

CRIFST- Oct. 2016

*

Science & Barockgeist

Gheorghe M. Ștefan

<http://arh.pub.ro/gstefan/>

Abstract:

Is there a significant relation between the science and philosophy of Descartes, Newton and Leibnitz and the art of Bernini, Vermeer and Bach? Between the killing of Bruno, by a dogmatic church, and the killing of Bach, by an unqualified surgeon, we are witnessing the unfolding process of the partial disenchantment of the European mentality. Despite an apparent diversity, the baroque period is characterized by the profound unity of the process of transition from magic to rationality. Bruno dreamed without fear and without hope the fusion of magic, religion and science, while Bach “has practiced mathematics without knowing it”. Thus, the Baroque takes place between a cultural impossibility and a scientific promise. The Barockgeist of art has unleashed in science the ineffable spirit of plenitude, which is characteristic for the initial, innocent phase of the rational approach.

Emergence of Baroque

The result of the **clash**, triggered by the 95 Theses nailed by Martin Luther in 1517 to the door of *All Saint's Church* in Wittenberg, **between:**

- **Renaissance** by its:
 - Humanism (ex.: Copernican revolution, ...)
 - Technology (ex.: perspective, printing, war machines, ...)
 - Esoteric approaches: Gnostic, Magic, Alchemic, Hermetic, Cabalistic ... traditions (ex.: Florentine Academy)
- the scared & dogmatic **Catholicism**
- the reluctantly revolutionary **Protestantism**

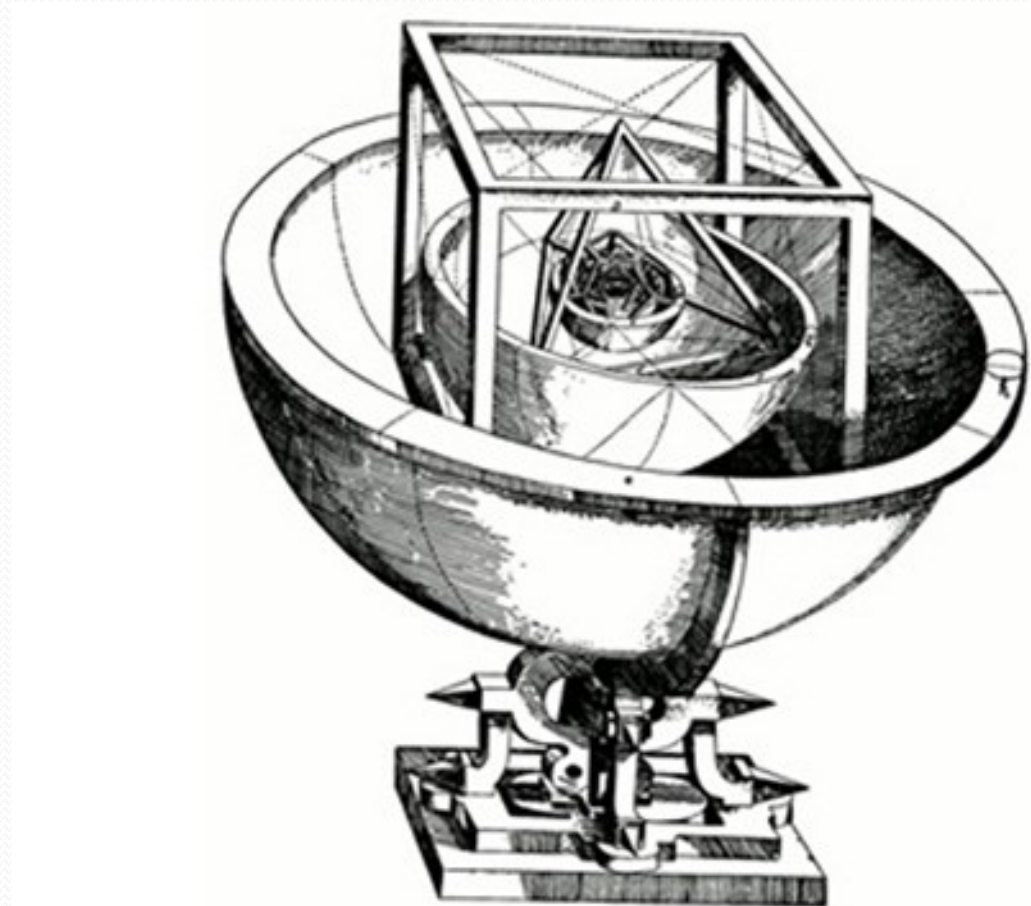
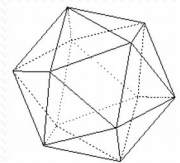
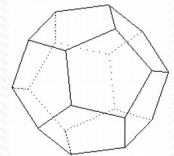
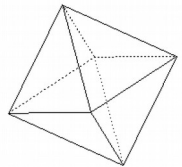
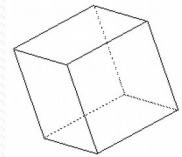
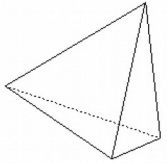
Philosophy

- Rene Descartes (1596-1650): restart; dualism (*rex extensa* - *rex cogitans*) as *distinction* will become a *disjunction* in Enlightenment
 - Mathematic form of philosophy
 - Science is the true wisdom
 - Deep **unity** of truth => fundamental truth & logic = science
- Baruch Spinoza (1632-1677): deep **unity** of neutral monism (*rex extensa* & *rex cogitans* are **derivatives**)
- Leibnitz (1646-1716): law of continuity, pre-established harmony and **plenitude** (secretary to the Nuremberg alchemical society; academy of Berlin created on his advice)

Science

- **Start:** Francis Bacon (1561-1626):
New Atlantis portrays a land ruled by Rosicrucians;
- **In between:**
 - **from** *methodical speculation* (Kepler),
 - **through** *empirical confirmation* (Brahe, Galileo),
 - **to** *formal codification* (Newton).
- **End:** John Locke (1632-1704): mind is *tabula rasa* filled up by *experience* derived by perception

Johannes Kepler (1571-1630)



Math & Computing (1)

- 1624: Henry Briggs (1561-1630) – *Arithmetica Logarithmic*
- Gottfried Wilhelm von Leibnitz:
 - *Disertatio de arte combinatoria* (1666)
 - *Nova Methodus pro Maximis et Minimis* (1684)
- Isaac Newton: *Method of Fluxions* (1671 – 1736)

Math & Computing (2)

- 1623-24: Wilhelm Schickard; in two letters to Kepler “*arithmeticum organum*” or *Rechenuhr* (calculating clock))
- 1642: Blaise Pascal; Pascaline; “Pascal’s wager”; his religious writings are rigorous because of his scientific training
- 1672: Gottfried Wilhelm von Leibniz (**stepped reckoner** (sequential computing machine); binary representation; importance of mathematical method for logic and philosophy; integrative reason

El Greco

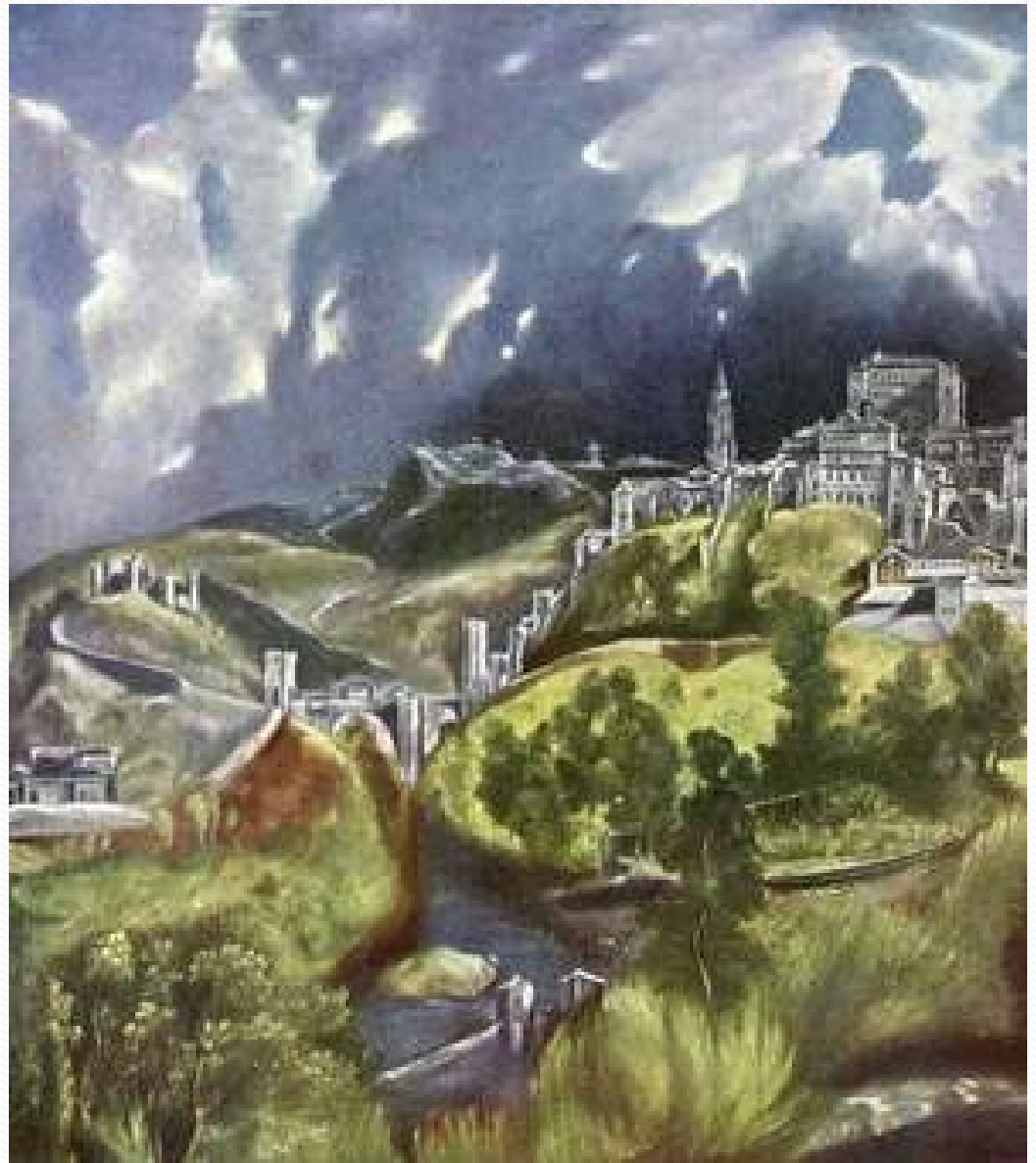
1541-1614

~1600

Dynamic & integrative image,
spatial complexity, artificiality,
affectation

instead of

classically proportioned
images, calm balance, and
spatial clarity of Renaissance



Caravaggio

1571-1610

1601

Robust material actions

Dramatic expressiveness

Nature faithfully copied,
without idealization



Lorenzo Bernini 1598-1680

1651

Baconian attention to the natural expression, starting from an autobiographical description



Rembrandt van Rijn 1606-1669

1661

The art of describing
the inner life



Jules Hardouin Mansard

1646–1708

~1678

Decorative
continuity
at any price.

Wholeness
dominates
details



Johannes Vermeer

Delft (1632-75):

The master of the
***detailed
wholeness***



Johann Sebastian Bach

1685-1750

The seeking of systemic completeness

At the global level:

The Well Tempered Clavier (1722)
2 x 24 pairs of prelude-fugue from C
(Do) major to B (Si) minor

At the local level:

Example: the same motif scattered all over the possible “space”

Prelude in C from *The Well Tempered Clavier*, Book One

Andante

J. S. Bach

The musical score for the Prelude in C from *The Well-Tempered Clavier*, Book One by J.S. Bach. The score is in C major, 4/4 time, and is marked Andante. It consists of 24 measures. The first system (measures 1-4) shows the right hand playing a sequence of eighth notes (C4-D4-E4-F4-G4-A4-B4) and the left hand playing a sequence of eighth notes (C3-B2-A2-G2-F2-E2-D2). The second system (measures 5-8) shows the right hand playing a sequence of eighth notes (B4-A4-G4-F4-E4-D4-C4) and the left hand playing a sequence of eighth notes (C3-B2-A2-G2-F2-E2-D2). The third system (measures 9-12) shows the right hand playing a sequence of eighth notes (B4-A4-G4-F4-E4-D4-C4) and the left hand playing a sequence of eighth notes (C3-B2-A2-G2-F2-E2-D2). The fourth system (measures 13-16) shows the right hand playing a sequence of eighth notes (B4-A4-G4-F4-E4-D4-C4) and the left hand playing a sequence of eighth notes (C3-B2-A2-G2-F2-E2-D2). The fifth system (measures 17-20) shows the right hand playing a sequence of eighth notes (B4-A4-G4-F4-E4-D4-C4) and the left hand playing a sequence of eighth notes (C3-B2-A2-G2-F2-E2-D2). The sixth system (measures 21-24) shows the right hand playing a sequence of eighth notes (B4-A4-G4-F4-E4-D4-C4) and the left hand playing a sequence of eighth notes (C3-B2-A2-G2-F2-E2-D2). The score includes fingerings (1-5) and dynamics (p, mf, mp) and is marked with 'Ped. simile'.

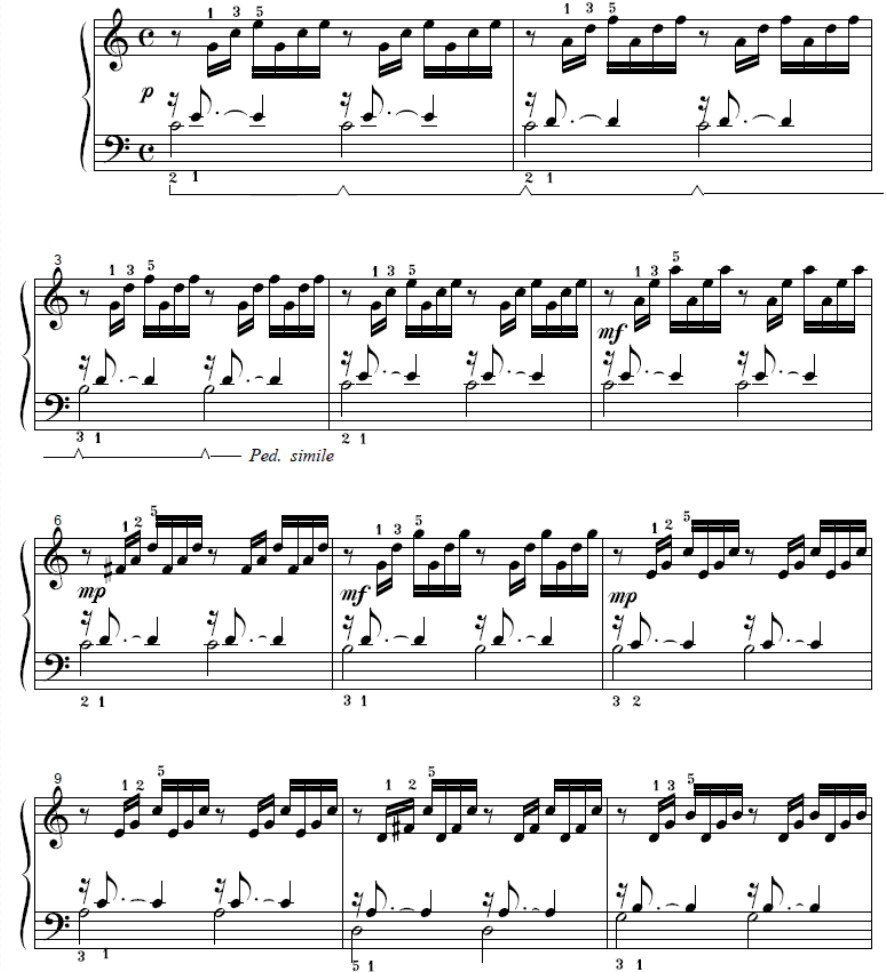


Prelude in C

from *The Well Tempered Clavier*, Book One

Andante

J. S. Bach



After Baroque

Mozart & da Ponte in Don Giovanni:

- quantity without quality
- profane without sacred
- liberty without responsibility

Distinctions □ Dissociations

Integrative reason □ disintegrative reductionism

Conclusion

The BAROQUE enfolds between:

- a cultural impossibility
- a scientific promise.

The Barockgeist of art triggered in science the ineffable spirit of **wholeness**, which is characteristic for the **initial**, innocent steps of the **rational approach**.

Euler's identity: $e^{i\pi}+1=0$

the “baroque” unity of numbers and operations

Five foundational numbers:

0, 1,

π , e,

i

The main operations:

add,

multiplication,

exponentiation



Thank you

Questions & possible answers