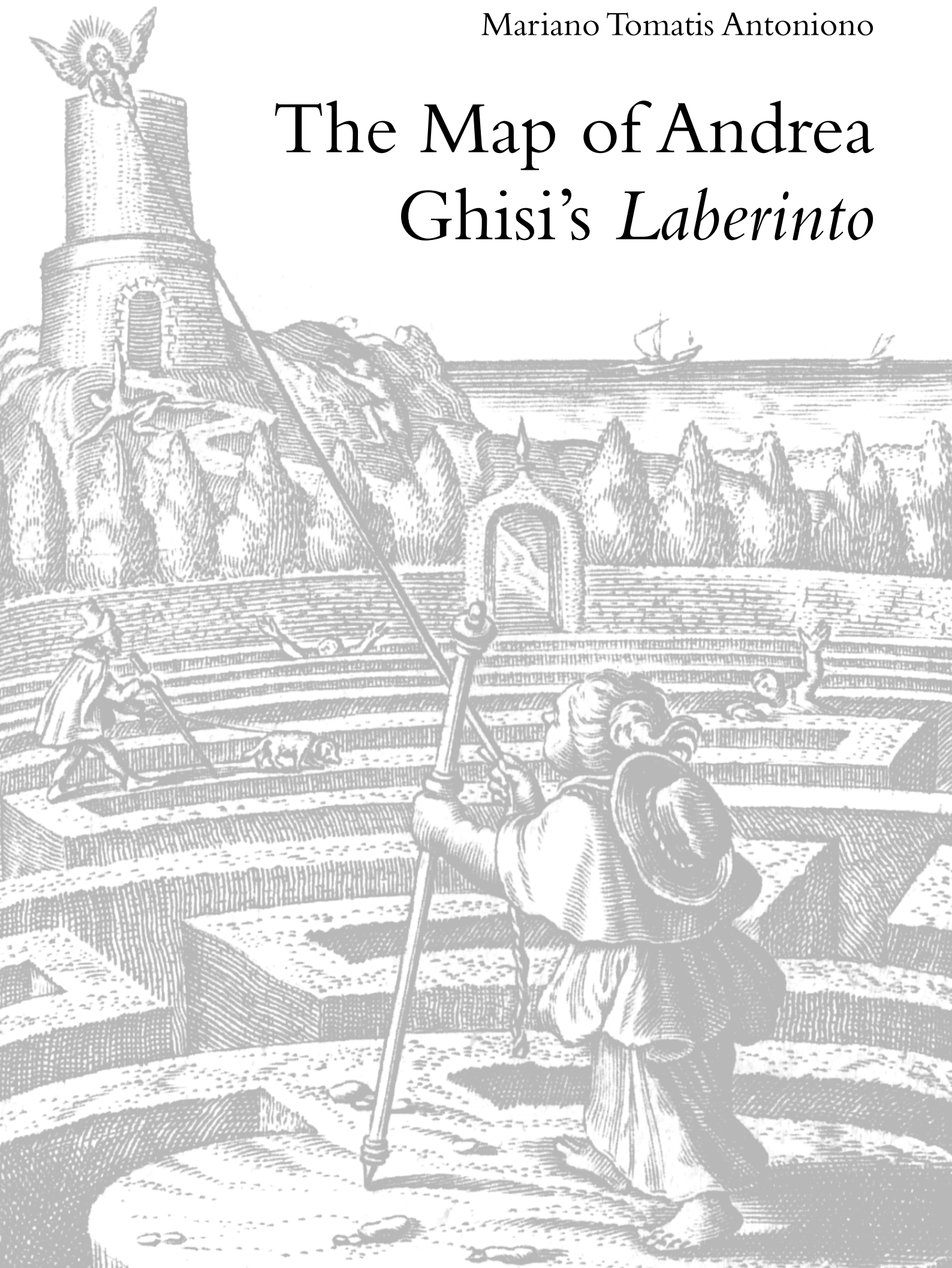


Mariano Tomatis Antoniono

The Map of Andrea Ghisi's *Laberinto*



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“...without mathematics you cannot build labyrinths.”



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MARIANO TOMATIS ANTONIONO
The Map of Andrea Ghisi's Laberinto
Turin (Italy), 2011

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Special thanks to Marcus Williamson for the help in translating this essay. Thanks also to Ferdinando Buscema, Nadya Chishty-Mujahid, Michael J. Hurst, Bill Kalush, P.G. Varola and Francesco Arlati for the kind support and the material provided.

In memory of Vanni Bossi



WITS
LABERYNTH,
OR,
THE EXERCISE OF
Idlenesse.

CONTAINING AN ARTIFICIAL TEXTVRE
OF TWO THOV SAND TWO HVNDRED AND SIXTIE

Figures, so placed and disposed, as by the helpe of a briefe Direction for that
purpose, you may tell which of them any man thinketh.

*AS ALSO BY THE SAME OBSERVATION, TO
discover any name, or number, that shall bee imagined,*

BESIDES AN AMPLE AND LARGE SVBIECT FOR THOSE THAT
affect such ingenious recreations, by the sharpnesse of their owne conceits, to drawe out
many other delightfull vanities.

FIRST COMPOSED IN ITALIAN BY ANDREA GHISI, AND NOW
Eng. fild and augmented.



AT LONDON,
Printed by Thomas Purfoot, and are to be sold at Britaine Burys
by Iohn Budge An. Dom. 1610.

Andrea Ghisi, *Wits Laberynth or, the Exercise of Idlenesse* (1610)



IN 1607 Andrea Ghisi, a Venetian nobleman, published a peculiar book entitled *Il laberinto del Signor Andrea Ghisi nel qual si contiene una tessitura di due mila ducento sessanta Figure, che aprendolo tre volte, con facilità si può saper qual figura si sia immaginata*. The book begins with a dedication to the Prince of Mantua, Francesco Gonzaga (1577-1616), where the author describes his work as an “exercise of idleness”: a recreational activity with no practical purpose, useful to recover energies and restore body and soul.

In 1610 the London publisher Thomas Purfoot printed its English translation, entitled *Wits Laberynth or, the Exercise of Idlennesse containing an artificiall texture of two thousand two hundred and sixtie figures, so placed and disposed, as by the helpe of a briefe Direction for that purpose, you may tell which of them any man thinketh*.

In 1616 the book was reprinted in Italy by the Venetian typographer Evangelista Deuchino with the new title *Laberinto dato novamente in luce dal Clarissimo Signor Andrea Ghisi, nobile veneto, nel quale si vede MCCLX figure, quali sono tutte pronte al servitio con la sua obbedienza, & corrispondenza, che parlano l’una all’altra*. This edition begins with a different dedica-

LABERINTO
DATO NOVAMENTE
IN LUCE

DAL CLARISSIMO SIGNOR

ANDREA GHISI
NOBILE VENETO.

NEL QUALE SI VEDE M. CC. LX. FIGVRE,
quali sono tutte pronte al seruizio con la sua obediencia,
& corrispondenza, che parlano l'vna all'altra;

ET CON LA TERZA VOLTA INFALLIBILMENTE,
si saprà la Figura imaginata, con il secreto di esso, da esser donato.

DEDICATO
AL SERENISSIMO PRINCIPE
DI VENETIA.

Con vna Tauola di veder con vna lettera di vn Z. che le narra, & parla à 500. mille
& più modi, come in quella, che nel principio del Libro è scolpita.

CON LICENZA DE' SUPERIORI, ET PRIVILEGIO.



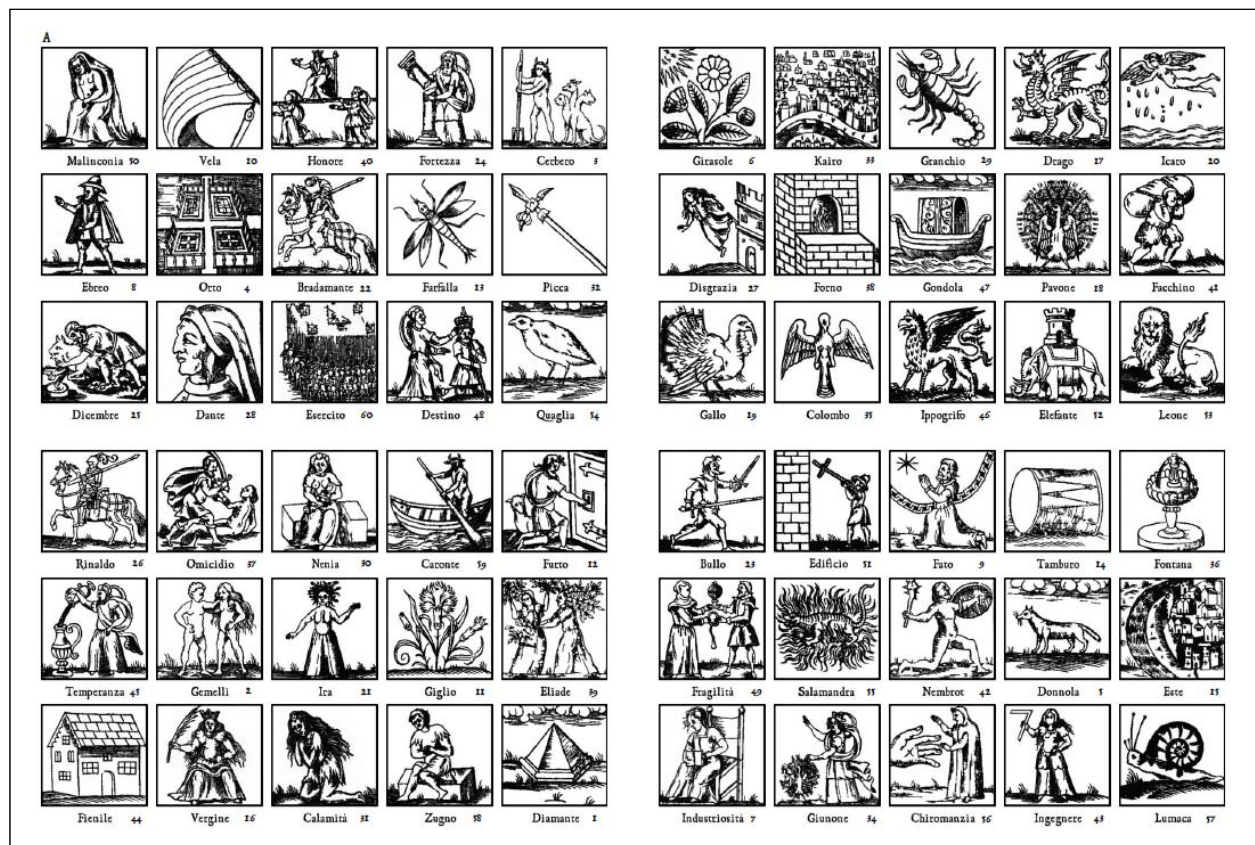
IN VENETIA, M. DC. XVI.

Per Euangelista Deuchino.

Andrea Ghisi, *Laberinto* (1616)

tion, dated June 24, 1616 and addressed to Venetian Doge (chief magistrate), Giovanni Bembo (1543–1618). In this new dedication Andrea Ghisi stresses the sophisticated structure of the book, which does not indulge in hazard, because in its pages “everything comes from intelligence”; the same argument can be used to describe Doge’s warfare, whose success is due more to the military value than to fate.

The book can be used to divine, through three questions, which figure a person thinking of, and it is composed of 21 tables, one for each letter of the Italian alphabet, each spread over two pages. Every table shows the same 60 figures, mixed in different ways and subdivided in four groups each containing 15 images.



The three editions show different figures, but they all share the principle on which the trick is based.

The analysis here is based on the English edition by Thomas Purfoot, expanded from the original, published in 1607.

Andrea Ghisi, Venetian nobleman

Not much biographical information about Andrea Ghisi is available. The title of his most famous book presents him as a Venetian nobleman.

In addition to *Laberinto*, we know that in 1620 he published in Venice, at the printing house of Alessandro de'Vecchi, *Il nobile et piacevole gioco intitolato Il passatempo, dato in luce novamente dal bidello academico conspirante; nel quale, oltre il diletto del solazzevole, & modesto giocare si contiene in lui il disegno di molti variati pezzi di figurine, le quali possono servire à qualunque virtuosa creatura, che si diletta di riccamare, tessere, cucire, & simili. Con la dichiarazione di detto gioco.*

A copy of this book is kept in the *Bodleian Library* at Oxford, and according to a note, it is very similar to *Laberinto*, but with only 52 images:

The item consists of 21 double-page openings, each with 52 woodcuts, and heading "Tavola prima[-vigesimaprima]" and number of the table. This game allows one to guess correctly a picture chosen by the player, by asking a series of questions about the position of the picture on the page, taking the player through a sequence of pages.

In an article by Carlo De Franceschi (1809–1893) there is a reference to a person named Andrea Ghisi:

Andrea Ghisi, later appointed (July 23, 1617 - September 22, 1618) mayor of [Pirano d'Istria]. (1)

Ghisi's name is also associated with the city of Pirano d'Istria in a note from a register dated December 22, 1617:

Given the serious damages caused to Andrea Ghisi - destined to become the mayor of Piran - the Uskoks and citizens of Trieste who partly plundered and threw into water his furniture, which was on its way to that city, are fined one thousand ducats. (2)

Since 1283 the town of Piran had been under Venetian control,

which is coherent with the dedication to the Doge of Venice in 1616. In the absence of other elements, however, we cannot exclude a simple case of homonymy.

Laberinto in literature

In 1633 Estêvão Rodrigues de Castro, a poet in the service of “Duke of Ghisa”, titled one of his sonnets “Soneto sopra quella impresa del *Laberinto* col moto *In silentio et spe*”. Here are some verses:

*Vive il cor mio tra silenzio et speme [...]
forte, intrepido, audace et non mai vinto,
in mezzo del horror d'un laberinto
brama assai, troppo spera et nulla teme.*

*My heart lives between silence and hope [...]
strong, fearless, bold and never beaten,
in the middle of a horrific labyrinth
desires a lot, hopes too much and is not afraid of anything.*

Although the reference is to a vague “labyrinth”, the Portuguese scholar Giacinto Manuppella considers very likely that the source of the poet was the book by Andrea Ghisi. (3)

In the eighteenth century, the book is listed in the catalogues of several libraries, including that of Victor-Marie d'Estrées (1660-1737) (4), Philipp von Stosch (1691-1757) (5), Gottfried Thomasius (1660-1746) (6) and Louis César de La Baume Le Blanc (1708-1780) (7).

In 1753 a pseudonymous author, Jonathan Puzzle, published *The Labyrinth: being an exercise for wit and humour by rational rebusses* (printed by James Hoey, Dublin) (8). The title of this book plays on that of the 1610 English edition of Ghisi's work. It presents a series of 140 word games involving the use of verbal rebus riddles, by which the clues are made up of words as syllables, combined to produce a final word as a solution.

In 1831 Andrea Ghisi's game is described briefly by Count Leopoldo Cicognara in his *Memorie spettanti alla storia della calcografia* (9), without any reference to the trick on which the book is based.

In 1857, the French scholar Paul Lacroix (1806–1884) published an article dedicated to playing cards (10), citing the English edition of *Laberinto* and saying that some of its 60 images come from the Mantegna Tarot, with the exception of 5 figures which have been replaced for alphabetical reasons. In the same period, Andrea Ghisi's book and its relationship with Italian Tarots are at the core of a curious controversy between Lacroix and a Parisian scholar, Romain Merlin (1793–1876), about the origin of playing cards (11).

In 1911 Robert M. Burch and William Gamble cite the 1616 edition of the book, not for its content, but for a peculiar physical characteristic: its woodcuts are all in red colour. (12)

In 1946 the English edition of the book is quoted in an article by Frank Percy Wilson (1889–1963) about Dante Alighieri's portraits in English literature. Wilson's interest is focused on Dante's silhouette that appears between the 60 pictures in the book. In a paragraph entitled "Wits Laberynth (1610)" the scholar briefly describes the game, without going into details of the structure on which it is based,

...which it would be tedious and impertinent to relate. (13)

In an article about sixteenth-century engravings, Jochen Becker uses the Dutch adjective "willekeurig" (random) to describe the arrangement of the images in *Laberinto*. At the same time, the scholar admits that the game offers no freedom to the player; the path through the tables is guided and unique:

It is a game that does not allow any control, whose players can act only as a puppet. (14)

In a recent academic talk (15), the Egyptian scholar Nadya Chishty-

Mujahid categorically denies the esoteric value of the work, but also its connection with playing cards:

I must clarify that in essence, Laberinto appears to have absolutely nothing to do with either divination, with which the Tarot has gradually become associated over the years, or even with basic card-play.

At the same time, the scholar is pessimistic about the possibility of finding an order behind the grid of images offered by Andrea Ghisi:

However, in spite of all the effort that obviously went into the creation of Laberinto, the deep and perhaps exciting mystery that this pictorial maze presents is unfortunately tinged with the frustration that arises from the complete absence of any fixed or set rules by means of which this game might be played.

In 2006, in an article dedicated to *book tests* (16), Max Maven credits Vanni Bossi as the one who introduced Andrea Ghisi's book to the magical community. Questioned on the subject, Bossi writes on May 28, 2008:

I worked for several years on Ghisi's Laberinto, which this year will be published in facsimile accompanied by an essay, more or less in the style of the already published works on Galasso and Cardano. A lengthy commentary on it is also present in my study of Italian magic that was almost ready for publication at the end of 1999, when I had to stop because of my wife's illness and subsequent death. I only recently started to work on this project with new additions. I think it will be ready for publication next year. (17)

Unfortunately Vanni Bossi died in December 2008, taking with him his research into the secrets of *Laberinto*.

Rebuilding *Laberinto*

It is not easy to take the baton to complete Vanni's work: the notes he left behind are bulky and can not be accessed quickly; the heirs are meticulously sorting them, but the notes on the book by Andrea Ghisi

have not been found yet.

If I want to rebuild *Laberinto* I have to start the work from the beginning, but I have to face a series of obstacles. Vanni Bossi was able to work on a Xerox copy of the English edition, inaccessible to me. I feel like William of Baskerville, who in “The Name of the Rose” is forced to reconstruct the structure of a labyrinthine library, without being able to enter it.

On October 14, 2009 Michael J. Hurst provided a good theoretical description of *Laberinto* in a web forum dedicated to Tarots and their history (18):

It's a trivial parlor trick, a 3-step guessing game. [...] The method for determining which figure was selected took three steps. In the first step, the person identified which of four groups, the four groups of 15, his subject was in. This instantly eliminated 3/4 of the possibilities. (If there had been only 4 subjects, this would have been the end the selection process.) Each of the four groups leads to one of four secondary pages, where the person again identified which of the four groups on that page his subject was in. This is where the arrangement becomes important - because of the arrangement of the pictures on the secondary pages, this eliminated 3/4 of the remaining possibilities. The arrangements were meaningless but crucial, sub-dividing the initial groups so the selection process conveyed far more information than it seems. (If there had been only 16 subjects, this second selection would have ended the elimination process and identified the subject.) This same process takes place a third time. (If there are only 64 subjects - and there were in fact only 60 - this ends the selection process.) The selected array on this third turn is the answer array.

The idea of identifying an object through a series of questions can be found in a 1478 manuscript by Luca Pacioli, where the method is used with 16 stones (19). Hurst clearly describes the core principle of the game, allowing the creation *ex novo* of a book like *Laberinto*, but since it does not offer a specific and complete map of the book, it cannot be u-

sed to create a facsimile.

In May 2010 I met Bill Kalush, founder of the *Conjuring Arts Research Center*, who told me that a PDF version of the 1610 edition is available in the database of *Ask Alexander*.

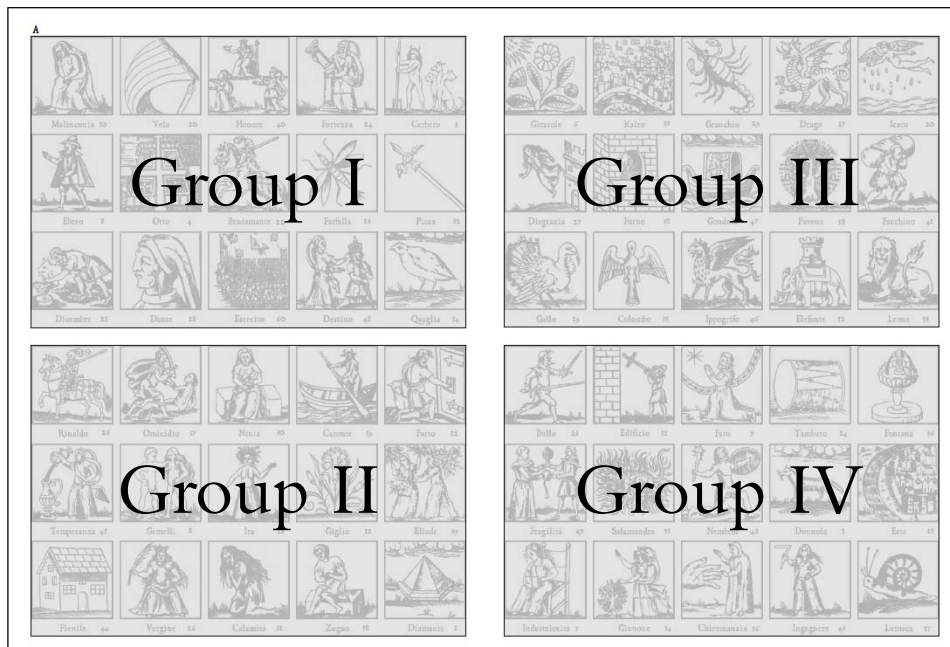
Some months later, Herzog August Bibliothek published on its website a PDF version of the 1616 edition. The material is enough for a complete analysis of *Laberinto*.

The creation of the facsimile is made up of several stages. Each figure was first scanned and digitally restored to remove dirt and distortions due to the poor condition of the pages. With 1260 woodcuts arranged, following the same structure as the original book, the risk of making an error is very high. So, I involve my computer by making it “walk” through all 60 possible paths, starting from each figure. The “electronic check” locates all my errors and allows me to correct them. The most difficult stage of the work is the recognition of all the 240 small numbers appearing on four tables. Many of them cannot be read, and I feel like I am playing a giant game of Sudoku: at first I have to discover the logic used to assign each number to the figures, the relationship between numbers in different tables and finally prepare a second “electronic check” to verify the correct working of all the possible choices. The holes are progressively filled, and after some hours the grid is complete. Following the transcription of the numbers next to the 240 figures, I proceeded to a second check to rule out any errors. I decide to correct two inaccuracies in the original text, already reported in the 1610 edition of the book: the transposition of the last two images in table Z and the wrong transcription of two numbers in table M.

When the facsimile is ready, I can start to map its structure: *Laberinto* shows a fascinating layout, chaotic and redundant for almost 70% of its images; the islands of order are few but crucial. As a protoexample of hypertext, here is how to use it to read minds.

How to divine a figure

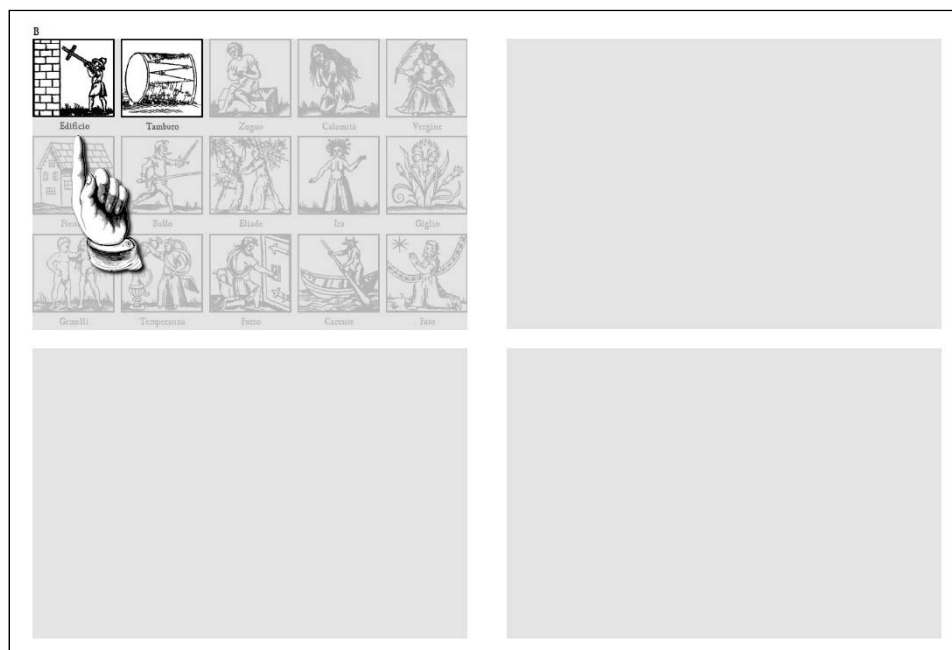
Ask someone to choose one of the 60 images displayed in table A and to tell you in which group it appears:



Look at the first image of the group chosen: the first letter of its name will tell you which is the next table. If *Tamburo* (Drum) is chosen, you'll be told that the image is in the group IV, whose first figure is the *Bullo* (Fencer):



Open the book at table B (the first letter of the word *Bullo*), and ask to find the original image and tell you in which group it appears:



As before, the first letter of the first image of the indicated group will tell you which is the next table. In the previous example, *Tamburo* is in group I, which begins with the *Edificio* (Architect).

Open the book at table E and ask for the group in which the chosen image can be found last:



In the example you will be directed to group IV. Look at the first figure in the indicated group: it starts with letter D (*Dante*). Starting from the first image, spell silently the letter A, then move on the second spelling B, going on until you reach D: the figure you are on is the one which has been thought.

Keep in mind that the alphabet to be used is the Italian one: A, B, C, D, E, F, G, H, I, K, L, M, N, O, P, Q, R, S, T, V, Z.

Iconographic structure of *Laberinto*

The book owes its title to the path you need to follow through its tables, which should not be read one after another in a sequential manner: each page can lead to different tables, each time offering four bifurcations, and it is the choice of the initial figure which determines the route to take, through what appears to be a complicated maze. Observed on the surface, the structure of the book by Andrea Ghisi is so chaotic that it seems to defy any attempt to draw a map. The 1260 images (that wrongly become 2260 in the title of 1607 and 1610 editions) appear to be randomly arranged but some believe that their order hides a deep esoteric symbolism, known only to initiates. Adam McLean, for example, confesses his inability to reveal the mechanisms of the book, suspecting the presence of a hermetic message hidden between its winding paths:

Whether this work has any hermetic import I am unable to say, as I have not been able to solve its enigmatic structure. The use of the Tarocchi of Mantegna derived emblems may have little significance, since the first edition used another set of images. However, the fact that the work was published in this form in 1616, during the explosion of hermetic and alchemical publications, is very suggestive that some hermetic riddle is woven into its strange structure. (20)

In fact, the structure that unfolds through the 1260 images can be

reconstructed with relative ease, based on the assumption that each of the 60 figures is reached through a single path: analysing all of them, it is possible to discover the method used by Ghisi to shape its labyrinth. Since three tables are enough to divine any image, each path can be described with the 3 letters identifying them. In order to divine *Tamburo* we started from table A, we moved to table B and finally to table E, where the figure appeared in the group IV; therefore the path leading to *Tamburo* can be identified by the sequence ABE⁴.

Since the game starts from table A, all paths will start with the letter A. And since the four groups of table A start with *Bullo*, *Girasole*, *Malinconia* and *Rinaldo*, the second letter of each path will be one of the following: B, G, M, R.

By analysing separately tables B, G, M and R we can identify an interesting rule: the peculiar arrangement of the images prevents any path from returning to a previously visited table. On the contrary, all paths lead to a table in a following position in the alphabet. Therefore the 21 tables can be divided in three groups, according to the position occupied in the 60 paths:

Tables in position 1	A
Tables in position 2	B,G,M,R
Tables in position 3	C,D,E,F,H,I,K,L,N,O,P,Q,S,T,V,Z

Sorting all the 60 paths into alphabetical sequence, the result shows a certain degree of order.

Each of the tables in position 2 leads to one of the four tables following in the alphabet: table B leads to tables C, D, E and F, table G leads to tables H, I, K and L, and so on.

Chiromanzia ABC ¹	Elefante AGH ¹	Vela AMN ¹	Omicidio ARS ¹
Lumaca ABC ²	Leone AGH ²	Fortezza AMN ²	Nenia ARS ²
Ingegnere ABC ³	Ippogrifo AGH ³	Malinconia AMN ³	Rinaldo ARS ³
Donnola ABD ¹	Icaro AGI ¹	Honore AMN ⁴	Caronte ARS ⁴
Industriosità ABD ²	Forno AGI ²	Cerbero AMO ¹	Furto ART ¹
Este ABD ³	Disgrazia AGI ³	Orto AMO ²	Gemelli ART ²
Giunone ABD ⁴	Gondola AGI ⁴	Ebreo AMO ³	Temperanza ART ³
Bullo ABE ¹	Girasole AGK ¹	Farfalla AMO ⁴	Giglio ART ⁴
Fato ABE ²	Granchio AGK ²	Bradamante AMP ¹	Ira ARV ¹
Edificio ABE ³	Kairo AGK ³	Dicembre AMP ²	Fienile ARV ²
Tamburo ABE ⁴	Drago AGK ⁴	Picca AMP ³	Eliade ARV ³
Fontana ABF ¹	Pavone AGL ¹	Dante AMP ⁴	Vergine ARV ⁴
Salamandra ABF ²	Gallo AGL ²	Destino AMQ ¹	Calamità ARZ ¹
Fragilità ABF ³	Facchino AGL ³	Esercito AMQ ²	Diamante ARZ ²
Nembrot ABF ⁴	Colombo AGL ⁴	Quaglia AMQ ³	Zugno ARZ ³

All the paths end on one of the 16 tables in position 3, and given the fact that each table is made up of four groups, in theory we could put $16 \times 4 = 64$ figures; since the figures involved are only 60, there are a total of 4 groups which are not at the end of a path. Andrea Ghisi chose to distribute the 4 empty groups with an admirable sense of symmetry, choosing the fourth group of tables C, H, Q and Z.

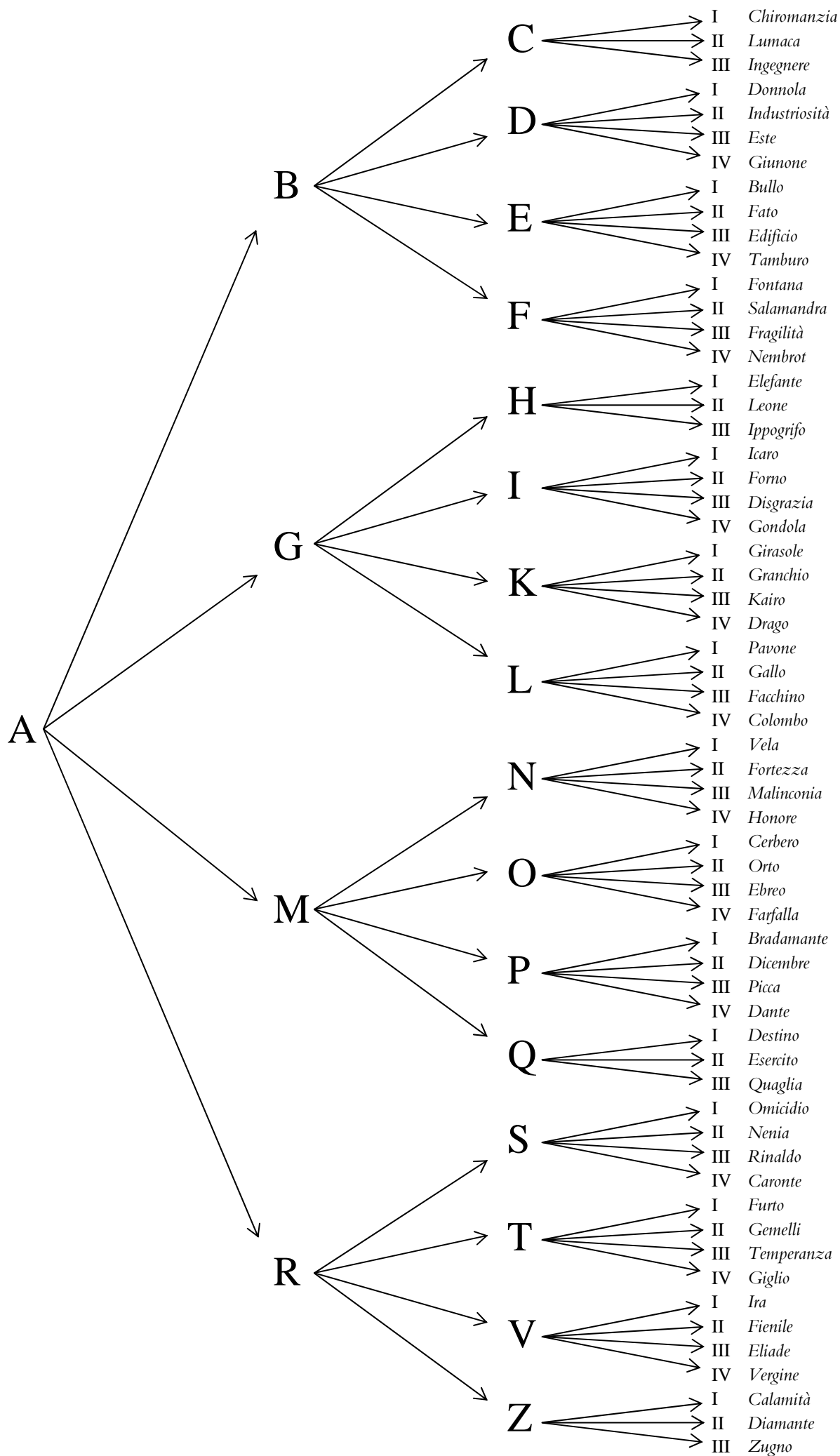
To better appreciate the hidden order behind Laberinto, you can find at the top of the next page a graphical map of its structure as a series of Chinese boxes. As if it were a file, each table is marked with a label in the upper left corner, and is divided into four groups. Table A presents four grey sub-tables, each of which contains four sub-sub-tables inside. These contain the names of 4 figures. The map allows you to foresee, at a glance, the path leading to each figure: *Salamandra*, for example, is in group IV of table A, in group III of table B with a grey background, and

A	
M	
N	
Vela	Malinconia
Fortezza	Honore
O	
Cerbero	Ebreo
Orto	Farfalla
P	
Bradamante	Picca
Dicembre	Dante
Q	
Destino	Quaglia
Esercito	
G	
K	
Girasole	Kairo
Granchio	Drago
I	
Icaro	Disgrazia
Forno	Gondola
L	
Pavone	Facchino
Gallo	Colombo
H	
Elefante	Ippogrifo
Leone	
R	
S	
Omicidio	Rinaldo
Nenia	Caronte
T	
Furto	Temperanza
Gemelli	Giglio
V	
Ira	Eliade
Fienile	Vergine
Z	
Calamità	Zugno
Diamante	
B	
E	
Bullo	Edificio
Fato	Tamburo
F	
Fontana	Fragilità
Salamandra	Nembrot
D	
Donnola	Este
Industriosità	Giunone
C	
Chiromanzia	Ingegnere
Lumaca	

finally in group II of table F. Therefore the path towards *Salamandra* can be expressed as ABF². If you check it with the actual book, the map allows you to foresee all the groups and tables along the path starting from any other figure. Another way to picture a map of the paths leading to the 60 images is the one on the next page. The graph makes it easier to understand its structure.

On the graph, a Roman numeral next to each figure identifies the group in the final table. The graph makes clear the hidden symmetry of Ghisi's work: the fourth group is missing from table C (the first from above) and from table Z (the first from below), but also from table H (the fifth from above) and from Q (the fifth from below).

Once we have identified all 60 paths, it is easy to see that the vast majority of images that appear in *Laberinto* are reproduced for the simple

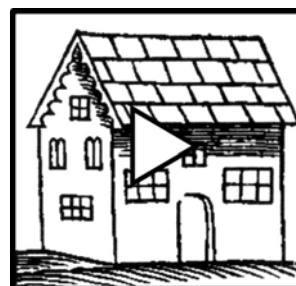


purpose of misdirection: if, as we have seen, the path that leads to *Salamandra* is ABF^2 , the *Salamandra* which appears in table C will never be considered during the game, because it is out of the route from table A, across table B until table F, and the same can be said of all other *Salamandra* that appear in tables that differ from A, B and F. The only necessary images are those that meet one or more of the following two criteria:

- they are on a table whose letter is on its corresponding path;
- they open a group in a table in position 2 or 3, except for groups IV of tables C, H, Q and Z.

To clarify the structure of the book, on the following pages I removed from the game all the unnecessary figures and marked the remaining depending on the role played by each:

- in order to allow the choice of any image, all images are necessary in table A;
- in tables A, B, G, M, R, some figures have a black triangle (see *Girazole* on the right): these are images that constitute the “pointer” to the following table of the path;
- in the remaining tables, figures with the white triangle (see *Fienile* on the right) constitute an “internal pointer”, the first letter indicating how far the target image is, the latter having a grey background (see *Bullo* on the right).



The 244 necessary images are:

- 60 in table A: they serve as starting figures;
- 15 in table B, 17 in table G, 16 in table M and 16 in table R: in each, 4 are pointers towards a third table, marked with a black triangle.
- 8 in each remaining table (4 internal pointers with a white triangle, 4 targets with gray

background), except for tables C, H, Q and Z, each with only 6 necessary images (3 with a triangle and 3 targets).

This is the distribution of necessary images:

Since *Laberinto* contains overall 1260 images, more than 1000 of them

A	B	C	D	E	F	G	H	I	K	L	M	N	O	P	Q	R	S	T	V	Z
60	15	6	8	8	8	17	6	8	8	8	16	8	8	8	6	16	8	8	8	6

serve only as filler, and their random arrangement made the analysis of the game very difficult for whomever was trying to find a unique total order.

Analysing the extended version of the book, which also allows the user to divine a number, we'll see that the number of necessary images increases to 394, because tables M, S and Z will play a key role. This is the distribution of necessary images for the extended version:

A	B	C	D	E	F	G	H	I	K	L	M	N	O	P	Q	R	S	T	V	Z
60	15	6	8	8	8	17	6	8	8	8	60	8	8	8	6	16	60	8	8	60



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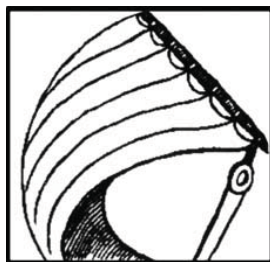


AT LONDON,
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by Iohn Budge An. Dom. 1610.

A



Malinconia



Vela



Honore



Fortezza



Cerbero



Ebreo



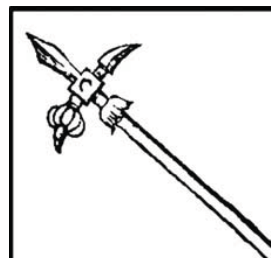
Orto



Bradamante



Farfalla



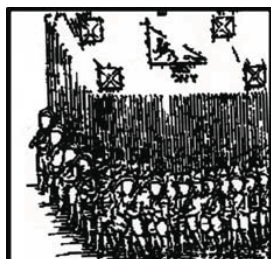
Picca



Dicembre



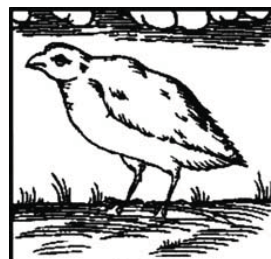
Dante



Esercito



Destino



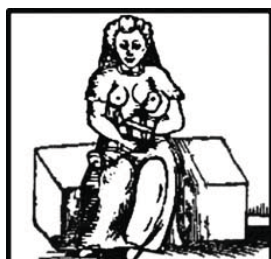
Quaglia



Rinaldo



Omicidio



Nenia



Caronte



Furto



Temperanza



Gemelli



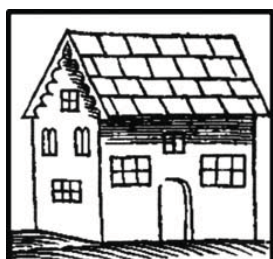
Ira



Giglio



Eliade



Fienile



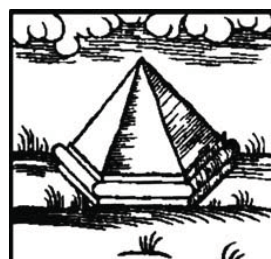
Vergine



Calamità



Zugno



Diamante



Girasole



Kairo



Granchio



Drago



Icaro



Disgrazia



Forno



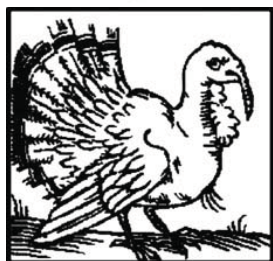
Gondola



Pavone



Facchino



Gallo



Colombo



Ippogrifo



Elefante



Leone



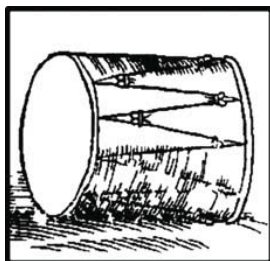
Bullo



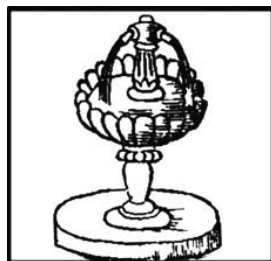
Edificio



Fato



Tamburo



Fontana



Fragilità



Salamandra



Nembrot



Donnola



Este



Industriosità



Giunone



Chiromanzia



Ingegnere

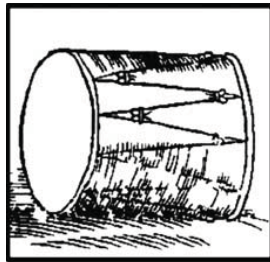


Lumaca

B



Edificio



Tamburo



Bullo



Fato



Donnola



Este



Industriosità



Giunone



Fontana



Nembrot



Salamandra



Fragilità



Chiromanzia



Ingegnere



Lumaca

C



Este



Chiromanzia



Facchino



Lumaca





Nenia



Ingegnere



D



Chiromanzia



Donnola



Elefante



Industriosità





Fienile

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Este

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Dicembre

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Giunone

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E



Este



Bullo



Facchino



Fato





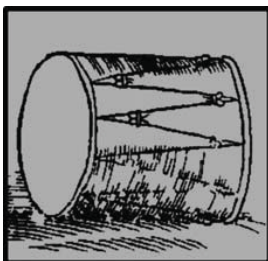
Gemelli



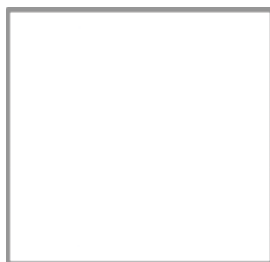
Edificio



Dante



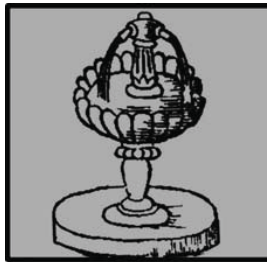
Tamburo



F



Donnola



Fontana



Gallo



Salamandra





Eliade



Fragilità



Honore



Nembrot



G



Kairo



Drago



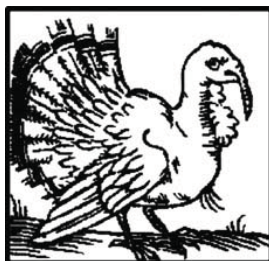
Granchio



Girasole



Lumaca



Gallo



Colombo



Pavone



Facchino





Icaro



Forno



Gondola



Disgrazia



Honore



Ippogrifo



Leone

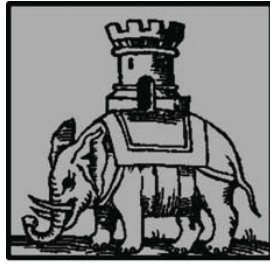


Elefante

H



Caronte



Elefante



Disgrazia



Leone

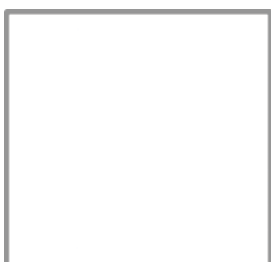




Este



Ippogrifo



I



Facchino



Icaro



Donnola



Forno





Giglio



Disgrazia



Honore



Gondola



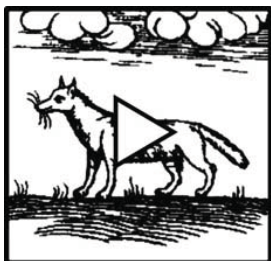
K



Forno



Girasole



Donnola



Granchio





Gemelli



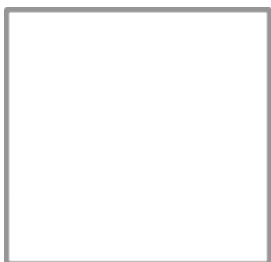
Kairo



Cerbero



Drago



L



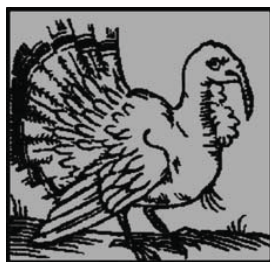
Eliade



Pavone



Granchio



Gallo





Diamante



Facchino



Fortezza



Colombo

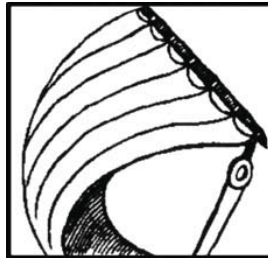
M



Nenia



Fortezza



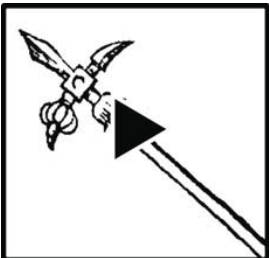
Vela



Malinconia



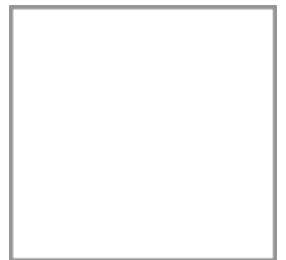
Honore



Picca



Dante



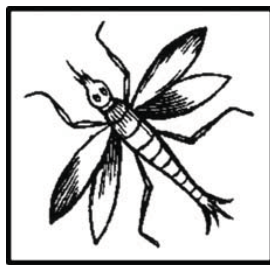
Bradamante



Dicembre



Orto



Farfalla



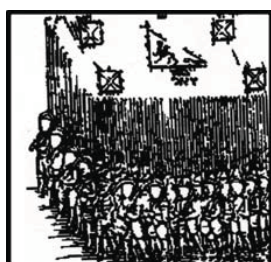
Cerbero



Ebreo



Quaglia



Esercito



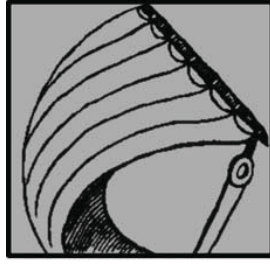
Destino



N



Drago



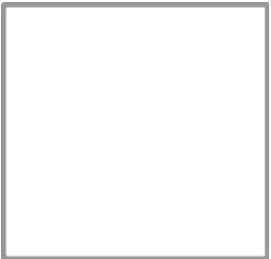
Vela

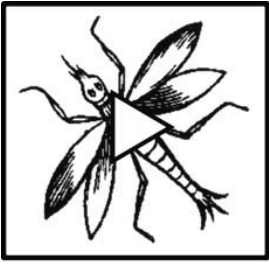


Giunone



Fortezza





Farfalla



Malinconia



Caronte



Honore



O



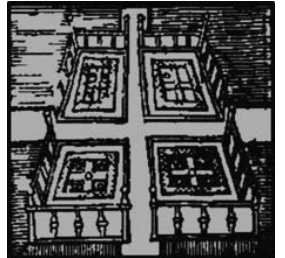
Bradamante



Cerbero



Eliade



Orto

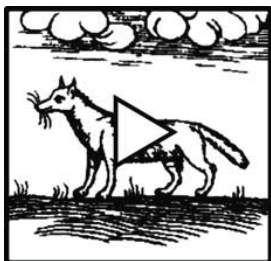




Gondola



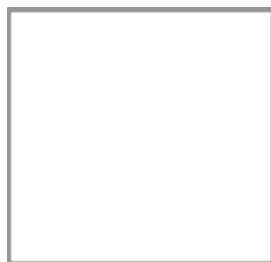
Ebreo



Donnola



Farfalla



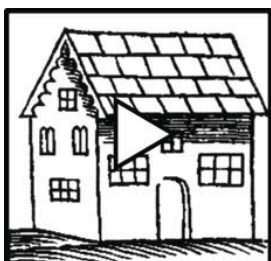
P



Destino



Bradamante



Fienile

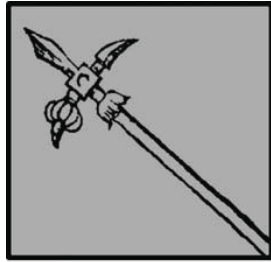


Dicembre





Colombo



Picca



Este



Dante



Q



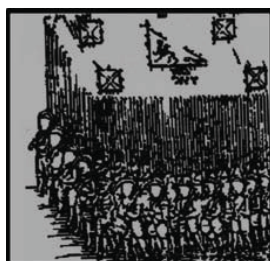
Granchio



Destino



Bullo



Esercito





Furto

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Quaglia

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--	--	--	--	--

R



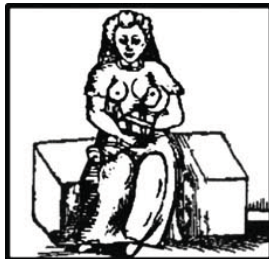
Salamandra



Omicidio



Rinaldo



Nenia



Caronte



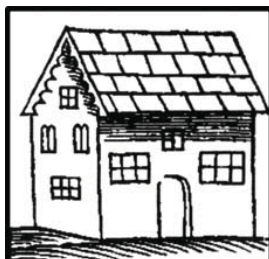
Vergine



Ira



Eliade



Fienile





Temperanza



Furto



Gemelli



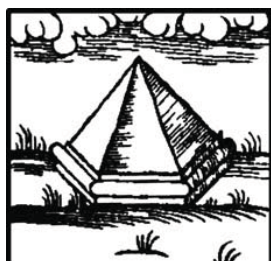
Giglio



Zugno



Calamità



Diamante



S



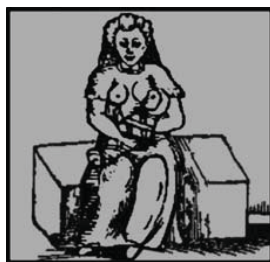
Fienile



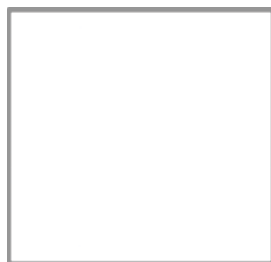
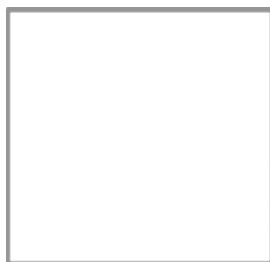
Omicidio

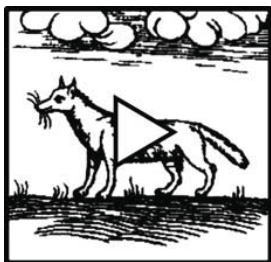


Gallo

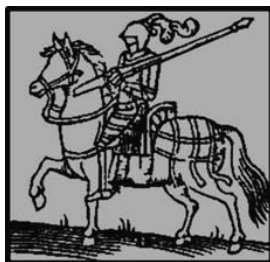


Nenia





Donnola



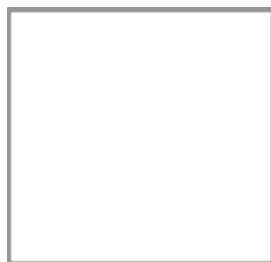
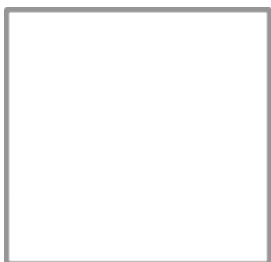
Rinaldo



Ebreo



Caronte



T



Calamità



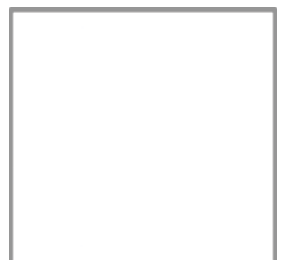
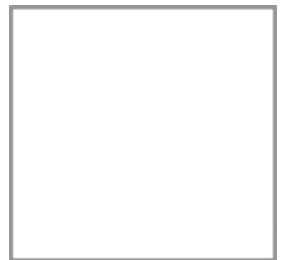
Furto



Esercito



Gemelli





Donnola



Temperanza



Fortezza



Giglio



V



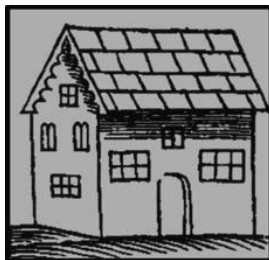
Bullo



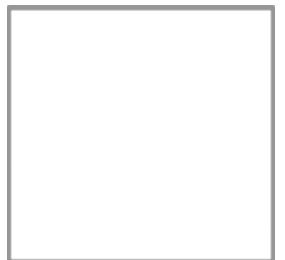
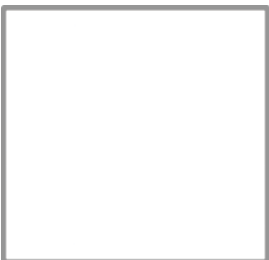
Ira



Icaro



Fienile





Giunone



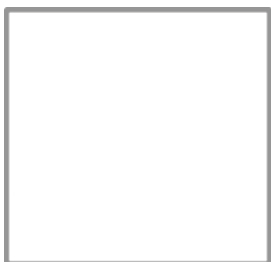
Eliade



Destino



Vergine



Z



Chiromanzia



Calamità



Elefante



Diamante

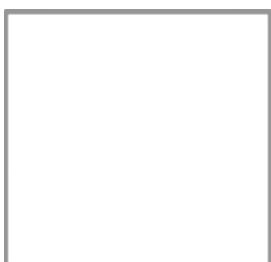
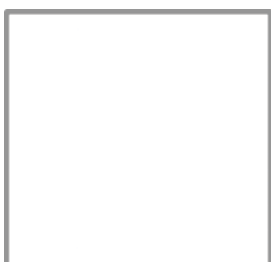
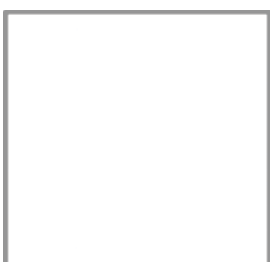




Ira



Zugno



How to divine a number

Tables A, M, S and Z show some numbers below each image: they allow you to perform a second mind reading trick and constitute the English extension of the Italian edition. Ask someone to think of a number between 1 and 60 and look for the corresponding image in table A. Browse the book to table M and invite him/her to find the same figure, bearing in mind the corresponding number, which will be different from the first. Open the book at table D and ask him to look up the number found in table M, keeping in mind the figure which corresponds to it; it will be different from the image in the table A. Finally, ask him/her to find the figure in the Z table, and tell you its number. By simply subtracting 6 from it, you'll discover the number initially thought of.

Citing the example provided by Andrea Ghisi himself, suppose that number 40 is thought of. It appears under *Honore*. The same figure in table M corresponds to number 52. Look up the number in table S and you will find it under *Fortezza*. The same image corresponds, in table Z, to number 46. By subtracting 6, you get 40, the number thought of.

The numerical structure of *Laberinto*

The route to guess the number is deliberately convoluted in order to confuse the player, but we can unravel it to recognize three simple steps. In table A, the numbers from 1 to 60 are listed, each corresponding to a different figure. In table M each figure shows a higher number of 12 units compared to table A. So *Diamante*, bearing number 1 in table A, in table M corresponds to number 13 ($= 1 + 12$). This applies to all figures, up to *Esercito*, which corresponds to 60 in table A and 72 in table M. Therefore table M shows all numbers from 13 to 72.

Once a number N is thought of, finding its corresponding image in table M is the same as performing the operation $N + 12$.

If someone thinks of the number 1, at first he see that it corresponds to *Diamante*, then he looks up the same image in table M and here the new number below *Diamante* is 13.

Here is the list of the numbers corresponding to each image in tables A and M:

	A	M		A	M		A	M
Diamante	1	13	Ira	21	33	Facchino	41	53
Gemelli	2	14	Bradamante	22	34	Nembrot	42	54
Cerbero	3	15	Bullo	23	35	Ingegnere	43	55
Orto	4	16	Fortezza	24	36	Fienile	44	56
Donnola	5	17	Dicembre	25	37	Temperanza	45	57
Girasole	6	18	Rinaldo	26	38	Ippogrifo	46	58
Industriosità	7	19	Disgrazia	27	39	Gondola	47	59
Ebreo	8	20	Dante	28	40	Destino	48	60
Fato	9	21	Granchio	29	41	Fragilità	49	61
Vela	10	22	Nenia	30	42	Malinconia	50	62
Giglio	11	23	Calamità	31	43	Edificio	51	63
Furto	12	24	Picca	32	44	Elefante	52	64
Farfalla	13	25	Kairo	33	45	Leone	53	65
Tamburo	14	26	Giunone	34	46	Quaglia	54	66
Este	15	27	Colombo	35	47	Salamandra	55	67
Vergine	16	28	Fontana	36	48	Chiromanzia	56	68
Drago	17	29	Omicidio	37	49	Lumaca	57	69
Pavone	18	30	Forno	38	50	Zugno	58	70
Gallo	19	31	Eliade	39	51	Caronte	59	71
Icaro	20	32	Honore	40	52	Esercito	60	72

Moving from table M to the following table is just misdirection: also table S shows numbers from 13 to 72, but the corresponding images are all mixed up. The person involved in the game should limit himself/herself to looking up the new figure corresponding to the number found in table M, and the same image should be found in table Z. In this latter table, each figure has a lower number of 6 units compared to table S.

In summary, moving from table A to table M the number N beco-

mes $N + 12$. In the transition from table M to table S, only the figure of reference changes, but not the number. In the final step from the table S to the table Z, the number is reduced by 6 units, making it $N + 6$. At this point, it is sufficient to subtract 6 to go back to the initial number. Here is the list of numbers corresponding to each figure on the tables S and Z:

	S	Z		S	Z		S	Z
Rinaldo	13	7	Giglio	33	27	Gallo	53	47
Ira	14	8	Farfalla	34	28	Lumaca	54	48
Ebreo	15	9	Edificio	35	29	Giunone	55	49
Fienile	16	10	Cerbero	36	30	Vergine	56	50
Nembrot	17	11	Bradamante	37	31	Gemelli	57	51
Kairo	18	12	Omicidio	38	32	Facchino	58	52
Donnola	19	13	Leone	39	33	Elefante	59	53
Orto	20	14	Esercito	40	34	Quaglia	60	54
Bullo	21	15	Drago	41	35	Ingegnere	61	55
Honore	22	16	Caronte	42	36	Vela	62	56
Eliade	23	17	Zugno	43	37	Fontana	63	57
Temperanza	24	18	Dicembre	44	38	Colombo	64	58
Picca	25	19	Granchio	45	39	Icaro	65	59
Fato	26	20	Este	46	40	Malinconia	66	60
Salamandra	27	21	Ippogrifo	47	41	Fragilità	67	61
Calamità	28	22	Tamburo	48	42	Industriosità	68	62
Pavone	29	23	Nenia	49	43	Dante	69	63
Forno	30	24	Gondola	50	44	Diamante	70	64
Girasole	31	25	Chiromanzia	51	45	Furto	71	65
Disgrazia	32	26	Fortezza	52	46	Destino	72	66

Coming back to the example of *Diamante*, in table M we have found the number 13. In table S, it corresponds to *Rinaldo*, which in table Z is assigned the number 7. Subtracting 6 from it, we get 1, which is the number thought of.

Therefore the complete path from the number thought of to the one in the table Z is forced:

TABLE A - Number N is converted to figure A_N .

TABLE M - Figure A_N is converted to number $N+12$.

TABLE S - Number $N+12$ is converted to figure S_{N+12} .

TABLE Z - Figure S_{N+12} is converted to number $N+6$.

Here are the 60 numerical paths through the four tables in *Laberinto*:

Table M					Table Z				
Table A			Table S		Table A			Table S	
N	A_N	N+12	S_{N+12}	N+6	N	A_N	N+12	S_{N+12}	N+6
1	<i>Diamante</i>	13	<i>Rinaldo</i>	7	31	<i>Calamità</i>	43	<i>Zugno</i>	37
2	<i>Gemelli</i>	14	<i>Ira</i>	8	32	<i>Picca</i>	44	<i>Dicembre</i>	38
3	<i>Cerbero</i>	15	<i>Ebreo</i>	9	33	<i>Kairo</i>	45	<i>Granchio</i>	39
4	<i>Orto</i>	16	<i>Fienile</i>	10	34	<i>Giunone</i>	46	<i>Este</i>	40
5	<i>Donnola</i>	17	<i>Nembrot</i>	11	35	<i>Colombo</i>	47	<i>Ippogrifo</i>	41
6	<i>Girasole</i>	18	<i>Kairo</i>	12	36	<i>Fontana</i>	48	<i>Tamburo</i>	42
7	<i>Industriosità</i>	19	<i>Donnola</i>	13	37	<i>Omicidio</i>	49	<i>Nenia</i>	43
8	<i>Ebreo</i>	20	<i>Orto</i>	14	38	<i>Forno</i>	50	<i>Gondola</i>	44
9	<i>Fato</i>	21	<i>Bullo</i>	15	39	<i>Eliade</i>	51	<i>Chiromanzia</i>	45
10	<i>Vela</i>	22	<i>Honore</i>	16	40	<i>Honore</i>	52	<i>Fortezza</i>	46
11	<i>Giglio</i>	23	<i>Eliade</i>	17	41	<i>Facchino</i>	53	<i>Gallo</i>	47
12	<i>Furto</i>	24	<i>Temperanza</i>	18	42	<i>Nembrot</i>	54	<i>Lumaca</i>	48
13	<i>Farfalla</i>	25	<i>Picca</i>	19	43	<i>Ingegnere</i>	55	<i>Giunone</i>	49
14	<i>Tamburo</i>	26	<i>Fato</i>	20	44	<i>Fienile</i>	56	<i>Vergine</i>	50
15	<i>Este</i>	27	<i>Salamandra</i>	21	45	<i>Temperanza</i>	57	<i>Gemelli</i>	51
16	<i>Vergine</i>	28	<i>Calamità</i>	22	46	<i>Ippogrifo</i>	58	<i>Facchino</i>	52
17	<i>Drago</i>	29	<i>Pavone</i>	23	47	<i>Gondola</i>	59	<i>Elefante</i>	53
18	<i>Pavone</i>	30	<i>Forno</i>	24	48	<i>Destino</i>	60	<i>Quaglia</i>	54
19	<i>Gallo</i>	31	<i>Girasole</i>	25	49	<i>Fragilità</i>	61	<i>Ingegnere</i>	55
20	<i>Icaro</i>	32	<i>Disgrazia</i>	26	50	<i>Malinconia</i>	62	<i>Vela</i>	56
21	<i>Ira</i>	33	<i>Giglio</i>	27	51	<i>Edificio</i>	63	<i>Fontana</i>	57
22	<i>Bradamante</i>	34	<i>Farfalla</i>	28	52	<i>Elefante</i>	64	<i>Colombo</i>	58
23	<i>Bullo</i>	35	<i>Edificio</i>	29	53	<i>Leone</i>	65	<i>Icaro</i>	59
24	<i>Fortezza</i>	36	<i>Cerbero</i>	30	54	<i>Quaglia</i>	66	<i>Malinconia</i>	60
25	<i>Dicembre</i>	37	<i>Bradamante</i>	31	55	<i>Salamandra</i>	67	<i>Fragilità</i>	61
26	<i>Rinaldo</i>	38	<i>Omicidio</i>	32	56	<i>Chiromanzia</i>	68	<i>Industriosità</i>	62
27	<i>Disgrazia</i>	39	<i>Leone</i>	33	57	<i>Lumaca</i>	69	<i>Dante</i>	63
28	<i>Dante</i>	40	<i>Esercito</i>	34	58	<i>Zugno</i>	70	<i>Diamante</i>	64
29	<i>Granchio</i>	41	<i>Drago</i>	35	59	<i>Caronte</i>	71	<i>Furto</i>	65
30	<i>Nenia</i>	42	<i>Caronte</i>	36	60	<i>Esercito</i>	72	<i>Destino</i>	66

In order to read the table properly, let us consider the last row. If we think of the number 60, this can be found below *Esercito* in table A. In table M *Esercito* corresponds to number 72, which in table S is below *Destino*. This image bears the number 66 in table Z, and by subtracting 6 we are back to the number we thought of.



“I was thinking of a way to get our bearings in the labyrinth. It is not simple... We will use the mathematical sciences. Only in the mathematical sciences, as Averroës says, are things known to us identified with those known absolutely. Mathematical notions are propositions constructed by our intellect in such a way that they function always as truths, either because they are innate or because mathematics was invented before the other sciences. And the library was built by a human mind that thought in a mathematical fashion, because without mathematics you cannot build labyrinths.”

—Umberto Eco, *The Name of the Rose* (1980)

Notes

- (1) Carlo de Franceschi, “Il ramo istriano della famiglia Bembo” in *Atti e memorie della Società istriana di archeologia e storia patria*, Volume 61, 1961, pages 99–122.
- (2) “Senato Mare. Cose dell’Istria”, trascrizione del registro 75 in *Atti e memorie della Società istriana di archeologia e storia patria*, Volume 12, 1897, page 441.
- (3) Giacinto Manuppella (ed.), *Estevao Rodrigues de Castro. Obras Poéticas em portugues, castelhano, latim, italiano*, Por Ordem da Universidade, Coimbra, 1967, page 598.
- (4) *Catalogue des livres de la bibliothèque de feu monseigneur le maréchal duc d’Estrées*, Volume 1, Jacques Guerin, Paris 1740, page 278.
- (5) *Bibliotheca Stoschiana sive Catalogus selectissimorum librorum quos collegerat Philippus liber baro de Stosch*, Florence 1759, page 213.
- (6) *Bibliothecae Thomasianae sive locupletissimi thesauri ex omni scientia librorum praestantissimorum rarissimorumque quos olim possedit vir illustris Gottofredus Thomasius*, Volume 3, W. Schwarzkopf, Nürnberg 1769, page 172.
- (7) *Catalogue des livres de la bibliothèque de feu M. le Duc de la Vallière*, Volume 2, Nyon, Paris 1784, page 495.
- (8) Jonathan Puzzle, *The Labyrinth: being an exercise for wit and humour by rational rebusses*, James Hoey, Dublin 1753. (Thanks to Marcus Williamson)
- (9) Leopoldo Cicognara, *Memorie spettanti alla storia della calcografia*, 1831, page 172.
- (10) P. L. Jacob [Paul Lacroix], *Revue universelle des arts*, Volume 5, page 104.
- (11) Romain Merlin, *Origine des cartes à jouer*, Rapilly, Paris 1869, page 46.
- (12) Robert M. Burch & William Gamble, *Colour printing and colour printers*, Baker and Taylor, 1911, page 42.
- (13) Frank Percy Wilson, “A Supplement to Toynbee’s Dante in English Literature” in *Italian studies*, Society for Italian Studies, Volume 3, 1946, pages 50–64.
- (14) Jochen Becker, “Plaatjes en praatjes: emblemata, gespreksspelen, conversatie en kunstgekleets” in *De zeventiende eeuw*, Volume 15, Verloren, Hilversum 1999, pages 118–130.
- (15) Nadya Chishty-Mujahid, “An Examination of Andrea Ghisi’s Venetian *Labyrinth* Game and its Hermetic Predecessor, the Mantegna tarocchi”, *Renaissance Society of America Annual Meeting*, Venice (April 9, 2010).
- (16) Max Maven, “Book Tests – The History”, *Magiceen*, number 11, November 2006.
- (17) Private communication with author.
- (18) <http://forum.tarothistory.com/viewtopic.php?p=4659#p4659>
- (19) Codice Vaticano Latino 3129, pages 220r and 220v (now in Dario Bressanini & Silvia Toniato, *I giochi matematici di Fra’ Luca Pacioli*, Edizioni Dedalo, Bari 2011, pages 60–68). The trick is also described in chapter 69 of *De Viribus Quantitatis* (now in Luca Pacioli, *De Viribus Quantitatis*, transcription by Maria Garlaschi Peirani from code n. 250 in *Biblioteca Universitaria di Bologna*, Ente Raccolta Vinciana, Milan 1997, pages 161–162). The principle appears also in the collection by Claude Gaspar Bachet, *Problemes plaisans, qui se font par nombres*, Pierre Rigaud, Lyon 1624 (1st ed. 1612), pages 152–154 (problem XIX).
- (20) Adam McLean, “Labarinto and the Tarrochi of Mantegna” at <http://www.levity.com/alchemy/labarinto.html>

- 5. The Map of Andrea Ghisi's *Laberinto*
- 8. Andrea Ghisi, Venetian nobleman
- 9. *Laberinto* in literature
- 11. Rebuilding *Laberinto*
- 13. How to divine a figure
- 16. Iconographic structure of *Laberinto*
- 23. Essential version of *Laberinto*
- 66. How to divine a number
- 66. The numerical structure of *Laberinto*
- 71. Notes

“...philosophers speculated that Life is a Game.”

ANDREA GHISI

June 24, 1616



Herman Hugo S.J. (1588-1629)
Gottselige Begierde, Augusta, 1622