

# A blast at midday:

## NOON GUNS & CANNON DIALS

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“And then one day, you’ll find ten years have got behind you/no one told you when to run, you missed the starting gun.” Thus goes the famous Pink Floyd song, in which the starting gun of competitive sports serves as a metaphor for the human drama of dealing with the unstoppable passage of time. In fact, guns have had an important role in marking time, and not only in sports competitions.

From the 18th century onwards, guns were used to give time signals in ports and military camps; even today, a gun shot can still be heard at 1:00 pm every day (except Sunday) around Edinburgh Castle, Scotland, (occasionally frightening the unaware passerby).

Apparent solar time was widely used until the 19th century; in such

circumstances, it was convenient to let the Sun command a time signal itself. This idea led to the development of the noon gun in the 18th century. A noon gun is an apparatus combining a miniature cannon with a lens that focuses a beam of light toward the touchhole, igniting the gunpowder at noon.

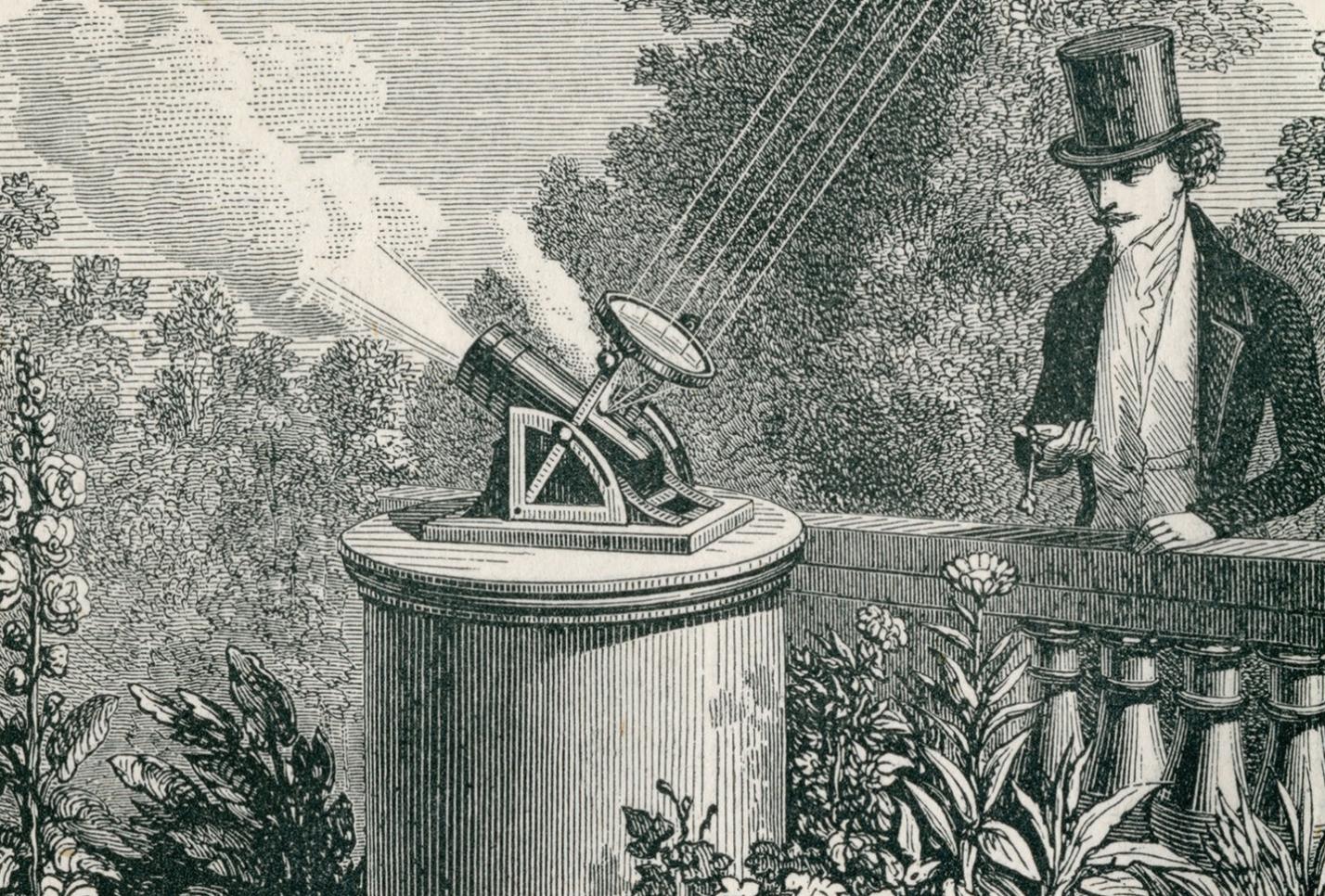
In order to prepare the device for the noon signal, the cannon would be loaded with a teaspoon of black powder, with more powder being sprinkled in the touchhole. The device also had to be adjusted for the altitude of the Sun at noon, since the latter varies with the latitude and the time of the year—higher

around the summer solstice, and lower around the winter solstice. For that purpose, the burning lens was usually attached to a frame with two arms pivoting around one quadrant (sometimes two, on either side). The desired altitude for a given date could be found through a simple calculation combining the latitude of the place with the declination of the Sun provided by an almanac (the declination of a celestial object is the angle between the object and the celestial equator). The lens would

be set accordingly, and then it was just a matter of waiting for noon to amuse oneself with the cannon blast, run to grab lunch, or

check out one’s pocket watch, as the gentleman in the image is doing

**Benjamin Franklin  
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(note that nowadays we use an adjusted and standardized time scale in our clocks and electronic devices, not the time taken directly from the Sun).

But what if you needed to check the solar time during the morning without having to wait until noon, or after missing the gunshot? The solution was to combine a noon gun with a horizontal sundial—a type of sundial which, as the name indicates, combines a horizontal hour scale with an upright triangular gnomon (the gnomon is the piece that casts the shadow on the hour scale.) This arrangement is called a cannon dial. You can see a fine example from our collections, M-284, on display in the *Astronomy in Culture* gallery. M-284 is a French cannon dial from the late 18th century, set on a round marble

base. The sundial is designed for the latitude  $45^{\circ} 27'$ . The quadrant on the west side of the apparatus has a scale labeled with the French initials of the months, so that the burning lens could be adjusted for the altitude of the Sun at noon throughout the year.

In 1757, Benjamin Franklin joked about the concept of the cannon dial in *Poor Richard's Almanac*, musing about a contraption with twelve burning lenses and seventy-eight guns, which would give a number of shots equal to the respective hour throughout the day. But cannon dials proved very popular, delighting all kinds of people during the nineteenth century. Those who literally “had a blast” (pun definitely intended) with these devices included sovereigns such as the emperor of Brazil, Pedro II,

who commissioned one for himself, and the anonymous citizens who recurrently gathered around the gardens of the Royal Palace in Paris by midday to see and hear the cannon dial there in action.

To this day, cannon dials remain a favorite of sundial enthusiasts. In the age of atomic clocks, a noon blast is still a sound reminder that time is always passing, without having to be taken as seriously as the shot of a starting gun. After all, we can always wait for the next day to enjoy the noon blast; and if it happens to be cloudy, we will just “save some powder”—as Benjamin Franklin so wittily remarked.