

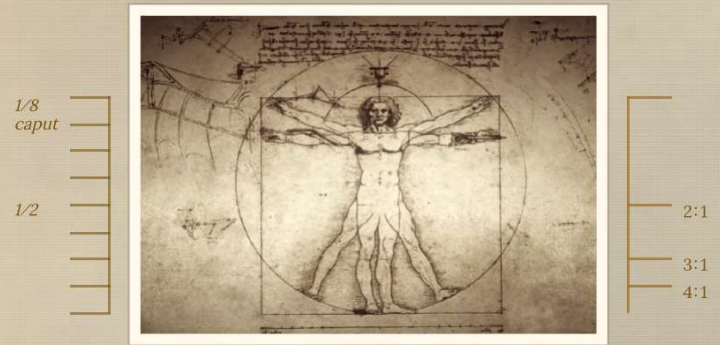
De Templo Musico

Of the Musical Temple · the body, the room and the consonant plan

1. HOMO AD CIRCULUM

The man within the circle, measured as a scale

The span of the arms equals the height; the head is an eighth of the whole; the foot a sixth; the face a tenth. Set these against the string and you have the octave, the fifth of the fifth, and the double octave with a third. The body is not merely proportioned — it is tuned, and to the same tuning as the lute.



the eight heads of the body, and the string beside them

Fig. 1. The figure in the circle and the square, with the monochord set at the right hand so that each division of the body names an interval.

2. SECTIO AUREA

The golden section, and the numbers of the Pisan

Divide a line so that the whole is to the greater as the greater is to the less. No whole numbers will do it, yet a ladder of whole numbers climbs toward it and never arrives: each rung the sum of the two beneath. Fra Luca showed me these; the Pisan wrote them down for a question about rabbits, which is the usual way great things are found.

NUMERI	RATIO	ERROR	VOX PROXIMA
3 : 2	1.5000	−7.3%	fifth
5 : 3	1.6667	+3.0%	major sixth
8 : 5	1.6000	−1.1%	minor sixth
13 : 8	1.6250	+0.4%	—
21 : 13	1.6154	−0.2%	—
Φ	1.6180	—	none

Note that the ladder passes through 3:2 and 5:3 and 8:5 — the fifth, the major sixth, the minor sixth — and then leaves the named intervals behind for ever. *Coniectura: the golden section is where music stops and proportion goes on alone. The ear can follow the first three rungs and no further; the eye can follow all of them. This is the exact place where my two sisters part company, and I have marked it here so that I may find it again.*

3. DE NAVE MEDIA

Of the middle of the ship — proportion in the built thing

The same six ratios govern everything I have measured in this city: the bay of a cloister, the rise of a stair, the sail of a boat, the neck of a lute. Not because the builders read Vitruvius — most cannot read — but because a wrong proportion is felt as a discomfort long before it is named, and the trade throws it out within a generation.

RES	MENSURAE	RATIO
Cloister bay, S. Ambrogio	4.2 : 2.8	3:2
Stair, tread to rise	300 : 170	7:4
Lute, body to neck	470 : 315	3:2
Sail of a river boat	5.6 : 4.2	4:3
Door of a house	2.10 : 1.05	2:1

Coniectura: the trade is a slow ear. It cannot hear a bad proportion in an afternoon, as a musician hears a bad fifth, but it hears it in fifty years and pulls the building down. Taste is therefore nothing but tuning carried out by a crowd over a long time, and a fashion is a temperament — a distribution of error that everyone has agreed to stop noticing.

4. TABULA PROPORTIONUM

The body, the room and the interval that governs both

MENSURA	PARS	RATIO	VOX
Statura <i>height</i>	1	1:1	unison
Umbilicus <i>navel</i>	0.618	8:5	minor sixth
Bracchium <i>arm</i>	1/2	2:1	octave
Pes <i>foot</i>	1/6	6:1	2 oct. + fifth
Facies <i>face</i>	1/10	10:1	3 oct. + third
Caput <i>head</i>	1/8	8:1	3 octaves
Palma <i>hand</i>	1/9	9:1	3 oct. + tone

Of seven measures, six fall upon named consonances and only the navel upon an irrational division — that same division the geometers call the mean and extreme ratio. *Coniectura: the golden section is the one interval the ear cannot name and the eye will not stop looking at. I suspect they are the same faculty, disagreeing.*

5. AULA SONORA

The sounding hall — a room built on 6 : 4 : 3

Let the length be six, the width four and the height three. Then length to width is the fifth, width to height the fourth, and length to height the octave. Such a room does not favour one note above its neighbours, for its three dimensions do not repeat each other's echoes; and the singer at the focus is heard at the door without shouting.

AULA	LONGA	LATA	ALTA
Camera <i>chamber</i>	7.0 m	4.7	3.5
Sala <i>salon</i>	14.0	9.3	7.0
Aula <i>hall</i>	21.0	14.0	10.5
Templum <i>church</i>	42.0	28.0	21.0

Every hall is the same hall, doubled; and doubling a room lowers its voice by an octave as it lowers a pipe's. *The church is therefore the bass of the chamber.*

6. DE MORA SONORUM

Of the lingering of sound in a room, and how long it should linger

Clap once in an empty church and the sound is answered for four beats of the andante thread; in a hung and crowded chamber, for less than one. The lingering is bought with the size of the room and sold by the softness of what stands in it. Too much and the voices tread upon their own tails; too little and the singer feels himself alone and pushes.

LOCUS	VOLUMEN	MORA	USUS
Camera nuda	115 m³	1.1 s	lute alone
Camera aulaeis	115	0.6	speech, cards
Sala	910	1.5	consort of six
Aula magna	3090	2.2	dancing, brass
Templum	24700	4.6	plainsong only

Hence the church may sing but not speak, and the chant which moves slowly and holds few notes at once was made for it — not by choice of the composer but by the shape of the stone. *Coniectura: the room writes the music. Give me the dimensions of any hall and I will tell you what kind of piece will be beautiful in it, and no other kind will be attempted there twice.*

7. CONCLUSIO

The conclusion, in the master's own hand and unfinished

Six leaves and one argument. The string taught me the ratios; the weight taught me that the ratios hide a root; the machines taught me that a ratio can be cut in brass and will hold; the heavens taught me that a ratio may be true and silent; the air taught me that the ratio travels and the matter stays; and the body taught me that I am built of the same six numbers I have been counting.

What remains is the thing I cannot reach. I can say why a fifth is sweet. I cannot say why sweetness should be anything at all — why a coincidence of returns, which is a fact about number, should arrive in a man as pleasure, which is a fact about him. Between the ratio and the delight there is a gap, and every page of this codex stops at its edge. *Coniectura: perhaps the gap is where we live, and the two arts I have practised are the two attempts to cross it — painting from the side of the eye, music from the side of time. I have crossed neither. I have only surveyed the banks, and it has taken me — Here the sentence ends. The remainder of the leaf is blank but for a small drawing of a whirlpool in the lower corner, and the word ancora — still, or again — written four times in the mirror hand.*

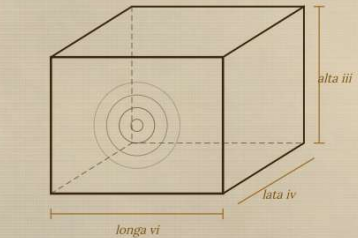


Fig. 2. The hall of 6 : 4 : 3 seen in perspective, with the singer at the focus and his rings drawn about him.

AD MARGINEM

In the margin, at the foot of the last leaf

Music is the sister of painting. *He wrote elsewhere that she is the younger sister, because she dies as soon as she is born. On this leaf he strikes out minore — younger — and does not replace it.*

EXPLICIT

The copyist closes the codex

Here the six folios end. Of the machines, two were built and one survives in an inventory; of the numbers, all may be tried by any man with a board, a gut and a stone on a string. The rest is the master thinking aloud, and I have not corrected it, for a corrected thought is a dead one.

He asks six questions and answers three. The three he answers are those a board and a weight can settle; the three he leaves are the heavens, the speed of light, and the speaking machine — and he leaves them in the same tone, as a man leaves a door open behind him. *I have bound the leaves in the order he numbered them and not in the order he wrote them, which no one now can know.*

MODULI

The module of the column, and the rooms it governs

LOCUS	MODULI	RATIO
Column, diameter	1	—
Intercolumn	2¼	9:4
Nave, width	12	—
Nave, length	18	3:2
Height to cornice	16	4:3
Dome, spring	24	2:1

One measure taken from the column rules the whole church, as one string ruled the whole canon. He who changes the column and not the room has made a false chord in stone.

MATERIA TEMPLI

Stone and wood, and how each returns a voice

MATERIA	ICTUS	VOX
Marble, polished	7	bright, long
Marble, rough	4	soft
Brick, plastered	5	even
Oak panelling	2	warm, short
Cloth, hung	1	dead
Water, in font	—	a ring

A church of marble sings for seven beats and speaks for none; hang cloth in the aisles and the preacher is understood but the choir is poor. The builder must choose whom he serves.

COLOPHON

Copied at Milan and completed at Amboise. Six leaves, one hand, two inks. Number is the only ornament that does not fade.