Notes on METRONOMES for Max Guy

AMBER MOYLES OSLO 2025

Time, as we know it, is a fragile construct. How we measure time shapes our experience of it. A minute divided into sixty seconds by a clock feels markedly different from one segmented into 208 beats by a metronome.

We tend to organize time through recurring natural and social processes—diurnal cycles, lunar phases, equinoxes, and the course of life from birth to death. Moishe Postone calls this **concrete time** or event-based time: time measured through relation, structured by the rhythms that give life texture and meaning.

Concrete time begins with observing finite durations of daylight and darkness, twilight and nightfall.

The Romans divided nighttime into structured intervals—variable-length hours called **vigiliae** [watches], which established temporal parameters for a rotating guard. Because these intervals did not span a fixed period but rather the duration from sunset to sunrise, their length varied with the seasons. Longer winter nights meant longer watches; in summer, the opposite.

It seemed impossible for individuals to remain awake at their posts. The watches (vigiliae) were therefore divided into four parts.

—Vegetius
Epitoma rei militaris III: VIII

The Regula Benedicti (c. +530) adapted the Roman vigiliae into canonical hours—variable intervals used by Benedictine monks to structure alternations between worship and labor. Matins and Lauds marked early morning with extended psalmody, patristic readings, and canticles such as Luke 1:68–79.

The rising sun will come to us from heaven to shine on those living in darkness.

—Luke 1:68–79

Prime began the workday; Sext offered midday rest; None prepared the body for sleep. Each interval mapped onto events from the life of Christ: Lauds with the Resurrection, Sext with the Passion, and None with his death.

Alongside concrete time, there exists a second, distinct form of temporal organization, which Postone calls **abstract time** or clock time. At the beginning of **Principia Mathematica** (+1687), Isaac Newton defines this concept as absolute time.

Absolute, true, and mathematical time, of itself, and from its own nature, flows equably without relation to anything external.

—Isaac Newton
Principia Mathematica

In contrast with concrete time, abstract timekeeping is a non-relational, autonomous framework for measuring durational intervals. Whereas meaningful events and lived experience structure concrete time, abstract time unfolds independently, indifferent to context.

Postone associates abstract time with the rise of capitalism in Europe, but abstraction emerges long before that—most notably with the **water clock**.

Invented independently in North Africa, Mesopotamia, and East Asia between -1600 and -1000, these devices measured duration by transferring water between vessels. In so doing, they rendered time as a visible, continuous flow.

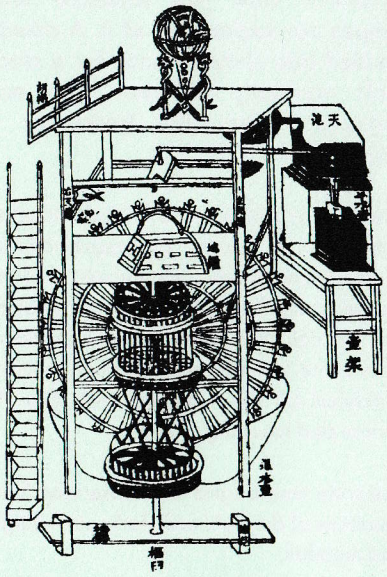
The addition of graduated scales—marks that quantify the oscillating water level—transformed this fluid motion into measurable, durational intervals. These intervals no longer stretch or compress to match the shifting span between sunset and sunrise.

Detached from natural and social rhythms, the water clock imposes a standardized metric: time no longer flows; it advances incrementally.

Escapement mechanisms deepen this abstraction by severing time from flow altogether. In mechanical clocks, an escapement is a notched gear that responds to the gradual changes of an oscillator, such as water level or a weight. As oscillation takes place, a tooth releases, marking a durational interval with a visible or audible event—a rotation, a chime, or a tick.

In the early-eighth century, the Buddhist monk and mathematician 一行 [Yī Xíng] developed an **astronomical clock** that uses such a mechanism to rotate an armillary sphere, marking time by simulating celestial movement.

Four centuries later, الجزري [Al-Jazarī] described a similar device in his **كتاب في معرفة الحيل الهندسية** [The Book of Knowledge of Ingenious Mechanical Devices] (+1206). In his **castle clock**, an oscillator powers an escapement that generates a complex, which marks the hour with a chime: a bronze ball drops from the mouth of a falcon automaton onto a cymbal. Both Yī Xíng and al-Jazarī's clocks illustrate



how escapements obscure the continuity of duration and replace it with the illusion of discrete, uniform intervals. More than mere regulators of motion, these mechanisms reveal a central effect of abstract timekeeping: clocks no longer respond to events—they generate them.

Rotations, chimes, and ticks do not simply mark time passing; within the logic of abstract timekeeping, these events are time. Durational intervals no longer adapt to natural rhythms but present themselves as integral features of the natural world. Seen through this lens, the world begins to resemble the inner workings of a clock.

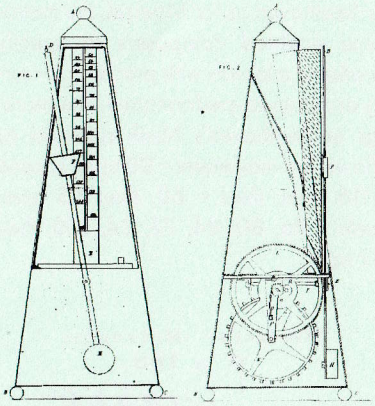
Shortly before his death in +1321, Dante captures this emerging sensibility in **Paradiso**. He likens the celestial dance of angelic choirs to the interlocking gears of a mechanical clock:

As in a clock, a wheel that turns appears to halt,
as though it moved not, while another, a tooth,
seems to be speeding past, though slow,
so in like manner did those circles, dancing,
appear to me, with differing swiftness moved,
to match the joy each angel had within.

—Dante Alighieri
Paradiso X, 139–144

Dante marvels at divine synchronization—a choreography of oscillating angels powering the rotary escapements of heaven. His metaphor reveals the extent to which abstract timekeeping effects perception.

Like mechanical clocks, metronomes visualize time passing by translating continuous change into marked intervals—both attach oscillators to escapements. But metronomes radicalize the abstraction of clock time. While clocks detach time from lived experience, they maintain a social function: clocks synchronize the temporal experience of a community.



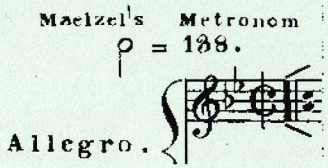
Metronomes, by contrast, construct a virtual temporal zone, wherein durational intervals are measured not in seconds but beats per minute and serve as a reference for musical tempo. In other words: the clock assumes a public rhythm; the metronome produces a private one.

Johann Nepomuk Maelzel patented the metronome in +1815 and sent the device to notable composers across Europe, Beethoven among them. In doing so, he ensured that the **Maelzel Metronome** became the standard device for notating musical tempo.

Beethoven, who began using metronome markings in his **Sinfonie Nr. 9** (+1824), publicly supported the device. At a dinner with Maelzel in attendance, the composer even sang its praises to the rhythm of his own **Sinfonie Nr. 8** (+1812):

ta ta ta, dear Maelzel
ta ta ta, fare well, very well
ta ta ta, sign of the times
ta ta ta, great metronome
ta ta ta ta ta.

For Beethoven as for Maelzel, the metronome enabled composers to specify durational intervals with precision, ensuring accurate re-performance. The markings in Beethoven's Ninth proceed as follows: first movement = 88 bpm; second = 116 bpm; third = 60, then 63 bpm; fourth = 96, 80, 84, 72, 84, 120, then 132 bpm.



These values allowed Beethoven to dictate tempo shifts—from Adagio molto e cantabile to Andante moderato in the fourth movement—with finer granularity than traditional terms allow. Beyond this, the metronome also imposed a rational framework that later musicians internalized. Herbert von Karajan, for example, once claimed he could walk at exactly 120 bpm while singing at 105:

If I get the tempo wrong, I feel it with my whole body...it makes me feel uneasy.

Musicians often overlook the metronome's radical potential. Rather than reinforcing a standardized sense of time, it can direct us toward alternative rhythms. Karajan and Beethoven's metronomes did not produce sixty seconds per minute but 88, 132, 120, or 105 beats per minute.

Metronomes set asynchronously with clocks restore texture to time—introducing qualities that, however artificial, make some intervals feel quick and others slow, some tempos dragging and others energetic.

Metronomes reveal that the sixty intervals assigned to every minute, indeed the very concept of durational intervals, is unnatural. Concrete or abstract, timekeeping is fictional. No tempo is absolute.

Even the most precise metronome falters. The Maelzel Metronome, encased in a mahogany box with its brass oscillator and escapement, abides by physical laws, not aesthetic ideals.

Mahogany absorbs moisture and swells; brass expands in the summer heat. At the molecular level, atoms vibrate faster as temperature rises. Continuous motion imparts microscopic injuries: friction, deformation, tiny fractures. Humidity, temperature, and debris overpower the oscillator's swing. This is why two identical metronomes, set to the same tempo, gradually fall out of sync; durational intervals, once perfectly aligned, inevitably come into conflict. This desynchronization reveals abstract timekeeping as a farce.

The metronome recalibrates our perception of time. By generating temporalities that unsettle the fixed rhythm of the sixty-second minute, it undermines the authority of the clock—beat by beat.