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Overlapping Textualities:
From Literary Machine to Binary-born Texts

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The Poetic Machines of Monsignor Juan Caramuel y Lobkowitz ¹

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ABSTRACT – Monsignor Juan Caramuel, *doctor universalis*, built ingenious and multifaceted poetic machines not only to automate literary creation but also to multiply it. He called such poetic machines *Labyrinths*, “metric schemes” or even *Ideae*. These machines are the compositions that close the Apollos and the Muses of *Metametricala* (1663), a rhetorical treatise dedicated to a homonymous science. To whose invention he attributes himself. In this article, we analyze the functioning of these poetic machines and their place in the history of baroque ideas.

KEYWORDS – affection; baroque; caramuel; machine; oblique; poetry.

Non recta, sed obliqua videre
Caramuel 1663, 113

1. INTRODUCTION

Trained in medieval scholasticism, Juan Caramuel y Lobkowitz (1606-1682) was a Renaissance man on account of all the sciences he worked on and, at the same time, was a baroque individual because of the way he approached these sciences. A great writer with a multifaceted intelligence who also spoke several languages, Juan Caramuel created in mathematics the first description of binary arithmetic, most likely inspired by Nahuatl (Mexican) numerals ². Leibniz arrogated credit for this achievement 30 years later, appealing

¹ Part of this investigation is found in our book: *Anamorfosis e Isomorfismo. De la retórica oblicua a la recta lengua universal en Juan Caramuel y Lobkowitz* (2018).

² Caramuel classifies arithmetics into linear or straight (such as Roman arithmetic that can only represent up to one hundred thousand) and circular (such as the decimal and the Nahuatl, which are recurrent). For this reason, Caramuel considers that all recurrent

to Chinese numerals. Caramuel also invented cologarithms and set the basis for a game theory that could calculate, unlike Huygens and Pascal, not only the probabilities of winning a game, but also the mathematical, legal, and theological legitimacy of each of the many plays that comprise the equity of opportunities in a single game (1670)³. In physics, the Madrilenian discovered the constant isochronous quality of the pendulum movement, and, just as Newton did later, considered that the falling of heavy objects was related to the round Earth and was not an *impetus* in things. In astronomy, he made detailed observations about the round moon (1643) and proposed a particular celestial system that was not oblique, but rectilinear (1639)⁴. In music, and following his teacher Friar Pedro de Ureña, Caramuel defended the division of the octave into 12 equal parts, thus creating the *temperamento equabili* (1645)⁵, before it was generalized by Bach. In Philosophy, the Madrilenian denied, as did Spinoza, the existence of beings of reason (*entia rationis*), and reduced them to mere beings of language (*entia linguae*) (1670, 1680). He was also opposed to the mechanism and the metaphysics of Descartes, in *Animadversiones in meditationes cartesianas* (1972), and was one of the first western thinkers to use the word Ontosophy, which would later become Ontology. Following the precepts of his treatise *Arquitectura civil recta y obliqua* (*Straight and oblique civil architecture*) (1678, 1984), Caramuel designed, with respect to a dissonant plaza, the concave façade of the Vigevano cathedral, a real stage design of Baroque architecture⁶. In linguistics, Caramuel

arithmetics, like the natural languages, are isomorphic between each other, and they can all be reduced to a single one, binary arithmetic: “Stat secundò, *Has omnes Arithmeticas esse analogas*: nam sicut omens linguae analogicè in suo fluxu conveniunt, sic etiam, aut certè strictiùs Arithmeticae inter se conveniunt” [After establishing, secondly, that all these *Arithmetics are analogous*; then, just like all languages match analogically in their development or, more strictly, in reality, so the Arithmetics match each other] (1670, 66).

³ In game theory, it is possible to say that different combinatorics in a game are also isomorphic (equipossibilities).

⁴ In astronomia rectininea (rectilinear astronomy), “with more audacity and wit [...] each Globe or Planetary Star, just like a Cannonball, is fired in a straight line and with its rectilinear movement saves all types of observations” (1984, I, 28). Thus, in astronomy, curved and rectilinear world systems are also isomorphic (hypothesis equivalence).

⁵ When music is accompanied by arithmetic, enharmonic, that *differentiola insensibilis* music that is composed with *logarithmi Enharmonici* in base 2 is isomorphic.

⁶ Caramuel distinguishes between straight and oblique architecture: “an Architect can build straight oblique, and also build oblique straight; do it wrong, and make many mistakes in straight Architecture; and do it right and without them exercise the Oblique”

invented a metaphysical dialect (1681) and began the search for an accurate and straight *Characteristica universalis*, that is, he tried to rectify the obliquity of all natural languages into a single universal writing, whose problem to be solved was the following: with which words, with what syntax, in which oblique natural language (particular) does the natural right reason (universal) speak?

In addition to the above, and to a long list of intellectual and practical production, Juan Caramuel, *doctor universalis*, created ingenious poetic machines. He did not create these machines to automate literary creation, but to multiply it and with it enrich or embellish divine creation. He called these machines *Labyrinths* or metric diagrams. These multiform poetic compositions are the peculiar projections of machines that are closed by the Apollos and Muses of *Metametrics*, a poetic science independent of the Rhythmic and the Poetic and that surpasses traditional Metrics. Caramuel himself takes credit for the invention of this poetic science: “Artem hanc, quam veteres mufae non docent, quam nefcit antiquus Parnaffus, ultra Pamaffum, & Scientia Metricam reperi, & ideo Metametrica vocari volui” [This metric art, unknown to the ancient muses, unknown to Parnassus, and that goes beyond him, and which I have found through science, I wish to name, for this reason, Metametrics] (1663, 4). If Caramuel is capable of composing a hundred Latin verses in one hour, a thousand in one day, it is because he works with meticulous poetic machines in motion, “qui ex plano & obliquo compositus sunt” (1663, 1).

2. *LABYRINTH MACHINES*

What is the poetizing machine that the bold Caramuel calls a “multiform labyrinth”? to Covarrubias, labyrinthine poems are “a manner of composing verses [...] when different parts take senses that fit together” (1977, 511). According to Gracián in his *Agudeza y arte de Ingenio (Acuity and Art of*

(1984, II, 94). He considers himself the inventor of oblique architecture, which already existed naturally in the creation: “the first Architect, that casted oblique lines in Heaven and Earth, was God. Because in Heaven the two Tropics, and the Arctic and Antarctic Circles, being parallel to the Equinoctial, made the Sun, with its annual movement, describe the Ecliptic, which is a circle that obliquely cuts the Equinoctial into the Zodiac [...]. Ordered the Mountains to be obliquely grown and erected; and the rivers and streams to obliquely run through its valleys” (1984, II, 95).

Wit) (1648), anagrams and palindromes are labyrinths as well since “the artifice of Spanish labyrinths consists of this transmutation or reversal of words. Read the retrograde name with intensified significance” (2001, II, 50). The *Diccionario de Autoridades* (*Dictionary of Authorities*) defines it as: “a certain genre of verses or dictions ordered and regulated with such disposition that they can be read in many ways, and whichever part that is read, finds its way to the copla, always with consonance, moral, and perfect sense. Made of different figures, depending on the whim of the composer” (1734, 342). In all the previous authorized definitions, the labyrinthine poem is closely linked to the letter (characters) and word game. These are *oblique signs* that, owing to the permutation of their elements, can produce *straight sense*, which was present in the poem only in a virtual way. What characterizes *Labyrinth* machines is the transmutation of the *sense*, combinatorics based on the permutation of *signs*, since the *sense* is what arises from the variation of formal elements. This is even if the permutation just as it advances, also retreats, and as it rises, also declines. In a very general way, we can call a poetic machine a poetic labyrinth whose productions or senses are, in principle, in a virtual *complicatio obliqua* of formal elements. Thus, these are *signs* or gears that need a current *explotatio recta*. The machine operates thanks to the acuity of the reader.

Labyrinth machines are a series of visual poems that, like the wheels of thought of Ramón Llull, are peculiar devices for producing, rather than creating, poetry. Such machines possess, apart from their formal elements or gears, their own volume, since according to Caramuel we can construct poems with forms that consider their longitude, latitude, and depth. Those labyrinths are 24 plates or boards, not all his own, that combine drawings, seals, tables, musical notes, geometric shapes, straight and curved lines, astronomical figures, linguistic signs, and, of course, verses in different languages such as Latin, Greek, Spanish, German, Dutch, and Chinese. Those elements, signs, *ciphras*, or gears and their arrangement evidence the influence of several textual traditions: the *Theatre of Memory* of Giulio Camillo, the Kabbalah (with its three methods: *gematria*, which was related to the Hebrew representation of numbers with letters; *temurá*, which was related to anagrams; and *notaria*, which was related to acrostics), the *carmina figurata*, the *Cryptographia* (or “art of writing in *ciphra*”)⁷, the four figures of thought from *Ars brevis* of

⁷ Caramuel wrote a stenography inspired by that of Johannes Trithemius; of course this art has a long medieval tradition. The influence of Trithemius on the work of Caramuel can also be observed in the “Quadrature of the steganographic circle” (1984, I, 131).

Llull. Llull was an author that Caramuel admired since the springtime of his youth and who had great influence on the combinatorial doctrine in the 17th century⁸ – Caramuel also considered that combinatorics, like chance, not only had a formal character, but also a gnoseological one –. Nevertheless, unlike many Renaissance thinkers, Caramuel's combinatorics is about production, not about hidden and transcendental, kabbalistic and metaphysical sense. It is about sense, although religious – since most labyrinths have a religious theme –, concrete, clear, and immanent: liberated from any esoteric shadow, Caramuel's *Labyrinths* are playful machines that produce, through the combinatorics of its constituent elements (the *signs of the poetic machine*), a concrete linguistic *sense*. The linguistic machine is immanent.

3. MACHINE COMPOSITIONS

What is important in those machinic compositions is what their author calls the *Idea* – a concept also important in *Arquitectura civil recta y obliqua* –, a word that is also always capitalized, but not out of pomposity. There is a reminiscence of the thought of Bruno Bruno⁹ and Llull in the word *Idea*, but with a fundamental difference. Unlike Bruno and Llull, to Caramuel the *Idea* is a concrete linguistic diagram, rather than an abstract universal, *sigillus sigillorum* or *clavis universalis*. The *Idea* is, without exaggeration, the soul, the *virtus* or dynamic engine of the poetic machine, whose elements, once combined, produce a particular number of linguistic singularities called poems (*carmina*). In other words, the *Idea* is an operative function and not, as in Plato, an abstract element fallen from the hyperuranion. Therefore, the labyrinth paradigm, the driving *Idea*, is just as important as its concrete materiality, the *carmina*. The Madrilenian even asserts that the singular things of the disordered world are but concrete and ordered poems from the totality of the Being that God has disposed through an absolute combinatorics: “Hence Homer, according to Demetrius, calls Nature itself a *Poem* [*carmen*]” (2007, 32). The world's globe is a machine inside another machine

⁸ Doctrine used, as well as in *Art of Memory*, in the *Characteristica universalis* project.

⁹ In *De umbris idearum* (1582), Bruno proposes concentric wheels as part of a mnemonic process.

whose celestial mechanics – straight (*Astronomia recta*: Caramuel) or oblique (*Astronomia sphaerica*: Ptolemy, Copernicus, Tycho Brahe, Kepler's elliptical, and *Astronomia oscillatoria*: Descartes) – has to be properly moderated and interpreted. The singular oblique objects are elements of the diverse world whose combinatorics results in the straight universal harmony: “in the same way as in anagrams different words result from the different combinations and coordination of letters, in this way, from the perfections of the first Being, arranged once in a way and again in a different way, results the perfection of all beings that are contemplated in the world” (2008, 222). Politics, music, astronomy, and all sciences are but great machines whose elements (gears and cogs of their machines) considered singularly, that is, as isolated signs and points of view, can appear to be unordered, confusing, contradictory, discordant, and oblique. However, when they are considered as a dynamic set, that is, as a single *total perspective*, they are but the universal music of *carmina*'s great chorus that constitutes the straight harmony of the world: *omnis in unum*. Indeed, opposite things placed next to each other, through the distribution of disparities, disagreements, and dissonances, and considering them in their own separate associative chain, are revealed as complementary accords. They do so like the gears of an entire clock: *considentia oppositorum*, an expression that in the 17th century is understood somewhat differently than in the Middle Ages, since the *considentia oppositorum* does not simply oppose two contradictory terms, but reconciles the tumultuous multiplicity of the whole in the jealous unit of the one. Best described by Descartes: “We should not examine a creature on its own, but all creatures together; because the same thing that could appear to be greatly imperfect being alone in the world, does not cease to be perfect as a part of the universe” (1921, 97).

In any case, if Caramuel states that “*Idea Metrica differt à Carmine, sicut vniversale à singulari*” (1663, 4), he does not mean that the *Idea* is a universal abstract separated from the world, like Plato's Archetype or Idea. In other words, for Caramuel the *Idea* does not have a transcendental value but an operative function, namely, mechanical and, although universal, immanent to its constituent elements – in fact, it seems that to the Madrilenian the transcendental and universal simply equals everything that surpasses the particular, but not as an abstraction, that is, the generality, the paradigm –. The baroque machine is never abstract, but rather concrete, overly concrete. Thus, the art of poetizing, like the art of thinking, is nothing other than uninterruptedly, and from a lesser to a greater order, moving from one singularity to another singularity, from one real being to another, from one concept to

another, and from one verse to another. This occurs without going through the purely abstract universal of the *transcendental sense*, since “In Concreto enim semper includitur Abstractum” [the Abstract is always included in the Concrete] (2000, 56). Ideas are the *universalia in re*. The concrete element and the individual paradigmatic *Idea* carry in them, just like a real microcosm, the universal in action. Great part of the thought of the 17th century, specially this one, is akin to the idea of singularity as an element that, differentiating itself, stands out within the uniform and immanent order of things, and not just as a simple opposite to the abstract and transcendental universal. Just as the word *rose* is a paradigm of all the names included in the first Latin declination and a particular case of the first declination, so the metric *Idea* is the paradigm of all the poems that are virtually contained in it and a particular or actual case of the paradigm (the Metric *Idea*). Caramuel maintained that it was necessary to end the “scholastic idolatry” of the *Idea* that considers that the paradigm precedes the beings and particular cases, and he bravely confronts that “idolatry” even in his poetic work. For that reason, he studies both the particular or oblique grammar, characteristic of the post-Edenic (or post-Babylonian) languages, and the speculative or straight grammar, as a common logic structure of all natural languages – the same can be said about all sciences, which can be classified as practical or oblique and as straight or theoretical –. Thus, Caramuel shows a strong tendency to search for a thought that is objective, concrete, paradigmatic, and operative, machinic, and not a purely abstract or ideal universal.

In any case, flat or with volume, cubical or spherical, in the machines of the multiform *Labyrinths* it is important not to confuse the *Idea* with the *carmina*, or a paradigm with an abstract universal: “Qui enim ideam cum exemplo confundit, a metametricae Palatio multum abeft. Idea projecto inuenta, facillimum est diagrammata multiplicare: at ideam novam invenire” [For who confuses the idea with the example is very far from the door of metametrics; certainly, once the *Idea* has been invented, it is very easy to multiply the diagrams] (1663, 8). Finding the *Idea* is the task of *Metametrics*, which is a science because it is related to geometry, arithmetic, and calculus – Rhythmics and Metric should evidently be studied independently, since two verses with a different number of syllables could be read in the same amount of time. If we focus on the number of short and long syllables, then the rhythms correspond, like in Arithmetic, to the discrete quantity; meters correspond, like in Geometry, to the continuous quantity. Furthermore, metric and rhythmics should study the *vox* (pure sonic form) or *sign* independently from the *dictio*

(sonic form plus meaning) or sense; since meters and rhythms are accidents of the voice, and do not need dictions to be formed –.

How can we calculate the exact number of combinations or permutations, that is, the number of *carmina* virtually contained in a metric *Idea* of each labyrinth machine? Caramuel turns to combinatorics: “a unique element is not susceptible to combinations. Therefore, it can only be obtained in one way: A. If we add another one to it, there are two possibilities: it either comes first or it is postponed, with which the number of combinations is two: BA/AB. If a third element is added, or it is put before the first one, or between the first and second one, or after the second one. Consequently, three combinations would be obtained. Nevertheless, because the order of elements can be reversed, the result is six: CBA/CAB; BCA/ACB; BAC/ABC” (2007, 151) ¹⁰. There more elements the metric *Idea* (the scheme, diagram, or structure of the machine) has, the more copious will be the number of poems, *carmina*, that the labyrinth can produce through the permutation of those elements, just as in the four wheels of the *Ars brevis* of Ramon Llull ¹¹. The elements of the *labyrinth* are at the mercy of the calculation of permutations, of their change of *situs*: “If all the elements are different, the number of possible combinations will be high. Equality decreases the possibility of combination, whereas difference increases it” (2007, 153). In this way, “Caramuel unites his combinatorial theory with his metric theory, providing not only the existing meters, rhythms, and poems, but also the possible ones” (Paraiso 2007, 12). He does this without falling into what he calls the scholastic idolatry of the *Idea*.

The audacious writer challenges his acute readers to calculate the number of volumes that would be filled if all the poems (*carmina*) virtually contained within his few multiform labyrinths were updated; even to calculate the size and cost of the library that would hold those volumes. The *carmina* of one of his labyrinths (*Coelum Liliveldense*, plate XVI) alone could produce the exuberant quantity of 2,000 million verses (Caramuel 1663, 60-66); plate XVII could produce 9,644 trillion verses. That is one copious and overflowing baroque library, just like the library implicit in Leibniz’s short work

¹⁰ And adds: “The rule will be the following: Multiply the immediately precedent combinations by the number of elements one is looking to combine, and the number of wanted combinations will be obtained” (2007, 151).

¹¹ Llull’s *Ars brevis* pretended to be, rather than a universal language, a method for machining and automating universal thought.

De l'horizon de la doctrine humaine – Leibniz read Caramuel's *Leptotatos* and *Mathesis Audax* – where the philosopher from Hanover calculates the (finite) number of truths, not of fact but of reason, of falsities, and of follies – not all connections of sound are possible because not all make sense – that humanity is capable of formulating before they start getting repeated. The group of differentiated letters or *signs* that produce *sense* is finite, but their combinations, including repetition, are infinite (Leibniz 1991).

Metametrics is composed of logogriffs, acrostics, anagrams, astronomical diagrams, *rebus* (images of things), palindromes, calligrams, loose syllables – which boast on the page like elements emancipated from language – and, of course, the metametric cube (1663, 57-58). *Metametrics* is summarized in *Arquitectura civil recta y obliqua* as follows: “It is a new Art. It composes several and very ingenious Labyrinths; and it can make a few dictions or lines read forward, backward, upward, downward around, & combined in different ways to be multiplied to a degree that they occupy entire Libraries” (1984, I, 24)¹². Each plate or labyrinth is a machine that can produce entire libraries.

One example of metric *Idea* is *Tabula XVI*, which we should imagine as a machine in motion, in the same way as in one of Llull's figures of thought, the “demonstrative figure”. In this case, the movement is backward and circling, rotating, since it moves in both directions and in a circular fashion¹³ (like celestial spheres, because they represent the different celestial systems, the spherical of Ptolemy, Copernicus, formerly of Pythagoras, and Tycho Brahe, and the rectilinear of Caramuel). At the center of *Tabula XVI*, we find the Earth and the cross of Christ: “Hoc signum Crucis erit in Coelo” (1663, 66) (see *Fig. 1*).

Some elements that can help to understand this labyrinth are the following: (1) the verses are being composed with the movement of the circles toward the center and away from the center: “a centro aut etiam in centro

¹² In that same work, the architectural, rather than poetic, labyrinths are defined like this: “The Labyrinths were subterranean and dark Buildings, filled with so many streets and posts, that those who entered were lost in them and could not find their way out” (1984, II, 216).

¹³ An example of a retrograde poem: “interitum id sidus radians, haud nunciat ortum Principis: / ito retro, non bona vaticinor” [This star irradiating death, does not announce the birth of a Principe: retreat! I do not foresee wealth] or [I foresee wealth. Do not retreat! the birth of a Principe announces, this star not irradiating death] (Singüenza y Góngora 1984, 58).

procurrunt”; (2) four equipollent astronomical systems are represented: on the upper left, the Aristotelian-Ptolemaic geocentric system; on the upper right, Tycho Brahe’s system, in which the sun, the moon, and the stars revolve around the Earth, whereas the five planets revolve around the sun; on the bottom left, Copernicus’s heliocentric astronomical system; on the bottom right, the rectilinear astronomical system (Caramuel 1984, I, 28).

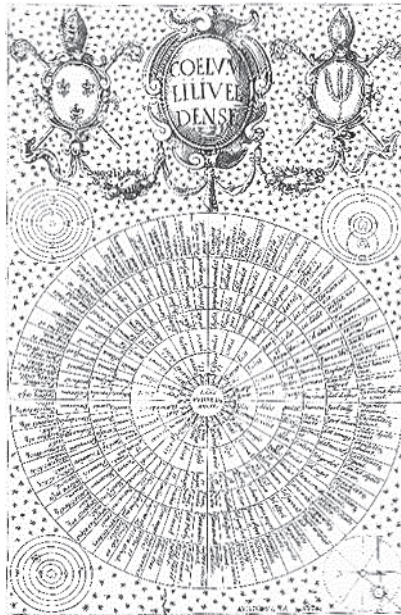


Figure 1. – “*Coelum Liliveldense*”, plate XVI (Caramuel 1663, n.p.).

For Caramuel, who never loses sight of the theoretical aspect of the scientific astronomical models, all of them are equipollent – and none of them is anything more than a theory –. However, he supported Ptolemy’s astronomical system for theological reasons, and he never stopped admiring the elegance of Copernicus’s system, the clarity of Galileo, and the coherence of Tycho Brahe, since Brahe’s model rescues or better explains astronomical phenomena.

Notwithstanding the above, not all labyrinths are complicated. Some are what Thesaurus calls grammatical hieroglyphs and Caramuel calls logogriphs: a logogriph uses figures, words, and characters to produce meaning.

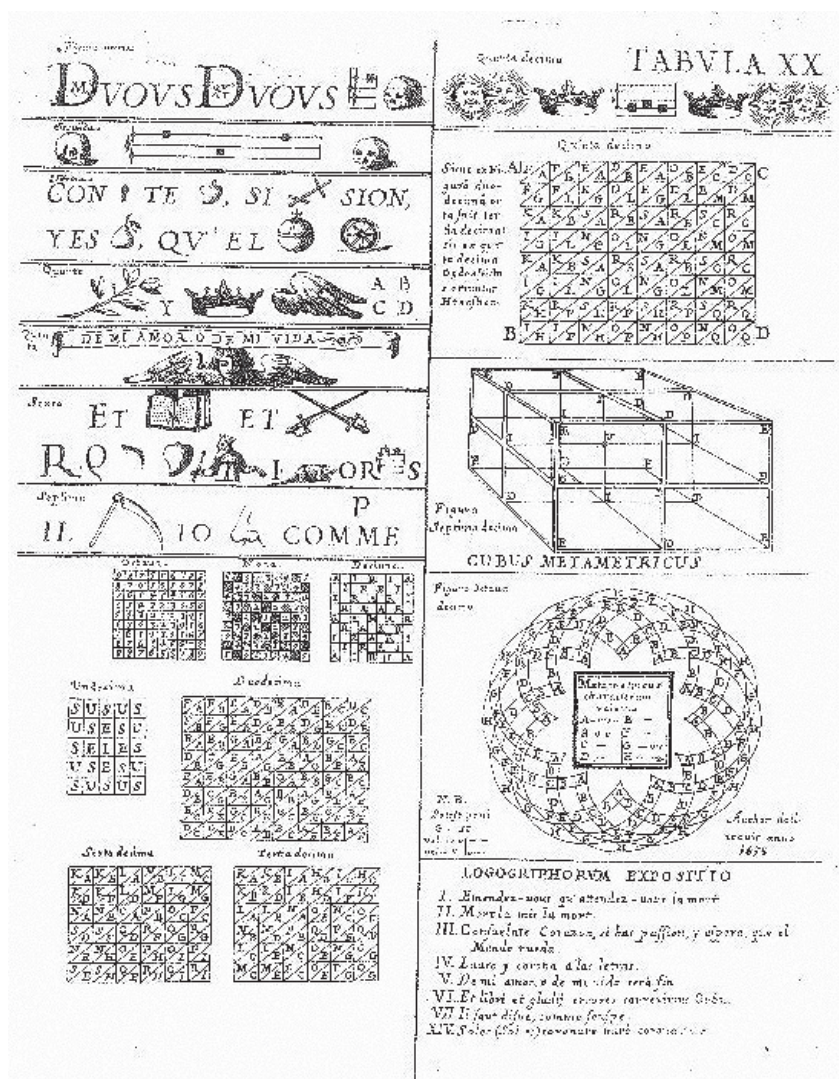


Figure 2. – Plate XX (Caramuel 1663, n.p.).

For example, Tesauro explains: “a hieroglyph of a sun, a die, a wing, and a hoe” means “Soldier wielding his sword” [un jeroglífico con un sol, un dado, una ala, y una azada: soldado a la azada] (1670, 329); the letters *con* plus the image of the sole of a shoe followed by the letters *te* plus the image of a heart mean: “console yourself heart and make passion for the world turns” [consuélate corazón y haz pasión que el mundo rueda]; the same with “il faut dîner comme supper”, etcetera (see *Fig. 2*).

In *Leptotatos*, Caramuel introduces a retrograde adistich labyrinth from which 9, 823, 275 recurrent verses and 39, 393, 100 simple verses can be obtained, which he claims to have composed in Salamanca in 1929 (2008, 45). In *Jesus Sol y Maris stella*, the names Jesus and Maria are placed in a central circle. Around that circle are several other circles that have the *qualitates* and *proprietates* of Christ and the Virgin, and which generate theological and apologetic lessons, straight and oblique, depending on the angle (point) and direction where the combinatorics begins: progressive straight or oblique, descending, ascending, retrograde, and recurrent (Caramuel 1663, 53). With that *Ave gratia plena*, the divine Caramuel celebrates the dense infinite with successive combinatorics, thus celebrating the glory of God.

4. POETIC MACHINES AND SOME CONCLUSIONS

It is important to mention a fundamental aspect regarding Caramuel's poetic machine and to generalize it to other machines of the 17th century: machines for thinking (Leibniz), automatons for singing (Descartes), and machines of affects (Spinoza). Caramuel gives the terms natural and artificial (machine) an essential characteristic that makes them entirely interesting: they do not oppose each other, because everything natural is, in a certain sense, also artificial, machined, and oblique. This is with respect to the connatural or straight. God Creator of everything is the straight; everything created by the One is the oblique, the artificial, and the machined. It is in this manner that all nature is a machine: the heaven, the world, the body, the soul, the thoughts, and the affects (inside a small machine there is always a smaller machine). Under the influence of Ramon Llull's thinking machines, the 17th century was interested in the construction of thinking machines for philosophy, which was not opposed to the natural part of the intellect, but contemplated it. With a *Caracteristica universalis* and a machine that made it work, Leibniz said: “when contro-

versies arise, there will not be a greater necessity for argument between two philosophers than there is between two calculators. It would really be enough for them to take a pen in their hand, sit at a table, and say to each other (after calling a friend, if they wish to): let us calculate” (Eco 1999, 237). Is Spinoza’s *Ethica* not a thinking machine, a machine whose driving force are the two affective tonalities or the virtues of “going from more to less” (sadness) and from “less to more” (happiness)? From those virtues emerge or are produced and are multiplied all the emotions (love, hate, hope, despair, envy, fear, etcetera), all the representations (sin, crime, marriage, betrayal, etcetera), all the societies and all their technological machines. Indeed, Spinoza’s affective machine goes beyond a mental world of representations, and attaches itself to the mere experienced eidetic connections, whose mobile coordinates are the functions of “from more to less” (sadness, that is, <, *minuere*) and “from less to more” (happiness, that is, >, *augere*). Those are the senses of what we call life. *Auget et minuit* are, ultimately, the two radical terms (or gears) of the Jewish’s non-Aristotelian *Characteristica geometrica binaria universalis* in the machine of the *Ethica ordine geometrico demonstrata*, and those primitive gears are not “logical” or “ontological” (names-substances), but mere affective connection and intensity. For this reason, the radical ontology of Spinoza cannot be called other than *Ethics*. The machine of *Omnis in unum*.

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