



Knowing Through Seeing
DIAGRAMS, SCHEMATA AND
TABLEAUX IN EARLY
PRINTED BOOKS, MEDIEVAL
MANUSCRIPTS, AND PRINTS

Knowing Through Seeing: Diagrams, Schemata, and Tableaux in Early Printed Books,
Medieval Manuscripts, and Prints

Princeton University Library, Gould Exhibition Gallery, October 16, 1987 -
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Notes on the exhibition compiled by Stephen Ferguson

Princeton University Library
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INTRODUCTION

Diagrams serve as windows through which readers can see into the writer's intricate construction of words. Even though such illustrations have their origins in ancient times, the printed book, in particular, facilitated the urge to make text more visually accessible. Walter Ong summed up this trend:

[There occurs a] drive toward thinking [from the Renaissance onwards] not only of the universe but also of thought itself in terms of spatial models apprehended by sight. In this context, the notion of knowledge as word, and the personalist orientation of cognition and the universe which this notion implies, is due to atrophy. Dialogue itself will drop more than ever out of dialectic. Persons, who alone speak (and in whom alone knowledge and science exist), will be eclipsed insofar as the world is thought of as an assemblage of the sort of things which vision apprehends -- objects and surfaces.(1)

With the printed book, the number of "visuals" attached to text became more commonplace, e.g. titlepages, indexes, running heads, abstracts at the head of chapters, tables of contents, in addition to diagrams and illustrations, both naturalistic and schematic.

The Library's collections of early printed books, manuscripts and prints provide ample evidence of the trend toward the visual, and this exhibition provides a sampling of diagrams, schemata and tableaux from nearly 80 items. While the exhibits are chiefly from the collections of the Princeton University Library, four generous loans are included: one book each from the University of Pennsylvania and Lehigh University; a manuscript and a printed book from the Scheide Library here in Princeton.

The exhibition is arranged by the following list of subjects, beginning with COSMOLOGY on the front entrance wall, then moving clockwise around the room to the final exhibits in the alcoves behind the introductory case. Because of the physical restraints of the gallery, only a few of the larger number of visually augmented books within each subject can be shown.

Cosmology	Chronology	Allegory
Geology	Genealogy	Poetry
Astronomy	Theology	Artificial Memory
Astrology	Philosophy	Systems of Knowledge
Alchemy	Logic	Diagrams in use

(1) Walter J. Ong, *Ramus, Method, and the Decay of Dialogue*. (New York: Octagon Books, 1979), p. 9.

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*

COSMOLOGY

The Greeks selected their word 'kosmos,' meaning 'order' or 'ornament,' as a descriptor for the universe, in order to emphasize it as an ordered and harmonious system. Such an all-encompassing and intangible idea as the totality of the universe has always been a common theme for visual presentation. In this case are two such depictions.

- Hartmann Schedel
Nuremberg Chronicle
Nuremberg, 1493
ExI 1016.816f

The Nuremberg Chronicle was a popular and extensively illustrated world history first printed in the 1490's in both Latin and German. Here the universe is a system of concentric spheres, with earth at center; God and angels outermost; beyond them the Four Winds.

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- John Blagrove
The Mathematical Jewel
London, Walter Venge, [1585?]
Ex 81075.184

"Heere folow the principles and rudiements of Astronomy and Cosmographie... Of the placing of the spheres and the division of the world." Diagram of the 11 spheres lying concentrically around the earth.

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3. Bartholomaeus Anglicus
 De proprietatibus rerum
 Westminster, ca. 1485
 Gift of Robert H. Taylor '30
 ExI 2949.1486.1495q
 Important chronicle of world history and encyclopedia of human knowledge. Each book of the work opens with a large woodcut illustration. In Liber Octanus, at the head of the first page of this book is a diagram of the schema of the Universe -- earth at center, divided into its 3 parts, then moon, sun, stars in concentric spheres and the angels outermost
- *
4. Agostino Caesaro (?)
 Arte del navigare
 Italian, ca. 1580. Preface dated 1567.
 Kane MS 54 Manuscripts Division
 Italian manuscript on the art of navigation, ca. 1580. This opening page shows the geocentric universe.
- *
5. Astronomical tracts. France, 13th century. Garrett 99, fol. 136 verso.
 Manuscript Division.
 Shown is a diagram of a lunar eclipse in one treatise forming part of a collection of 21 astronomical and astrological works dating from the 13th century. Note that the earth is at the center of the diagram and that the sun revolves around it.
- *

GEOLOGY AND ASTRONOMY

6. Thomas Burnet
 Telluris Theoria Sacra (the Sacred Theory of the Earth)
 Amsterdam, 1699
 Ex 6252.228.22
 "The frontispiece to Thomas Burnet's Telluris theoria sacra (The Sacred Theory of the Earth) may be the most comprehensive and accurate epitome ever presented in pictorial form -- for it presents both the content of Burnet's narrative and his own internal debate about the nature of time and history. Below the requisite border of cherubim (for Burnet's baroque century), we see Jesus, standing atop a circle of globes, his left foot on the beginning, his right on the culmination of our planet's history. Above his head stands the famous statement from the Book of Revelation: I am alpha and omega (the beginning and the end, the first and the last.) Following conventions of the watchmakers' guild, and of eschatology (with bad old days before salva-

tion to the left, or sinister, side of divinity), history moves clockwise from midnight to high noon. We see first (under Christ's left foot) the original chaotic earth "without form and void," a jumble of particles and darkness upon the face of the deep. Next, following the resolution of chaos into a series of smooth concentric layers, we note the perfect earth of Eden's original paradise, a smooth featureless globe. But the deluge arrives just in time to punish our sins, and the earth is next consumed by a great flood (yes, the little figure just above center is Noah's ark upon the waves). The waters retreat, leaving the cracked crust of our current earth, "a broken and confused heap of bodies." In times to come, as the prophets foretold, the earth shall be consumed by fire, then made smooth again as descending soot and ashes reestablish concentric perfection. Christ shall reign for a thousand years with his resurrected saints on this new globe. Finally, after a last triumphant battle against evil forces, the final judgment shall allocate all bodies to their proper places, the just shall ascend to heaven, and the earth (under Christ's right foot), no longer needed as a human abode, shall become a start.(2)

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7. Alessandro Piccolomini

De la sfera de mondo...dele stelle fisse

Venice, 1540

Ex 8409.717

First known star atlas with many diagrams. Piccolomini (1508-1578) was a member of a noble Sieneese, some of whom became important political figures, writers, and scientists. In addition to the charts in this book, Piccolomini introduced a system for the classification of stars according to their magnitude. The system was keyed to the Roman alphabet, but was eventually abandoned for another system. Here opened to the first two full page woodcut diagrams in the book -- two famous constellations of the Northern Hemisphere: the Big Dipper (right page) and the Little Dipper (left page).

*

8. Philipp Cluver

Introductio in Universam Geographiam...ac Notis

olim ornata a Johanne Buno

London, 1711

Ex 1007.265

Frontispiece shows the celestial systems of Copernicus, Tycho Brahe, Ptolmey, and Descartes. This very copy may have been used at Princeton during the colonial period, for, although, early Library markings can not be seen in the book, this edition

- (2) Stephen J. Gould, *Time's Arrow and Time's Cycle Myth and Metaphor in the Discovery of Geological Time* (Cambridge: Harvard University Press, 1987) p. 21.

appears on page 10 of the catalogue of the Library of the College of New Jersey (now Princeton University) published in 1760.

*

9. Rene Descartes
Opera
Paris, 1685
Ex 6128.1685

Descartes discusses this elaborate diagram over the course of more than 30 pages in the third part of his Principles of Philosophy. The diagram summarizes various features of his views on the composition of the heavens, including such propositions that: [1] The heavens consist of various bodies, such as the planets and fixed stars. In the diagram, S, F, f are fixed stars. [2] The fixed stars have their own "heavens" which are like a vortex. Points l, E, A, R, and Q mark the boundaries of the "heaven" of S (= the Sun) and [3] N and it's "tail" (numbers 1 to 7) is a evidently a comet.

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ASTROLOGY AND ALCHEMY

10. Padre Maestro Vincenzo Maria Coronelli
"Idea dell' Universo"
Venice, ca. 1700.

Print acquired by the Library in January, 1987.

Compendium, in chart form, of astrological information. Labeled in banner at top: Idea dell' Universo (Plan or Likeness of the Universe); it is an assemblage of a central panel of five wheels surrounded by a border of 28 other wheels and spheres. The central five are labeled A to F; the main series in the border are numbered 1 to 22. The dominant, center-most wheel is that of the zodiac, the chief "informational operator" for astrology. (Astrology is a kind of "processing machine"; data comes in at one end, results [i.e. what the data means for everyday life and actions] comes out the other.) Within the zodiacal wheel is a sort of horoscope chart. The smaller wheels in the border epitomize various topics of astrological data: the star signs that govern parts of the body (number 20); the "seven climates" of the earth (number 4); and so on. At bottom are wheels useful for reckoning dates, such as Easter.

*

11. George Ripley. Scroll of alchemical emblems on preparing the philosopher's stone with also some verses from Richard Carpenter.
England, 16th Century.

Princeton MS 93. Manuscript Division
Panels: Portrait of an Alchemist (next to title case)

Bird of Hermes (side wall, front)
 Serpent of Araby and the Philosopher's Stone
 (side wall, front)
 Waters of Life surrounded by Seven Alchemists
 (side wall, front)
 Portrait of a Man (not shown)

The gift of Robert H. Taylor '30, the several sections of what was once a long parchment roll contain a series of colored pictures and English verses which describe in mystical terms the making of the philosophers' stone. This extraordinary document is one of a number of similar objects ascribed to the most famous of English alchemists, George Ripley, Canon of Bridlington, an Augustinian who died about 1490 and whose works continued to be studied as late as the eighteenth century. To judge from its similarity to the Ripley scroll in the British Museum, which bears the date 1588 (Add. Ms. 5025), the Princeton exemplar is the work of some late sixteenth-century copyist, perhaps the same Thomas Mundye whose name occurred on a scroll mentioned by Elias Ashmole (Catalogue of the Manuscripts Bequeathed unto the University of Oxford by Elias Ashmole, Oxford, 1845, No. 1530).(3)

In addition to the British Museum example, several others of this alchemical scroll by Ripley are known: one at Yale (Mellon MS 41); another in California (Manly P. Hall Collection MS 205); Fitzwilliam Museum (Cambridge); and in 1658 Sir Thomas Browne sent his friend Elias Ashmole "Ripley's Emblematicall or Hieroglyphical Scrowle in parchment, about 7 yards long with many verses somewhat differing from those in your first part of Ripley's vision" which is presumably still at the Ashmolean at Oxford.

Alchemy -- in one sense, the effort to turn base metals into gold, but in another sense, the art of transmutation -- was alleged to have been founded by the god Hermes (Mercury). Thus, alchemy became known as the 'hermetic art' and alchemists' vessels were sealed with the seal of Hermes or 'hermetically sealed.'

Alchemy was based on a general theory that all substances were modifications of one primitive matter and that subtracting qualities from compounds would yield prime matter which in turn could be augmented to make other, desired compounds. Prima materia was the essence of mercury; in turn, it was treated with sulfur to make the desired substance, such as gold.

Within the scope of this theory, the desired compound is a balancing of opposite -- the red lion over against the green lion.

Bird of Hermes (side wall, front)

(3) James Holly Hanford, "A Sixteenth-Century Scroll of Alchemical Emblems," in the Princeton University Library Chronicle, XIX, 3-4 (Spring-Summer, 1958), p.201-202.

Serpent of Araby and the Philosopher's Stone (side wall, front)

The dragon with its wings fixed to the chaotic material orb gives its blood for the making of the red and white stones and the elixir, the triple goal of alchemy.(4)

Waters of Life surrounded by Seven Alchemists (side wall, front)

The eternal unity of opposites: the tree of life where the sun is inspired by the Spirit from above, the waters of life surrounded by the alchemists in which man and woman find the fruitful vine.(5)

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12. Heinrich Khunrath.

Amphitheatrum sapientiae aeternae

Hanau, 1609

Edgar Fahs Smith Memorial Collection,
Special Collections, Van Pelt Library,
University of Pennsylvania.

(Call number SMITH 540.1 K527.2)

13. Society of the Mercurii.

The Astrologer of the Nineteenth Century or the Master Key of Futurity being a complete System of Astrology, Geomancy & Occult Science.

London, 1825

Ex BF1691.xS6

At the right is Heinrich Khunrath's *Amphitheatrum sapientiae aeternae*, published in 1609 and loaned to the Library for this exhibition by Special Collections, Van Pelt Library, University of Pennsylvania. The engraving shows Khunrath himself on his knees in his alchemical oratory -laboratory. Before him on the table is a book of diagrams, such as the pentagram, the five-pointed star credited with credited with magical powers.

Heinrich Khunrath (1560?-1605) received an M.D. from the University of Basel in 1588, then practiced medicine in Hamburg and Dresden. On February 1, 1625, the Sorbonne condemned his *Amphitheatrum* for its mixture of Christianity and magic. The book was reprinted as late as 1900. Remarkably in London in 1825 a portion of the Khunrath self-portrait was copied for the frontispiece of *The Astrologer of the Nineteenth Century* shown at the left.

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14. Leohard Thurneisser.

(4) C.A. Burland, *The Arts of the Alchemists*, (New York: Macmillan Company, 1968) p. 81.

(5) C.A. Burland, *The Arts of the Alchemists*, (New York: Macmillan Company, 1968) p. 83.

Quintae essentiae

Leipzig, 1574

Ex 8013.905

This illustrated text covering the teachings of alchemy portrays a number of the activities and concerns of the alchemist. Here the "Tree of Life" is like the refraction apparatus and retort of the alchemist.

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The woodcut here begins the first chapter of the Tenth Book which is on the subject of the quicksilver or mercury. Cut shows the "Tree of Life" in operation: the roots of the various elements (arsenic, zinobar, mercury, etc.); the trunk labeled with the various alchemical operations (distillation, sublimation, coagulation, reduction, etc.) yielding the fruits of the alchemist's efforts, which are "fixed".

*

15. Athanasias Kircher.

Oedipus Aegyptiacus

Rome, 1652-4

Volume III, p. 358

Ex 2181.523q

"Figure reflective of the microcosm with the macrocosm"

For astrologers, the duality of the universe was paramount; that is, "things above are as they are below," thus, various signs of the zodiac governed various parts of the human body.

*

16. Johannes de Indagine

Chiromancie

Utrecht, 1536

Ex 6483.49

A portrait of the book's author Johan van der Jaght who labels himself "Theologian and Astrologer." Opposite is an astrological chart. Beneath the portrait is a motto saying: "You who research the course of the stars and the sense of the gods; you carry all so well the name 'Indagator,' namely, researcher or hunter (vernacular: van der Jaght)."

The chart is "the figure of the revolutions of the zodiacal signs and of the planets in accordance with the Natural Astrology

in whose horoscopes is Aries and his master Jupiter." Following the chart is a table which is a "continuation of the represented picture of the first year of Aries until the 84th year."

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GENEALOGY

17. Hartmann Schedel
Nuremberg Chronicle
Nuremberg, 1493
ExI 1016.816f

The Nuremberg Chronicle was a popular and extensively illustrated world history first printed in the 1490's in both Latin and German. Here the beginning of the human race portrayed in the chain of lineage starting with Adam.

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18. Rudimentum Novitiorum.
Lubeck, 1475.
Loaned by the Scheide Library, Princeton.

Important book of chronicles said to have been compiled for the instruction of young ecclesiastics. It is also the first dated book printed in Lubeck. The text includes fullpage genealogical tables, in the form of chains, the round links sometimes filled with figure subjects, the smaller ones show, among other things, the building and storming of a city, battles, representations of emperors, pope and saints. Also included are important early maps. Shown is the immediate lineage of Jesus.

*

19. King James Bible
London, 1611
Ex 3179.1611f (Kane Room)

The King James Bible was intended to bring the Scriptures into the intellectual reach of ordinary people, through translation into English from the original Hebrew and Greek. Another means of reaching them was by an elaborate series of 34 genealogical charts. The intent of these "Genealogies of the Holy Scriptures" was to help the reader fix his understanding of sacred history in terms of "Person", that is, as tangible substance. Such understanding is in contrast to "Time" and "Space," which are abstractions. (See explanation headed "The Genealogies of Holy Scriptures. To the Christian Reader.") Shown here are two tables showing: [1] The inter-relatedness of the peoples of the world as stemming from Noah (whose origins are given on the preceding table which shows Adam and Eve) and [2] Particulars about the offspring of two of Noah's sons.

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20. Lignies des roys de France.

Genealogical chart of the Kings of France.

A vellum roll of six parts derived from the

Grandes Chroniques de France. France, 15th century.

Princeton MS 56. Purchased on the Robinson Fund in 1947

Manuscript Division.

The roll begins with Priam, the legendary founder of the French line. In separate chains of medallions at the sides, contemporary persons and events are noted. To the left are the popes; to the right the first three roundells are the death of Ovid, the conversion of St. Paul, and the bishopric of St. James.

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CHRONOLOGY

21. Jean Boulaese

Tabula chronographica ex collatione temporum Hebraeorum,

Italorum, Chaldaeorum, et Aegyptiorum

Paris, 1573

(Ex)D11.B68e.

Boulaese was born about 1540 in the parish of Arrou near Courtalain. In 1611 one writer described him as the "fiery Boulaese." His life seems to have been filled with striving. He entered the priesthood in 1556 and took vows of poverty in 1568. A professor of Hebrew, he became principal of the College de Montaigu, but the position proved difficult to hold. Between 1568 and 1571 Boulaese seems to have been in Rome in order to present to Church officials details of the 1566 exorcism of a demon from a young girl in the Cathedral of Laon. Upon his return, Boulaese learned that his position as principal had been challenged by one Jean Margot; the dispute was not settled until 1578 in Boulaese's favor. Boulaese then proceeded to impose a change on the College, ordering that it be a school for the religious who had taken vows of poverty, and calling himself "father of the religious poor." This action did not please the wealthy regents of the College. In the end Boulaese lost, was condemned for obstinacy and was excommunicated in 1579.

Boulaese published a number of books which were highly esteemed in their day. His mainstay was an account of the exorcism performed at Laon. This account first appeared in 1573 and again in an expanded form in 1578 and in 1598; Princeton has both versions of the story issued during the 1570s. In addition to this, Boulaese published a commentary on Daniel, books on Hebrew, and another Biblical work. Unrecorded and published during Boulaese's turbulent years of the 1570s is his Tabula chronographica.

Boulaese's Tabula lays out in detail four time systems: the Biblical (based on the genealogy of Christ as given in Luke), the

Roman, the Babylonian, and the Egyptian. He names his sources, including among them Philo, Berosus, Metasthenes, Manetho, Eusebius, and Jerome. According to Boulaese's chartings, all systems demonstrate clearly that 3960 years had passed from the creation of the earth to the birth of Christ. As Boulaese points out at the end of the dedication to Rene de Birague, his chart is intended to aid Christians engaged in acquiring the "sacred things." In the dedication he also expresses his interest in eschatological matters (anagogicus).

The eschatological import of the *Tabula chronographica* is of particular interest. It is known that Boulaese was concerned with the Second Coming of Christ. In his *Ad mysticos sacrae scripturae sensus varia dictionum significatio in compendium collecta....*, published in Paris in 1575, he mentions the star of 1572: "From the 11th or 12th of November 1572 up to this day on which I write, the 22nd of November 1574, two entire years and 11 days have occurred since the day the new star appeared. It is not certain what this signifies, but it is possible, as the Scriptures say, that it indicates the Second Coming."

In his *Tabula chronographica*, Boulaese is at pains to demonstrate that his estimate of the time that had passed from the creation of the world to the birth of Christ was correct. Why such anxiety over fixing the precise number of years? And, why 3960? As C. A. Patrides points out, during the Renaissance, there was a distinct received tradition that the world would last no longer than 6,000 years. But determining where one was in that sequence of 6,000 years was not a simple matter. The learned of the age knew that the Second Coming was near, but how close? Over 100 writers of Boulaese's period agonized over this question, presenting more than 40 separate solutions to the problem. Luther, for example, chose exactly 4,000 years. The learned Joseph Scaliger settled on 3948. The variations depended in part on the source of one's information. If one selected the Septuagint, then at the time of the Renaissance the world was at least 6,500 years old. This was some 500 years past the "due date" and the world had not yet ended. So, for some, the chronology of the Septuagint contained an error, and the answer to the eschatological question must lie elsewhere.

Boulaese, like others, chose Luke's recounting of the forebears of Christ as his primary authority; the 42 generations listed there worked out nicely to 3960 years. Moreover, given the authority of Luke, the chronologies of the Romans and others could all be shown to agree with the Bible. In Boulaese's *Tabula chronographica*, columns two, three, and four to the right of the listing of Luke's 42 generations show in detail the parallels as well as the sometimes arbitrary adjustments required to make the eschatological chronology work out.

The *Tabula chronographica* has its original imprint canceled by a pasted-over square of paper. Underneath it reads "Apud Thomam Belot, sub D. Barbarae signo, in via Iacobaea." Belot held a 10-year royal privilege granting exclusive rights to the works of

Boulaese. Apparently Belot wished to disassociate himself from Boulaese; he sold the publication to Denis Leval, whose name as printer/publisher appears in the lower left corner. Exactly why Belot ended the relationship (he never published a Boulaese work again) is not known. Certainly Boulaese's life was in turmoil in 1573, and he had his detractors. And in the 16th century, as Anthony Grafton points out, chronology could make tempers flare. It was a subject fiercely argued. Moreover, the authenticity of one of Boulaese's sources, Berosus, was debated by a number of scholars; perhaps Belot decided to distance himself from Boulaese because of such doubts regarding his sources(6)

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22. Werner Rolewinck
 Fasciculus Temporum
 Strasburg, 1487
 ExI 3126.383.1489

In Werner Rolewinck's chonicle of the events of human history, time is depicted as a continuous line moving from right to left. The scene here is Noah and his ark. Other woodcuts show the Tower of Babel, the Temple of Solomon, views of important cities, Christ as Salvator Mundi. Rolewinck, a Carthusian monk of Cologne, used as a model Marianus Scotus, the 11th century chronicler.

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23. Werner Rolewinck
 Fasciculus Temporum
 Venice, 1479
 Kane Collection

In this first Italian edition of Werner Rolewinck's chonicle is the first known view of the city of Venice. The year is 464 AD and the 5663rd year since the Creation of the Earth.

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24. Henry Issacson
 Saturni ephemerides sive Tabula
 Historico-Chronologica, Containing a Chronological Series or
 Succession of the foure Monarchyes, with an Abridgement of the
 Annual Memorable Passages in them, as also, A Succession of the
 Kings and Rulers over most Kingdoms and Estates of the World,
 with a Briefe Chorographical Description of them.
 London, 1633
 Ex 1018.492f

Said to be the only edition of the first tabular chronology of its kind published in England. The Library's copy is opened to show the events of the turbulent 1550's in England, when

(6) Stephen Ferguson, "System and Schema: Tabulae of the Fifteenth to Eighteenth Centuries" in the Princeton University Library Chronicle, xlix, 1 (Autumn, 1987), pp 21-29.

Edward VI died and Elizabeth I eventually came to the throne.

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THEOLOGY

25. The Map of the Man of Sinn

G.W.

A Mappe of the Man of Sin: wherein is most lively delineated the Rising Raigning and Ruine of the Kingdom of AntiChrist....

[London, 1622-23]

Print purchased by the Library in Spring, 1987.

"The progress of a sinful man from 'A', the Antichrist as a bishop on a hill blinded by the sun, to 'T' and 'V', the Kingdom of Heaven or New Jerusalem, where "none unclean" are admitted. Way-stations include the Fountain of Silo with its stream muddied by churchmen, abbeys and cathedrals being juggled by simoniacs around the Pope, Rome, and tis cloisters, and Babel and its Tower collapsing. The 'route' is illustrated with scriptural analogues and at the foot are sixty lines of explanatory verse signed "W:G: scripsit et trans:" Perhaps this is William Gouge, the arch-puritan preacher at Blackfriars and chronicler of the 1623 'Fatal Vespers'." (7)

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26. Richard Dey

The Tree of Mans Life

[London, engraved by John Goddard, not later than 1653]

Print purchased by the Library in Spring, 1987.

The "tree" image elaborated to show the progress of life from birth to death. On the left is the life of the poor; on the right is the life of the rich. The lesson of the comparison is that, in the end and at the beginning, humans share the same lot, regardless of wealth or social standing.

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27. Biblia Sacra Latina

MSS. written in England in 13th century (about 1230)

Lent by the Scheide Library

At the back of this Latin Bible written in manuscript on vellum are several tables and diagrams, such as:

Beginning at:

Leaf 397b: Table of nine spheres and four elements as well

(7) [Arthur Freeman] in Four Centuries of English Books with a Few Manuscripts Catalogue number 1043 issued by Bernard Quaritch, Ltd., London, ca. 1985. Item 77. This item is also described in STC (new ed.) as 11511.2

as a table for finding the date of Easter

Leaf 398: Tree of virtues and vices showing 7 petitions
(Lord's prayer)

Leaf 398b: Table connecting the 12 prophets,
12 articles of faith and 12 apostles.
Another of the same [with differences]

Leaf 400b: Tree of vices and 7 branches

Leaf 401: Tree of virtues

Ls. 402-3: Four hands treated a "memoria technica:"
the first of the Church - its duty in preaching;
the second, the Devil's wiles:
the third, of God calling to repentance;
the fourth is blank (i.e. outline of hand only)

Leaf 404: Table connecting 10 plagues of Egypt;
10 commandments; and 10 contrarities

These tables and diagrams appear to have been added in the 14th century. Shown are the hands of leaves 402 verso and 403 recto.

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28. Tabula Christianae religionis
[Italy, 15--]
Purchased on the Reed Fund in 1986.
(Ex)BX1754.T32.1495s

This early 16th-century book of only 18 pages is headed Tabula Christianae religionis. The closely printed text covers all the essential points of faith: the Apostles Creed (complete with an Apostle's name next to a point to serve as a mnemonic), the Ten Commandments, the Lord's Prayer, the Seven Sacraments, the Seven Cardinal Virtues, the Seven Deadly Sins, the Seven Ages of Man, the Six Eras of the World, important feast days, and the like. No images are included. At least nine editions of the Tabula Christianae religionis are known, all undated and with no indication of printer. Most of them are thought to have been printed in Italy between ca. 1485 and ca. 1520.

Given the simplicity of both content and language, this was just the sort of book appropriate for a wide and general audience. It could have been used by clergy for training new clergy or instructing the laity. Similarly, it could have been used by laity to help them learn the basics of the faith, or when teaching other laity, as a household master would have taught servants. Such a book was the companion to missal and breviary, both of which are essential for the outward demonstration of inward faith; it would also supplement Italian vernacular literature such as saints' lives, which played a major role in the religious life of ordinary clergy and laity alike. Because tabulae like this one were undoubtedly heavily-used, their casualty rate might have been high, much higher, perhaps, than the 10 to 25 percent estimated loss of all books produced during the 15th century.(8)

(8) Stephen Ferguson, "System and Schema: Tabulae of the Fifteenth to Eighteenth Centuries" in the Princeton University

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Protestant and Catholic alike used diagrams in order to present Church dogma. At the left, is:

29. William Perkins

An Exposition of the Symbole, or Creed of the Apostles:
According to the tenour of the Scripture, and the consent
of Orthodox Fathers of the Church.
London, 1635.

Ex 5709.707q

At the right, is:

30. Jacobus a Sancto Michaelae.

Sacrorvm Novi Testamenti librorvm omnivm analysis
catholica, et oeconomia generalis.
Lyon, 1670.

Purchased in 1987 on the Sanxay Fund.

Ex BS2355.S23

Perkins, the staunch Calvinist, and Jacobus, the Catholic religious, both illustrate points of doctrine by means of tree diagrams which show sub-divisions within divisions of categories. Some scholars point out that this dichotomizing methods seems to stem from the influence of the 16th century figure, Peter Ramus.

In his *Sacrorvm Novi Testamenti librorvm omnivm analysis catholica, et oeconomia generalis* of 1670, Jacobus a Sancto Michaelae used schematic trees turned on their sides to make systems of divisions and parallelisms. At the left, we read the single summarizing statement; as we progress from left to right, the divisions of the unity are explicated. In turn, each of these parts is subdivided yet again. In the entire book, two of the *tabulae* analyse the New Testament as a whole, and one sets out Roman Catholic doctrines in a hierarchy (shown here.) All the remaining sheets *tabularly* explicate the contents of one or more New Testament books beneath a short prose synopsis in large italic type.(9)

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31. *Epitome of Gospel Mystery emblematically illustrated.*

[London, c. 1650].

Purchased on the Reed Fund during 1984-85.

(Ex)N7710.E64.1650f

In the *Epitome of Gospel Mystery emblematically illustrated* (London, ca. 1650), the major visual elements and their arrangement in space serve as an exposition of theological dogma. The central scene is flanked by two tall columns covered with text,

Library Chronicle, xlix, 1 (Autumn, 1987), pp. 19-21.

- (9) Stephen Ferguson, "System and Schema: *Tabulae* of the Fifteenth to Eighteenth Centuries" in the Princeton University Library Chronicle, xlix, 1 (Autumn, 1987), p. 19.

and surmounted by open sky and clouds. A cherub floats over each capital and trumpets a banner on which a rhymed triplet is inscribed. Below the banner and filling the central space is a scene emblematic of the "Gospel Mystery." Flowing from a fiery sun, a river runs through two hearts (one "of love," the other "of stone") and thence through wounds to irrigate the Tree of Life, beneath which is a portal to a holy place. In front of the door is a porch, which only a few figures have reached. In front of the porch is "The Broad Way to Destruction" on which figures in wigs and waistcoats walk toward a burning pit. To the left of the porch stand Adam and Eve exiting Paradise. All of the figures and scenes are labeled, usually in rhymed couplets and triplets.(10)

The scene depicted and the visual elements used (double hearts, flowing river, and so on) suggest those used in the "Testamentum Christi" diagram of Jacob Boehme show in the table case below. Even though the plate in the case dates from ca. 1730, Boehme's work was known in early to mid-17th century England when this Epitome was published. (See in this catalogue number 34).

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32. The New Jersuaalem

[London, 169?]

Print acquired by the Library in Spring, 1987.

Depiction (overhead view) of the Heavenly City based on the account of its physical features as given in chapters 21 and 22 of the Revelation of St. John.

"And [the New Jerusalem] had a wall great and high, and had had twelve gates, and at the gates twelve angels, and the names written on thereon, which are the names of the twelve tribes of of the children of Israel:

"On the east three gates; on the north three gates;
on the south three gates; and on the west three gates...

"And the city lieth foursquare, and the length is as large as the breath ...

"And I saw no temple therein; for the Lord God Almighty and the Lamb are the temple of it ...

"And he showed me a pure river of water ... proceeding from the throne and ... there [was] the tree of life, which bare twelve manner of fruit ...

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Tree of sermons

in

33. Joannes von Keisersberg

Sermons.

(10) Stephen Ferguson, "System and Schema: Tabulae of the Fifteenth to Eighteenth Centuries" in the Princeton University Library Chronicle, xlix, 1 (Autumn, 1987), p. 17.

Strasbourg, 1521

Ex 6167.37.1521

In this text of sermons on the Christian Life, the tree diagram sets out in order clock-wise around the tree the letters of the alphabet. The entire image is intended to aid the memory recall the 24 sermons which follow the cut. Each sermon begins with a word starting with the letter of the alphabet which is proper to it's place in the alphabetical order. The tree diagram evokes the "Tree of Life" symbolism, common in Christian art since early medieval times.

*

Jacob Boehme (1575-1624) German mystic whose influence spread throughout Europe and was studied by Sir Isaac Newton as well as other Englishmen such as William Law (mentor of John and Charles Wesley), William Blake, Samuel Coleridge, and William Butler Yeats.

"Boehme was a devout Lutheran whose mystical experiences led him to formulate a strikingly original account of God and Creation, which he expressed in a complex, private terminology drawn in part from alchemy. Although born of well-to-do farmers, he was apprenticed to a shoemaker at an early age and later moved to GLrlitz, then one of the most important cities in what is now East Germany, to practice his trade. There, at age twenty-five, he had his first mystical experience, in which he felt himself penetrated by the "Light of God." He later wrote that "in one quarter of an hour I saw and knew more than if I had been many years together in a University. . . . I saw and knew the Being of Beings, the Byss and Abyss, the eternal generation of the Trinity, the origin and descent of the world, and of all creatures through Divine Wisdom" (quoted in Rufus M. Jones, *Spiritual Reformers in the Sixteenth and Seventeenth Centuries* [1914; Boston: Beacon Press, 1959], 159). Another major mystical experience occurred ten years later, in 1610. He published an account of his experiences and beliefs in 1612. He immediately ran into hostility from Lutheran authorities and was forbidden to continue publishing. Nevertheless, as a result of further internal growth, hed resumed writing in 1618, but published nothing until 1623. From then until his death the following year, he was under constant attack by ecclesiastical officials who doubted his orthodoxy.(11)

34. Jacob Boehme

[Collected works]

Germany, ca. 1730

Ex 6157.19.1730 vol 6

(11) Robert Galbreath, "Boehme" in *The Spiritual in Art: Abstract Painting 1890-1985*, Organized by Maurice Tuchman with the assistance of Judi Freeman. (New York: Abbeville Press, 1986), p. 367.

In this plate "the vessel of the heart is doubled and converted into a circulatory system that assures perpetual inter-change and interaction between the upper arc of divine light and lower arc of corrosive fire. The left-right opposition of the divine bipolar eye in Boehme's original diagram has been rotated to the left ninety degrees into a bottom-top opposition. The trunk of the tree/cross sinks its roots/veins into prima materia, and the life blood of the system is conveyed through alchemical transmutations into the heart of the upper realm. At the point of intersection of the horizontal and vertical of the cross, the blood with its source in base matter is converted into the wine/blood of the Son, and the tree itself, rooted in the devouring flames, becomes the tree of eternal life. The circulatory system is constructed so that there need be no end to this process of alchemical transmutation."(12)

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Jacob Boehme

The Philosophical Globe

"The diagram that Boehme designed for Forty Questions of the Soul and his explication of this drawing achieved a visual structure that could accommodate all his propositions. He gave the illustration two titles: The Philosophical Sphere and Wondrous Divine Eye of Eternity. Boehme explained that the divine eye, a circle, must be split into two and the two resulting arcs placed back to back and rotated in opposite directions. One eye becomes two eyes, which propel one another through their mutual opposition to one another. One arc issues from the corrosive fire eye of the Father, the other, from the loving eye (of sustaining warmth and illumination) of the Holy Spirit. The heart at the center point of contact between the arcs is the Son. Although the circle that contains the system has a center focal point, this center is in fact engendered by the two foci of the opposing arcs, which project their respective arcs to the point of contact, which is also the spark of ignition. Only when ignited can this center point engender the outer circle that contains and unifies the entire system. The geometrical figure of a perfect circle with a single center point has been used for millennia as a metaphysical symbol of unity and equilibrium. Boehme strains the confines of this figure to the limits by insisting upon the initial split into two eyes, the two foci that between them generate a center to the circle. At the beginning of the nineteenth century, the two foci within a circle caught the attention of German Romantic poets and philosophers, such as Baader, Friedrich von Schelling, Ludwig Tieck, and Friedrich von Schlegel. The Romantics sought a symbolic representation of a

(12) Harriett Watts, "Arp, Kandinsky, and the Legacy of Jakob Bohme" in *The Spiritual in Art: Abstract Painting 1890-1985*, Organized by Maurice Tuchman with the assistance of Judi Freeman. (New York: Abbeville Press, 1986), p. 246.

unity that could embrace diversity, even polarities, two foci rather than one, and Boehme was the Western philosopher to whom they looked for suggestions." (13)

35. Jacob Boehme
 [Collected works]
 Germany, ca. 1730
 Ex 6157.19.1730 vol 6.

36. Jacob Boehme
 Forty Questions for the Soul
 London, 1647
 Ex 6157.19.335.9
 Copy 1 and Copy 2.

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37. Jacob Boehme,
 The Works of Jacob Behmen, the Teutonic theosopher
 London, 1764-81. 4 volumes.

Copy of the English translation on loan from Special Collections, Linderman Library, Lehigh University. (Lehigh call number: 248.B676w.T). The entire work is illustrated. At the front of the first volume is a life of the author by William Law, who influenced Methodism.

Volume I. Colored chart "The True Principle of All Things"

Evidently a depiction of Boehme's look into the 'Byss and Abyss'
 Volume II. Second Table

Explained in Volume III (p.27, last count):

"The Second Table shews the condition of Man in his old, lapsed, and corrupted State; ... first, ... his earthly visible Body; second, ... his more interior and invisible Astral Body, in conjunction with his Transitory and Astral Spirit;... third, his immortal Soul...; and his Eternal Spirit, which is the Inmost of all."

Volume III. The Origin of Things and the Process of Christ

Shown step by step, starting with the first event at the topmost panel and continuing onward down the right and across the bottom ("The Lowest Parts") then up the left to "Finis."

Volume IV. Plate VI. The Fall of Lucifer

Explained in Volume II (at end): "He [Lucifer] commits High Treason, revolts, lets his dark, proud Will- Spirit, in a false Magia, without any Occasion given him from without ... [Lucifer] falls through the Fire into Eternal Darkness ..."

- (13) Harriett Watts, "Arp, Kandinsky, and the Legacy of Jakob Bohme" in *The Spiritual in Art: Abstract Painting 1890-1985*, Organized by Maurice Tuchman with the assistance of Judi Freeman. (New York: Abbeville Press, 1986), p. 251. Also see her footnote to this section referring to the work of Marshall Brown.

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38. Athanasias Kircher.
Oedipus Aegyptiacus
Rome, 1652-4
Volume II.
Ex 2181.523q

The Seventy-Two Names of God

"The Cabbala says that there are seventy-two names of God, which Kircher interprets by giving God's name in the seventy-two languages: each is spelt with four letters, to reflect the Hebrew Tetragrammaton IHVH (no. 1). Sometimes this leads to compromise, as in Italian IDIO (no. 15) and English GOOD (no. 22). The other circles contain God's various attributes: Creator, Perfection, Light, etc. In the centre is Jesus, whose name is comprised of the 'mother' letter Shin inserted in the Tetragrammaton: IHSVH. The two trees are those of the seven planets and angels (left) and the twelve signs of the Zodiac and tribes of Israel (right). The leaves at the top bear seventy-two names in Hebrew, distributed among the nine angelic orders -- with the caution that they are on no account to be used for magical invocations."(14)

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39. Athanasias Kircher.
Ars Magna Sciendi.
Amsterdam, 1669.
Goertz 11012

"Ars Magna Sciendi is one of his most difficult, books being an elaboration of the Art of Ramon Lull, the thirteenth-century Majorcan philosopher, into a kind of symbolic logic. Its object is nothing less than the categorization of all qualities and relationships, and the application of the symbolic formulae thus obtained to every department of learning. The frontispiece shows the eye of God presiding over this formidable list: Theology, Metaphysics, Physics, Logic, Medicine, Mathematics, Moral Ethics, Ascetics, Jurisprudence, Politics, Scriptural Interpretation, Controversy, Moral Theology, Rhetoric, and the Combinatorial (i.e. Lullian) Art. On the tablet in the hand of the Divine Sophia is the 'Alphabet of the Arts', the archetypes of all experience and knowledge. To construct such a system as this book unfolds would have been a reasonable life's work, yet for Kircher it was only one among many encyclopaedic undertakings, and its Greek inscription might well serve as his own motto: 'Nothing is more beautiful than to know the All.'"(15)

- (14) Joscelyn Godwin, Athanasias Kircher. A Renaissance Man and the Quest for Lost Knowledge (London: Thames and Hudson, 1979) p. 63.
(15) Joscelyn Godwin, Athanasias Kircher. A Renaissance Man and the Quest for Lost Knowledge (London: Thames and Hudson,

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- "The Jesuits' Universal Horoscope" in
 40. Athanasias Kircher.
 Ars Magna Lucis
 Amsterdam, 1671
 Ex 8013.523q

"The tree of the Society of Jesus, with its roots in Rome, sends its leaves into every corner of the known world. The purpose of the chart is to show the time and length of the day in every land. Such tables, less fancifully drawn, are used by astologers today to align birth times throughout the world with Greenwich Mean Time. The corner panels show in thirty-four languages the words 'From sunrise to sunset, praised be the Name of the Lord.'"(16)

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41. Athanasias Kircher.
 Musurgia Universalis
 Rome, 1650
 Graphic Arts

Frontispiece to Musurgia Universalis, Rome, 1650 by J. Paul Schor
 "The symbol of the Trinity sheds its rays on the nine choirs of angels, who sing a 36-part canon (by Romano Micheli), and thence on the earth. The terrestrial sphere is shown encircled by the Zodiac and surmounted by Musica, who holds Apollo's lyre and the pan-pipes of Marsyas. In the landscape are seen dancing mermaids and satyrs, a shepherd demonstrating an echo, and Pegasus, the winged horse of the Muses. On the left is Pythagoras, the legendary father of musical theory. He points with one hand to his famous theorem, and with the other to the blacksmiths whose hammers, ringing on the anvil, first led him to discover the relation of tone to weight. On the right is a muse (Polymnia?) with a bird perched on her head -- possibly one of the nine daughters of Pierus, who for their presumption in attempting to rival the Muses were turned into birds. These figures are surrounded respectively by antique and modern instruments."(17)

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- 1979) p. 9.
 (16) Joscelyn Godwin, Athanasias Kircher. A Renaissance Man and the Quest for Lost Knowledge (London: Thames and Hudson, 1979) p. 78.
 (17) Joscelyn Godwin, Athanasias Kircher. A Renaissance Man and the Quest for Lost Knowledge (London: Thames and Hudson, 1979) p. 68.

PHILOSOPHY

42. Louis de Lesclache.
 La philosophie expliquée en tables.
 Paris, 1652-63.
 Purchased on the Zabriskie Fund in 1983.
 (Ex)B1889.L4 P5 1651.

The tree diagrams are horizontal rather than vertical, and schematic rather than naturalistic, as in Louis de Lesclache's *La philosophie expliquée en tables* (Paris, 1652 - 1653). His three-volume set of bound engraved plates shows the points of philosophy in schematic, tree-like diagrams turned on their side so that we read them left to right, rather than bottom to top, as with standard tree diagrams. The utility of the tables, the author declares, is that many things can be compressed into a few words. Moreover, they show an orderliness that aids memory and reason, and they display the correspondence that one thing has with another. Here, "philosophie" is construed in a wide sense to include moral teaching, logic, and metaphysics.(18)

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43. Gregor Reisch
 Margarita Philosophica
 Basel, 1583
 Gift to the Library from the Estate of Harold L. Ruland
 Ex 6179.7522.361.11

Reisch's text was a kind of desk-top encyclopedia of knowledge in its day. In this woodcut of the "Figure of Logic," we see logic shown as a huntsman chasing the hare ("Problem"). He is armed with the sword of "syllogism" and the bow and arrow of "inquiry." Off in the distance are the woods of insoluble problems. In the pages following the reader is taught the rules of logical deduction and other matters, all means toward solving intellectual problems.

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44. Gregor Reisch
 Margarita Philosophica
 Strasbourg, 1512
 Ex 6179.7522.361

Reisch's text was a kind of desk-top encyclopedia of knowledge in its day. In this woodcut of the "Figure of Grammar," first of the Liberal Arts, we see a matron with leading a student to school. She holds out a hornbook with the alphabet on it in her right hand; in her left a key unlocks the school door, a "tower of learning" with classes in session in the lower floors and in the upper stories await the ancient masters: Cicero to

(18) Stephen Ferguson, "System and Schema: Tabulae of the Fifteenth to Eighteenth Centuries" in the Princeton University Library Chronicle, xlix, 1 (Autumn, 1987), pp. 17-19.

teach rhetoric; Ptolmey for astronomy; Peter Lombard for Theology and Metaphysics; Aristotle for logic; Euclid for geometry and so on.

*

LOGIC

45. Martin Meurisse

Artificiosa totius logices descriptio
 ("A technical and artfully-done depiction of logic
 in its entirety")
 Paris, 1614.

This engraving is kept with other oversize prints of 17th century France in the Graphic Arts Collection of the Library. At the bottom edge of this engraving a Franciscan monk monk gestures towards several novices. Behind him is a walled courtyard surmounted by a formal garden above which stands a grove of trees. Exactly what is the monk doing? Why such an exotic scene of trees, fountain, half-clad women, and numerous small objects?

The monk is Martin Meurisse (1584 - 1644), a Cordelier Franciscan who eventually became Bishop of Madaure. His duties included training novices, and toward that end he prepared three instructional charts. (List of the others in the series is below.) In 1983 Princeton University Library acquired the first in the series, "A technical and artfully-done depiction of logic in its entirety" (Artificiosa totius logices descriptio), published in 1614. In the Logices descriptio, Meurisse is shown teaching the novices how the three chief operations or processes of the intellect -- according to Duns Scotus and Aristotle, as interpreted by Meurisse -- can be apprehended by studying the details of the chart.

The chart is divided into two principal parts: the three-tiered central feature depicting the operationes mentis, and a surrounding border of emblems. The three tiers of operationes are the traditional Scholastic processes of the intellect arranged in a hierarchy, with the lowest, Categories, at the bottom, followed by Judgement, and Syllogism at the top.

Categories are represented by a walled-in courtyard entered by ascending five steps and going through a portal. The steps are the five predicables of Aristotelian logic as interpreted by Porphyry, among others: genus, species, difference, property, and accident. Within the courtyard are Aristotle's ten categories (substance, quantity, quality, relation, action, passion, place, time, position, and state) flowing from the central source, the fons of being. The fons is a pool adorned with a statue of a half-clad man standing with one foot on a sphere. A banner over his head reads: "The first process of intellect refers to differentiating thinking, which explains the nature of an object."

The second process of intellect, Judgment, is depicted as a formal, hedged-in garden at the gate of which sits a half-clad woman, perhaps Judgment personified. Like the man below, she has a banner over her head. Hers reads: "This is the dividing process in which the whole is distributed into its parts, or the manifold is separated according to the multiplicity of the whole." In the garden behind the woman are inscriptions giving particulars concerning the process of judgment.

Syllogism is a grove of three trees that sit above the second realm. The central tree is the "Tree of Knowledge," flanked on the left by the "Tree of Sophisms," and on the right by the "Tree of Beliefs." Each tree is ripe with its corresponding fruit; the Sophists' tree bears the fruit "error" and "ambiguity." In front of the central tree sits a gowned woman with outstretched arms. An inscription above her arms reads: "This is argumentative process (syllogism) in which the one is concluded from the other."

Embedded in the border surrounding the three realms of operationes mentis are many emblems. Outside the first and lowest realm lie bits and pieces of reality (ens incompletus) separated from their completed form by the wall of carentia, or deprivation. Outside the second realm the Sophists pipe on their harmonicas, perhaps a reference to fools and their pipes. In the upper corners are miniature portraits of Aristotle (right) and Duns Scotus (left), whose doctrines Meurisse is explicating in his chart. In the uppermost compartment, the Logices descriptio is dedicated to Jacques Auguste de Thou, the great French bibliophile, a nobleman and member of the Third Order of St. Francis.

These are only a few of the most obvious readings of the chart. A full explanation would take many pages, just as Meurisse intended, and just as is entailed by the instructional form which he used, a tabula.(19) Other charts in the series:

Clara totius Physiologiae Synopsis

("A clear synopsis of physiology in its entirety")

(1615)

Artificiosa totius Moralis Philosophiae tabella

("A technical and artfully-done tableau of moral philosophy in its entirety") [1630?].

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Logic is the science of the processes of inference, that is the 'mental operation which proceeds so as to cause a consequent conclusion.' In short, the art of reasoning.

In western culture, Aristotelean logic has been studied since earliest times and his works on logic were commonly used as school texts. Over time, visual aids for understanding Aristot-

(19) Stephen Ferguson, "System and Schema: Tabulae of the Fifteenth to Eighteenth Centuries" in the Princeton University Library Chronicle, xlix, 1 (Autumn, 1987), pp. 8-11.

lean logic developed -- such as the square of contradiction or the tree of Porphyry. (Porphyry was an 3rd century commentator on Aristotle.)

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Tree of Porphyry

46. Paulus Pergulensis

Logica

Venice, 1495

ExI 6275.702

and

47. Peter Hispanius

[Work on Logic]

Vienna, 1516

Ex 6275.501.2

The Tree of Porphyry "set out the relationship between genera and species and called for a multiplicity of choices. It originated as an illustration to commentaries on Porphyry's Isagoge (late 3rd cent) and proceeded from the ultimate genus, substance, to the ultimate species, individual men, by a series of dichotomous divisions. Each bifurcation of the tree contained a positive and negative side." (20)

Paulus Pergulensis, Doctor Insignis, Acutissimus and Perspicacissimus, born at Pergola near Urbino. He was canon of St. Mark's and lecturer in Science at Venice where he died ca. 1451. His Logica on leaf aii shows a Tree of Porphyry; also seen in this logic text of Peter of Spain, published in 1516.

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Square of Contradictions

48. Peter Hispanius

[Work on Logic]

Venice, 1622

Ex 6275.501.2

Logic is the science of the processes of inference, that is the 'mental operation which proceeds so as to cause a consequent conclusion.' In short, the art of reasoning.

In western culture, Aristotlean logic has been studied since earliest times and his works on logic were commonly used as school texts. Over time, visual aids for understanding Aristotlean logic developed -- such as the square of contradiction. The square demonstrates the inter-relatedness of particular premises and illustrates the so-called "principle of contradiction," that contradictory statements can not both be true at the same time.

(20) Michael Evans in "Geometry of the Mind" AAQ: Architectural Association Quarterly vol 12, no 4 (1980) p. 45.

On leaf 43r, in the Tractatus Primus is a diagram of the square of contradictions.

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ALLEGORY

49. Robert Burton

Anatomy of Melancholy

London, 1621

Ex 3658.86.312.122 copy 1

Robert Burton (1577-1640), the Oxford scholar, is best remembered for his Anatomy of Melancholy, which went through nine editions between 1621 and 1676. Burton revised the book continually after its first appearance in 1621. The Anatomy was widely read in the 17th century, admired by Samuel Johnson and by Charles Lamb. The "Arguement of the Frontispiece" explains the content of the book. Moreover, the book is divided into three 'Partitions' -- the First defining the disorder as well as covering causes and symptoms; the Second discusses cures; the Third is devoted to Love-Melancholy and Religious Melancholy. Shown across the gallery is his five page diagram of the divisions for the understanding of diseases.

*

50. Thomas Greenhill

Necrokededia or the Art of Embalming

London, 1705

Ex RA623.G81

The "Explanation of the Frontispiece" faces the titlepage.

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51. Michael Sparke

The Narrative History of King James

London, 1651

Ex 14431.669

Its "Emblematic titlepage explained" is opposite the titlepage.

*

POETRY

52. William Blake
 Visions of the Daughters of Albion
 1793
 Ex3631.3.393q
 Opened to "The Argument" and the First page of the poem. The theme of this poem is contained in Oothoon's cry "Love! Love! Love!, happy, happy Love! free as the mountain wind!" It consists chiefly of the complaint of Oothoon, bound by prejudice to an unhappy marriage with the rational Bromion, whereas her true love is for the emotional Theoormon. The latter is withheld by jealousy and will not listen. Oppressed womanhood in the persons of the Daughters of Albion "hear her woes, and echo back her sighs." (21)
- *
53. William Blake
 Songs of Innocence and of Experience
 1794
 Ex3631.3.388.1794
 "Song of the Rose"
 Blake was influenced by among others Jacob Boehme whose works in English translation published in the 18th century are displayed in a case across the gallery.
- *
- Shaped or pattern poetry in English Literature is chiefly a 17th century phenomemon. No pattern poetry is known to have been printed during the 18th century in England. Virtually all of the shapes used for these poems are those prescribed in Puttenham's The Art of English Poesie. In shaped poetry, the physical form of the printed poem and the emotional flow of the text re-enforce each other. Herbert's "Easter Wings" is an excellent example of such re-enforcement.
54. George Herbert
 The Temple
 London, 1634
 Ex 3780.5.388.19 (3rd Edition)
 On page 34-5 is his pattern poem "Easter Wings" (wings)
55. Philip Ayres
 Lyric Poems, Made in the Imitation of the Italians
 London, 1687
 Ex 3612.827.1687
 On page 162 is his "The Trophy" (monument)
56. Edward Benlowes

(21) Note on a loose page laid into the the Princeton copy.

Theophila, or Love's Sacrifice

London, 1652

Ex 3625.6193.389

On page 14 is an altar poem. Also shown is an allegorical engraving of "Theophila" or the soul, shown here in meditation on the Trinity, symbolized by the triangle.

57. Facetiae. Musarum Deliciae: or the Muses-Recreation.

(London, 1656)

and

Wits Recreations. Selected from the Finest Fancies of Modern

Muses.

(London, 1656)

Ex 3598.333

Facsimile edition printed in London in 1817.

A love-knot, one of several in the book.

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ARTIFICIAL MEMORY

"Artificial memory" is a technique of memorization in which memory is developed purposefully by an individual. The technique is actually quite ancient and was once considered to have been developed by Cicero. It rests on the common judgment that sight is the most powerful of the six senses and thus should be used for remembering. Just as the distinction between object and background is necessary for seeing to occur, so is this distinction central to the classical theory of memory.

In essence, the theory tells us that, to establish background, we must first memorize places. Go to a building, view the doorway, fix it in mind, move along, view a window, fix it and so forth. At this first stage, we build a storage system, an aggregation of niches into which something can be put. Secondly, we proceed to fill these places (topoi or loci) with images. The images (imagines agentes) represent specifics that are intended to be remembered. The images are to be striking (e.g. a bloodied face) so that their power to provoke emotion helps the mind to remember. To recall the memorized data, we then visualize a gallery of images in place, and by scrutinizing them carefully we decode the abstractions represented by the images.

*

58. Johannes Buno

Memoriale juris civilis Romani, quo tituli omnes et praecipuae leges, quae in quinquaginta Digestorum seu Pandectarum libris sunt, emblematis imaginibus ita efficta exhibentur, ut una cum titulorum materiis eorum etiam numeri memoriae imprimi, contineri ac reddi quin etiam leges illae praecipuae ad suos referri titulos facili negotio queant ... edidit Johannes Buno.

Hamburg, 1673-74.

Ex KDB.B86 1673.

Recently, the Philadelphia rare-book dealer, Bruce McKittrick, gave the Library a bold example of a memory aid. It is from a Latin text discussing the Justinian Code, and was published in Hamburg in 1673 - 1674. Distinguishing this text from many other schoolbooks on the Code are a series of 22 engravings designed to assist students with memorizing important points. The text and plates are the ingenious work of Johannes Buno, a schoolmaster who also prepared a Bible similarly adorned with exotic aids to memory.

Buno's engravings were to be used in accord with a specific program. First, the student had to discover the underlying image. In this engraving for the Digests of Justinian, there are ten such principal images, starting in the upper left with a stone and moving left to right and then down to the leftmost image in the second row, to the last image, a sheath. To learn the sub-divisions of each Digest, the student next examined and memorized the series of small images fixed on the principal image. These images are arranged according to the numerical order in which the subdivisions of the Digest appear. Each small, tagged scene depicts the gist of a sub-division. These many subdivisions are explained in the accompanying diagram, giving English translations of the Latin.(22)

*

59. Johannes Buno

Memoriale juris civilis Romani, quo tituli omnes et praecipuae leges, quae in quinquaginta Digestorum seu Pandectarum libris sunt, emblematis imaginibus ita efficta exhibentur, ut una cum titulorum materiis eorum etiam numeri memoriae imprimi, contineri ac reddi quin etiam leges illae praecipuae ad suos referri titulos facili negotio queant ... edidit Johannes Buno.

Hamburg, 1673-74.

Ex KDB.B86 1673.

In this engraving for the Institutes of Justinian, there are four such principal images, starting in the upper left and moving clockwise: a young man, a rucksack, a money-purse, and a barrel. To learn the sub-divisions of each major section, the student next examined and memorized the series of small images fixed on the principal image. These images are arranged according to the numerical order in which the major subdivisions appear. Each small, tagged scene depicts the gist of a sub-division. These many sub-divisions are explained in the accompanying diagram, giving English translations of the Latin.

- (22) Stephen Ferguson, "System and Schema: Tabulae of the Fifteenth to Eighteenth Centuries" in the Princeton University Library Chronicle, xlix, 1 (Autumn, 1987), pp. 13-17.

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60. Cosmas Rosellius
 Thesaurus Artificiosae Memoriae
 Venice, 1579

Copy bought in Feb. 1987 for the Rare Books Collection

Cosmas Rosellius, the author of this "Treasury of Artificial Memory" was a Florentine and member of the Dominican Order. In the book, Rosellius offers a number of memory place systems for the storage of information, as directed by the techniques of artificial memory. Suggested place systems included: abbeys, cathedrals, the constellations, human figures, Hell, and Heaven. "The place of Paradise is to be imagined as surrounded with a wall sparkling with gems, In the centre is the throne of Christ; ranged in order below are the places of the celestial hierarchies, of Apostles, Patriarchs, Prophets, Martyrs, Confessors, Virgins, Holy Hebrews and the innumerable concourse of saints. There is nothing at all unusual about Rosellius's Paradise, except that it is classed as 'artificial memory.' With art and exercise and vehement imagination we are to imagine these places." (23)

Shown here are repeating cuts of the design of Heaven. The two cuts straddle at either end the section of the book on Paradise.

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61. Johannes Romberch
 Congestorium Artificiose Memoriae
 Venice, 1533
 Ex 6443.782

"The visual alphabets illustrated in the memory treatises, were ... intended to be used for making inscriptions in the memory. In fact, this can be proved from the example (shown here) in the third part of Romberch's book of a memory image covered with inscriptions in visual alphabets (Xerox adjacent). This is one of the very rare cases in which a memory image is illustrated; and the image turns out to be the familiar figure of old Grammatica, the first of the liberal arts, with some of her familiar attributes, the scalpel and the ladder. She is here, not only the well-known personification of the liberal art of Grammar, but a memory image being used to remember material about grammar through inscriptions on her. The inscription across her chest and the images near of on her are derived from Romberch's visual alphabets, both the 'objects' one and the 'birds' one which he is using in combination. He explains that he is memorising in this way to answer the question whether Grammar is a common or a particular science; the reply involves the use of the terms 'predicatio', 'applicatio', 'continentia'. 'Predicatio' is memorized by the bird beginning with a P (a Pica or pie) which she holds, and

- (23) Frances Yates, *The Art of Memory*, Chicago: University of Chicago Press, 1966, p. 122.

its associated objects form the object alphabet. 'Applicatio' is remembered by the 'Aquila' and associated objects on her arm. 'Continentia' is remembered by the inscription on her chest in the 'objects' alphabet (see the objects representing C, O, N, T, in the 'objects' alphabet)."(24)

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62. Robert Fludd

Title page of 'Ars Memoria'
 in Tomus II (concerned with the lesser world or the microcosm
 of the world of man) of his
 Ultriusque Cosmi, Maioris scilicet et Minoris, metaphysica,
 physica, atque technica Historia
 ("Metaphysics, physics and
 technical history of two cosmoses, namely the greater
 world and the lesser world")
 Oppenheim, 1621
 Ex 6252.352q

Robert Fludd lived in England when he wrote this fascinating 'History of the Two Worlds' in which he expounds his own learned theories of what is nowadays called 'occult' thinking. In the arts of the microcosmos section of his book, he covers 'artificial memory.' "The chapter on 'the science of spiritual memorising which is vulgarly called Ars Memoriae' is introduced by a picture illustrating this science. We see a man with a large 'eye of the imagination' in the fore part of his head; and beside him five memory loci containing memory images. Five is Fludd's favorite number for a group of memory images, ... and the diagram also illustrates his principle of having one main image in a memory room. The main image is an obelisk; the others are the Tower of Babel, Tobias and the Angel, a ship and the Last Judgment and the damned entering the mouth of Hell -- an interesting relic in this very late Renaissance system of the mediaeval virtue of remembering hell by artificial memory. These five images are nowhere explained ... in the text."(25)

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63. Petrus de Rosenheim

Memorabiles evangelistarum figurae
 Pforzheim, 1502
 Ex NE1235.A7P4

Striking examples of the technique of artificial memory is to be found in this series of woodcuts summarizing the contents of the four Gospels. The example above is typical of the device used. The dominant figure is the standard symbol of the Gospel

(24) Frances Yates, *The Art of Memory*, Chicago: University of Chicago Press, 1966, p. 119-120.

(25) Frances Yates, *The Art of Memory*, Chicago: University of Chicago Press, 1966, p. 326.

writer -- Luke is represented by the bull. Fixed on the body of the bull, starting at the head are six 'sub-images', each depicting a section in the Gospel. In this cut, the six are the beginning of the Gospel -- to be read starting at the head of the bull, and reading down his torso, then over to the left and across to the right:

- | | |
|--|--|
| 5. Selection of Peter
(his fishing net and
his bed roll) | 6. Teaching the Sermon
on the Mount
(the Eight Beatitudes) |
|--|--|
1. the Angel announcing the birth of Christ
 2. the Nativity narrative
 3. Baptism of Jesus
 4. Temptation in the Desert

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64. Petrus de Rosenheim
Memorabiles evangelistarum figurae
Pforzheim, 1502
Ex NE1235.A7P4 copy 2

Another copy of the same book described above. In this woodcut the beginning sections of the Gospel of Mark are depicted. By learning all the images in proper series, one could recall the entire contents of a particular gospel.

*

SYSTEMS OF KNOWLEDGE

Denis Diderot, editor.

Encyclopedie ou Dictionnaire Raisonne des Sciences, des Arts et
des Meiters
Paris, 1751

Ex 0984.325q and shelved in the Dulles Reading Room

One of the great intellectual achievements of the 18th century, Diderot's Encyclopedia stated that one of its expressed purposes was "to set forth, as far as possible, the order and and the interrelationship of human knowledge"

The organization of knowledge into a general scheme is explained in the "Preliminary Discourse" at the beginning of the first volume and then set forth graphically in three other ways:

65. I. Allegorical frontispiece showing Truth surrounded by Reason and Philosophy with Theology kneeling at her feet [Frontispiece in smaller format in Atlas encyclopedie volume 1 of the Encyclopedie methodique. (Ex AE25.E5q)]
66. II. A schematic "tree" diagram showing that Human Understanding perceived the world trough the faculties of Memory, Reason,

and Imagination.(26) [Systeme Figure des Connoissances Humaines. Entendement: Memoire, Raison, Imagination]

History and related sciences derive from Memory

Moral and natural philosophy derive from Reason

Poetry and related arts derive from Imagination

67. III. A naturalistic "tree" diagram showing the "genealogical distribution of the principal arts and sciences" was drawn up by Christian Frederic Wilhelm Roth of Weimar and in 1769 published as the frontispiece for volume one of the Tables for the Encyclopedia. Roth developed his endeavors at presenting a system of knowledge by publishing separately the next book (Erfurt, 1785) [number 68].

68. IV. Christian Frederic Wilhelm Roth.

Versuch einer Mappemonde litteraire.

Erfurt, 1785.

Purchased on the Sanxay Fund during 1986.

(Ex)Z2000.R67.1785f

Christian Frederic Wilhelm Roth's Versuch einer Mappemonde litteraire (Erfurt, 1785) offers an interesting contrast. Roth covers the whole range of knowledge. He charts a Mappemonde Litteraire -- "Map of the World of Letters." He does so using a columnar arrangement, with each column filled with text and disposed left to right across the page. There are no images on the tabula, only text. In Roth's thinking, "Letters" is the total intellectual culture of humankind, not just philosophy, theology, and the genealogies of Kings. Significantly, financial backing for the book did not come from a single patron, but from a group of subscribers. True, the list is headed by eight members of the German nobility, but they are far out-numbered by the more than 150 others on the list. These others are lesser men: merchants, booksellers, Cappelmeisters, and so forth. From both the list of subscribers and Roth's ambitious attempt to represent all the new knowledge of his time, we get a glimpse of the democratic age arriving, an age when knowledge would be transmitted by means more accessible to the common man, unversed in the systems and schema of "artificial memory" and the often esoteric meanings of emblems.(27)

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69. Robert Burton

Anatomy of Melancholy

London, 1621

(26) Howard C. Rice in Diderot's Encyclopedia 1751-1780 An Exhibit Commemorating the 200th Anniversary of Its Publication. Princeton University Library. Exhibition Catalogues Number 8. (Princeton, 1951), p. 7.

(27) Stephen Ferguson, "System and Schema: Tabulae of the Fifteenth to Eighteenth Centuries" in the Princeton University Library Chronicle, xlix, 1 (Autumn, 1987), pp. 29-30

Ex 3658.86.312.122 copy 2, 3, and 4

Robert Burton (1577-1640), the Oxford scholar, is best remembered for his *Anatomy of Melancholy*, which went through nine editions between 1621 and 1676. Burton revised the book continually after its first appearance in 1621. The *Anatomy* was widely read in the 17th century, admired by Samuel Johnson and by Charles Lamb. The book is divided into three 'Partitions' -- the First defining the disorder as well as covering causes and symptoms; the Second discusses cures; the Third is devoted to Love-Melancholy and Religious Melancholy. This tabular synopsis of the First Partition of the book extends five pages. The beginning sections is at the far right and the table continues across to the far left.

*

70. John Dee

"Here have you (according to my promise)
the Groundplat of my mathematicall Preface: annexed
to Euclide (now first) published in our English tongue.
An 1570. Febr. 3."
London, 1520 (Feb. 25)
Ex 2654.331.570q

Diagram of dichotomys showing that the Sciences and Artes Mathematicall are either Principall (2 such) or Derivative (19 such)

*

71. Robert Fludd

"Temple of Music" in Tomus I (covering the macrocosm)
Ultriusque Cosmi, Maioris scilicet et Minoris, metaphysica,
physica, atque technica Historia
("Metaphysics, physics and
technical history of two cosmoses, namely the greater
world and the lesser world")
Oppenheim, 1618
Ex 6252.352q

"This extraordinary structure, obviously influenced by Renaissance theatrical architecture, was probably conceived as a mnemonic device for the rules of music. Proceeding along the bottom we find first a lute, an instrument which Fludd honours with the following encomium:

'No other invention, ancient or modern, is more seemly for consorts nor more desirable for symphonies, nor more admirable to the ears of listeners. Time destroys not the sweetness of its sounds, neither do fickle inventions seduce men's affections from it, however rare, unusual, or more easily learnt these may be.'
(p. 226)

Next is the famous scene of Pythagoras entering the forge in which he noticed the consonant pitches produced by four hammers. Examining the hammers, he found their weights in the proportion 12, 9, 8 and 6, giving the intervals of fourth, fifth and octave.

The massive foundation obscuring the remainder of the arcade is in the form of a staff with a bass clef. The lowest note is G, the bottom of the gamut, and as the notes proceed up the scale so their values get smaller, from maximus to semifusa (the latter equal to our quaver or eighth-note). This is the basis which the rest of the temple amplifies.

In the second storey we find first a column-monochord with the notes of the gamut marked off for two octaves, two higher octaves being indicated only by Gs. Skipping the chart, we come to another gamut between the first two Tuscan columns, running up from F to a": the normal limits of most music in Fludd's day. The next three spaces explain the three species of hexachords, the six-note 'scales' of medieval music whose lowest note, 'ut', could fall on an F, C or G. These were called respectively the soft, natural and hard hexachords. In the engraving the soft hexachord is surmounted by a round tower and round organ pipes, the hard hexachord by square ones. These reflect the different versions of the note B as it falls in the respective hexachords: in the soft one it sounds B-flat, written with a round b that became the familiar flat sign; in the hard one it sounds B-natural, written with a square b which survives in our natural sign. These two accidentals may be seen in the top of the ground-floor arcading. The natural hexachord runs for six notes up from C, hence avoids B altogether. It being the highest of the three, Fludd likens it to the highest element, fire, and gives it the highest tower, pointed like a flame.

We consider next the clock above Apollo. Aptly surmounted by Father Time, the upper dial shows 12 hours, the lower one the different note-values. The two outer circles contain the notes 128 semifusae. (The last note should have two flags on its tail.) To each of these are added their appropriate rests. For some reason each is also accompanied by a note of the next value down, and their relationships: 1 maxima (Fludd calls it larga) equals 2 longs, 4 breves, 8 semibreves, 16 minims, 32 semiminims, 64 fusae, but this system fails when the fusa is reached.

The area above Pythagoras is divided diagonally. On the left is the Platonic lambda, described in the Timaeus. There are two errors, rectified in the text (p. 204): 16 should be 12, and 24 should be 27. The ramifications of this 'net' are vast, but here it serves simply to show the proportions of note-values to each other. In medieval and Renaissance notation a breve could contain either 4, 6, or 9 minims, depending on the time-signature. The possibilities for longer notes were correspondingly greater. ;P.The 'chess-board' is an aid to composition, constructed rather like the charts which show the mileage between cities: it shows the distances between the notes of the scale. But it only gives consonances. Suppose one has written a low A and wants to write a middle C against it. The chart shows that all is well: the interval is a tenth. Try a B, however, and one meets a blank: the interval is a discord.

The 'clerestory' on the level of the three towers is a similar device, enabling one to check at a glance the notes respectively an octave, sixth, third and fifth from any given note. The windows for the sixths and thirds are smaller, these being only imperfect consonances as opposed to the perfect octave and fifth.

Finally, in the alcove beneath the twin portals representing ears, a Muse stands pointing at a phrase in three parts, the triumphant result of these compositional aids (right).(28)

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DIAGRAMS IN USE

In this case are displayed illustrations intended to show some of the circumstances in which diagrams were used.

72. John Booker, alleged translator.

The Dutch fortune-teller: Discovering XXXVI several questions. Which Old and Young, Married Men and Women, Batchelors and Maids, Delight to be Resolved of.

London, [1690?]

Ex 3633.9225.331

Cut on the title page shows Astrologer at his desk with the wares of his business, including an open book of diagrams. To the side of his desk, a ordinary Englishman who has come to consult him. The text of this book is quite bizarre with a page of instructions and many pages of wheels and the "results" of using the wheels.

*

73. Christopher Marlowe

The Tragical History of the Life and Death of Doctor Faustus.
London, 1620.

Robert H. Taylor Collection.

The cut shows the famed actor of the period, Edward Alleyn, in role of Mephistopheles, who stands inside the zodiacal circle, with book of magical lore in hand.

*

74. George Fisher

The American Instructor

New York, 1760

Graphic Arts. Sinclair Hamilton Collection.

Frontispiece shows diagrams in the school room

- (28) Joscelyn Godwin, Robert Fludd. Hermetic Philosopher and Surveyor of Two Worlds (Boulder: Shambala Publications, 1979), p. 78

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