

POLITICAL LANDSCAPE AND WORLD ORIGINS IN MESOAMERICAN TEXTS

**GORDON BROTHERSTON,
Department of Literature,
University of Essex,
Colchester, Essex, C04 35Q,
United Kingdom.**

ABSTRACT/RESUME

There are no known maps, in the post-Renaissance since, surviving of Mesoamerica in the pre-Cortesian period. There are, however, a number of designs forming parts of early texts. When analyzed, these are seen to be statements of political and economic geography based upon concepts of tribute among the Aztec. These texts reflect diagonal quadrants, the fundamental paradigm of Mesoamerican map-equivalents.

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In the corpus of texts which has survived from pre-Cortesian Mesoamerica, there is nothing that could be readily classified as a map, that is, according to the criteria of co-ordinates, scale, and so on developed in post-Renaissance western cartography (Bagrow, 1964). Such criteria, however, are no more appropriate to this Mesoamerican tradition than they are, say, to the mappamundi of medieval Europe. Rather, in order to understand and read the equivalent of maps in this other tradition, we are bound to respect the way it co-ordinates landscape with such factors as political economy and ritual cosmogony. To this end, we need to identify the spatial paradigms, precise and limited in number, according to which maps were laid out, and see the designs thus produced as privileged and highly condensed examples of the *Mesoamerican* script system.

Aztec Tribute According To The Mendoza Codex

A fundamental map paradigm of Mesoamerica is that of the four diagonally-divided quarters; and the best known example of it is the title-page of the Mendoza Codex. Produced for Antonio de Mendoza, New Spain's first viceroy (1535-50), this text was the work of Aztec scribes still fully conversant with the old script tradition. It falls into three parts, devoted *successively* to the conquests made by the ten Aztec emperors (pp. 2-16), the commodity tribute due from towns subject to the Aztec capital Tenochtitlan (pp. 17-55), and the labour tribute due from its citizens according to their age, sex, and status (pp. 57-71). Despite small differences in style, the text as a whole displays a *remarkable coherence* and logic, which our science and scholarship are only now beginning to appreciate.

Formally, the title-page of Mendoza consists of an outer frame of years, which runs from 2 House 1325 AD, the year of Tenochtitlan's foundation, to Reed 1375 AD, when the imperial line began. Enclosed in this frame of years is the name-emblem of the city and its four quarters, which are diagonally separated from one another by four watercourses that converge on the capital. In the other known examples of this diagonal pattern, like the title-page of Fejervary and p. 74 of Madrid, the quarters placed above and below the centre always correspond to east-west or west-east. In the quarters depicted here above and below Tenochtitlan are two matching signs, House and Reed-Arrow, which correspond to the two in the set of four year signs used in the Aztec calendar (House, Rabbit, Reed, and Flint) with which the year-frame begins and ends; when given directional significance this pair of signs always indicates west and east respectively. By placing west at the top, as does the Madrid map (p. 74) which is probably from the west coast of Yucatan, the Mendoza map underpins Tenochtitlan's own image of itself as the western bulwark of Mesoamerican civilization. In addition, the skull-rack

placed in the right-hand or northern quarter suggests the place-name Tzonpanco (Zumpango), which lies due north of Tenochtitlan on the northernmost shore of the highland lake system.

As a true title-page, this complex design in Mendoza anticipates each of the three parts of the text. The story of the imperial conquests like the years in which they were accomplished (1 Flint 1376 to 1 Reed 1519) have their actual starting point here; the geography of the towns rendering tribute follows that of the four quarters surrounding the capital; and the human life-patterns of the third part are predicated on the name-emblems found in the quarters (forms and stages of growth from primeval water; male anatomy and the odd-number 5 to left, female and even-number 4 to right; royal banners above, bare-feet below). For our purposes here, the most instructive of these connections is that between Tenochtitlan's four quarters and the roll-call of tribute towns in the second part.

Preliminary to the system of tribute towns recorded in Mendoza stand the garrisons which guarded it; these fall into two groups of eleven, which respectively served the metropolitan area and the four provinces beyond (p. 18). Stretching from north to south of the highland lakes, from Citlaltepec to Chalcoatenco, the former set of garrisons echoes the eleven-fold sequences placed in the same geographical area by such Aztec migration histories as Boturini screenfold (Huitzcol-Tzonpanco to Azcapotzalco, pp. 10-15) and the Aubin Codex (Huitzcol-Apazco to Azcapotzalco, ff.10-15; Vollmer, 1981); the specifically zodiacal connotations of the number eleven, which are explained for example in the eleven-town sequences found in the Tudela, Magliabechiano and other codices (Boone, 1983; Brotherston, 1988), is deftly brought out by the fact that the first garrison to be named is Citlaltepec, literally "star-mountain". Subsequently, the tribute towns proper are listed in groups, 38 in all, each of which has its cabecera or head town (Barlow, 1949). According to the layout of the text and to the sheer positions they occupy geographically, these groups of towns fall in turn into five main areas, each governed by a gobernador; these correspond respectively to Tenochtitlan at the centre, with 9 cabeceras, and to the four surrounding quarters, to west, south, east and north, which together have 29 cabeceras.

The metropolitan area with its nine cabeceras (pp. 20-29) corresponds to the Distrito Federal of today, with extensions south to Cuernavaca (Cuahnahuac), east to Texcoco, and north to Axocopan and the Mezquital valley. The ensuing shift out to the four quarters or provinces is signalled by the repetition of a place name, Atotonilco (el Grande, p. 30) after Atotonilco (de Pedraza, p. 28), the only such repetition in the entire sequence. Atotonilco el Grande is then the gobernador and the first of the seven cabeceras of the western quarter (pp. 30-35), whose main definition is the

line which today still forms the western edge of the State of Mexico. The last two of these western cabeceras are gathered on to one page, which formally alerts us to the transition made next to the southern quarter, which in turn has seven cabeceras (pp. 36-40). With their first cabecera and gobernador as Taxco (Tlachco), these southern towns mark out an area almost exactly synonymous with the modern State of Guerrero.

The shift from the southern to the eastern quarter is indicated by the accumulation of the last three of the seven cabeceras on to one page, i.e. just the means previously used to show the shift from the western to the southern quarter. Dependent on the third provincial gobernador Chalco, this eastern quarter again has seven cabeceras but was by far the richest in manufactured goods (pp. 41-7). It is perhaps best understood as a road which reached out through the lowlands of Anahuac as far as Guatemala, and which passed via the key town of Coixtlahuaca whose conquest by Motecuzuma I (1440-69) receives a special mention in the preceding annals (p. 8). The special position of the last cabecera of the eastern quarter Xoconochco, is highlighted by the fact it was physically separate from the others; and that its great distance from the capital calendrically-speaking meant a lesser frequency for the delivery of tribute, the minimum being specified as the 180 or 9 x 20 days which separate the equinoctial "months" Ochpaniztli and Tlacaxipehualiztli (p. 47). This leaves the fourth and final quarter with its gobernador Cuauhtochco, which had eight cabeceras (pp. 48-55). It lay to the east and north along the Gulf Coast, beyond the independent kingdoms of Teotitlan, Tlaxcala and Metztitlan.

Heavenly dependent on the conventions of Mesoamerican script, this arrangement fits in perfectly with the spatial logic of the title-page map; and it is further confirmed in terms proper to the arithmetical astronomy of Mesoamerica and hence to the "zodiac eleven" of the garrisons. For the totals of towns, cabeceras, and gobernadores shown to have rendered tribute to Tenochtitlan are made to conform to an ingenious formula which relates them to the cycles of sun and moon. Hence, the towns subject to the five gobernadores of the system exactly equal the 365 days of the solar year; and just as the cabeceras of the quarters equal the 29 nights of the synodic moon, so those of the centre equal the archetypal lunar number nine. Indeed, in Mesoamerica the particular combination of 9 and 29 lies at the very root of the ritual "Book of Fates" (tonalamatl) and the calendrical night count, in which the lunar 29 combines with the nine "Night-Lords" (yoallitecutii) of human pregnancy invoked by the midwives. A further astronomical cipher, familiar from such texts as the Cospi screenfold and the Coixtlahuaca Map, stems from the fact that the total of all the towns in the quarters equals the 246 nights of nine sidereal moons.

gobernadores		head-towns	towns											
Petlacalcatl	+ 123	centre	9	13	10	26	16	26	7	10	7	9	=	124
Atotonilco	+ 46	west	7	6	7	13	12	6	2	1			=	47
Tlachco	+ 69	south	7	10	14	12	14	8	6	6			=	70
Chalco	+ 82	east	7	6	22	11	11	3	22	8			=	83
Cuauhtochco	+ 45	north	8	7	6	7	11	7	2	5	1		=	46
	365		29											246

As it is expounded in Mendoza, the economy of Tenochtitlan is made to conform with a range of paradigms. The positions of the tribute towns are given significance through the map of the four quarters, through which they come numerically to echo key cycles of sun and moon. In practice, the identity and status of towns in this system must continuously have been adjusted, as the Aztec empire grew and changed shape. But on the evidence given, there can be little doubt about the principle of patterning as such, or its fundamental connection with four-quarters geography of the title-page map. Though scribes added alphabetic and Spanish glosses to Mendoza, it is clear from all this that the original in native script deserves the highest consideration as a Mesoamerican literary product.

Parallels With The Fejervary Screenfold

Once perceived, the spatial and arithmetical paradigms shown here to have informed Mendoza, and therefore the otherwise well-documented tribute system of Tenochtitlan, can reasonably be sought in texts which antedate it, in the Mesoamerican script tradition. A prime candidate for comparison here is the much-celebrated Fejervary, a deerskin screenfold of indisputably pre-Cortesian origin, which has a high degree of formal resemblance to Mendoza. It is normally assigned to what has been called the "ritual" genre, which is to be distinguished from the other main genre of the Mesoamerican script tradition, year-histories or annals, by the principle of sequence or reading-order (Nowotny, 1961 ; Brotherston, 1988). For here, information is always arranged in chapters whose internal reading order is determined, without exception, by one or more of the number-sets of tonalamatl (9, 13, 20) or of the year (the 11 of the zodiac, the 18 of the 20-day tribute "months"). Of the nine pre-Cortesian ritual-genre texts extant, Fejervary, along with the closely comparable Laud, is perhaps the most challenging in terms of spatial logic, numeracy, and script convention. For this reason, it still awaits a satisfactory overall reading, although Miguel Leon Portilla's recent attempts (1985) to associate it with tribute and the pochteca traders surely point in the right direction. In any case, concerted com-

parison with Mendoza reveals a range of telling parallels.

To begin with, the title page of Fejervary shows a "map" diagonally-quartered in the same way as the Mendoza example, though with east rather than west uppermost, directions denoted by a rising sun opposite a crescent moon. And there is the same outer frame of years whose sequence in this case is given by means of just four key dates 13 Rabbit - 12 Reed - 11 Flint - 5 House; the number of co-efficients here are given esoterically by birds belongs to the tonalamatl set of the Thirteen Quecholli or "fliers", in which the Parrot is 13, the Quetzal 12, the Macaw 11, and the Eagle 5. A further analogue can be found in the presence of the midwives' nine Night-lords, and of growth emblems identical in some details with those in Mendoza.

Just as with Mendoza, this title-page effectively announces the structure and detail of the text as a whole; more striking, much of this subsequent structure and detail proves actually to be analogous to that in Mendoza, which implicitly endows with great formal significance the title-page map as such. The first short chapter (pp. 2-4) repeats the Night-Lords, this time in attitudes of conquest reminiscent of those of the Aztec emperors. The second chapter (pp. 5-22), again as in Mendoza, unmistakably concerns quantities and frequencies of tribute; and it does so with reference to the two principal number sets of Mesoamerican ritual which stem from astronomy and the sky rather than from the tonalamatl: the zodiac 11, which as we saw is the total of the garrisons at the start of the second chapter of Mendoza; and the 18 of the 20-day "months" of the solar year, which underlies the whole principle of tribute delivery in Mendoza. In Fejervary, 11 is the optimum number base of calculations in bar (5) and dot (1) notation that are set under a sequence of eleven celestial figures, and which neatly reconcile the small discrepancies between the sun, the moon, and Venus within the octaeteris; further calculations, which double the number base to 22 and use the convention of angle value, are then set under signs for the 18 tribute months. To complete the picture, the reverse side of Fejervary (pp. 23-44) presents a series of chapters which thematically correspond to the third part of Mendoza: child-birth, tied here to the four moments of begetting and bearing, severing the umbilical cord and suckling; marriage; male and female labour; temple duties: transport; the pochteca; and the military.

Given this order of consistency between Fejervary and Mendoza, we may decode details in the title-page map of the former which otherwise must remain enigmatic or consigned to an arcane vocabulary of ritual. In each of the quarters of the Fejervary map stands a tree on which sits a bird. Geographically, the four types of tree shown no doubt correspond to the regions in question, in the fashion suggested for example by the "four-trees"

chapter of the Tuleda Codex (ft. 97-125). As for the birds, like those which number and carry the four year signs at the diagonals, all four belong to the set of Thirteen Quechoili and consequently have the following number value, quarter by quarter:

east	Quetzal	12
south	Parrot	13
west	Hummingbird	1
north	Hawk	3
		29

In other words, the lunar total of 29 produced by the cabeceras of the four quarters in Mendoza (7 + 7 + 7 + 8) recurs here, in the Fejervary map of its four quarters, in the ritual numbering convention of the Quecholli. Taking the overall parallels seriously suggests that at one level the Fejervary map in its turn represents the tribute catchment of the town from which it stems, which possibly was Teteutlan (Place of gods, in this case the Night-Lords) placed by Mendoza (p. 46) on the Papaloapan drainage, under the eastern cabecera Tochtepec.

Too much to be coincidence, the lunar total of 29 can in fact be found in other texts concerned with the four quarters of tribute, represented either by cabeceras or by the bird numbers of the Quecholli. Good examples of the former come in the Tepexic Annals (Vindobonensis obverse; Brotherston, 1985), the most extensive extant in this genre from the pre-Cortesian period, where the six cabeceras of the centre (p. 32) are followed by those of the quarters to east (7, p. 35), south (5, p. 39), north (11, p. 43), and west (6, p. 48); and in the closely-related Biography of Eight Deer (Nuttall reverse), where one hundred subject lords are assigned to quarters and cabeceras in the sequence south (6, p. 60), west (5, p. 61), north (11, p. 65), and east (7, p. 68). Then, in the more succinct number-convention of the Quecholli used by Fejervary, the same total of 29 can be found, again related to four quarters and trees, in at least two of the other texts in the ritual genre: Laud, in a chapter which also deals with the Nine Night-Lords and lunar and planetary formula (pp. 31-38; 12, 1, 3, 13); and Borgia, in a chapter emphatically devoted to tribute collection (pp. 49-52; east 12, west 5, south 8, north 4).

What all this suggests is that just as the material economy of Mesoamerica was organized in space and time according to ritual principles, with particular reference to the four-quarters map, so the genre of pre-Cortesian ritual texts may be seen to include information of an economic order. Since the ritual genre is already known to deal at one level with larger

questions of cosmology, we need now to see how this last is integrated into the geographical scheme.

The Deeper Time In landscape

In the pre-Cortesian ritual genre, besides Fejervary (p. 1) the most map-like design to have survived is the single-page design on deerskin whose faded central detail can be reconstructed with some certainty as the place-name Coixtlahuaca (snake-star-plain), and which was referred to above as the Coixtlahuaca Map. Further place-names are ranged around the centre of this text, and have been recognized as such by even the most sceptical commentators (Glass, 1975:90). They occur as a set in other texts from the same upper Papaloapan region. That it is a question of decoding place-names at all, in what is after all a ritual-genre text, strongly corroborates in itself the geographical and economic reading made above of Fejervary.

Structurally, the Coixtlahuaca Map again presents us with a system of centre and four quarters; but this time they are divided not diagonally and in relation to years but at right angles and in relation to fifths of the tonalamatl. A subsidiary division runs between the upper and the lower halves. Above to the right stands Tepexic, home of the magnificent Annals quoted above, from which a chevron road or path of conquest runs to a place upper left identified by a sun and a row of flint-knives. Below two further paths emerge from the central area and lead to a place of volcanic ash, identified by with Nexapa (left) and to the temple of the skull, possibly Mictlantongo (right). This set of place-names can be the more surely deciphered through comparison with the Tepexic Annals, and with end-page maps found in two other pre-Cortesian screenfolds from the same general area: Laud, possibly from Teotlillan; and Diaz, which comes from nearby Cuicatlan. In the Coixtlahuaca Map their relative positions mean that the upper register stands to north as the lower one does to south; and that the line between them corresponds in actual geography to the continental divide that separates the river system of the Papaloapan, on which Coixtlahuaca itself stands, from the Mixteca rivers that flow to the Pacific or southern sea.

Though the attribution of this grand text to Coixtlahuaca remains to be generally accepted, it concords well with the key importance attached to this town in Mendoza, and with the notable body of documents that emerged from there in post-Cortesian times (Caso, 177:118-36; Parmenter, 1982). Moreover, it is supported by such additional details as a name decipherable as that of the great Mixteca hero Eight Deer, at an appropriate position on the road to Nexapa. More important here, the geographical scheme as a whole finds its corroboration at the cosmological level.

That the Coixtlahuaca map bears some formal resemblance to the "Sun-stone" of Tenochtitlan, famous for its representation of the Mesoamerican cosmogony of world-ages, was suggested already in nineteenth century by Gondra; his opinion was, however, dismissed as "improbable" in the *Census of Native Middle American Pictorial Manuscripts* (Glass, 1975:90), a work generally indispensable in the study of these texts. In truth, there seems to be little reason for such scepticism. The layout of the map corresponds to the central area of the Sun-stone, in which the names of the four ages inherent in our present age or Era "4Ollin" are arranged in four quarters, so as actually to constitute the sign Ollin. And quarter for quarter, the detail attaching to the four inherent ages, as this has been narrated in such Nahuatl texts as the *Cuauhtitlan Annals* (Lehmann, 1974) and is depicted on the Sun-stone itself, finds consistent echoes in the Coixtlahuaca text. Hence, the water rising up the temple steps at Mictlantongo, full of heart-shaped fish, recalls the Flood that ended the age 4 Water, when humankind reverted to fish; the serried flint-knives ranged over the "sun-town" recall the blood-thirsty flints (also shown on the Sun-stone) of the solar Eclipse that ended the age 4 Jaguar; the rising volcano and the saurian at Nexapa recalls the fire-rain that ended the age 4 Rain, and its saurian denizens; and the privileged position and astronomical knowledge attaching to Tepexic recall the human triumph, and imperial crown on the Sun-stone, that concluded the 4 Wind. It should be emphasized that none of these readings in any way displaces the primary geographical significance of the toponyms in question; rather, they rely on a logic which adds a deeper cosmic resonance to the political ambitions of Coixtlahuaca. In so doing, they guide our further reading of the Fejervary Map.

For, on close inspection, the Fejervary map proves to offer the same order of multiple-level reading by subtly appealing to spatial and numerical logic. First, while it is certainly the case that the trees standing in their quarters represent actual tribute zones around the centre, at the same time it is no less the case that two of these quarters, east and west, are distinguished from the other two by virtue of being connected by a continuous line with the centre. By contrast, the south and north float free, as it were, and in so doing allow for a deeper reading as below and above. The emblems out of which the trees respectively emerge are an earth maw and the bowl that reflects the sky. With their counterparts in other ritual texts and most notably in the fourfold set of directional emblems used in Maya hieroglyphic writing, this pair, maw and bowl, may readily be seen as locatives for the fifth of the Nine Night-Lords, the underworldly Mictlantecutli below, and for the ninth, Tlaloc, the rain god that sends rain from the sky above (Burland, 1950; Brotherston, 1975).

In other words, between the constants of the east and west horizons we may detect a spatial switch from the earth's surface to the zodiac path of sun and moon, which in Mesoamerica passes through nadir and zenith. Consistent with this is the appeal to a time-depth greater than that of the years of tribute, specifically to the cosmogony of world ages represented in the texts discussed above, and narrated at great length in the Popol vuh or "Bible of America" as it has been called (Edmonson, 1971; Tedlock, 1985). For example, the dismembered male anatomy attaching to diagonals recalls that of the father who descended to the Underworld, in the epic which heralded and made possible this world age, and from whose severed head (upper right) were engendered the magic twins who "walked into the sky" from the eastern horizon. Then, evocative of yet greater depths of biological and finally geological time, the millions of years recorded in Maya hieroglyphic texts - not least the chapters in Madrid centred on this same diagonal map (pp. 57, 69, 72) - the four emblems of growth found inside the diagonals culminate in maize (again, upper right), the plant whose invention and worship are synonymous with the economy of this world age.

A last and powerful confirmation of these successive readings of the highly-complex title-page map in Fejervary comes from comparison with texts which, though they stem from beyond Mesoamerica, bear an intimate relation to the maps that characterize the ritual genre, as Nowotny has shown (1961:43. "Die Ähnlichkeit mit den Sandgemalden des Pueblo Gebietes its keine zufallige"). For the dry- or sandpaintings of the US Southwest, particularly those of the Navajo, explicitly relate the story of the world ages to geography, typically to sets of four mountains or trees that can be located in their territory.

On this principle, an astounding analogue for Fejervary page1 occurs in the "Red Mountain" painting of the Navajo Shooting Chant, which like it has quarters separated by diagonals, with east at the top. Then, just as the Nine Night-Lords of Mesoamerica are ranged in four pairs in the quarters with Fire (Xiuhtecutli) at the centre, so four pairs surround the fire in the Navajo painting; and just as members of the Thirteen Quecholli yield the lunar total of 29, so the need for a thirteenth intercalated moon is indicated in the root totals of the four diagonal plants of the Navajo. In turn these plants provide further parallels since in both cases maize (upper right) lies opposite the squash vine (lower left). Cosmogonically, the Popol vuh tells us that as the plant which *characterizes* the *economy* of this Era in *Mesoamerica*, maize was eaten by people whose senses transcended those of their predecessors in the world; and in Fejervary the four senses of sight (bird), smell (copal incense), touch (jaguar ear), and hearing (hand by ear) attach to the head of the central Fire-god. Similarly, the original purpose of the

Navajo Red Mountain design was precisely to endow with human senses the Holy Man who has passed through the four hoops of creation (Reichard, 1977).

Conclusion

Approaching the highly complex map designs that characterize the ritual genre of Mesoamerican texts severely tests certain received notions of cartography and for that matter literacy. In these maps we are confronted with a holism, millennially rooted in the practice of American shamans, which effectively conjoins the geography, material economy, and politics of everyday, with the deeper questions of world origins. The exposition offered here, focused as it is on only two pre-Cortesian texts (Fejervary and the Coixtlahuaca Map), cannot hope to be more than preliminary.

REFERENCES

Aveni, Anthony F. (Editor)

1982 *Archeoastronomy in the New World: American Primitive Astronomy*. London, New York: Cambridge University Press.

1988 *WorldArcheoastronomy*. London, New York.

Bagrow, Leo

1964 *History of Cartography*. London: C.A. Watts.

Barlow, Robert

1949 *The Extent of the Empire of the Culhua Mexica*. Berkeley, Los Angeles: University of California Press.

Boone, Elizabeth Hill

1983 *The Codex Magliabechiano*. Berkeley, Los Angeles, London: University of California Press.

Brotherston, Gordon

1976 Mesoamerica Description of Space: Signs for Direction, *Ibero-amerikanisches Archiv* 2(1):39-62.

1979 *Image of the New World*. London, New York: Thames Hudson.

1982 Astronomical Norms in Mesoamerican Time-Reckoning, in Anthony F. Aveni (Editor): *Archeoastronomy in the New World: American Primitive Astronomy* pp. 109-142. London, New York: Cambridge University Press.

1982a A Key to the Mesoamerican Reckoning of Time, in Anthony F. Aveni (Editor): *Archeoastronomy in the New World: American Primitive Astronomy* pp. 109-142. London, New York: Cambridge University Press.

- 1985 The Sign Tepexic in its Textual Landscape. *Iberoamerikanisches Archiv* 11:209-50.
- 1988 Zodiac signs, numbers sets, and astronomical cycles in Mesoamerica, in Anthony F. Aveni (Editor): *Archeoastronomy in the New World: American Primitive Astronomy* pp. 211-40. London, New York: Cambridge University Press.
- Burland, Cottie
1950 *The Four Directions of Time*. Santa Fe.
- Caso, Alfonso
1977-9 *Reyes y mitos de la Mixteca*. Mexico. 2 vols.
- Edmonson, Munro
1971 *The Book of Counsel: the Popol vuh of the Quiche Maya*. Tulane, New Orleans: Middle American Research Institute, Tulane University.
- Glass, John B.
1975 A Census of Native Middle American Pictorial Manuscripts, *Handbook of Middle American Indians* 14:81-252. Austin: University of Texas Press.
- Lehmann, Walter
1974 *Die Geschichte der KSnigreiche von Colhuacan und Mexiko*. Berlin.
- Leon-Portilla, Miguel
1985 *Tonalamatlde los pochtecas (Fejervary)*. Mexico.
- Nowotny, Karl Anton
1961 *Tlacuilolli. Die mexikanischen Bilderhandschriften*. Berlin.
- Parmenter, Ross
1982 *Four Lienzos of the Coixtlahuaca Valley*. Washington, D.C.: Dumbarton Oaks.
- Reichard, Gladys
1977 *Navajo Medicine Men Sandpaintings*. New York: Peter Smith.
- Tedlock, Denis
1985 *Popol vuh*. New York: Touchstone.
- Vollmer, Gunter
1981 *Geschichte der Azteken. Der Codex Aubin*. Berlin.