

GAME/CONTROL

(2)

From Theseus,
the hero
to "Theseus",
the Mouse
from SANCTA ECLESIA
to "The Garden of Forking Paths"
from IKEA to S.T.A.L.K.E.R.
from "The Art of Worldly Wisdom" to May '68
and once right across the board.

Presented by Johannes Kirsten
Galerie für Zeitgenössische Kunst Leipzig
October 20 2010, 7 p.m.

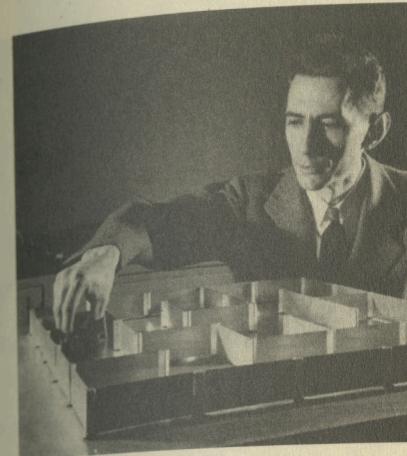
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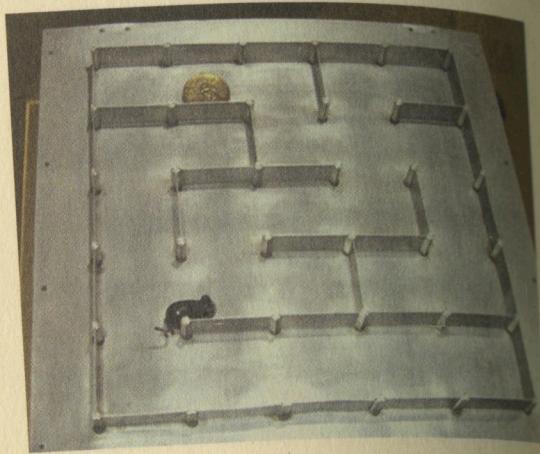
2.01 Theseus, the hero.



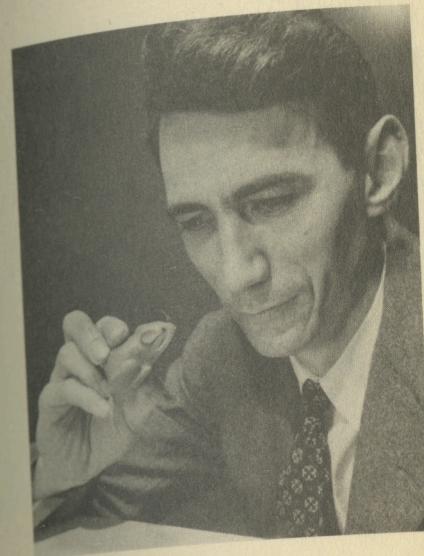
2.02 "Theseus", the mouse.



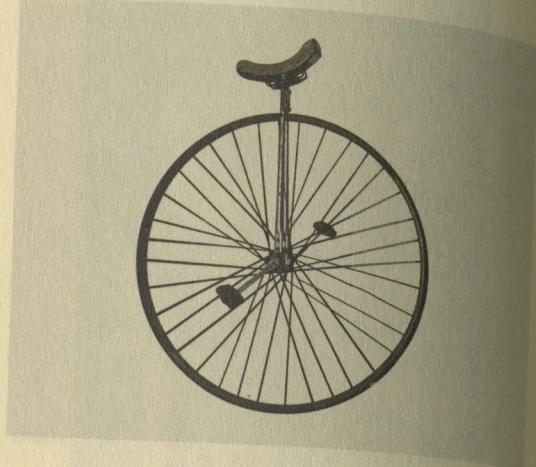
2.03 Theseus the mechanical mouse lived in Bell Labs in Murray Hill, New Jersey. It was invented by Claude Shannon, a pioneer of the information age. Shannon named his mouse "Theseus" after the hero of the Greek epic.



2.04 Theseus the hero was not, it seems, as shrewd as Theseus the mouse, which had no need of an Ariadne's thread to guide it through the labyrinth. With what it had already learnt about the routes, the mouse used trial and error to escape unaided from its tin trap.



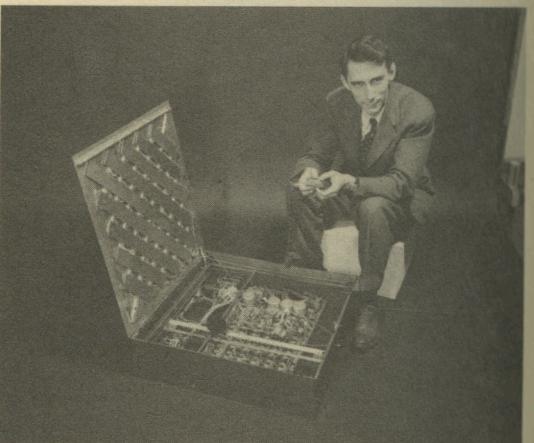
2.05 Theseus is now regarded as one of the first machines capable of learning for itself: the prototype for a new kind of communications system.



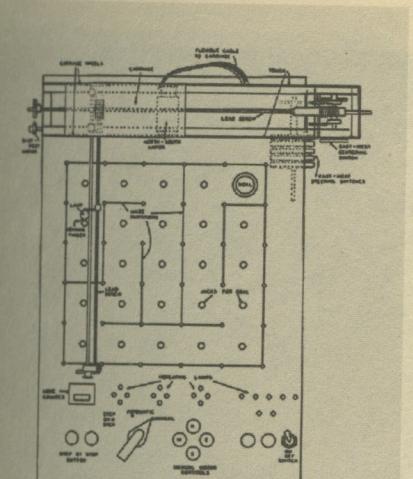
2.06 Theseus the mouse was not the only playful device developed by Claude Shannon in his efforts to represent particular aspects of information theory. As a mathematician and engineer, Shannon had a weakness for toys of this kind, which were of practical value and at the same time purely scientific interest. The famous unicycle that he built himself and rode around the Bell Labs corridors was Shannon's metaphor for control. A one-wheeled juggling device—information theory in a nutshell.



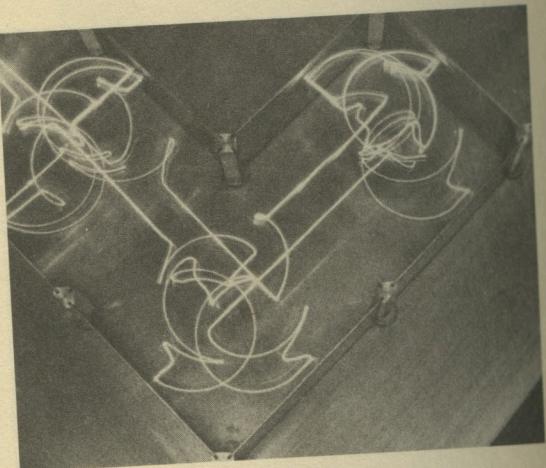
2.07 If Alan Turing was a hero of World War II, Claude Shannon was a hero of the Cold War. Shannon's information theory formed the basis of America's electronic defenses and was crucial to the development of Nike, the 1950s system of radar-controlled missiles. His definitions, calculations, and models of highly complex interactions and secure systems of command and control enabled him to solve the problem of calculating several flight paths in advance so that missiles could react to evasive enemy action while in flight.



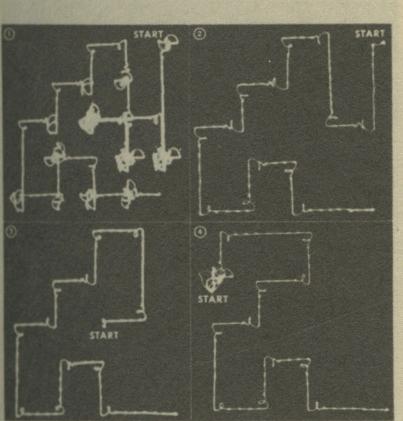
2.08 At the famous cybernetics conference organised by the Josiah Macy Jr. Foundation in the early 1950s, Shannon offered Theseus the mouse as an example of this kind of control. His "Presentation of a Maze-Solving Mouse" was intended to demonstrate that a machine could successfully negotiate a maze without human intervention.



2.09 Shannon's maze had twenty-five sections defined by aluminium partitions, which could be moved at the experimenter's will. The mechanical explorer, which really did resemble a mouse, was propelled by a sensor and a system of magnets under the floor of the maze. The mouse would move tentatively between the fields, using its copper whiskers to feel its way along the walls.



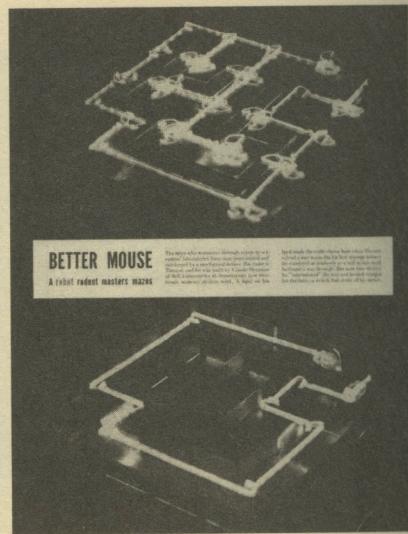
2.10 Whenever the mouse came across an open path, the route was stored in its memory. If it reached an impasse, it searched for a way round. It could direct itself towards its goal: Shannon's information theory gave it the ability to aim and move with the same kind of decision-making capacity later assumed by US anti-aircraft missiles. Regardless of where it was dropped into the maze, the mouse could recall what it had already learnt in order to find its own way to its goal.



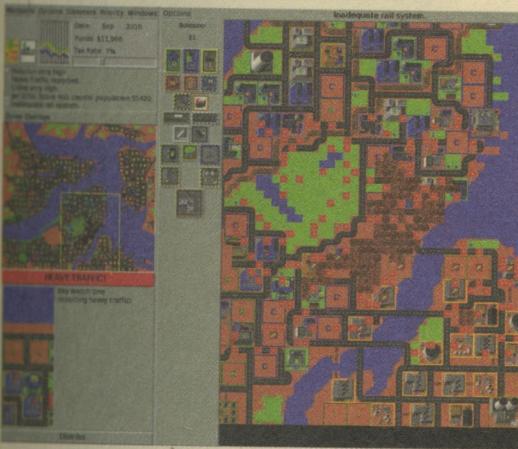
MEMORY TESTS show how Theseus learns. In first trial the mouse makes wrong turns, leaves complicated trail. Second time he starts from the same place, goes straight to the goal. In third trial he is started from different spot but is on the original trail, so has no trouble. The fourth time he is put in an unfamiliar square, blunders around until he gets on the course he has learned.

2.11 This article, published in the July 1952 edition of "Life Magazine", gives a good description of the ways in which the mouse could orientate itself. Put into an unfamiliar location, or in response to a change in the layout of the labyrinth, the mouse could again run its algorithms to search through the information it had stored about the routes.

These images make it very clear that Shannon's electromagnetic Theseus was able to learn and find the quickest way through the maze on only its second attempt. If someone turned the relays off, however, all the information it had stored was lost.



2.12 The mouse's algorithms resembled those in a telephone switching system. If two users make calls between the east and west coast, for example, an automated system locates the available connections. Together with the TCP/IP protocol, Shannon's mouse was therefore a prototype for the way data now moves on the Internet. This is how every email, every text message, every data packet finds its way through the maze of today's global network of servers.

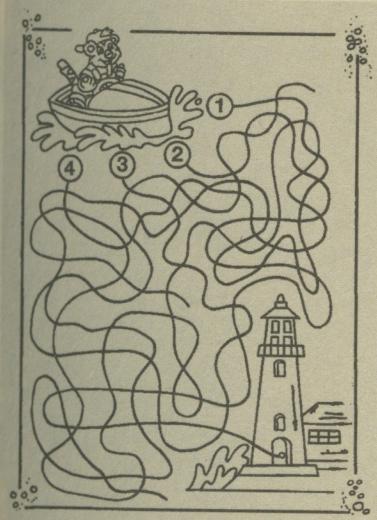


2.13 Shannon coined the term "bit" (binary digit) to define the smallest unit of information, when he started to work on computer game consoles at the end of the 1940s. In 1949 he developed "Caissac", an algorithmic chess program which ran on a relay computer and was one of the very first digital games. Four years later he built the first console, the "3-Relay Kit", on which more than fifty games could be played.

Many of these computer games were basically orientation exercises in digital space, ways of learning how to move through the labyrinth of cyberspace. This is a theme to which I will return.



2.14 This lecture is called "Game/Control". I'm not sure if these are contradictory terms or simply form a tangled knot, an indissoluble connection. Hence the next question: What kind of game is to be played in the labyrinth? And what can we learn from it?



2.15 Is it a matter of finding the way? Or rather a willingness to let oneself feel lost?



2.16 Is it about making choices, even when their consequences are as yet unknown?



2.17 In the twelfth and thirteenth centuries, vast, flat labyrinths were laid out on the floors of several gothic churches in Italy and France. Pilgrims would follow the labyrinthine path, often while praying on their knees, to symbolise the perilous passage of the dead to paradise, the sinner's path to salvation. For this reason some of these labyrinths were known as "Chemins de Jérusalem", roads to Jerusalem.

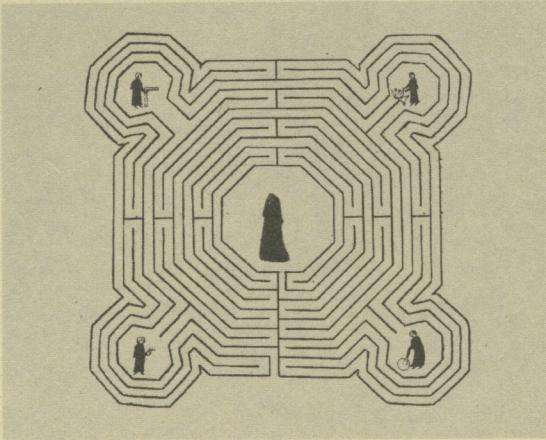


2.18 As well as the contemplative, meditative practice of walking the labyrinth, the courses laid out on church floors in the Middle Ages were also used for dancing. According to Gernot Candolini, “labyrinths were paths on which to reflect and dance floors too. Men and women, bishops, priests, and children prayed and danced on them in churches for some 300 years. In 1500, dancing in church labyrinths was brought to an end. Within just a few decades it would seem quite alien, even unthinkable.”



2.19 More than half of these gothic labyrinths were removed in the late eighteenth century. They were scraped away, dug out, or covered with white marble, and all for the same reason: it was considered too disturbing to see children having fun as they made their ways around the paths.

Play was regarded as a waste of time—one’s own time, and God’s time too—and such inconsequential ways of losing oneself were intolerable to the authorities, especially in a church.

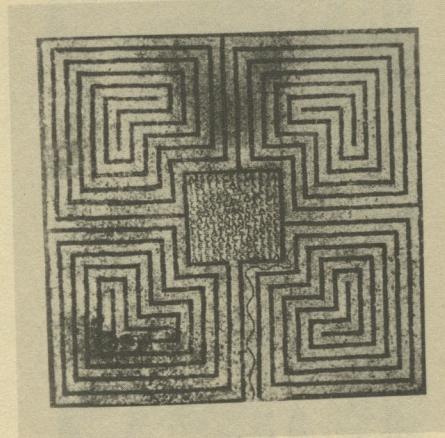


2.20 This late sixteenth century pen and ink drawing shows the labyrinth in Reims. The labyrinth itself was probably built between 1287 and 1311. In 1778 it was destroyed at the behest of Canon Jacquemart, who was willing to pay a fortune to put an end to the children's games.



2.21 This image, from an engraving dating back to the eighteenth century, shows not Reims Cathedral, but Chartres. It is clear how beloved the labyrinth was here and, it seems, in Reims as well. It is easy to imagine that cathedral choir leaders, whose duties included celebrating holy mass and organising hourly prayers, found so much activity disruptive.

Christianity's entanglement with rituals connected to the labyrinth is long: it was the road to Jerusalem, the journey to Christ, the way to the mother church.

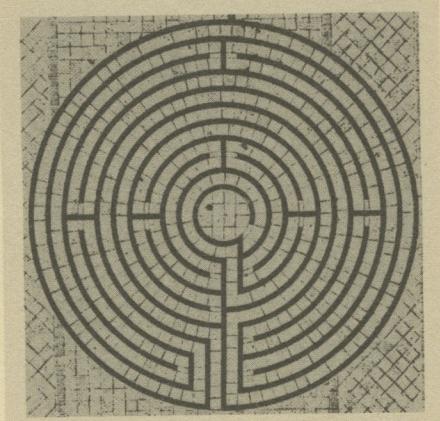


2.22 The first mosaic labyrinth of Christian significance was found in St Reparata's Basilica in El-Asnam, or Orléansville, in Algeria. The labyrinth is now housed in Algiers Cathedral. It is some two-and-a-half metres square, divided into four sections, and has an entrance at the centre of the lower edge from which an Ariadne's thread snakes up towards the first turning.

A	I	S	E	L	C	E	C	E	L	S	I	A
I	S	E	L	C	E	A	E	C	L	S	I	A
S	E	L	C	E	A	T	A	E	C	L	S	I
E	L	C	E	A	T	C	T	A	E	C	L	E
L	C	E	A	T	C	N	C	T	A	E	C	L
C	E	A	T	C	N	A	N	C	T	A	E	C
E	A	T	C	N	A	S	A	N	C	T	A	E
C	E	A	T	C	N	A	N	C	T	A	E	C
L	C	E	A	T	C	N	C	T	A	E	C	L
E	L	C	E	A	T	C	T	A	E	C	L	E
S	E	L	C	E	A	T	A	E	C	L	S	E
I	S	E	L	C	E	A	E	C	L	S	I	A
A	I	S	E	L	C	E	C	E	L	S	I	A

2.23 A square of letters, not a Minotaur, stands in the centre of this labyrinth. Starting with the letter "S" in the middle, the thirteen rows next to and on top of each other spell out the words SANCTA ECLESIA (Holy Church).

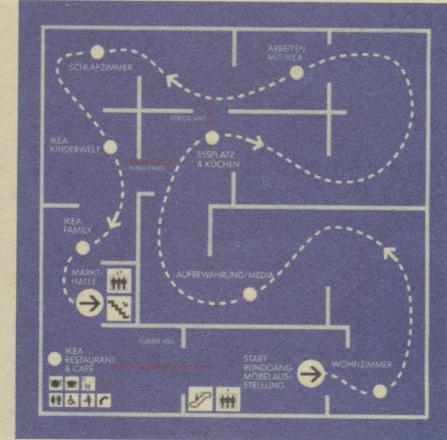
Its Ariadne's thread makes this labyrinth remarkable for the safe passage it offers through the heathen realm which lies between the outside world and the inner truth of the mother church. The centre is the only goal; there is no need for a way back out.



2.24 Medieval church labyrinths—such as this labyrinth in Bayeux Cathedral—are unicursal, offering a single route with no alternative paths from which to choose and no dead ends. The path represents the clarity and indisputability of Christian teachings on salvation.

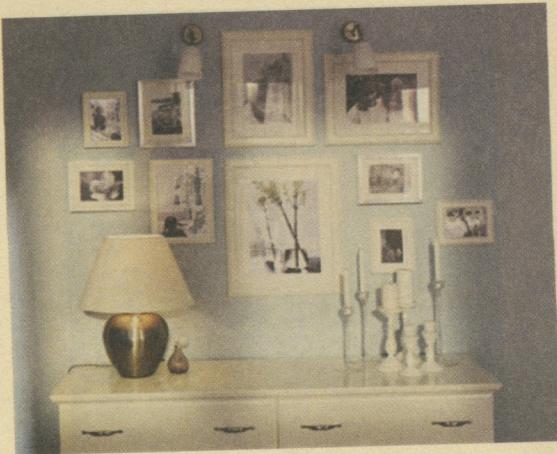
Or perhaps it should be said that these teachings were utterly unable to even countenance the possibility that there might be more than one route to salvation?

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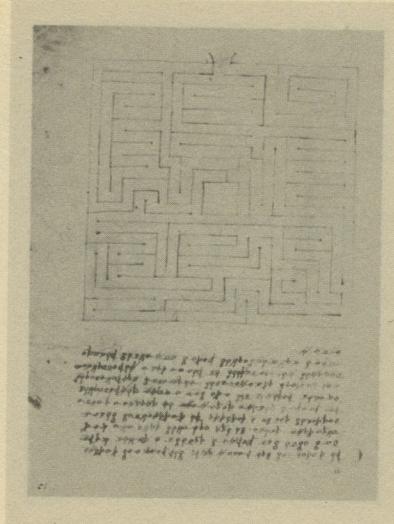
2.25 IKEA, the Swedish home furnishings store, lays out its stores as labyrinths, each with a single route to the exit on which choices nonetheless have to be constantly made. These labyrinthine layouts are deliberate: customers move on a preordained zigzagging path which keeps sending them left and right so that they see as many new products as possible.

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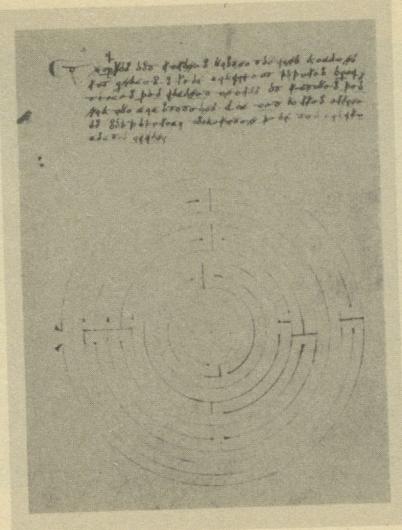


2.26 “IKEA shop floors are very user-friendly,” writes Peter Weinberg, professor at the Institute for Consumer and Behavioural Research at the University of Saarbrücken, on the company’s spatial concept. “They make it easy for people to find their way and get a good overview. They place no great intellectual demands on the customers. The only thing that is difficult to find is the way out.”

Studies conducted by IKEA show that when customers walk through a branch without following a preordained route, they simply seek the quickest way to the exit and leave without even looking at most of the shop.

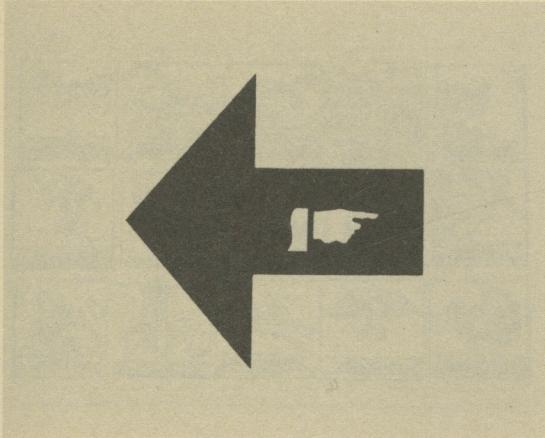


2.27 Until the fifteenth century, all labyrinths had a single, if often very convoluted, path. It was not until the Renaissance that alternatives and choices were brought into play. In his 1420 book on war machines, the Venetian artist Giovanni Fontana presented two labyrinths and wrote: “I do not understand why labyrinths are only ever drawn with a single route. If the idea is for people to get lost in a labyrinth, there must be several ways between which they must choose.”



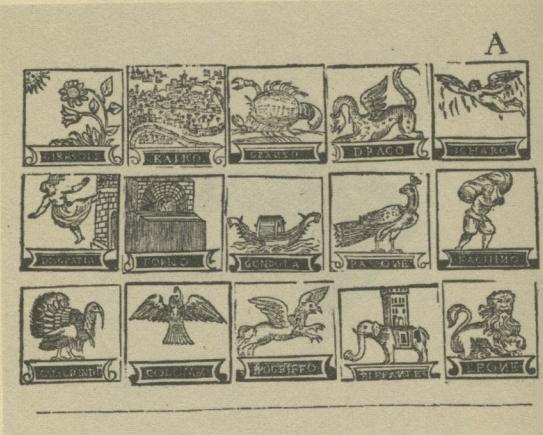
2.28 This is the second labyrinth from Giovanni Fontana's book on war machines, in which he also suggests that labyrinths need not be confined to a particular shape but might assume any number of forms. He also refers to a book containing countless mazes of his own design, but this Little Book of Labyrinths seems to have been lost.

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2.29 From this point on, the presence of alternative routes became a defining feature of labyrinthine games.

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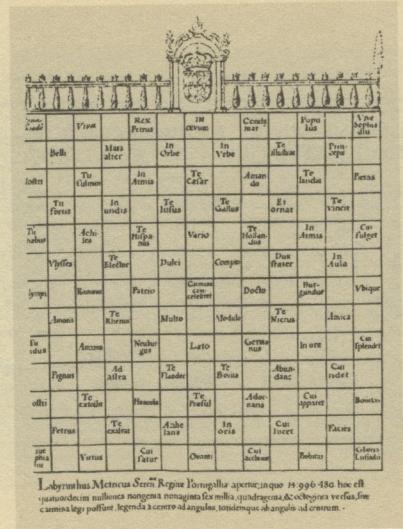
2.30 "Labyrinto", published in Venice by Andrea Ghisi in 1607, is the perfect example of this change. The book contains no pictures or descriptions of labyrinths but 2,260 woodcut vignettes, each furnished with a word, which could be combined and recombined to pass the time.

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LABYRINTHUS A DIVO BERNARDO COMPOSITUS QUO BENE VIVIT HOMO					
DICERE	SCIS	DICIT	SCIT	AUDIT	NON VULT
FACERE	POTES	FACIT	POTEST	INCURRIT	NON CREDIT
CREDERE	AUDIS	CREDIT	AUDIT	CREDIT	NON EST
DARE	HABES	DAT	HABET	MISERE	NON HABET QUAERIT
JUDICARE	VIDES	JUDICAT	VIDET	CON-	NON DEBET TEMNIT
NOLI	OMNIA	QUIA	OMNIA	SAEPE	QUOD QUAE

2.31 The structure of the book is reminiscent of the labyrinthine game of combinations attributed to St Bernard, in which words could be put together to produce moral statements. The first text, composed of the words of the top and bottom lines, beginning at the bottom left, reads: "Noli dicere omni a quae scis quia qui dicit omnia quae scit saepe audit quod non vult." (Don't say all you know, because those who say everything are often told what they would rather not hear.)

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2.32 A similar concept is at work in the metrical labyrinth constructed in the seventeenth century by the Portuguese writer Luís Nunes Tinoco in honour of Queen Maria Sophia Isabel. Tinoco proudly reported that there were 14,996,480 ways in which one could read from the centre to the outside, and back again as well.

In both these cases, the word “labyrinth” is used to refer to an abundance of choice, which can make a decision feel like a labyrinth or, in the words of Jorge Luis Borges, a “garden of forking paths”.



2.33 With his great theoretical interest in problems of freedom of choice, these mazes must have been an inspiration to Claude Shannon. Nike's air defenses were able to react to flight paths resulting from decisions made by the pilot of an enemy aircraft or a missile's guidance system to go up or down, left or right. If the subject is—as with Hegel—a series of freely chosen actions, Shannon made this freedom of choice—be it of human or machine agency—vulnerable to calculation, so much so that computers now use probability theory to predict the parameters of our purchasing decisions.



2.34 Still, we are always free to use things in different ways, to see and reveal something new in them. A mouse can become "Theseus". The broom used by a Parisian street cleaner can be turned into a work of art. A place of religious repentance and prayer can be transformed into a playground. And there is no end to the ways in which the labyrinth can be "replayed", taking on new forms and meanings in an age-old story of transformation.

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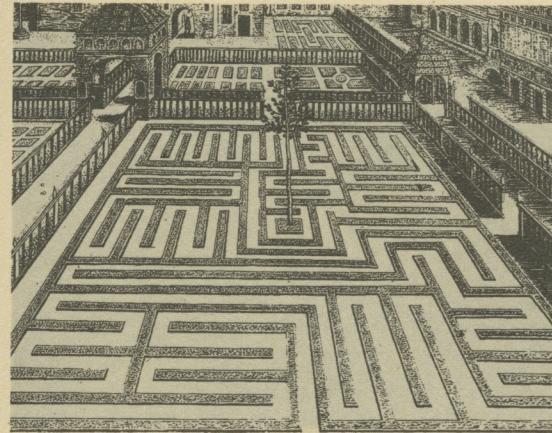


2.35 But what is the enduring fascination of the labyrinthine form? Why can't we escape its entanglements?

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2.36 And how does the labyrinth make us so ready and willing to play its games?



2.37 Many Renaissance paintings depict gardens planted out with floral labyrinths. Flowering plants and low hedges were arranged close to the terraces of villas so that they could be viewed with ease: they were not intended to be entered, but to be appreciated by the eyes alone.

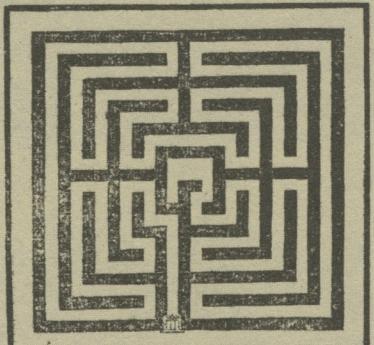


2.38 Not until the late Renaissance in Italy was there a shift from the visual to the kinaesthetic. Paths now ran between high hedges that could no longer be scaled.

They were not then to be followed with the gaze alone, but to be explored with the whole body. And the shift from the labyrinths of the late Middle Ages, which had no forking paths, to mazes with branches and dead ends signified a new way of thinking too. Centre stage were no longer individuals guided solely by God, but subjects responsible for their own decisions.

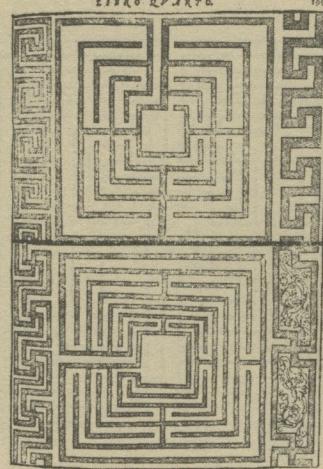


2.39 With their thick hedges, often rising above head height, garden mazes offered all sorts of hiding places too. They were often described as lovers' labyrinths.



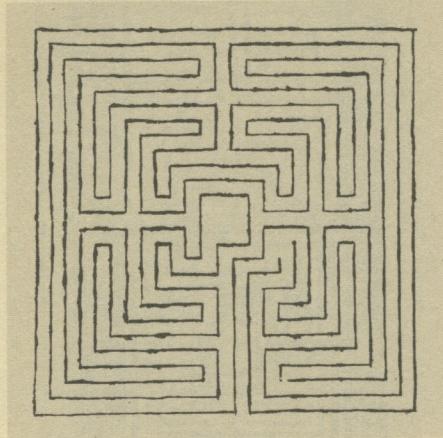
2.40 The popularity of these garden labyrinths and mazes is clear from the countless layouts which appeared in the landscape gardening books of the day. In "Le Thrésor Des Parterres De L'Univers, contenat les figures et pourtraits des plus beaux Compartiments, Cabanes et Labyrinthes des Jardinages", which was published in 1579 and is today best known in its second edition of 1629, the court physician Daniel Loris published twenty-three different labyrinths. Some of his woodcuts are based on older patterns, as in this drawing...

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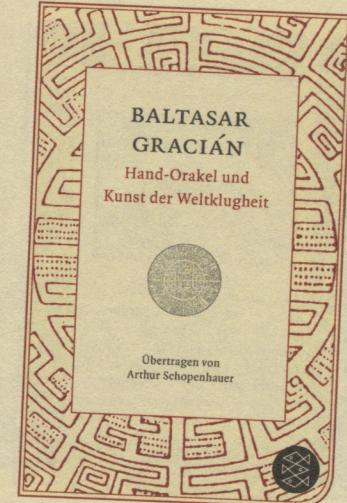
2.41 ...of a labyrinth dating back to Sebastiano Serlio's "Books of Architecture", the first of which was published in 1537.

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2.42 The same design inspired an unknown German draughtsman from the second half of the 16th century. His lines adhere to Serlios's labyrinth with one exception: shortly past the entrance one can choose to go straight onto the usual path heading for the centre of the labyrinth, or instead turn right into a tangle of dead ends.

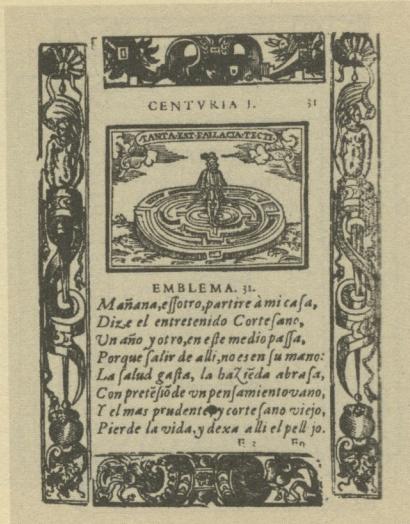
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2.43 When mazes became fashionable elements of landscape gardening, as they did in many parts of Western Europe, the labyrinth became a symbol for the confusions of the earthly world—or, more specifically, the social niceties of the royal court, whose convoluted rules were difficult to grasp.

Power games, erotic play, and gambling were crucial to the evolution of these courtly conventions. The games enjoyed by the higher social echelons, who “played” with their opponents and their rivals, their enemies and lovers too, became the stuff of political theory.

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2.44 An impressive example of these metaphorical labyrinths is Emblem 31 from Sebastián de Covarrubias y Orozco's collection "Emblemas Morales" [Moral Emblems], in which the labyrinth symbolises the precarious situation of the courtiers and the perils and deceits of courtly life.



2.45 Like garden labyrinths, these metaphorical mazes, loaded with social symbolism, can be seen as a kind of theatricalisation of knowledge, a way of opening it up to physical and spatial exploration through the presentation of scenes in which the play of changing fortunes, virtues, and loose morals could be staged.



2.46 In this copper engraving by Hieronymus Wierix, which dates from the 16th century, an angel guides young men through the “labyrinthine age” of immaturity...



2.47 ...to their later professional life. The fine arts bear the attributes of mathematical rationality: measuring instruments, a clock, and a book.



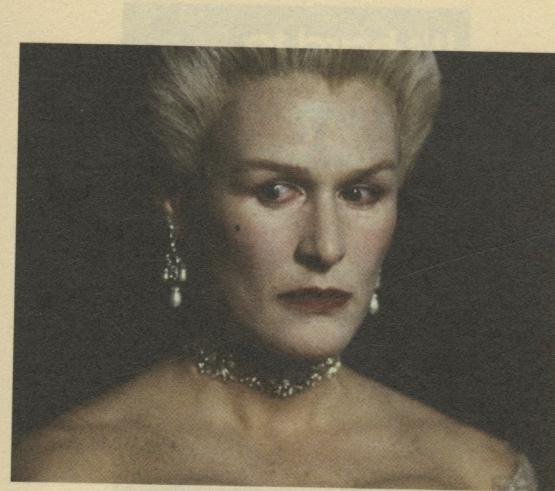
2.48 The labyrinth in the background represents the erroneous path. Couples stroll arm-in-arm, musicians play...



2.49 ...in another part of the maze a duel is underway: here the labyrinth represents entanglement in vices and empty pleasures, as well a call to foster self-control as a way of staying on the virtuous path.



2.50 Because the social rules were so nuanced and opaque, and the pleasures and temptations of courtly life so great, guides to good behaviour were popular in the age of absolutism. The most famous of these “manuals” is “The Art of Worldly Wisdom: A Pocket Oracle” by Baltasar Gracián, a Jesuit whose practical moral teachings were presented in this collection as 300 short maxims composed in the light of his own experiences at the Spanish court.



2.51 Gracián saw morality as a strategic matter of furthering one’s own interests. Defining self-restraint and emotional control as the highest virtues, “The Art of Worldly Wisdom” advises its readers not to act on impulse but instead to hedge their bets.

It's hard to
be down when
you're up.



THE OBSERVATION DECK
AT THE WORLD TRADE CENTER

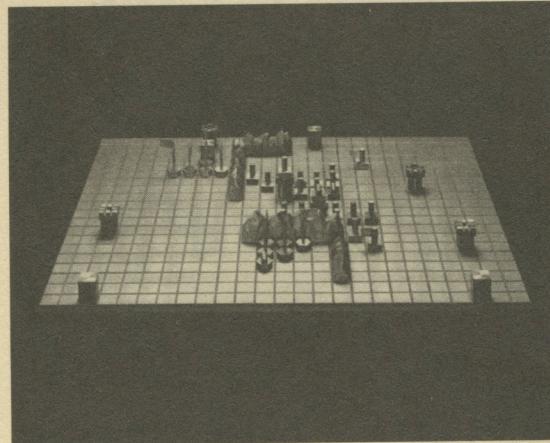
2.52 Emotions are neatly collapsed into tactical games, their expression subsumed into the play of pragmatic interests. In his meditations on the subject, Gracián creates a protagonist who is constantly in a state of alarm, shifting between stoical sangfroid and nervous indecision.

Gracián's readers learn that identity is constituted through a continual dialogue between people's perceptions of themselves and the ways in which they are perceived by others, so that one's own behaviour is determined by the one's rivals' desires rather than by one's own. The world as labyrinth.



2.53 And these days? What games entertain and educate us now? How do we hone our tactical skills and learn strategies for regulating self-expression and spontaneity?

This game, "May 68", was developed in 1980 by François Nedelec and Duccio Vitale. Players take the side of the students or that of the police to play out the unrest of 1968 on a schematised map of Paris.



2.54 Then there is the “Game of War”, in which two armies meet—a game developed by the situationist Guy Debord and inspired by the military theorist Carl von Clausewitz. Giorgio Agamben reports that when Guy Debord was once described as a philosopher, he was indignant and protested: “I’m not a philosopher, I’m a strategist!”

The “Game of War” deals with strategies of military manoeuvre and territorial defense, improvisation and creative adaptability. In order to present the conduct of war in its widest sense, Debord included communications amongst the military resources he put at players’ disposal.



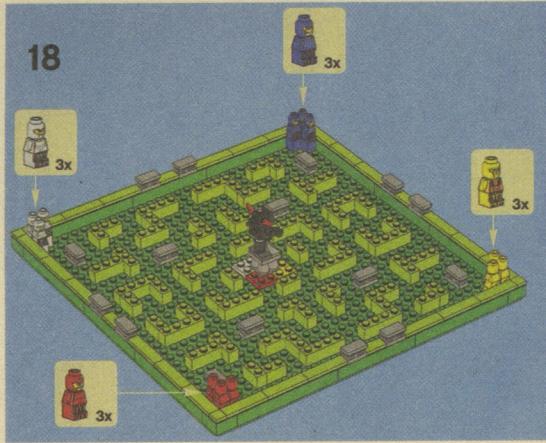
2.55 In the LEGO game “Minotaurus”, one has to engage with opponents of two different kinds. On the one hand there are the other players, who, as soon as they have thrown the right colour with the dice, can build a wall and therefore hinder one’s way through the labyrinth. On the other hand, there is the black Minotaur, housed in the centre of the game, who—if the black side of the dice has been thrown—can move eight places and can send one’s figure home if it meets it on the way.



2.56 In “Man, Play and Games”, Roger Caillois writes that although we enter into games voluntarily, the particular choices we then make are determined by the nature of our thoughts about the ways in which our decisions are affected by internal impulses or external forces—ways of thinking that govern how we play.



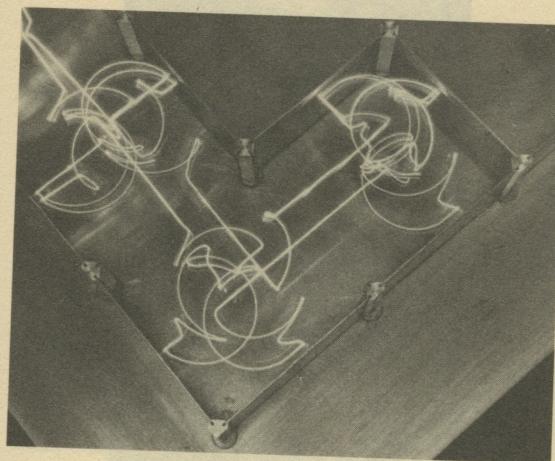
2.57 So the games we enjoy suit the ways in which we think. As we play, we put this principle to work; we externalize and control it to the extent that we control the game. But a game also grips us: we play, and are played by the game as well.



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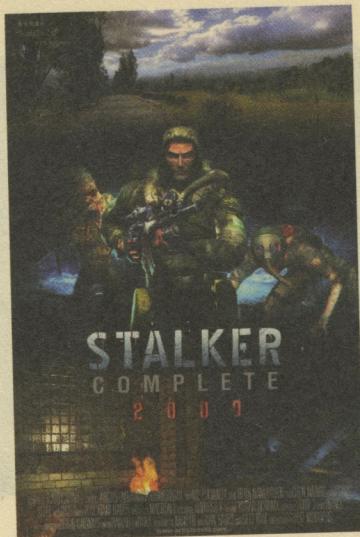
2.58 This certainly applies to Lego's Minotaurus, a contemporary labyrinthine game whose players are free to set up the rules of the game as they wish. According to the instructions, "the LEGO® Dice gives you the freedom to change the game and make it your own. You can change the playing area, the pieces and even the rules. Every little change makes it more and more YOUR game. The secret to changing a game is to change only one thing at a time. That way, you can see if the change makes the game more fun. If it does, keep it and then try another. Changing a game is always more fun when done together. That way everyone knows the rules and knows what is being changed. Remember to make sure everyone playing is aware of any new rules BEFORE you start playing."

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2.59 A tall utopian story, or a short guide to the flexibilities of late capitalism?

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2.60 I began with Theseus the mouse and its inventor Claude Shannon. That Shannon was one of the first to develop portable computer games brings us full circle in a way: the structure of so many computer games—especially those of the first-person shooter kind—is reminiscent of pathways through a maze. This is particularly true of the game “S.T.A.L.K.E.R.: Shadow of Chernobyl”.

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2.61 This game, from the Ukrainian developers GSC Game World, is set in the Chernobyl nuclear power plant. In an imaginary sequel to the 1986 nuclear catastrophe, a new explosion leads to the establishment of an exclusion zone alive with anomalous activity.

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2.62 The game belongs to the first-person shooter genre, and has an element of role-play too. It was first announced in 2001, but only appeared in March 2007; it was billed as “one of the most eagerly anticipated titles in gaming history”. The story is based on the novel “Roadside Picnic”, which was published in 1972 by Arkady and Boris Strugazky, and was also the inspiration for Andrei Tarkovsky’s 1979 film “Stalker”.



2.63 In the game, stalkers trawl through the contaminated area, which has been sealed off by the military. Under threat from radiation, new kinds of natural phenomenon, and also—in an extended version of the original game—from mutated human and animal forms, the player hunts for legendary artefacts whose novelty makes them of great interest and enormous value to the sciences.



2.64 When the game begins, in 2012, the player has lost his memory. His interlocutors know him as “the marked one”. He has only one clue about his previous life: he knows that he has to kill a certain “Strellok” (which is Russian for “shooter”). He then sets about getting funds for better arms and equipment, as well as clues about the secret of the “Zone” and his own identity.



2.65 Any one of five different endings is possible, depending on the moves the player makes. Two further endings become possible if the other five have been circumvented. The theme of controlling one’s own destiny reconnects the game to the book and the film, for which alternative endings were precluded by their linearity. But, like each piece of the action in the game, these closing scenes are simply video clips which have already been spliced together.



2.66 It is the game's graphic interface that makes it particularly compelling. The developers used aerial images and their own photographs to reconstruct the atmosphere of the abandoned Chernobyl plant in such detail that players can really feel as though they are moving through the site of the catastrophe. A landscape of industrial ruins conjures up a post-apocalyptic mood and, like the labyrinth of Daedalus, testifies to the hubris of human inventiveness and a natural world turned upside down. Players have to learn new ways to travel through the Zone just as we now learn to find our way through cyberspace.