

# Shipman's Guide: early card-packs and the Arcana

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## Abstract:

Europe's preference for card-packs consisting of 52 or 78 tokens, and the organisation of card-packs into their quarters and levels, their numerical cards and picture-cards appears to be an intriguing result of that fascination in late medieval Europe for devising methods of systematically ordering and ranking information 'by the chart'. The larger pack's levels, ratios and standard emblems follow those of the mariner's chart and imitate the radically new sort of map introduced to Europe by the Vesconti family of Genoa, early in the fourteenth century. The smaller (52) card pack, on the other hand, reflects more closely the traditionally and classical divisions for the world. Examples mentioned include one by Bowes, a sixteenth century English card-maker, and another from the 'Charles VI' set of 17 Atouts.

In late medieval Europe, among the various forms of card-sets that were tried, two were apparently found most useful. One contained 78 cards, of which 38 cards were formed as pictures. The other pack had 52 tokens, only twelve of which were always made as figures. Today the larger pack is sometimes treated as qualitatively (and, dare one say) morally distinct from the lesser but though there are differences between them, any true history of western card-use must logically take both into account<sup>1</sup>. The most obvious differences are the larger pack's having sixteen figures for its Kings and Courts, an additional 22 pictures, and a number of highly irritating anomalies in conventions for its games<sup>2</sup>. But modern students of this subject are often alienated from any comprehensive study by an over-emphasis in some quarters on distinctions between the two sorts of pack - a tendency to concentrate overmuch on the larger-pack's curious figures, for example, or a habit of terming the larger pack's 22 highest figures *arcana major* and its remaining 56 cards *arcana minor*. Those terms are not found used in relation to the 52-card pack and probably for that reason it is assumed their use derives from the larger pack's use in 'cartomancy' or fortune telling. It should be said, however, that such an assumption is not necessarily correct, for the terms were adopted at a date unknown and are quite in keeping with the period when cards first appear in Europe. They are also appropriate to the long-established habit of using *both* forms of pack for number-games.

We have, for example, Hugh of St. Victor's emphasis on the pattern of the arca as repository and memory-aid in the twelfth century; still in the twelfth, Michael Scot uses 'arcana' to mean things held in mind or heart. In the latter part of the fifteenth century, we find Paccioli's use of *arte minore* and *arte maggior* to distinguish plain arithmetic from geometry. Geometry was traditionally associated closely with gromatics, or land-measuring<sup>3</sup> and thus suggests that early allusion to card-use in which

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<sup>1</sup> As Michael Dummett showed in his seminal *The Game of Tarot: from Ferrara to Salt Lake City*, London: Duckworth, 1980.

<sup>2</sup> See Michael Dummett, *Twelve Tarot Games*, London: Duckworth, 1980.

<sup>3</sup> On this point and on upon late medieval ideas about the quadrivia in general, see the very valuable article by Evgeny Zaitsev, 'The Meaning of Early Medieval geometry: from Euclid and Surveyor's Manuals to Christian Philosophy', *Isis Journal of the History of Science*, Vol.90 (1999) pp.522-553. Fra Luca Paccioli was a Tuscan, (fl.

the card-pack is said to be a means for describing the world in its steps or stages<sup>4</sup>. On the other hand, one should be wary of describing the minor arcana as if it were simply an enlarged version of the lesser pack's 4 'ladders' of 12 rungs. The minor arcana were designed, instead, as two parallel circuits of 40 and 16 cards, quartered. That distinction in design is important to keep in mind, since it is indicative of why the two types of pack were so formed in Europe.

Another difficulty for the comparative approach is a widespread, if tacit assumption, that the difference between a rational historian and a cartomancer may be discovered by how closely the form of the picture-cards is studied: whether they merely identified or whether 'read' for meaning. To read imagery of the fourteenth to sixteenth centuries is, of course, quite right and one could hardly expect any study of medieval imagery to proceed otherwise. Were these same figures painted on wood or canvas, or bound into a book, we should expect to have their 'reading' explained by the scholar, as a matter of course. A caption which said simply 'figure on horse' and neglected to mention the social and moral importance attached to the equestrian figure *per se* would fail to enlighten. Since the use of captions and numbers on cards came later, we may also suppose that early card-users read their painted figures before beginning play, and that they did so with the same depth as they read any other figure - which in the fourteenth and fifteenth century was quite deeply. Much about the pack, and its likely range of original uses, can be learned by considering the major arcana figures, and the Kings and Courts, by reference to the wider social and historical context of their period, as reflected in its art.

However, with card-decks having survived chiefly by reason of their use in number-games, study of those games has often seemed the most practical way to go about discovering the western pack's origins. There are other ways of approach, of course, and lately we have seen a renewed interest in considering the western pack as expressing late medieval Europe's social and aesthetic standards. Separate investigation of number-games, innate structures, methods of manufacture, traditional emblems and early pictorial figures now advance more or less independently, as can be seen in the most recent issue of *The Playing Card* (Nov-Dec 2002). John Park's article there on the possible origins of the major arcana, however, still stands somewhat apart from the rest. What I should like to do here is show how one might unite that sociological approach with the more usual technical one. Both offer important information about the pack's origins, uses, variant forms and *raison d'être*.

Park's argument was that the now-standard set of 22 major arcana figures may be a reduced version of a 50-page picture-book in which the world's physical, social and philosophical divisions were depicted, one plate to each figure. Known as the Mantegna

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c.1494) employed at the court of Ludovico Sforza. He was also a friend of Leonardo da Vinci and had an important influence in the work of the elder Cardano (father of the famous mathematician). The terms *arte maggior* and *arte minore* come from Paccioli's *Summa*

<sup>4</sup> *ludus cartarum .. status mundi nunc modernis temporibus describitur et figura*. And see note 7 below.

Tarocchi, that book offers what was essentially a pictorial 'Groundplat'<sup>5</sup> of the late medieval world. In his conclusion, Park then suggests, somewhat suddenly, that the set of cards might have been imagined as a moveable cosmograph - which I imagine something similar to a three-dimensional, but illustrated astrolabe, or akin to Peter Apian's *Astronomicum Caesarium* with its moveable paper parts that he made for the Emperor Charles V, or even those Chinese 'universe-maps' discussed by Needham.<sup>6</sup>

It is certainly true, as noted earlier, that between the larger and smaller packs the common principle of design would appear to have been a formal pattern for assigning the world's parts or categories within a set system. Such formal steps, stages, parts or categories were quite commonly described as 'status mundi'.<sup>7</sup>

The numerical structure of the larger and shorter packs, as well as their standard imagery certainly conveys that intention, as we describe further below. But where that intention is common, the expression and primary systems of reference for each is markedly (and identifiably) different. Our key to the methodology is nicely demonstrated by a geographical pack of 52 cards made in sixteenth century England by a card-maker named Bowes. A card from that pack is illustrated in the same issue of "The Playing Card" as Park's article appears.<sup>8</sup> Bowes' cards are particularly interesting because while he makes a 52-card pack, the allusions of his devices are to the same ideas which informed the pattern of the larger pack. In the upper right hand corner, Bowes set a schematic compass Rose. This is not simply to suggest the geographic quarters of direction, but specifically the mariner's habit of describing direction by the circuit of winds, a method which had informed a radically new type of world-chart introduced to Europe early in the fourteenth century. Introduced by a Genoese family of mapmakers called the Vesconti,<sup>9</sup> the new sort of world-map made its divisions by cutting the surface of the map<sup>10</sup> with the lines of a circle of radiating Roses. It adopted, in fact, the mariner's habit of defining direction and time (as function of distance) by reference to the wind-Rose or bussola/buxola. Drawn upon the surface of the map, the grid work of mariner's rhumb-lines<sup>11</sup> enabled the world not only to be more accurately described but to be measured from the map itself with accuracy never before possible. These

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<sup>5</sup> I borrow the term from a sixteenth-century Englishman's 'plan' of the whole range of applications for mathematics within his *Euclide*, the first in English (1570).

<sup>6</sup> In connection with Su Sung's celestial atlas (c.1065). On the use of the astrolabe by mariners in the west see Taylor, E.G.R., and Richey, M.W., *The Geometrical Seaman: a book of early nautical instruments* London: The Institute of Navigation, 1962 Ch.10. it was a short-lived and relatively useless instrument at sea, but a mariner who knew his stars could use an ordinary astrolabe. The techniques for sidereal surveying and for sidereal navigation are virtually identical.

<sup>7</sup> On the implications of the term 'status' for late medieval Christendom see 'Status' in the Catholic Encyclopaedia. It meant a *position within in any progressive path or ordering e.g.*, along a physical path, in the path of historical time, in the path of religious purification or within the ordered 'ways' of society etc.

<sup>8</sup> Booth, John, 'The map-cards of William Redmayne circa 1676', *The Playing Card: Journal of the International Playing Card Society*, Vol. 31, No.3, Nov-Dec. 2002.

<sup>9</sup> Vesconti with an 'e'.

<sup>10</sup> It may be worth noting that the term 'tarosh' which Court de Gebelin knew as a reference to the larger pack is a perfectly good word of Phoenician and/or Hebrew. It means literally: make/take/cut a head-ing.'

<sup>11</sup> the line along which a ship is impelled by its following wind.

maps brought a revolution in Western Europe's understanding of the world's organisation, form and parts. They were controversial - not least in that they depicted four continents<sup>12</sup> rather than the older '3' of which so much had been made in Christian exegesis of the world's god-given order. Noah's three sons, it was said, had fathered the 'three races' and languages of the world and served as prefiguring of the Holy Trinity. From that idea had been organised much of the older teaching in history, geography, religious study and even natural history. It seems no coincidence that most of the older number-games, played with the larger pack, are for three players.

And even after the new type of chart was known, the older 'Noachian' form of diagram-map (the so-called 'T-O' map) remained in use, revived oddly enough by a fashion for mathematical studies after the style of the Ptolemaic works on astronomy, genealogical history and geography. One sees it, for example, in Regiomontanus, who must certainly have known of the new style.

Apart from introducing the realistic form which would become the modern world map, the Vesconti were content to maintain a older custom of using a world map or 'ground map' as a condensed mnemonic for arranging the universe of learning about the world's peoples and divisions: small figures and emblems refer the reader of those maps to texts on history, religion, customs, geography, natural history and so on. But that use was now notably aided by the addition of mathematical charts and tables complementary to the new sort of gridded map. In 1375 another brilliant example of the new style was made in Majorca, and was soon presented to Charles V of France. Its marginal figures and calculation tables cover the full range of information then thought indispensable for a knowledge of the world and its parts - everything from how to establish tide-rise about the coast (by reference to the lunar phases), to a perpetual calendar,<sup>13</sup> a medical 'zodiac man' and to how to calculate the times of - for example - tide rise by reference to the moon's 28-fold path.<sup>14</sup> The reckoner's tables occupy two great parchments of the Majorcan Atlas' six. And it is upon that Atlas' world map that we also find the emblems of the Rod, Gold and Sword as devices for the universal directions: east, south and north.<sup>15</sup> The same became standard emblems for the quarters in the larger pack and were again used as the quarter-signs for the 52-card packs used in France and Italy.

As I have elsewhere noted, the tarot's *arcana minor* equals in number a doubling of that immensely useful factor of '28' while its 16 parts for the level of the Kings and courts enables another easy correlation to the sixteen points of the mariner's wind-rose. The *arcana major* are based on the stars used to indicate location, time and direction.

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<sup>12</sup> Any good history of cartography will treat this but for its connection to Islamic science, moralised geography and astrology see e.g. Nasr, Seyyed Hossein, *An Introduction to Islamic Cosmological Doctrines*, SUNY Press, pp.143-150.

<sup>13</sup> Including a perpetual calendar in which the 14<sup>th</sup> day of the month was set aside in honour of Noah.

<sup>14</sup> Cresques, Abraham, *Atlas Catala. Mappamundi. The Catalan Atlas of the year 1375*. Edited by Georges Grosjean [the English translation is not separately credited]. In English and Catalan. Dietikon-Zurich: Urs Graf 1979.

<sup>15</sup> Something of this connection has been mentioned in an article of mine, kindly published on the internet by Diane Wilkes. The article's title is 'The King of Gold in its historical setting.'

What apparently connects the two predominant forms of western card-pack is this original intention to take a set method for describing the divisions of the world 'by the chart.' The variation in the 'Kings and Courts' inform us whether the system of division is (a) according to the simpler and classical system of '12-fold division' most useful for the landsman, or (b) according to the more complex and accurate system of the mariner's '28' and 16. The interest of Bowes' sixteenth century geographic cards is - as I see it - a union of these two systems of reference; his pack is made in 52 cards, but refers to the mariner's world-map, its grid of the Rose and its emphasis on locating a position in the style of the navigator.

The explanation of the card shown in Booth's article occurs within a work produced shortly before by an English mathematician named William Bourne. As Bowes' cards were being produced, that author who had earlier published the first English equivalent for the content of the Catalan Atlas' charts, 'A Regiment for the Sea' was reluctantly issuing his second set of Almanacs and Prognostications. Deploring astrology, Bourne was nevertheless obliged *by the pressure of popular expectation* to add to his lucid account of navigational quartering and computation, such additional matter as medical 'prognostications' about the tides of health and predictions for the days of the year. Whether he liked it or not, any sixteenth century mathematician was still expected to know and employ to order *all* the sections of his art's Groundplat.<sup>16</sup>

But it is in his *Regiment for the Sea* that Bourne related the ports of England to the patterns of tide-rise by the lunar path, just as is done in the diagrams of the Majorcan Atlas. Charting and predicting tide-rise in this way is not astrology, but is the method still observed by seamen to the present day. Bourne writes that "*The Moon South or North: on Landes end full sea; the Moon South and by West: at the Gore end full sea... it floweth at Poole in the haven: a south east Moon.*"<sup>17</sup> If Bourne's 'Poole in the haven' means the inlet near Poole in Cornwall<sup>18</sup>, then certainly its location is close indeed to the point of intersection for Bowes' cutting lines.

Bowes' *map* uses the later, square grid of Mercator, but intimates the mariner's way by the device of that Rose in diagram, and by triangulating in the way he does to that precise point on Cornwall's shore. This is evident when one considers how a mariner's rhumb-line is always described in terms of 'direction from'. The wind named Africus blows from a southerly direction and took one towards the north for example. And just so, on Bowes' card, the numbered, diagonal line should be read, I think, from the lower right [South east] upward [Poole in the haven]. Poole in the haven, a south-east moon. Tidal rise, incidentally, is conceived even in the sixteenth century as if the moon 'blew'<sup>19</sup> the flow of water away from it to an opposite *locus*. The analogy of the ship's

<sup>16</sup> For that reason, one cannot discount the possibility that some, at least, of our mathematical exercise-games were first developed to test or learn applications for mathematics not now considered orthodox.

<sup>17</sup> Taylor, E.G.R. (ed.), *A Regiment for the Sea and other writings on navigation*, C.U.P. The Hakluyt Society Second Series No, CXXI, 1961, p.182.

<sup>18</sup> whose inlet was later silted up.

<sup>19</sup> today, being more used to the magnetic directions, we tend to think of the moon's 'pull' rather than its 'push' and so speak of the moon's gravitational *attraction*.

wake, or of the sailing wind, is plain.

Booth's comments that "though [Bowes' geographic cards] are supposed to represent the points of the compass, none are easily evident."<sup>20</sup>

And that is so for many of our card-sets. It is a mistake to forget that they were meant to connect with knowledge contemporary players could be expected to have at their fingertips but which now requires extensive research to recover.

The necessary information for establishing the port was already present in the charts of the Catalan Atlas, along with the diagram of the 28 stages of the lunar path. Defined by the 28 asterisms which terminate those stages, the series was known as the lunar mansions, or inns. The Arabic term was *manzil*, the Chinese *hsieu* and the Indian *nakshastra* or 'conjunction'<sup>21</sup>. Islamic spirituality associated each *manzil* with one in the succession of Islamic prophets (Naibs).

Other traces of connection to the mariner's world remain in our common terms for cards and card-play: the 'deck' of cards, 'hands', 'busso'<sup>22</sup> *murnival*<sup>23</sup>, etc. The Persian and Arabic terms *Ganjifa/Kanjifah* appear to the present writer also to refer to the eastern mariner's practical sailing-grid of winds and stars.<sup>24</sup> The mariner's world, and its system for universal divisions, seems to be an early and authentic stimulus to the card-pack's development in the west.

I have noted elsewhere too that the French and *Tarot* pack's suit-signs: Rod, Sword, Gold and Cup are derived from well-known emblems<sup>25</sup> for those stars which mariners especially used to name the cardinal points of direction. All four astronomical indicators are actually present on the Atlas Català, signifying the universal character of that region and of the Barbary Coast, notorious of pirates.

The larger form of pack not only has those factors of the lunar path and the compass rose of 16 points in its minor arcana. It also has a higher set of figures which originally represented the chief navigational and surveying stars. Astronomy was not the specialised subject it is today but was one of the basic applications for mathematics, taught commonly as a kind of celestial geography, and peopled with constellations whose standard moral characters in Christian commentary had been known for

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<sup>20</sup> Booth, John, 'The Map Cards ..' *op.cit.*, p.102.

<sup>21</sup> The three systems are not identical.

<sup>22</sup> Dummett, Michael, *Twelve Tarot Games*, pp. 87-88.

<sup>23</sup> I take 'murnival' as an early 'Franglish' word for the white wall which marked the northern extremity of the mariner's sailing, the equivalent of which, in astronomical terms, was the northern circumpolar limit. Monastic Europe had for centuries made that wall the boundary of the heaven-haven of a northern God. Similarity to the 'white wall' made in Mah Jong is also plain.

<sup>24</sup> In essence the grid was composed of the '17' and the lunar mansions, the winds serving as an additional system of reference.

<sup>25</sup> The four constellations are those of Qut b Suhail - Sth celestial Pole (pressed gold); Al Jah - north celestial Pole - (Sword); Orion - astronomical due east (flourishing Rod); Pleiades (cup or whip). On the equivalence of the cup and whip as emblems for the westering Pleiades see the very poorly written article, 'A response to the \*tuman problem' in *The Playing Card: Journal of the International Playing-Card Society*, Vol. XXIX No.4 (Jan-Feb 2001) pp. 158-162.

centuries. Orion, star of the east, for example, was normally depicted as the giant and 'blind fool', whose device was most usually the flourishing rod.

Though one is not surprised to find the major arcana cards omitted in the formation of that smaller, ordinary pack, the better educated could easily have recognised those figures, and seen in the minor arcana's quarter-signs an allusion to the standard devices for the cardinal four. In this way, the pattern of the larger pack as a forme for description of the status Mundi would have seemed self-evident to many. How well it was understood to derive from the world of the eastern mariner is harder to determine.

*"For we divide the ship in length and breadth according to the compass rose and we have measurements of star altitudes..."*

wrote Ibn Majid, a Moorish mariner of the India run who lived and wrote in the fifteenth century.<sup>26</sup> A manuscript copy of his book is now in the same library as that holding the set of 'Charles VI' major arcana cards. The latter depict the 17 stars which named the points of the eastern mariners' sidereal Rose.

Given all this, the present writer's view is that the 17 major arcana cards of Charles VI of France are more critically important for the history of western cards than the more commonly mentioned Visconti-Sforza. They tell us not only that the eastern mariner's sidereal Rose was known in addition to the western wind-rose *before* da Gama took pilotage from east Africa to India, but that the larger pack may be reasonably argued to deliberately structure its description of the 'status mundi' of the mnemonic habits of the eastern long-distance mariners. Each of the 17 figures in the Charles VI set is carefully drawn as a plan, or diagram, which imitates the form of its constellation, and then packs that outline form with meaningful elements [devices] which convey to the reader the content of well-known texts, and the increasingly used Arabic nomenclature in astronomy. Just as if each were a 'world-chart' in itself. This is how they were constructed:

## A compass-card in Charles VI set: The Guards and Dancers

This card (usually called *l'Amoureux*) represents the point of North by East on the eastern sidereal Rose, a point named for the pair of circumpolar stars  $\beta$  and  $\gamma$  *Ursa Minoris*. That pair are here pictured as twin angels, elevated on an emerald cloud-mountain and armed with bows and arrows. Below them is a group of gesticulating people, who process in their pairings in what is evidently a dance. The English mariners call the pair 'the Guards' or 'the Wardens of the Pole.'<sup>27</sup> One may time the night-watches at sea by them<sup>28</sup> as well as marking the time of year and establishing the exact position of the true North, if sight of the Pole star is obscured. 'The Guards' were

<sup>26</sup> Tibbetts, G.R. (ed. and trans.), *Arab Navigation in the Indian Ocean before the coming of the Portuguese, being a translation of the Kitab al-Fawaid fi usul al-bahr wal-qawaid of Ahmad b. Majid al-Najdi*, London: Luzac 1971, p.121-2.

<sup>27</sup> Hinkley Allen, Richard, *Star Names: their lore and meaning*, New York: Dover, 1963 pp.458-9. (Originally published G.E. Stechert 1899 as *Star Names and their Meanings*).

<sup>28</sup> See Taylor, *Haven-Finding Art* (various editions) for a lucid explanation of the method.

observed and revered most particularly in late medieval Portugal, Spain and France.<sup>29</sup> Bourne's *Regiment* mentions the pair, which had been portrayed in western monastic art since the tenth century either as armed twin guards or as twin angels by the limit of the northern circumpolar 'city'.<sup>30</sup> In Arabic the same pair is called the *Farqadan*.<sup>31</sup> On the Charles VI card, these high, armed and angelic guards appear on the emerald cloud/mountain which is part of the astronomical legends of Islam and India. It is called Mt. Meru. In Muslim religious tradition, the chief duty of the circumpolar stars was that of driving off demons who try constantly to approach heaven and overhear what is said there. Indian and Muslim esoteric thought also locates near them the emerald Mt. Meru<sup>32</sup> the approach to which signals one's proximity to the celestial Pole. As early as the tenth century al Biruni had doubted the mountain's physical existence. He wrote:

*According to the [Hindu astronomers], heaven as well as the whole world is round, and the earth has a globular shape, the northern half being dry land, and the southern half being covered with water... they adopt the theory of Mount Meru being under the north Pole, and that of the island of Vadavamukha lying under the south Pole. ...whether Mt. Meru is there or not, it is only required for the particular mill-like rotation, which is necessitated by the fact that to each spot on the plane of the earth there corresponds a spot in the sky as its zenith. According to them, the earth is the centre... and everything heavy gravitates to it. Evidently on account of this law of gravitation they consider heaven, too, as having a globular shape.*<sup>33</sup>

I have quoted this as translated by Sachau, but perhaps Al-Biruni is implying more exactly that whether Mt. Meru is there or not, it is only required for [exact analogy to] the particular needs of the astrolabe's 'mill-like rotation'<sup>34</sup> which must correlate each spot on the plane of the earth to a spot in the sky as its zenith.

It is noteworthy that Meru is portrayed in this card as a celestial and not as a terrestrial object.

In Europe, imagery of the Farqadan soon underwent a change, because the 'steadfast'

<sup>29</sup> Bourne 'cannot be suffered' to include the usual diagram. Taylor, E.G.R., *Regiment*. pp.8-9. The diagram he omits is figured, and its usefulness explained in Taylor, *Haven*... pp.145-8 et. *passim*. Thomas Hood (according to Hinkley Allen p.459) said the term 'guards' came from the Spanish *guardare* which is 'to behold' because they are diligently to be looked to, in regard to the singular use they have in navigation.' It may be so, but the pair appear as Guards in English manuscripts from the late tenth century and Charles V of France was specifically informed of the English usage by Martin Cortes Taylor, *Regiment*, *loc.cit*.

<sup>30</sup> As unarmed seraphs see e.g. Ormsby Psalter (1320-30), Bodleian Library, MS Douce 366 fol.147v. As guards of the tower see frontispiece of the *Liber Vitae* of New Minster, Winchester. This last example I have quoted often, but for readers not well acquainted with astronomy, let alone medieval moralia, it is one of the most immediately 'readable' examples.

<sup>31</sup> Which suggests a reason for the 'position of the bulls' around the tower of Laon cathedral. See the illustration in Evan, Joan (ed.) *The Flowering of the Middle Ages*, London, Thames and Hudson, 1998 p.71. On the farqadan in Islamic lore See Tibbetts *op.cit* and Hinkley Allen, *op.cit*. [Indexes]

<sup>32</sup> The emerald rock as the summit of the mountain leading to celestial north see Corbin on Suhrawadi p.42. Though the mountain at the North was known in the west, this is certainly the easterners' Mt. Meru, being distinguished by its colour, which the later western writers seem not to have noticed. See Hinkley Allen, R., *op.cit*. pp.451-2.

<sup>33</sup> Qeyamuddin, Ahmad, *India Al Biruni*, India: National Book Trust 1983. Abridged edition of the translation by Dr. Edward C. Sachau in 1905.

<sup>34</sup> In the earlier medieval imagery, great emphasis is placed on the 'mill-like' rotation of the astrolabe, the forms of it being compared with the threshing-floor on which Jerusalem was built, the threshing/thrashing floor of hell, the 'threshing' floor of the ship tossed at sea and so on.

stars were described by a term which, through the Anglo-Norman, was linked with the 'steadfast' of marriage. This notion is actually quite close to the stars' traditional eastern character too for, as Hinkley Allen notes, the Bedu claimed to have a perpetual treaty with  $\beta$  U. Minoris, that it would be a faithful and constant companion for the night traveller. The evocative 'tag' for the image became 'the Lovers' and once the original meaning assigned to the figure in Christian moralia had been lost, picture-makers tended to illustrate its conventional tag than the constellation and stars in question.

Desert dwellers make their way as does the navigator by sea, or the sidereal surveyor, by drawing first a path made of the star-dots. An eastern navigator wrote of how commonly allusion to the Farquadan gave point to Islamic poems:

*[The Farquadan] are used as a comparison for honour, and companionship and a climax, and also for doubling<sup>35</sup>, everlastingness<sup>36</sup>...*

The designer of this card indicated all these moral qualities for this 'stage' or status within the larger pack. But since he was equally interested to teach mathematical astronomy, the lower part of the card enables the whole to be read as allusion to the complete constellation Ursa Minor.

As *Circatores* - the Circlers, or *Ludantes* - the Dancers, Europe described Ursa Minor<sup>37</sup> and recognised how tightly that constellation wheels about its north-star. So Manilius had noted in the early Christian centuries, in a late classical work that would be published as a printed book in 1472 by Regiomontanus and Poggio Bracciolini:<sup>38</sup>

*brevis torquetur in orbe...* "Wheels about in a narrow circle"<sup>39</sup> *posteriora pedem Cynosure praeterit astra transversam secat vicino cardine caudam* "the stars of the hinder feet, whose tail it cuts at right angles close to the Pole."<sup>40</sup>

Apian's *Astronomicum Caesarium* may be a conscious reference to the same work. It is tempting to think that his moveable 'astrolabe' of paper might have been made to help the Emperor in reading the book.

In the cards which I think originally made for the other Charles V a century earlier, Manilius' phrases are precisely represented, the second phrase in the depiction of the hindermost dancer's feet. As 'the Dancers' the Ursa Minor stars "were well known from classical times to late astronomy."<sup>41</sup> The card-maker also seems to have read Dante, who says of the circumpolar stars: "Ladies they seemed, not from the dance released" adding that Ursa Minor was 'horned' (*cornu*). So here, among the pairings of Dancers, we see a lady who is to be understood as the 'horned Cynosure' - horned by reason of her headdress and Cynosure because all eyes are drawn to her. But like

<sup>35</sup> Hence perhaps Paul Christian's wrongly allotting the geomantic figure of the "doubled path" to this card.

<sup>36</sup> Tibbetts p.128

<sup>37</sup>  $\alpha, \beta, \gamma, \gamma^2, \delta, \eta$  U. Minoris

<sup>38</sup> Manuscript copies survive from the eleventh century.

<sup>39</sup> *Astronomica* I. 299

<sup>40</sup> *Astronomica* I. 627

<sup>41</sup> Hinkley Allen, *loc.cit.*

Dante's allusion itself, this figure presents a play on the text of the *Phainomena*, the other important classical text on astronomy available in earlier medieval Europe.

*Then too the head of Cynosure runs very high when night begins (ll 308-9).*

In all, given a little knowledge of Latin and astronomy, with some reading of Dante, even without access to Arabic star-names, a European could recognise the astronomical reference 'Guards and Dancers' without numbers or written captions to aid him. He would see the *very high, horned Cynosure*, the paired *Circatores* and would also, perhaps, note how the young man had lost his Tramontane.<sup>42</sup> 'Tramontane' means literally 'over the mountain' and meant metaphorically to lose one's bearings as thoroughly as a mariner without sight of the Stella Maris, the Pole star. In such cases, of course, one turned to the Guards.

It might be useful to note too, in view of the idea of the card-pack as a system for describing the divisions of the whole mundus, or human centred universe, that each of these 17 appears to have had its specific geographical allusion, established (in what are evidently the forms from which these were taken) by reference to the stations of the circuit of Islamic pilgrimage.<sup>43</sup> It is clear that in constructing the (and, we argue, the larger form of western card-pack) the designers' idea was to represent the world divided according to the custom of the eastern navigator, and to permit it to be used in the same way as a basis for memory, learning and calculation. The sort of philosophical and poetic reflection inculcated by education was expected able to translate any physical journey into a parallel tour of all the celestial, intellectual and spiritual 'ways'.

*"we have the better knowledge of the sea and its sciences and the wisdom of the stars in the high roads of the sea, and the knowledge of the division of the ship in length and breadth."*<sup>44</sup>

In more practical use, the same notion of the shipman's divisions gives us the style of long-division known as 'Galley' [batello] division. This was imported into Europe from North Africa and remained a most popular form among mathematicians until late in the sixteenth century.<sup>45</sup>

In this way, it emerges that the pack of cards is a collection of a chart's patchwork *pieces* whose contemplation and use in reckoning enable both memorisation of, and practical manipulation of, skills in both word and number. *Ludus cartarum*.

## Expansion of the Major Arcana

Twenty-two stars became standard for the *arcana major*, a form which had the practical advantage of providing a card for each of the stars most commonly engraved on

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<sup>42</sup> i.e. lost his bearings. The phrase was proverbial among the Latin races according to Hinkley Allen, who says that Ursa Minor was called tramontine (over the mountain). *op.cit.*p.454

<sup>43</sup> It is hoped to have a paper on that subject appear soon.

<sup>44</sup> Tibbetts, G.R., *op.cit.*, p.121-2.

<sup>45</sup> The method is pictured in Smith, D.E. *History of Mathematics*, vol.2 p.34 & 36.

astronomical instruments and tables of the time.<sup>46</sup> For clerics the habit, too, of using the 22 letters of the Hebrew alphabet as a mnemonic system derived from the 'language of God' meant that associating each with a Hebrew letter might enable the card-set to be used as a portable memo or florilegium, as much as a ready-reckoner.

But the majority scarcely needed such a pack. The eastern navigator's circuit of Rose and lunar mansions was also less comfortable for western peoples than their own well-known wind-rose or the circuit of monthly constellations on the ecliptic. Religious teachers also had pinned much of their teaching on allusion to the 'twelve' - the classical twelve winds,<sup>47</sup> Apostolic division of the world into 12 parts, division of the world's agricultural year by 12 months, the 12 zodiacal constellations as symbolic of the Christian church's genealogy.<sup>48</sup>

Such uses were better served by a pack describing the universal divisions by its mid-level of 12 rather than 16 parts. The classical/agricultural system is emphasised especially in packs made for the Swiss and German spheres, their quarter-signs alluding to the four principal seasons.

The larger pack was altogether more naturally suited to the world-measurer of our modern, pragmatic sort and it is an irony of history that their reputations are now reversed.

## Philosophical Dimensions of the Mariner's Way: the lunar path in Islam.

A balanced picture of the eastern mariner's way of measuring and describing the world's parts must concede that such factors as direction, sun, moon, winds and so on were inextricably bound to the accumulated lore and poetry of millennia. Sometimes, of course, that 'lore' was superstitious, but more often the opposite: a religious philosophy developed from the accepted idea that in a god-created world, all things had place and purpose. Comprehending that Reason was the purpose of study in Islam as in Christendom, and infused teaching of all subjects from geography to natural history.

Since the idea for a card-pack probably came to the west first from regions then or earlier within Islam, one must take into account how the divisions by wind, lunar path or sun were there understood. Here we can only spare time to glance briefly at one element, that of the lunar '28'. The same al Biruni who spoke so sceptically of

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<sup>46</sup> For a superb discussion of the Arabic-inscribed globes see, Savage-Smith, Emilie, *Islamicate Celestial Globes: their history, construction and use*, Washington: Smithsonian Institution Press, 1985. Savage-Smith does not mention the important trade in astronomical instruments between Sicily and Europe, first via the Genoese and then in the time of Frederick, through the Venetians. For comparative examples of astrolabes, their most common stars and variety of their forms see Gunther, Robert, *Astrolabes of the World*, (2 vols) London: the Holland Press, 1937.

<sup>47</sup> On which see Taylor, E.G.R., *Haven...* Ch.3

<sup>48</sup> The Greeks actually had a 'rose' of location which centred the circuit of the zodiac upon a capital city, and then described direction relative to that centre. It was not an entirely satisfactory system since each city might make itself the central one, City 'Aries' for one becoming 'city Sagittarius' for another. But on this see Richer, Jean, *Sacred Geography of the Ancient Greeks*, Albany: SUNY Press, 1994.

gravitation and of Mt. Meru was an astronomer, celestial cartographer, religious philosopher and an astrologer. About his works Nasr comments in part as follows:

*[In al Biruni's corpus of work, writes Nasr] The moon acts as the intermediary ['deputy'/Na'ib] between all the heavens and the terrestrial domain so that the lunar mansions synthesise in themselves all the aspects of the intellect manifest in the planetary spheres and the archetypal world of the [celestial] signs.*

In other words, calculations made by reference to the lunar path are of a higher order than similar calculations made by reference to the sun and planets. In terms of navigation, surveying and cartography this is literally true.<sup>49</sup>

Nasr continues:

*The numerical symbolism involved clarifies their relations. The number of the mansions of the moon, which is 28, is equal to 7+ 6+ 5+ 4+ 3+ 2+ 1 i.e. the sum of the number of planets.*

*Moreover the 28 mansions are the macrocosmic counterparts of the 28 letters of the alphabet which form the language of the Divine Word and may be considered as the form or expression of the Divine Breath (nafas al-rahman) itself.<sup>50</sup>*

[Muslim and general Islamic habit made this series the basis for much learning by rote]

*The significance of the lunar mansions is [also] fundamental to Islamic astrology<sup>51</sup>, particularly as it is related to the science of Divine names in certain aspects of Sufism...*

*As the 'cosmic memory'... the moon... in its 28 mansions synthesises the whole of the Cosmos and therefore becomes the symbol of the Universal Man who is himself the archetype of the universe. In is in this perspective that certain Sufis have identified the Moon with the Prophet [= Na'ib] Mohammad.<sup>52</sup>*

As far as other sets of cards, elsewhere, is concerned, it is worth noting that the Chinese term for the navigator's unit of measure is the chi[h]. The Chinese term for the 'red' or direct line of sail [rhumb-line] is 'kan'<sup>53</sup> and the equivalent in the Arabic-speaking world was 'khann'<sup>54</sup>. 'Fa' as others have noted, may have been understood as the Chinese word for a character-card, or picture-card. Thus Kan[ch]jifah "Rhumb measure pictures" would perfectly describe Bowes' cards and the form of the larger deck. Allusion to the moon as measurer, with its inns, shows the piquancy of one Chinese scholar's comment that the cards are related to 'drinking cards.' But again, thinking of Bowes' geographic pictures, one might simply translate Khanjifah as 'port cards.' Or even pass-port cards.

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<sup>49</sup> *De noe*, IV, 35; AN III, 301.

<sup>50</sup> The circuit of 'breath' also implying the *compass* of the winds.

<sup>51</sup> Islamic in the broadest sense. Its eastern Christian expression is seen in Dickson, Gladys, *A Jerusalem Christian treatise on astrology*, Edmonds: Sure Fire Press, 1989..

<sup>52</sup> And to the genealogy of Islamic Prophets, so that one might here take naibby as allusion to the series of manzil.

<sup>53</sup> See the terminal essay by Joseph Needham in Taylor, E.G.R., *Haven ...* (1971 edition).

<sup>54</sup> The word is variously romanised. I take the orthography of Sergeant, R.B., *Farmers and Fisherman in Arabia*, Great Yarmouth: Variorum, 1995. In his paper 'Hadramawt to Zanzibar: the Pilot-Poem...' [Paper v], Segeant records an interesting use of the term Naibby, where it has the sense of 'Prophet-like' or similar in elevation of character to the Prophet (as spiritual Moon/North of Islam). p.113.