The Lullian 'Art of Finding Truth': A Medieval System of Enquiry
Robert Pring-Mill

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A MEDIEVAL SYSTEM OF ENQUIRY

ROBERT PRING-MILL

Ramon Llull is best known today as the creator of literary Ca-
talan and the founder of Catalan literature, but the present article
is entirely concerned with another aspect of his work, namely his
efforts to elaborate an 'art of finding truth' which would be
applicable to every subject under — or above — the sun (includ-
ing theology) and which would, he hoped, provide an effective
intellectual means of securing converts to Christianity. Though
it failed as an instrument for proselytization, its wider-ranging
nature as a general *ars inveniendi veritatem* fascinated many Eu-
ropean thinkers, and it would be fair to say that his international
fame — as opposed to his popularity among Catalan readers —
rested almost entirely on this side of his activities from his own
day right through to the mid-eighteenth century.

His Art, which provided a workable basis for the systematic
unification of existing knowledge, has also been frequently des-
cribed as a forerunner of both modern symbolic logic and mo-
dern computer science. Though it must be admitted that such
debts are both remote and indirect, it was certainly one of the
most remarkable attempts to establish a universal system of en-
quiry and verification prior to the scientific revolution, and what
is beyond question is that it provided the direct inspiration for
Leibniz's great dream of a 'universal algebra'.

Leibniz stated the basis of its combinatory approach succinct-
ly in his own *Dissertatio de arte combinatoria* (1666): «A propo-
sition consists of a subject and a predicate, hence all propositions
are combinations. So the logic of inventing (i.e. discovering) pro-
positions involves solving this problem: (1) finding all the predi-
cates which fit a given subject, and (2) finding all the subjects

which a given predicate can fit, whether by affirmation or nega-
tion».¹ The issue was not a purely logical one: Leibniz wanted
to provide a practical 'tool' for the exploration of all obser-
vable phenomena, and Llull's Art similarly lies between logic
and metaphysics. It was a tool to be used in each discipline in
terms of that discipline's own kind of 'subjects' and 'predica-
tes'. But its generality helped bridge the gap between specia-
lisms — just as mathematisation helps to bridge today's ever
widening gaps — by providing a common 'language'. For
Llull this meant producing techniques to investigate every
possible question in any field of enquiry by relating the prob-
lem back to certain common basic concepts and then explor-
ing all the resultant combinations, thereby shedding light on
the subject from every possible angle.

Thinkers always claim a timeless status for their theories,
and Llull made absolute claims for his Art. But, with hindsight,
all systems turn out to be timebound: direct answers to ques-
tions which posed themselves in very specific forms in specific
historical contexts, and dependent on the kind of knowledge
about the external world provided by the science of their day.
The kind of theory a thinker builds depends on what he alrea-
dy believes about the world. In any period, there are agreed
ground-rules governing what kinds of question can be asked,
accepted by all those taking part in the discussion. To under-
stand Llull's system, one therefore has to get it in perspective:
seeing it at its proper distance, and in the context of the preva-
lent climate of thought.

Although most European medieval thinking took place in
a Christian theocentric framework, it was not merely an ex-
tension of Christian dogma. As Gordon Leff's *Medieval
Thought* makes clear, an outlook «founded upon a guiding set
of assumptions cannot... be unconcerned with where the argu-

¹ G.W. Leibniz, *op. cit.*, num. 55, in *Sämtliche Schriften und Briefe*, II
Reihe, I Bd. (Darmstadt 1926), p. 192.

ment leads or uncommited to certain fundamental proposi-
tions; at the same time, it is quite possible to apply those
beliefs to matters of practical experience and by a process of
reasoning to adduce arguments in their favour. This is very
largely what all medieval thinkers did: they sought to explain
the natural and the human by reference to such tenets of faith
as God, creation, the Incarnation, using philosophical and
logical argument to do so».[2] This is broadly true of Llull, but
with one important difference: the Art was not circumscribed
by what was specifically Christian, being a consequence of
Llull's desire to establish a system acceptable to two large
non-Christian sections of mankind, the Moslems and the Jews.
Its premisses excluded whatever was differentially Christian
precisely because he wanted to exploit 'common ground', be-
fore going on to use the Art itself to 'prove' the Christian
doctrines of the Trinity and the Incarnation.

His Art was born of this proselytising aim, which had a
very specific historical context. Llull was born in Majorca (ca.
1232) soon after its reconquest from the Moors by James I of
Aragon, whose campaigns brought huge numbers of Moslems
under Christian rule. Their conversion was a prerequisite for
national unity. Llull was brought up with the king's younger
son, becoming his seneschal. He received a noble's normal
education, which did not include much Latin, undergoing a
religious conversion when he was about thirty (ca. 1263). The
remaining fifty-odd years of his life were dominated by three
resolutions, which were all colored as much by political preoc-
cupations as by his personal spirituality. These were: to be-
come a missionary and die a martyr, to establish colleges where
future missionaries could study oriental languages, and to pro-
vide them with «the best books in the world against the errors
of the infidel». During the next ten years he trained for this

[2] Gordon Leff, *Medieval Thought* (St. Augustine to Ockham), Harmonds-
worth, 1958, p. 11.

triple mission by learning Arabic and Latin, reading omnivo-
rously, and studying both theology and the natural sciences
(the latter chiefly in Arabic sources, and concentrating on
medicine and 'astronomy', which was of course largely what
we would call astrology). The earliest version of the Art was
composed towards the end of this period, under what he took
to be divine inspiration.

The rest of his life was spent either writing or travelling.
The latter included missions to North Africa, and numerous
attempts to gain support — from various kings and four suc-
cessive popes — for his projected colleges: although only one
was established in his lifetime, his proposals ultimately led to
special foundations in Rome, Bologna, Paris, Salamanca and
Oxford. He wrote almost three hundred works, in Latin, Ara-
bic and Catalan (he was the first person to write on either
theology or philosophy in any Romance vernacular), using
Catalan in the discussion of all the academic subjects of his
day. His more learned — i.e. non-literary —contributions
included some highly original medical and astronomical trea-
tises and eight major versions of his Art, from the *Ars compen-
diosa inveniendi veritatem* (also known as the *Ars magna et
maior*) of 1273-74 (?) to the *Ars magna generalis ultima*
(1305-8) and its pocketsized abridgment the *Ars brevis* of 1308
(from which figs. 3-6 are taken).

Llull's Art was clearly motivated by the existing concern
with the conversion of non-Christians in recently reconquer-
ed territories. He joined no religious order (having married
while at court), but was much influenced by the Dominicans,
whose Catalan master-general St. Ramon de Penyafort
(1175-1275) developed a technique of holding public disputa-
tions with Moslem and Jewish theologians. But whereas one
could use 'arguments from authority' (based on the Old Tes-
tament) with the latter, debating with Moslems involved deve-
loping techniques of argumentation based on human reason.

Penyafort asked Thomas Aquinas (1225-1274) to provide suitable material. During Llull's preparatory years, Aquinas produced the *Summa contra gentiles*: a treatise on God in relation to his creatures which was based entirely on reason. Without trying to 'prove' the truths of faith Aquinas used reason to reach a position wholly compatible with Christian dogmas, whereas Llull wanted to produce 'necessary reasons' for accepting them. His 'necessary reasons' were not, however, logical proofs, but rather arguments of greater or lesser congruence which could not be denied without denying generally accepted principles. Lying «between faith and reason» (as he said himself), his Art is really no more 'rationalistic' than Aquinas' 'proofs' that faith and reason were not incompatible.

Llull's Art owes its more eccentric characteristics to his personal background. Penyafort wisely dissuaded him from going to Paris, where his age and lack of fluent Latin would have brought him into ridicule, so he studied in Majorca itself. Missing out on the rigid scholasticism he would have met at the Sorbonne left his mind open to unfashionable sources, like Jewish cabbalism and the combinatory techniques of Arabic humoral medicine, or a slightly antiquated Christian neo-platonism. This last strand proved particularly useful: its parallels with both Islamic and cabbalistic neo-platonism provided 'common ground' for inter-religious debate, and his highly syncretic system was rooted in metaphysical doctrines equally acceptable to Christian, Moslem, and Jew.

Llull's Art works by arguing its way up and down the «ladder of being» at the core of the medieval world-picture. The learned men of all three religions were agreed that the universe had been created by a wise God, and also that everything he had created bore his image. They talked of three 'worlds', arranged in descending order: the divine world of the godhead, the intelligible world (immaterial, but accessible to the human mind), and the material world (composed of the four elements).

Both lower worlds were reflections of the highest (their common 'exemplar' or model), and each of them had several levels. Each level would have the same general structure, since they 'exemplified' a common pattern (but this appeared in different terms on different levels). Given this patterned resemblance between them, those levels could serve as steps up which the human intellect could climb towards God by studying the 'analogy of being' (see fig. 1). Equally acceptable to Jew and Moslem, this was one of the most potent ideas in medieval Christian thought. Indeed its vitality was such that it could still inspire a serious treatise as late as 1615: St. Robert Bellarmine's *The Mind's Ascent to God by the Ladder of Created Things*.

Llull described the pattern on each level in terms of the manifestation of such specific divine attributes as goodness, power, and truth, which he called 'dignities' (a term for which an Arabic source was postulated until H. Merle pointed out, as recently as 1977, that *dignitas* was the common Latin translation of the Greek *axiôma*). He viewed them as God's creative instruments, whose imprint — and that of their interaction — could be found in all aspects of creation. They also constitute the 'absolute principles' of his Art, visually represented in its Figure A. There were sixteen 'dignities' in the early versions, but Llull drastically simplified its workings in the *Ars inventiva veritatis* of 1289 (?), reducing the 'dignities' to nine when he imposed this symbolic number on every basic set of concepts so as to give his whole system a symbolically 'Trinitarian' pattern. Thereafter, Figure A (see fig. 2) always showed the following nine principles: goodness, greatness, eternity (or duration), power, wisdom, will, virtue, truth, and glory — lettered BCDEFGHIK for combinatory purposes.[3]

The theological character of Llull's first principles, which

[3] 'J' was not used in order to avoid confusion, 'i' and 'j' being virtually interchangeable in medieval script.

rendered them immediately acceptable to his Jewish and Moslem opponents, is precisely what would render them unacceptable to a modern scientific readership. Yet the idea behind them, namely that the universe in which we live must have some common underlying structure and that it must therefore be possible to construct a theory which would explain all observable phenomena, remains perfectly respectable. Indeed, the notion that one might wish to characterise its common features by a series of abstract nouns would also be shared by most readers —although they would no longer regard it as their scientific business to use such concepts as arguments for the existence of God, and would therefore not call them 'divine attributes'. What is of continuing interest about Llull's approach is not its theocentricity but rather his assumption that a scrutiny of all observable phenomena would lead one to discern such common features, and therefore to look for a general theory to explain their presence.

To analyse phenomena, Llull also needed terms to describe their basic relationships, and he used three 'triangles' of terms — later called 'relative principles' — right from the start: difference, agreement, and contrariety; beginning, middle, and end; majority, equality, and minority. These triads are the triangles at the centre of his Figure T (see fig. 3), and they became his basic tools, used to open any subject up. Like the absolute principles, these could be represented by the letters BCDEFGHIK, which take on additional meanings as the Art develops, ending up with the six sets shown in his definitive 'alphabet' (see fig. 4).

Its third column consists of interrogatives, listing ten general questions connected with the Aristotelian categories —and to get them into the nine available slots, Llull put the last two in together. Each such question had its subordinate species («when» and «where» have fifteen each), and they span the areas of 'possibility', 'definition', 'materiality', 'for-

mality' or 'causality', 'quantity', 'quality', 'temporality', 'locality', 'modality', and 'instrumentality'. They function both logically and metaphysically when applied to any problem relating to the column of nine subjects, consisting of the eight levels of the standard world-picture (which differs somewhat from the woodcut version in fig. 1) plus an 'instrumental' level. Tacked on at the end to bring the total up to nine, this item denotes something not itself the immediate object of enquiry but rather being used 'instrumentally' on that object.

Those first four columns cover the general workings of the Art. On their right one finds two further columns, both of them relating to just one of its particular applications: the moral field. These lists of Virtues and Vices have been rounded up from the traditional seven to nine so as to fill the requisite number of compartments. It is characteristic of medieval thought that the symmetrical completion of the grid was an over-riding consideration; but it is characteristic of Llull that the comprehensiveness of the system was even more important than its symmetry — if there were ten questions to ask then they would have to be asked, even though this meant slotting two of them into the same compartment.

From the metaphysical point of view, Llull's sets of concepts are what matters: the manipulative techniques of the *ars combinatoria* are purely ancillary. Yet they are of some scientific interest in themselves — and they have also turned out to provide the key to the true nature of what Llull was trying to do. This *ars combinatoria* speeds up the operations of the Art with the help of visual and mechanical aids, and alphabetical notation: concepts are replaced by letters, manipulated by the use of various *figurae*.

The alphabetical notation took over only gradually, until Llull was using the whole alphabet in the *Ars demonstrativa* (1275-76 ?) from 'A' for God to 'Y' and 'Z', which stood for truth and falsity. The simplification of ca. 1289 cut his combi-

natory alphabet down to the nine letters BCDEFGHIK, each with its own half-dozen meanings: since each such set is quite specific, it should be noted that these nine letters are not true 'variables' — unlike the letters used in algebra — but merely multivalent. Although the replacement of words by symbols had been used previously in the field of logic, Llull's multivalent 'alphabet' does nonetheless represent a further step towards Leibniz's proposal that all logical argument be reduced to algebraic manipulation; but it is only in this sense that Llull's art is an ancestor (admittedly a fairly remote one) of Boolean algebra, and hence of the later developments of modern formal logic.

Similarly, the devices used to handle such letters do justify classing the Art among the antecedents of later 'logic machines' —and hence (if only indirectly) of modern computers. Once again, the *Ars demonstrativa* is the most complex version: sixteen basic diagrams (the same number as that of the divine attributes in its Figure A), with three supplementary figures for use in theology, philosophy, and law. Once again, it took the *Ars inventiva veritatis* to cut through earlier complexities by reducing the sixteen diagrams to four. Two of these have already been discussed. The third (see fig. 5) is a simple combinatory tabulation whose logical function is to set up pairs of concepts. The operator (or 'artist', so named by Llull because he practices an 'art') is meant to explore each pair in search of an appropriate 'middle term', thereby establishing a suitable 'subject-predicate' combination. The fourth figure (see fig. 6) takes this one stage further by providing three rings of letters, the outer written directly on the page, with the inner two inscribed on separate rotating discs. This figure is the most 'mechanical' feature of the Art in that it uses 'moving parts' to 'generate' the ternary combinations of the same nine letters. The third and fourth figures both concern the interaction between the principles of Figures A and T, whose combi-

nations are to be applied (in conjunction with the general
questions and all their dependent species) to problems on the
'subject' levels — as well as to the virtues and the vices.

This complex system, developed over almost forty years,
grew out of Llull's initial desire to provide missionaries with
'necessary reasons' for accepting Christian dogma. It never
lost its theological application, but Llull realised from the
start that he was developing a general 'art of finding truth'.
Not unnaturally, its later users went straight to the definitive
version. But if one does this now, one sees only a totally
aprioristic system (whose 'relevance' had to cease when science
broke free from theology) backed up by a curious series of
devices which seem to have appeared out of nowhere. Its fun-
damental nature is much more interesting, but its successive
modifications progressively removed all the most useful clues.

A new line of research was begun by F.A. Yates, who
suggested in 1954 that the Art might have been conceived as a
means of applying 'scientific' principles connected with the
doctrine of the four physical elements to higher areas of know-
ledge, and that its combinatory techniques must have been
modelled on those developed in that pseudo-scientific field.[4]
Today, it seems obvious that its combinatory nature must be
connected with the procedures used by medieval doctors and
astrologers, but this had not been seen by any previous mo-
dern scholar. She concluded that the Art was «patterned on
elemental astrology», and decided that the essential clue must

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[4] Frances A. Yates, «The Art of Ramon Llull: An Approach to it through
Llull's Theory of the Elements», *Journal of the Warburg and Courtauld Institu-
tes*, XVII, 1954, pp. 115-173. All of Miss Yates's Lullian contributions have
recently been republished, translated into Catalan, as Frances A. Yates, *Assaigs
sobre Ramon Llull* (Barcelona, Empúries, 1985), with a useful prologue by Lola
Badia. For bibliography of works by and about Llull, see «Llull, Ramon» in
Dictionary of Scientific Biography, E.W. Platzeck's comprehensive survey of
research from 1955 to 1969 in *Antonianum*, 45, 1970, pp. 213-272, and Anthony
Bonner, *op. cit.* in the *Note on further reading*.

lie in some kind of connection between BCDEFGHIK and ABCD, the letters used for the four elements (fire, air, water, earth) in Llull's fairly late *Tractatus novus de astronomia* (1297). My own research started out — in 1956 — from the assumption that it must lie earlier, in the Arts of sixteen 'dignities'.

That number seemed quite arbitrary in Llull's doctrine of the 'dignities'. But it was unavoidably connected with the particular subject of his earliest medical treatise, the *Liber principiorum medicinae* (1274-75?), whose sixteen 'principles' are the four grades of each of the four humours (the physiological manifestations of the elements). In it, Llull tells his readers that this art of medicine contains a 'metaphor' which will enable one to understand all other sciences (as well as law and theology) by using its «Grades and Triangles and other Distinctions». Its triangles are the same as those of Figure T, but the real clue lies in the word *metaphora*, which suggests that the link between elemental grading and the 'general' Art must be an analogical relationship.

The picture which has emerged from subsequent research (Bonner, Hillgarth, Llinarès, Platzeck, Pring-Mill, Yates) shows the Art in a much more 'scientific' light, helping one to understand the cogency of its argumentative procedures in its original context. Given the accepted view of the «ladder of being» (all of whose levels were congrous with one another) if one but knew all there was to be known about a lower level, could one not argue validly from this to higher ones *per analogiam*? This is where the elemental theories come in: Llull apparently accepted them as constituting a scientifically authoritative body of knowledge concerning the lowest of all levels, capable of providing a strictly scientific basis for the analogical discussion of higher things. P.H. Nowell-Smith once pointed ed out that whereas metaphysicians have always «claimed a timeless status for their metaphysical theories», we can see

them «only as reflections on the condition of the sciences in their time».[5] This is eminently true of the Lullian Art: it now seems to have been a rather fascinating attempt to construct a system applicable to every field of knowledge on the basis of one single science, as this stood in Llull's own day. Llull's original aim having been to 'prove' the fundamental dogmas of the Christian faith, the chance to ground his 'demonstrations' in a scientific theory held by his opponents must have seemed to open up a splendid vista.

The Art's earlier versions contained many elemental figures, while the discussion of non-elemental topics often employed elemental examples, and its numerical patterns were all quaternary — except in Figure T. But as the Art was perfected, the supporting elemental diagrams and examples vanished, while the argumentation became entirely self-referential and the ternary pattern of Figure T spread outwards till the whole system had a Trinitarian appearance. By the end of this process, the only quaternary feature left was the number of its working diagrams.

Given its ternary patterning and its dependence on the descending imprint of God's attributes, it came to be viewed by historians of philosophy as an entirely arbitrary system, bearing no relation to the 'real world' unless its theological frame of reference were accepted. But it ought, rather, to be recognised as an intriguingly 'modern' attempt to use a universally accepted scientific hypothesis regarding the physical world as the 'model' for a general theory to explain everything within man's ken. Unfortunately for Llull, the scientific revolution of the seventeenth century not only cut science loose from the theology behind the exemplarist world-picture but also rejected the very scientific hypothesis which had been his 'model': in fact the 'scientific' basis of his Art ceased to

[5] *Education in a University*, Leicester, 1958, p. 11.

convince at just about the same time as its theocentric attitude lost cogency.

There is no evidence that the Art ever made any converts to Christianity, but Llull's application of its methods to other disciplines inspired numerous followers during the later middle ages. He himself wrote 'artistic' works on both rhetoric and logic (though not on grammar, the third discipline of the *trivium*), on geometry and astronomy (two of the four disciplines of the *quadrivium*, the others being arithmetic and music), and on all the four 'higher disciplines' (theology, philosophy, law and medicine). But theology, astronomy and medicine were the only subjects in which he did original work, his contributions in the other fields being limited to showing how they could be handled in parallel by the use of his Art. This in its itself made a deep impression on succeeding generations: surprising though it may seem, the Art's function as a means of unifying all branches of knowledge into a single comprehensive system remained viable well into the seventeenth century. An even later spate of editions of many of Llull's works, produced in Germany as well as Spain during the first half of the eighteenth century, reflected a last attempt to revive it as a workable universal 'art of finding truth'.

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Note for further reading: Those interested in following up Llull's scientific side, as well as many aspects of his literary production, would do well to start with the two-volume *Selected Works of Ramon Llull* edited and translated by Anthony Bonner (Princeton University Press, 1985, xxix + 1329 pp.). A Catalan edition has recently appeared, also in two volumes, as *Obres selectes de Ramon Llull* (Palma de Mallorca, Moll 1989, I xxvi + 606 pp., II 623 pp.). Anthony Bonner has also collaborated with Lola Badia to produce the excellent introductory survey *Ramon Llull: Vida, pensament i obra literària* (Barcelona, Empúries, 1988). My own *El microcosmos lul·lià* (Palma de Mallorca, Moll, 1961) retains some relevance; there is a project afoot to reprint this together with the majority of my remaining Lullian contributions (translated into Catalan where necessary) in a single volume in Barcelona.
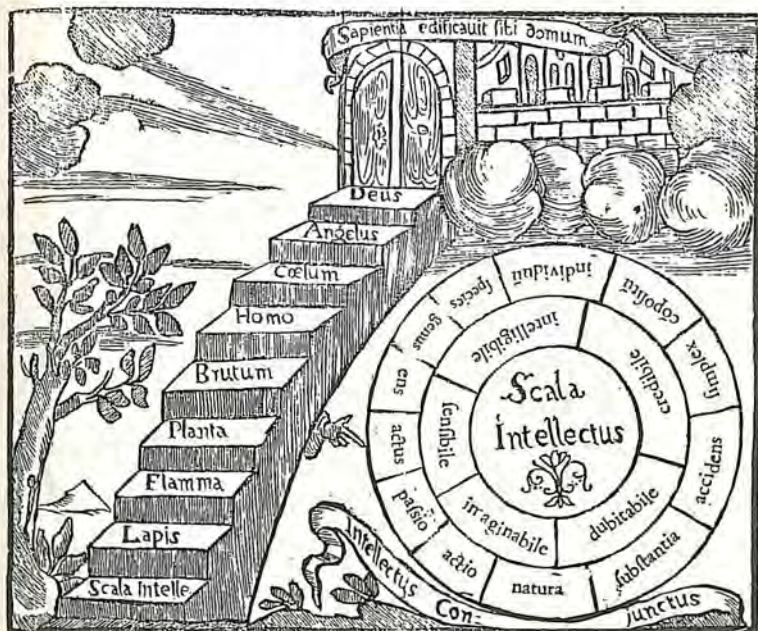
Fig. 1.- The 'exemplarist' world-picture: this 18th-century woodcut from Lull's *Book of the Ascent and Descent of the Intellect* (*Liber de ascensu et descensu intellectus*) of 1305 shows the levels of creation as a stairway for the mind towards the House of Wisdom. Each level 'exemplifies' the creator in its own terms. The mind ascends the 'analogy of being' by studying these imprinted images of God. The names of the steps vary (cf. the column of 'Subjects' in fig. 4). The circular diagram is combinatory (like those of the Lullian Art cf. figs. 2, 3, and 6): the mind ascends and descends considering the five categories of the inner ring in the light of the twelve concepts in the outer ring. The methods of Lull's Art are similar, although these two sets of concepts are not shown in fig. 4.
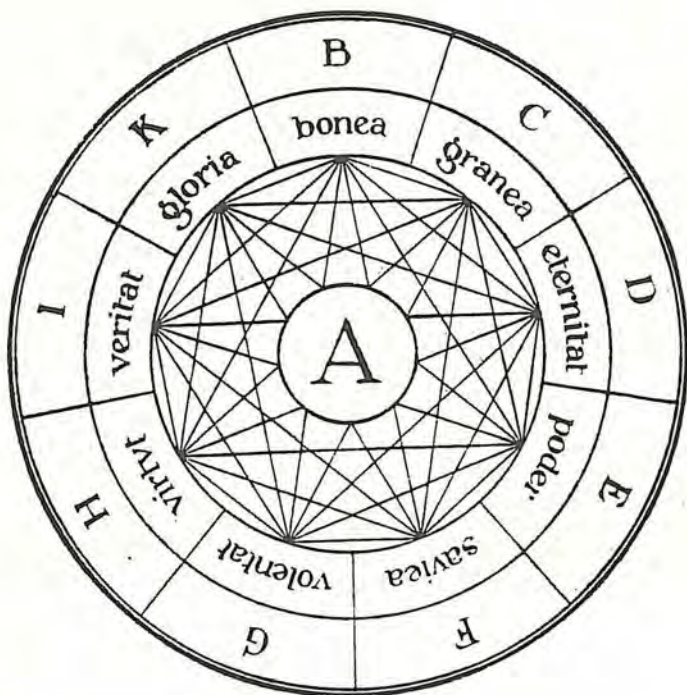
Fig. 2.- Figure A, reproduced in its Catalan form from the *Taula general* (1293-1294), the Art's nine 'absolute principles' (attributes of the creator, mirrored on each level of creation) lettered BCDEFGHIK for combinatory purposes. The thirty-six criss-crossing lines represent their binary combinations (cf. fig. 5, which spells these out). These absolute principles are shown in the first column of fig. 4.
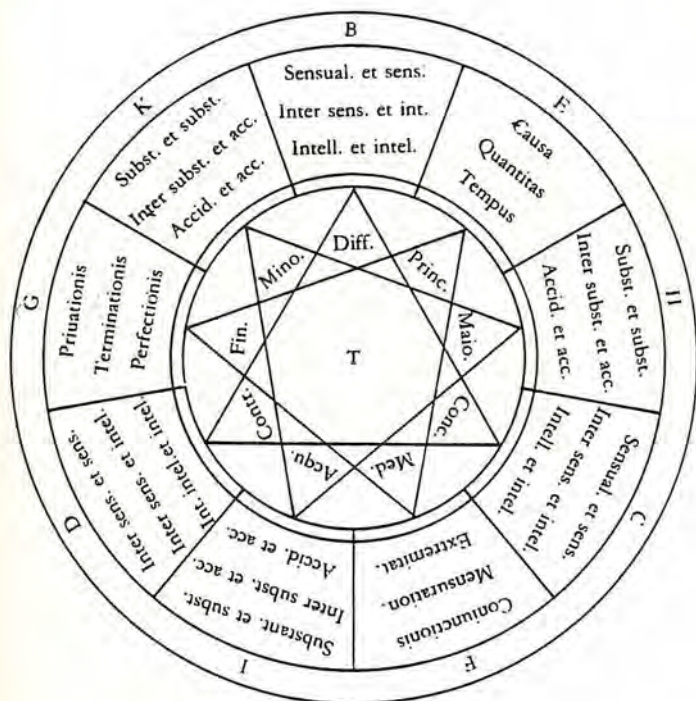
Fig. 3.- Figure T, the *secunda figura* of the *Ars brevis*, showing three triangles of 'relative principles' (the second column of concepts in fig. 4). The outer rings relate to their application. Thus a 'difference' (B) being explored in search of 'agreement' (C) or 'contradiction' (D) could be either between two things perceptible by the senses ('Sensual & Sensual'), or between something 'Sensual' and something 'Intellectual' (i.e. non-material but intelligible), or between two *intelligibilia*. The nine relative principles are lettered BCDEFGHIK for combinatory purposes, the same as the absolute principles of Figure A. Figs. 3, 5 and 6 have all been taken from edition of the *Ars brevis* published by A. Madre in *Raimundi Lulli Opera Latina*, XII (*Corpus Christianorum*, XXXVIII, 1984), pp. 200, 206 and 209.

	Fig. A	Fig. T	Questions	Subjects	Virtues	Vices
B	goodness	difference	whether?	God	justice	avarice
C	greatness	concordance	what?	angel	prudence	gluttony
D	eternity	contrariety	of what?	heaven	fortitude	lust
E	power	beginning	why?	man	temperance	pride
F	wisdom	middle	how much?	imaginative	faith	accidie
G	will	end	of what kind?	sensitive	hope	envy
H	virtue	majority	when?	vegetative	charity	anger
I	truth	equality	where?	elementative	patience	lying
K	glory	minority	how? and with what?	instrumentative	pity	inconstancy

Fig. 4.- The 'alphabet' of the *Ars brevis* as summarised in tabular form by Anthony Bonner (*Selected Works of Ramon Llull*, vol. I, p. 581), though I have omitted the words «*and Rules*» from the heading to the «*Questions*» column and substituted «anger» for «ire» in the list of vices (Bonner used a footnote to indicate that the third item in the first column of meanings, «Eternity», could also be taken to indicate «duration»). This definitive summary of concepts to be lettered BCDEFGHIK contains no clues to show that the combinatory procedures of the Art had been modelled on those of medieval humoral medicine.

BC	CD	DE	EF	FG	GH	HI	IK
BD	CE	DF	EG	FH	GI	HK	
BE	CF	DG	EH	FI	GK		
BF	CG	DH	EI	FK			
BG	CH	DI	EK				
BH	CI	DK					
BI	CK						
BK							

Fig. 5.- The *tertia figura* of the *Ars brevis*, which spells out the binary combinations of BCDEFGHIK. It 'generates' propositions, inviting the Lullian 'artist' to find the 'middle term' between any two concepts denoted by a pair of letters.
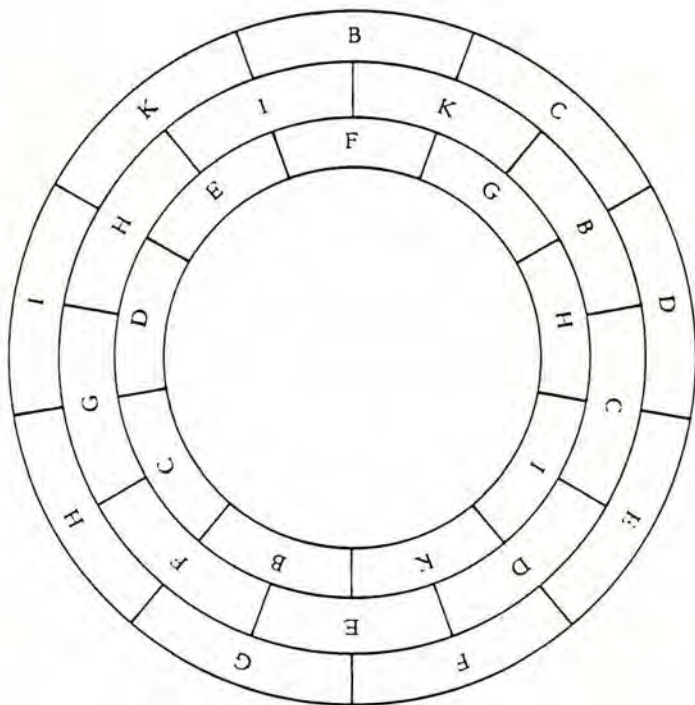
Fig. 6.- The *quarta figura* of the *Ars brevis*, whose two inner rings are inscribed on independently rotating discs (known to bibliographers as 'volvelles'). It 'generates' ternary combinations of the letters BCDEFGHIK, the intermediate ring serving to find appropriate 'middle terms' to go between 'subjects' presented by the outer ring and 'predicate' nouns presented by the central disc.