of the moon.

Briefly, the usual way of displaying this is to have an umbrella-shaped aperture in the dial. A disc with two images of the full moon printed or applied to it, is centred behind the aperture.



Figure 1. Lange & Söhne Moonphase Day/Night.



Figure 2. The Lange & Söhne Moonphase movement.



Figure 3. The golden moons.

* Apologies to Spike Milligan.

Only one of the pair of moons is visible at any time, slowly advancing clockwise as it makes its first appearance as a crescent-shaped sliver peeping out from below the left hump of the ‘umbrella’. Day by day, it waxes, becoming more and more visible, until the whole image of the moon appears in the centre of the space. Then, it slowly disappears, as the clockwise motion continues, until there is nothing left, at the time of new moon. Meanwhile, the second moon has taken its place in the wings, ready to make an appearance the following day.

Lange 1 Moonphase Day/Night

Of the three, the most traditional display is found on this classical watch by Lange & Söhne, part of the Richemont Group. By all accounts the umbrella-shaped aperture on the dial of this watch appears perfectly normal, **Figure 1**.

However, there is an important difference: it also carries an integral Day/Night indicator, **Figure 2**. Instead of a solid disc with two moons upon it, the two moons are ‘cut out’, floating over an independent disc. The lower disc is coloured bright blue for the daylight hours, and the night-time is in dark blue with stars. This goes round once a day. The golden moons are joined at a common centre, hidden beneath the dial, and pressed on to the output arbor of the lunar train, **Figure 3**.

This is an elegant, and extremely subtle technical display, typifying the German maker’s signature restraint.

Andreas Strehler’s Lune Exacte

In a normal moon phase display, only at full moon or new moon can the wearer be exactly sure of the phase shown by his watch. Even then, one can only be sure of the phase to within about half a day, because these devices typically click forward some hours after midnight. Ironic, because makers often boast about the precision of their lunar trains to many decimal places. Against this, it seems rather a defeat to leave the final determination to the viewer’s acuity.

Enter Andreas Strehler, watch maker, AHCI member, creator of the Opus 7 watch, and famous in the industry for



Figure 4. Andreas Strehler’s Lune Exacte system uses a vernier for reading the moon’s phase to within three hours. In these two watches, the system is combined with his trademark jumping-dead-seconds.

his microscopic clusters of bevel wheels and differential gears that can be found in a raft of his own watches and those of third-party manufacturers.

With his *Lune Exacte*, **Figure 4**, Strehler abolishes this incongruity by narrowing the uncertainty to a mere three hours, and does so with a unique, patent-pending, display.

The moon is shown graphically in the traditional way. In addition to this are two concentric scales, the inner of which rotates, **Figures 5a–5d**. The current age of the moon in days is indicated on the outer scale, against the moving red arrow: 27 days in **Figure 5c**. If the arrow falls between two figures, the lower number is read.

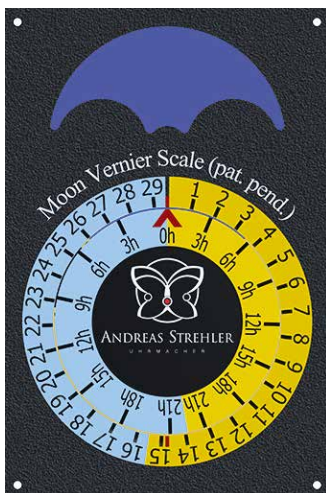


Figure 5a. At new Moon, the red arrow is exactly vertical. These figures demonstrate the principle, although on the watch dials, the functions are laid out differently.

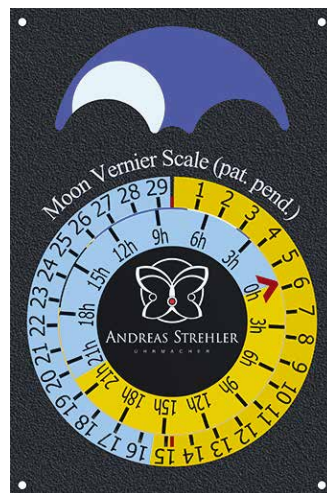


Figure 5b. The red arrow points to somewhat after 5, and is in the yellow zone. This, added to the information on the yellow vernier scale, indicates the Moon to be 5 days and 18 hours into its waxing phase.

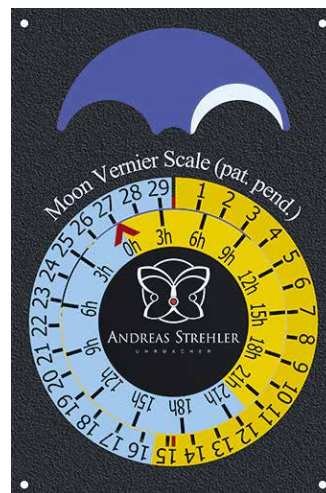


Figure 5c. Now in the blue area, the Moon’s phase is 27 days and 3 hours waning.

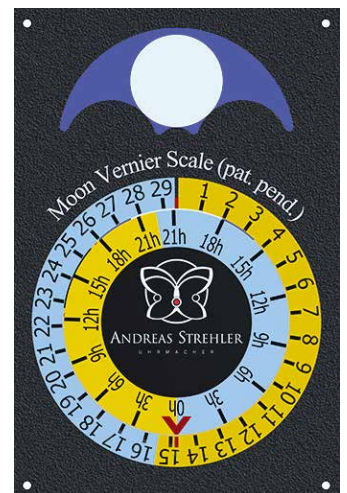


Figure 5d. When the arrow comes to rest opposite the second red mark, the Moon is full, also easily seen on the main display.



Figure 6. Rolex Cellini Moonphase.

Next, add the correct number of hours, in three-hour quanta, using the vernier divisions. There are yellow and blue areas, yellow for waxing and blue for waning – the vernier must be read off the corresponding colour. Referring again to the same figure, we notice that 27 is in the blue zone, so use the blue vernier.

For those who do not know how to read a vernier, the target number is read off the moving scale at the point where any two graduations on both upper and lower (or in this case, outer and inner) scales exactly meet up. If none meets up exactly, then the reading lies somewhere between the two nearest graduations.

In **Figure 5c** we find that the moving (inner) scale lines up exactly with the fixed scale at one point in the blue zone: at '3h'. So the moon phase is 27 days and 3 hours.

When the red arrow coincides with the primary (top) index on the outer scale, we are exactly at new moon. Full moon is when the red arrow meets the supplementary red index, near the bottom.

However, this system is not without its problems. It was pointed out to me by one of our members, John Kirk, that the length of the mean synodic (lunar) month is increasing over time. A fixed train calculated to match the current mean synodic month would have its accuracy reduced by about a factor of ten within a century. Also, the actual length of each synodic month can vary from the mean by up to seven hours. Now these problems, which arise because we apply a mechanical analogue to the real world, are not unique to Strehler's watch. But given the precision to which the *Lune Exacte* watch can be read, the difference from reality, (when the watch starts getting on for a century old!) will be much more pronounced.

Rolex Cellini Moonphase

Finally, we turn to a brand almost as famous for *not* producing moon-phase watches as they are for their robust, no-nonsense, highly reliable and highly waterproof watches.

The last time Rolex produced a moon-phase watch was in the 1950s, with a pair of related models, the 5171 (also colloquially known as *Paddelone*) and the 6062, the former being in a traditional 'clip-case' and the latter a screw-back. Both watches are triple-calendar with moon phase, characterised by a distinguished gold 'man-in-the-moon' face set against a deep blue enamel ground.

After a mere 70-odd years, Rolex again introduced a moon-phase watch at Baselworld 2017. This time it was the turn of their 'classical' range, the Cellini, to enjoy a moonlit makeover. It must be said that the Cellini has gone from what were once, frankly, ghastly watches from the 1980s to 2000s, to extremely elegant and appealing dress watches today. The Cellini Moonphase, in 'Everose' gold** with restrained milled bezel and white lacquered dial eschews the traditional presentation of the moon, instead laying the entire blue field of the night sky bare in a round aperture near six, **Figure 6**.

Again we have the rich, deep blue of the 1950s models, but this time the body of the moon itself is a slightly domed meteorite pad, set among silver stars, see **Front Cover**.

I promised you three unusual moons, and this Cellini does not disappoint. It is as unusual as it is impossible. The blue disc rotates once every lunation, passing a fixed gold index at the top of its aperture. First, the meteorite moon lines up with the index, and half a lunation later, an empty circle has taken its place: full moon and new moon. In between these times, there is absolutely no way to be sure what the indication is! There are no graduations, nor markings of any kind against which to take a precise reading.

I have spent a long time thinking about this. Rolex were unable or unwilling to add anything to the original press information they'd supplied me.

This presentation is so unusual, and yet so vague, that I can only conclude that it must be a conscious decision by the Rolex designers to repudiate the in-between times. Only the full and new moons matter, and as long as the wearer can tell when one of those *is*, and when it is due, nothing much else matters.

If my interpretation of what they intended is accurate, then, in many ways I agree with them. The precise position or age of the moon is of little use to most of us, even agricultural types mentioned at the outset. It might be useful to know that a new or full moon is *due*, but does it really matter what happens in between? It is, after all, just a shadow whose precise shape is indeterminate. Astronomers may need to know very precisely what the moon is up to, but they would never consult a wristwatch for this data.

For planning that banquet, it's useful to know when the next full moon is due, but the ultimate determinant of the banquet's date will probably be the day of the week, rather than the exact date of the full moon – who hosts parties on a Tuesday, even if its brighter than Friday?

Certainly, it is gratifying to see the ready supply of imagination and high craft still in evidence among watchmakers.

** A Rolex 18ct alloy with a high platinum content, whose pink colour, unlike ordinary rose gold, does not change over time.

Waxing and Waning

To know at a glance whether the moon is on the wax or wane, an old friend taught me this rhyme in his northern Italian dialect: *'Gobba a Ponente luna crescente, gobba a Levante luna calante'*.

Thinking about the etymology will help those not from a small Italian village to remember it. *Gobba* is 'hump', from which we get 'gibbous', *Ponente* is the ancient name for the west wind, while *Levante* is related to the Levant, where the crusaders travelled, east, and is also the name of a wind from the east.

So, if the hump (shadowed part) is to the west, or left side when looking north, the moon is on a crescendo, rising. With the hump to the Levant, the moon is waning.

In fact, I almost never use this! My mental picture is determined by the hundreds of calendar watches I have set up; I can just see the little moon disc creeping out from the left hump of a moon display, rising to full, then disappearing to the right.



Image courtesy of NASA

Figure 7. On the far left is the waxing moon, or *crescendo* meaning rising, and far right, the waning moon, or *Levante* where the moon is descending.

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