

ESPACIOS MAYAS

USOS
REPRESENTACIONES
CREENCIAS

Alain Breton
Aurore Monod Becquelin
Mario Humberto Ruz
(editores)



ESPACIOS MAYAS: REPRESENTACIONES, USOS, CREENCIAS

Alain Breton, Aurore Monod Becquelin y Mario Humberto Ruz
editores



Centro de Estudios Mayas, IIFL, UNAM
Centro Francés de Estudios Mexicanos y Centroamericanos

México, 2003

DANGEROUS PLACES IN ZINACANTEC PRAYER

John B. Haviland
Reed College (Portland, Oregon) / CIESAS-Sureste

THE CONSTRUAL OF SACRED / DANGEROUS / POWERFUL spaces in contradistinction to domestic / unmarked / safe places in Zinacantan, Chiapas, México, is perhaps most accessible to consciousness (and hence investigation) in the context of shamanistic curing. The conceptualization of these spaces is directly, if somewhat esoterically, manipulated in curing prayer, which employs images dichotomous in both form and meaning to track the progress of a ceremony across physical and ritual landscapes. Certain types of Zinacantec curing rely directly on transitions between spaces: the highly constrained domestic space, or the over-structured interior of the church, *vs.* the caves, stones, waterholes, and milpa edges where soul-danger both lurks and can be redressed. Transitions across such boundaries are necessary for cure, but they are themselves potentially harmful and thus produce profound ambivalence, expressed in both word and deed by curer, patient, and helpers alike. Indeed, central parts of curing performances seem explicitly designed to counteract the dangerous places where the performance must by necessity take place. I will present discursive and gestural exhibits, extracted from recordings of several Zinacantec curing ceremonies, to argue that it is principally through language (in a broad sense, including highly structured ritual speech and its gestural and corporeal accompaniments) conjoined with other communicative action that Zinacantecs seek to control the world and protect themselves during their passages across dangerous places.

Places as metaphors

The following lines are drawn from a reenacted prayer by the late Domingo de la Torre of Zinacantan, Chiapas, a prodigious Tzotzil poet. They evoke a somewhat dark side of the veneration of the candles offered by a new house owner (Laughlin 1980: 212).¹²⁷ The prayer represents part of a ceremony to instill a new house with a soul, and to secure its boundaries by soliciting the protection of gods, spirits, and ancestors alike. Here, the owner asks to be protected against obliquely mentioned but quite specific human dangers.

(1) Laughlin 1980: 212

Tzauke, jtot,	Take heed, My Father,
Tzauke, kajval!	Take heed, My Lord!
Ma`uk to jta o ti jun ba vitze, ←	May I not yet reach the mountain- top, ←
Ma`uk to jta ti jun ba stzeleje, ←	May I not yet reach the hilltop, ←
Ma`uk to jk'u`un o ti lume,	May I not yet clothe myself with dirt,
Ma`uk to jk'u`un o ti ach'ele	May I not yet clothe myself with mud,
Ma`uk to xkak'be o yelav ti jtote,	May I not yet amuse my father,
Ma`uk to xkak'be o yelav ti jme`e,	May I not yet amuse my mother,
Ma`uk to stze`in o jun jtot,	May my father not yet laugh,
Ma`uk to stze`in o jun jme`e,	May my mother not yet laugh,

Like their cousins elsewhere in Maya country, Zinacantecs pray in the formally parallel lines characteristic of all Tzotzil ritual speech (Gossen 1985). Typically, as in the fragment quoted in (1), lines of prayer come in matched pairs, with exactly identical environments framing a conventional pair of words or short phrases, which in turn encapsulate a standardized, if

¹²⁷ I have altered Laughlin's orthography slightly to make it consistent with current Tzotzil practical orthography which includes the following digraphs: ch = c = IPA /tʃ/, tz = z = IPA /ts/.

sometimes oblique, "stereoscopic" image (Fox 1974, 1977).¹²⁸ Thus, the injunction *tza-uk-e* which Laughlin translates as 'take heed' (from an archaic root *tza* evidently denoting 'intelligence, skill, craft' [Laughlin 1988]), is a frame which pairs with the conventional doublet for addressing male deities: *J-TOT / K-AJVAL*, 'my father / my lord'. In a massively parallel construction, the house owner follows this opening formula with a string of negative injunctions, asking for divine intervention to avoid the demise (frame: *ta j-ta o ti jun ba__*, "I will reach the top of—" and doublet: *VITZ / STZELEJ*, "a mountain / a ridge" –that is, explains Laughlin, the graveyard; frame: *ta j-k'u`-in o ti__*, "I will wear–", and doublet: *LUM / ACH'EL*, "dirt / mud" –that is, when I am buried) planned by *J-TOT / ME`*, "my father / my mother" –that is, my enemy, thereby "amusing him" (frame: *ta x-k-ak'be elav__*, 'I cause amusement to...' my enemy) / "making him laugh" (frame: *ta s-tze`in o__*, 'he laughs because of it...').

Several formal characteristics may be observed in this fragment of elaborately structured speech. First, the doublets and frames are highly conventionalized. (The pair *LUM / ACH'EL* conventionally denotes exactly the "dirt / mud" under which one is buried, and by extension, one's very body). But they are also syntactically flexible. (In death one can *-k'u`in* this dirt, that is "clothe oneself" in it, as in this prayer. But one can also simply find oneself *ta yolon lum / y-olon ach'el*, 'under dirt / under mud'.) Importantly, the imagery of the parallel constructions is ordinarily **indirect**, underspecified, and consequently semiotically malleable. One does not name the enemy who plots witchcraft: he or she is instead merely *jun j-tot / jun j-me`*, 'one father of mine / one mother of mine', and thus a kind of distanced kinsman, whose evil intentions do not reflect overtly stated reciprocal animosity on the part of the speaker. Similarly, although it is, as Laughlin points out (1980, fn. 29), *ta jun ba vitz / jun ba stzelej*, 'on a mountaintop / on a hilltop', where Zinacantecs typically place their cemeteries, as I shall argue in this paper, this is not all that Zinacantec ritual speech locates in such exposed, salient, and dangerous places. The properties of referential ambiguity and semiotic flexibility that characterize all

¹²⁸ I will call the repeated context of parallel lines the **frame**, and the paired varying phrase the **doublet**, although frequently parallel lines come in sets of three or more.

Zinacantec ritual speech are the tools I wish to bring to bear on the notions of space and place in contemporary Mayan societies.

The conventionalized, multivalent, and flexible poetic imagery of Tzotzil prayer provides a unique key to Zinacantec conceptualizations of space, geography, and the dangerous places that surround us here on earth. If it is largely through interactive discourse that Zinacantecs, like everyone else, learn the conceptual parameters of their world, the crystalized stereoscopic images of ritual frames and doublets may be seen as the meta-tools of cultural discourse, distilling out exactly those elements of the world we create through talk with the greatest semiotic potency. We may learn a good deal about the conceptualization of the universe by directly interrogating our informants; but our informants themselves learn about the universe in large part by listening to and interpreting the powerful, if often opaque, words of their own ritual specialists, in shamanistic prayer and elsewhere. My aim in this paper is simple, and largely descriptive: to enter Zinacantec geography through this back door of ritual language, in which things are never quite what they seem, and places never quite where they seem. How are the spaces of the Zinacantec world portrayed in prayer?

Let us consider the image conjured by the doublet *VITZ / STZELEJ*, 'mountain / ridge', or its close relative *VITZ / CH'EN*, 'mountain / cave'. Let me pass from simulated prayer¹²⁹ to the genuine article, prayers recorded over the last 30 years¹³⁰ in the moment of their actual performance, at various points scattered across the Zinacantec landscape. Here is

¹²⁹ Laughlin remarks that despite the fact that his compadre performed the fragment in (1) during a reenactment of the ritual, he was brought to tears by the performance, which he uttered with a speed and fluency that seemed "beyond human possibility" (1980: 206).

¹³⁰ My ongoing field research in Zinacantan, which began under the auspices of the Harvard Chiapas Project in 1966, has over the years had support from the National Science Foundation, NIMH, Australian National University, the National Geographic Society, the Harry Frank Guggenheim Foundation, the John Simon Guggenheim Foundation, the Universidad Nacional Autónoma de México, the Centro de Investigaciones y Estudios Superiores en Antropología Social, and Conacyt (México), which supported major parts of the current research as part of the project *Archivo de los Idiomas Indígenas de Chiapas*, grant #R30877-H.

a fragment of prayer in a cornfield (recorded in the central lowlands of Chiapas in 1982) designed to protect young and vulnerable maize plants from devastating winds and rain.

(2) t8208b452—4th cross

ta yu ba vitz / ta yu ba stzelej ←

chajta ta k'oponel /
chajta ta yu ti'ine:l
yu'un ti yu avalabe /
yu'un ti yu anich'nabe
k'u yepal stz'unoj / k'u yepal yavoj

t.axojobale / t.anak'ubale
ch'ul vinajeletik / ch'ul balamiletik
ch'ul reyetik / ch'ul anjeletik
ch'ul yaxal lumal toketik / ch'ul ik'al
lumal toketi:k

...
tzauke mu jinesbiluk /
tzauke mu vuk'esbiluk
mu ta k'a`epuk / mu ta ik'ubaluk

ta axojobalike / -
mi o bu ta ba vitz /
mi o bu ta ba stzelej ←
tal ti jun ik' tale / ti jun sik tale

pero mo`oj sbeuk tal un /
pero mu xanebuk tal un
k'opon abaik un / ti'in abaik un
ch'ul vinajel / ch'ul balamil

on the humble mountaintop / on
the humble ridgetop ←

I will reach you by word /
I will reach you by mouth
for your humble child /
for your humble offspring
whatever he has sown / whatever he
has planted

your sunbeams / your shadow
holy heavens / holy earths
holy kings / holy angels
holy blue fog / holy black fog

...
may it not be thrown down /
may it not be blown down
may it not be rubbish / may it not
be filth

your sunbeams
if there be on a mountaintop /
on a hilltop
should one wind come / should one
cold come

but may it not find a path to come /
find a step to come
speak to each other / talk to each
other
holy heaven / holy earth

The image of the mountaintop / the hilltop is invoked twice, but now not as an ominous indirect reference to death. Instead, both the divine addressee whose intercession is being requested, and apparently also the very corn crop in need of protection, are located on the same *ba vitz / ba stzelej*, 'mountaintop / hilltop'. The image of the cemetery on an exposed mountain peak is replaced (if not entirely supplanted) by a different image that merges the mountaintop shrine –access point to divine attention– with the vulnerable, exposed field of young corn. Later in the same prayer, the shaman makes it plain that his addressees –variously invoked in the prayer with a series of doublets: holy heaven / holy earth, holy kings / holy angels, holy gray [lit., blue / green] fog [lit., clouds of the earth] / holy black fog, lords of heaven / lords of earth, black mirrors / white mirrors– are themselves “seated” “on the mountaintop / on the hilltop”. Divine forces of nature, with powers both to nurture and to destroy a corn crop (and by extension a corn farmer), are located in a place whose imagery is unmistakable in Chiapas: the mountaintop swiftly fading from view before rapid, rolling banks of thundercloud.

(3) explicitly locating divinities: t8208b452

xanavanik un / beinanik un	walk! / set out!
k'opon abaik un / ti'in a-	speak to each other! / talk to each other!
yajval ch'ul vinajeloxuk / yajval ch'ul balamiloxuk → chotoloxuk ta yu ba vitz /	you are lords of holy heaven / lords of holy earth you are seated on the humble mountaintop /
chotoloxuk ta yu ba yu stzelej yajval ch'ul lumoxuk / yajval ch'ul osiloxuk yaxal lumal toketik / ik'akil nenetik / sakikil nenetik	seated on the humble ridgetop you lords of holy soil / you lords of holy land blue fog black mirrors / white mirrors

In a similar vein, the same doublet appears again in the following sequence from a house dedication prayer recorded in 1984.

(4) t843a480, MK at Nabenchauk house

tzauk une jtot / tzauk une kajval	take heed my father / take heed my lord
vo`oxuk totiloxuk / → nichim ch'ul ba vitzetik / nichim ch'ul ba stzelejetik nichim ch'ul reyetik / nichim ch'ul anjeletik ta avokik un / tak'obik un tavalabik une / tanich'nabik une chijlanik un bi / joylanik un bi slekilal ti ta ch'ul k'elbon talel / slekilal ti ta-ch'ul-'ilbon talel	you are the fathers flowery holy mountaintop / flowery holy ridgetop flowery holy rings / flowery holy angels at your feet / at your hands your child / your offspring enclose us / surround us come watch well for me / come see well for me

The shaman directly addresses the “flowery mountaintop / the holy hilltop”, asking the divine powers who there reside to “surround” the house owner and to take him into their care (by placing him “at their feet / their hands”). Zinacantec prayer identifies and typifies a series of places –here, mountaintops– and endows them with a range of associations –in this case framing them as site of danger and death, as the source of devastating natural powers, and as the abode of divine protectors. Zinacantec ritual language represents a poetic distillation of such cultural associations into words. Prayer and other ritual forms encode what Zinacantecs have theorized about sacred space over generations. Moreover, it is largely through attention to the words of ritual specialists that each new generation of Zinacantecs acquires knowledge of the sacred geography thus presented. In this study I put a corpus of ritual language to use in trying to discover what elements there are in the landscape of prayer, in Zinacantec conceptual geography as seen through the stereoscopic lens of frames and doublets. I will start with the Zinacantec idea that the earth itself, and some of its creatures, are invested with power and danger. I then consider the relationship between place and illness, and the techniques of curing as they relate to transformations of space. Finally, I trace the movement of a curing ceremony through space as an icon of the geography of illness or the spatialization of health, before turning to some conclusions about the

In ritual speech, the doublet *vinajel / balamil*, 'heaven / earth', can stand for the entire universe in its dual aspect, both heavenly and earthly. When invoked in prayer, the universe so characterized is paired with other doublets which reflect the same duality in various interlinked pairings: *rey / anjel*, 'king / angel',¹³³ *chon / chauk*, 'animal / thunder', *chon / bolom*, 'animal / jaguar', and *tok / chauk*, 'cloud / thunder'. Heaven, the domain of kings and angels, is the origin of clouds and thunder; thunder, in turn, is linked via the *yajval balamil*, 'lord of the earth', to powerful earthly beasts, most notably snakes and jaguars, as well as to both life giving and potentially destructive rain. Consider, for example, the following extract from a new house dedication prayer, in which protection is sought from all the forces of heaven and earth:

(7) t843a480: <i>sk'inal na</i>	
ch'ul nombre de dyos jesu kristo	holy name of God, Jesus Christ,
kajval	My Lord
k'usi yepal jtot / k'usi yepal kajval	how much, my father / how much, my lord
...	...
k'u yepal ch'ul vinajel /	how much, holy heaven /
ch'ul balamil ←	holy earth ←
ch'ul rey / ch'ul anjel	holy king / holy angel
ch'ul chon / ch'ul chauk	holy animal-serpent / holy lightning

Balamil, the literal source from which all things Zinacantecos grow, is addressed directly with the Tzotzil imagery of beauty and respect, for example in the following extract from a cornfield dedication ceremony. Cultivated land is described as previously "lying down", that is, asleep, until planted and sowed by man ('your child / your offspring') in order to produce corn ('your beam of light / your shadow').

Aissen 1997) having to do with constituent order and verbal voice can also be observed in clauses involving *balamil* as a nominal argument.

¹³³ Note that both words are loans from Spanish.

(8) t8202b140: <i>sk'inal cobtik</i> : the land was previously "asleep"	
chotoloxuk / vutz'uloxuk	you all are seated / you all are settled
ra skotol ch'ul k'ak'al /	every holy day /
ra skotol ch'ul ak'ubal	every holy night
li' ta puch'ul osil /	here on the lying land /
li' ta puch'ul balamile	here on the lying earth
k'u yepal li stz'unoje / li yavoje	however much he has planted / he has sown
taxojobale / tanak'ubale	of your sunbeam / of your shadow
tavalabe / tanich'nabe	your child / your offspring

The lords of earth and sky are likened to a beautiful and fertile valley. They are called down from their mountaintop abodes to enter into conversation and thereby agree to protect the cornfarmer's crops.

(9) t8202b140 continued	
yajval ch'ul vinajel /	lord of holy heaven /
yajval ch'ul balamil	lord of holy earth
jpul ch'ul osil / jpul ch'ul balamil	holy valley of land / holy valley of earth
chotoloxuk ta ba vitz /	you all are seated on the mountain-top / you all are seated on the ridgetop
chotoloxuk ta ba stzelej	
k'opon abaik bi / ti'in abaik bi	speak to one another / talk to one another
ch'ul rey / ch'ul anjel	holy king / holy angel
ch'ul chon / ch'ul chauk	holy animal / holy thunder

The images can also be inverted. In curing prayer, the epithet *balamil* is frequently attached to the lowest of the low, the forces and impulses of evil that produce witchcraft and illness, or the basest nature of man and beast. When, in conversational Tzotzil, one laments one's uselessness (from disease or other incapacity, for example), one may characterize oneself as *yech ta balamil*, 'just this way, on earth', or, like my aged blind

compadre, kukul ta balamil, 'groping about on earth'.¹³⁴ The frames of prayer link the word *balamil* with witches, in typically ironic and indirect images:

jun balamil utz / jun balamil kolo`e	one earthly good / one earthly evil
ti` balamil jve`ele /	the eater on earth /
ta balamil j`uch`vo`e, kajval	the drinker on earth

The disease one suffers as a result of the efforts of witches is also linked explicitly to the earth.

ti balamil ip e / ti balamil k`ux une	the earthly illness / the earthly pain
---------------------------------------	--

Finally, the metaphors for humility in a shaman's self-references place him on her square on the ground:

ti stz`i`alon osil une /	I am the dog of the land /
ti stz`i`alon balamil une	the dog of the earth
labalamil bole / labalamil sonsoe	your earthly fool / your earthly idiot

In ritual speech, then, the verbal resonances of *balamil*, the earthly plane on which all space is grounded, thus endow the earth itself with a special semiotic ambivalence: it is the locus of life itself, source of all sustenance; it is also rife with danger, and its power tends to suggest evil and malevolence.

Illness, danger, and geography

My primary ethnographic material for this paper is shamanistic prayer, supplemented by the more prosaic conversational currency of Zinacantec daily interaction. In particular, I have been immersed in the prayer of the *j`ilol*, 'seer, or shaman', during curing ceremonies, a profusion of poeti-

¹³⁴ T9717b1.

cally structured ritual language collected in many years of serving in Zinacantec curing ceremonies as both patient and helper. What does "place" have to do with the practices and speech of curers, or with illness, health, and the restoration of physical well-being in Zinacantec life?

Let me quickly rehearse certain central aspects of Zinacantec cosmology that bring these things together, as revealed principally by Tzotzil discourse about curing. First is the idea of the *yajval balamil* himself, the 'lord of the earth', a fat, non-Indian man with the trappings of a wealthy *patrón* or landlord whose dominion includes the land, the water, the elements, and the animals and plants of the natural world. This Earth Lord is always present in the minds of Zinacantecs whenever the earth itself looms large in their thoughts. My *compadre* Petul tells me of his travels as a very young child, leading a mule team past the mysterious hole in the ground at Toch' whence wisps of steam could be seen wafting skywards in the early morning. The adults would offer the following explanation.

(10) *toch`*

yajval balamil sta`aj sve`el sta`aj skajvel xi li moletik une
 "It's the Lord of the Earth, cooking his food, cooking his coffee", the old people would say.

We have already met the frames of prayer that normally invoke the Lord of the Earth.

(11)

<i>yajval ch`ul balamil /</i>	lord of the holy earth /
<i>yajval ch`ul vinajel</i>	lord of the holy heaven
<i>yajval ch`ul lum / yajval ch`ul osil</i>	lord of the holy dirt / lord of the holy land
<i>yajval ch`ul ch`en / ch`ul vitz</i>	lord of the holy cave / lord of the holy mountain

Why should one pray to such a figure? Those places where the "earth is alive" are both places where the actions of the Earth Lord are most to be feared and expected, and also where redressive action to placate him can

be taken. What is perhaps most commonly feared, in the normal course of life, is the illness known by the very name *balamil* –often taken to be the consequence of *xi`el*, ‘fear’, in which a sudden fright can cause parts of ones soul to become detached and to remain at the site, *to kom- ta balamil*, ‘remain in/on the earth’. In (12) P and X discuss a frightening encounter the latter once had on the path. P asks whether X got sick as a result.

(12) t8814A

p; bueno	p; OK
lek lakol un	but did you recover alright?
muk' laa-	didn't you...?
x; lek likol, muk' bu	x; I recovered, I didn't...
p; mi laxi` o jutuk	p; were you frightened a little?
mi lakom ta balamil ←	did you remain in the earth?
x; mu`yuk xixi`	x; I wasn't frightened
p; muk' laxi=	p; you weren't frightened?
x; =mu`yuk xixi`	x; I wasn't frightened
p; eso	p; so
x; eje	x; right
kuch'oj jutuk pox	I drank a bit of cane liquor

In a more sinister vein, one may fall ill not simply because one has, through fear, “remained” *ta balamil*, ‘in the earth’, but because one has been actively “sold to the earth”. The idea of *chonvan ta balamil*, ‘selling [people] to the earth’, involves metaphors of ghastly cannibalism on the one hand, and of ordinary commercial transactions on the other. In (13) a curer uses an anti-witchcraft doublet (*TI* / *LAJES*, ‘bite / eat-finish’) to ask for protection against the former.

(13) petucure05

ma`uk nox xkak`betikotik ti k'u chisti`otikotik / chisIajesotikotik
We will not let them bite us / eat us (and finish us off).

The verbs used to describe what happens when a soul is dealt to the Earth Lord, whether out of revenge or simply for monetary reward, makes plain

the latter: ones soul is ‘sold’, ‘received’, ‘delivered’, ‘given’, etc. In the conversational fragment (14), a *compadre* tells me about the demise of a neighbor through witchcraft in a sequence peppered with these commercial images.

(14) t9314a

p; a ti manvel aliaxe chonbil	p; Manuel Arias also died from
ibat manvel aliax uke	being sold
x; bueno pues	x; well, then
p; chonbil bat	p; he died sold
i ta balamil ibat	and he went to the earth
chk'ot jk'eltikotik chi`uk ti jme`e	I went to see him with my mother
ja`smuk	He was her younger brother
stzaklajet ta yibel na ti manvel une	Manuel was just grabbing the walls
	of his house
tal j'ilole	The curer came
balamil xi ti j'ilole	“It's ‘earth’”, said the curer.
balamil chonbil ta balamil	“Earth. Sold to the earth”,
xi li j'ilol une	said the curer.
mu xa k'u xkutik ch'amem xa xi un	“Nothing we can do, he's been
	received”, he said.
ch'amemon xa ya`el un xi ti	“I seem to have been received”,
jchamel une	said the sick man.
ti anima une	The deceased.
ch'amemot xa un manvel	“You have been accepted, Manuel.
chacham un	“You will die.”
a batikon	“Ah, let me go.
yiluk xa yil	“Never mind.
kiloj xa much'u liyak' xi	“I have seen who it was who gave
	(i.e., witch) me”, he said.
yojtikinoj ti much'u	He had recognized who it was.
ak'bat xa yil ti anima une	The deceased had seen that he'd
	been given (i.e., witch).

A shaman trying to cure witchcraft often attempts to reverse it –to send the symptoms back to the initiating witch:

(15) kalvayo01

yu`un me mu to xak'ik i k'ope /	let them not yet cause words /
yu`un me mu to xak'ik i lo`ile	let them not yet cause gossip
yu`un me mu to xak'beik elav /	let them not yet cause enjoyment /
yu`un me mu ta xak'beik tze`il	let them not yet cause laughter
ati balamil utze / ti balamil kolo`e	to the earthly good / to the earthly evil
ta smakel o sat uke /	may his eyes be covered /
ta smakel o sba uk une	may his face be covered
li` me spatin stuk uke /	here shall he himself wear it on his
li` me xokonik stuk uke	back / on his side

Despite the fact that the patient's enemy –his 'earthly good / earthly evil'– is anticipating 'words / gossip' (that is, talk about the demise of the patient) which will cause 'amusement / laughter', here the shaman asks that the witch's 'eyes / his face' be covered and that the witch himself 'wear on his back / wear on his side' the same malady which has been sent to afflict the patient.

Zinacantecs think of some places as especially dangerous, perhaps because being *kuxul*, 'alive', they are impregnated with possibilities for soul-loss. Zinacantecs take special care of their children (and themselves) around waterholes, mountaintops, and other steep places such as caves and cliffs. Caves are the special haunts of witches, and although some caves are known as places of great power to cure illness, many more are thought to be visited only by people with malevolent intentions. *Ma`uk k'anob pertonal skwenta chamel un. Ii, parte.*¹³⁵ "These are not places where one can ask for pardon in order to cure illness. No, these are for OTHER things" –that is, for causing rather than curing illness. Curing prayer has the ready-made doublet (VITZ / CH'EN, 'mountain / cave') for such witching places, as in the following line from an anti-witchcraft

¹³⁵ T9801a.

ceremony, where the shaman asks the deities whether an enemy has approached them with a soul for sale.

(16) petucure05

mi o bu ta jun vitz / mi o bu ta jun ch'en
Did it happen on one mountain / did it happen in one cave?

Other shamanistic ceremonies are specifically designed to fix the boundaries and thus protect the interiors of spaces where human beings spend much of their lives. *Chobtik*, 'cornfields', still the prototypical workplaces of most Zinacantecs, are by their nature perilous, outside the bounds of house and yard, and linked semantically to the *te`tik*, 'forests', in which they nestle. The forest, for Zinacantecs, is the prototypical wild place, and the fact that milpas are carved from the wild produces the juxtaposition which most characterizes this primordial workplace: familiar, cultivated, and yet not quite tame, not quite home.

Similarly, waterholes on which both man and plant depend are dangerous enough to merit their own forms of address, for example, in dedication rituals such as *k'in krus*, the festival of the Holy Cross in the month of May.¹³⁶

(17) t8202b140: land and water

chotoloxuk ta skotol ti ch'ul k'ak'ale /	you all are seated every holy day /
chotoloxuk ta skotol ti -	you are seated on every holy —
ch'ul muk'ta ninab vo` /	holy great spring /
ch'ul bik'it ninab vo`	holy small spring
ch'ul ninab vo`etik /	holy sources of water /
ch'ul ninab nabeti:k	holy sources of lakes

¹³⁶ In earlier rimes, in Nabenchauk, the Zinacantec village I know best, *k'in krus* ceremonies were often organized by lineages which shared a common waterhole (called "*sna*" by Vogt 1969). These were occasions both to bless waterholes and to give them yearly maintenance. Now that water is piped into most Nabenchauk houses, and few families share responsibilities for maintaining wells, the ceremony has become both more general in focus and less communal in its social organization.

In *k'in krus* ritual, shamans often make a special plea to the Earth Lord to withdraw from cornfarmers' paths the snakes that are his most feared emissary.

(18) kkrus2b

mu k'u spas uk un /	may nothing befall him /
mu k'u snuptan uk un	may he meet nothing
mi oy ti yu latz'unobe /	should there be what you have
mi oy te yu lavovole	planted / should there be what you
	have sown
chak'ejbon ech'el sbe /	store it away his path /
chak'ejbon ech'el xane	away from his step
ta jot o osil / ta jot o balamil	on another side of the land /
	another side of the earth
mu sibtasbiluk spat /	may his back not be frightened /
mu sibtasbiluk yu xokon	may his side not be frightened
tavalabe / tanich'nab	your child / your offspring

In the same way, shamans ask the Earth Lord to moderate the winds and storms that threaten to rob his children / offspring of the legitimate product of the sweat of their brows / their faces.

(19) t8208b452

lekil me makik un /	cover well /
lekil me vetz'ik un	put well away
ta ba vitzuk me / ta ba stzelejuk me	may it be on the mountaintop / on
	the ridgetop
ti jun ik'e / ti jun sike	the one wind / the one cold
yu'un laxojobalike /	for your sunbeam /
yu'un lanak'obalike	for your shade
yu'un i svokolike / yu'un i yik'iti'ike	for their suffering / for their trouble
yu'un i xchik'ike / yu'un i ya'lelelike	for their sweat / for their juices
lavalabe / lanich'nabe kajval	your child / your offspring, my lord
sta to ti jjope / sta ti i jk'ete	may they find a handful / may they
	find a fistful

(20) t8208b452-4th cross at Nvo Guerrero

ch'ul yajval ch'ul lum /	holy lord of holy earth /
ch'ul yajval ch'ul osil	holy lord of holy land
ch'ul yaxal lumal tok /	holy blue fog /
ch'ul ik'al lumal toketik	holy black fog
ch'ul muk'ta ninab vo'etik /	holy great spring /
ch'ul bik'it ninab vo'etik ch'ul	holy small spring holy source of lakes
ninab nabetik	
k'u yepal un jtot / k'u yepal un kajval	how much, my father / how much
	my lord
maltabil ta axojobale /	your sunbeams will be irrigated /
maltabil ta anak'ubale	your shade will be irrigated
mu jinesbiluk / mu vuk'esbil(uk)	may they not be blown down / may
	they not be blown over
ya'lel yu abaik / ya'lel yu asatik	the drops of your brow / drops of
	your face
sjaxobil avokik -	the cleanser of your legs —
lekil va'luk / lekil tek'luk	may they stand well / may they be
	well upright
t.axojobale / t.anak'ubal-	your sunbeam / your shadow
ch'ul ba vitzetik / ch'ul ba stzelejetik	holy mountaintop / holy ridgetop
ch'ul reyetik / ch'ul anjeletik	holy kings / holy angels

Not only wind and rain, but also earthquakes and other disasters threaten the well-being of humans. Shamanistic prayer addresses such natural forces directly. Shamans link the quadrilateral bounding of humanly occupied spaces with the cardinal directions that bound the earth itself. A cornfield has its four sides, each protected by the watchful gaze of the deities.

(21) t8208b452-4th cross at Nvo Guerrero, cornfield ceremony

k'opon abaik ta chan jechel	speak to each other at the four sides
anichim ba /	of your flowery face /
k'opon abaik ta chan jechel anichim	speak to each other at the four sides
sat	of your flowery visage

ti yajval ch'ul vinajeloxuke / for you are the lords of holy heaven /
ti yajval ch'ul balamiloxuke you are the lords of holy earth

In much the same way, the *chanib eskina*, 'four corners', that enclose a new house during its dedication ceremony represent the bounded, protected universe in microcosm. A space as consecrated by prayer has a typical, quadrilateral geometry.

(22) t843a48 Earthquakes–house dedication

svik'obil tu yu satike /	awakening place of their humble
skuxobil ti yo`-	eyes / resting place –
ali ta yo xmale / ali ta yu sakube	at dusk / at dawn
ali ta yu k'ak'ale / ali ta yu ak'ubale	in the day / in the night
yu`un avalabik un /	for your children /
yu`un anich'nabik un	for your offspring
mu me xach'aybekon ti spat e /	do not throw away their back /
ti yu xokone	their lowly side
mu me jipbiluk tal yu xmal un /	may they not be discarded at dusk /
mu me jipbiluk tal ti yu sakub un	may they not be discarded at dawn
yajval ch'ul vinajeletik /	lord of holy heaven /
yajval ch'ul balamiletik	lord of holy earth
mu me xbak' tanichim baike /	may your flowery face not move /
mu me xbak' ti yu-	may ...
chan jech ti chotlebike /	four sides their sitting place /
chan jech ti svutz'lebike	four sides their kneeling place
chan jech ti svik'obil satike /	four sides the awakening place of
chan jech ti skuxob(il yo`on)	their eyes / four sides the resting
	place of their heart
o`lol ch'ul k'ok' / o`lol ch'ul yut na	center of the holy fire / center of the
	house
o`lol svik'obil sat /	center of the awakening place /
o`lol skuxobil yo`on	the resting place
ti yu avalabe / ti yu anich'nabe	of your child / of your offspring

As this last prayer suggests, in addition to the four corners or boundaries, houses also have *o`lol*, 'middles', considered by Vogt (1976) to be the most vulnerable spot in the house since it is far from the ritually secured corners. Those things to which prayer ascribes an *o`lol* or 'center' include, in addition to the earth and heavens themselves, the hearth and house (*o`lol ch'ul k'ok' / o`lol ch'ul yut na*), the eating place / drinking place, the place of sitting / kneeling (*chotlebike / svuz'lebike*), and the place of rest (*o`lol svik'obil sat / o`lol skuxobil yo`on*).

Being away from home, on the road, is fraught with danger, and travelers are especially vulnerable. In recent times, as Zinacantecs and other Tzotzil speaking Indians from Chiapas have made their ways across borders and even oceans in search of work, shamans and patron saints are kept busy guarding their sons and daughters far from home.¹³⁷ Of course it has long been true for Zinacantecs that productive life requires travel, captured in such doublets as *be / xan*, 'path / pace', *tek' / xan*, 'step / pace' – references to the (once) standard mode of travel on foot– and *yal / muy*, 'to descend / to ascend', *bat / ech'*, 'go / pass', and *lik / totz'*, 'start out / leave (lit., be lifted off) home (conceived of as a place to which one sticks, like a tortilla to a hot griddle)', verbs that capture both the traveler's varied trajectories across the territory, and a certain reluctance travelers may feel to set out at all. In a curing ceremony for a senior ritual advisor, who is referred to indirectly as *ba'yi c'ul jxanavel / jbeinel*, 'the first holy walker / the first holy traveler' (because of the ritual circuits and cycles of visits over which he must preside), the shaman asks his divine addressees to protect the patient as he moves across the landscape. He refers to the patient's movements, in both ritual and everyday life, as follows:

(23) m145-48

k'usi chanav, k'usi chbein	should he walk / should he travel
k'usi chyal un / k'usi chmuy un	should he go down / should he go up

¹³⁷ Before a recent journey between Chiapas and the United States, I asked a Chamula *compadre* who is also a powerful curer to accompany me on a visit to the San Juan church in the cabecera of Chamula. He spontaneously improvised a series of prayers to protect me wherever I traveled / walked, whether on bus / train, car / airplane".

The road or path on which one moves is itself presented in prayer as an inherently dangerous, exposed place, where ones troubles may be on public view, and where, likewise, the evil activities of a witch or other wrongdoer can be recognized and exposed. The dangers of the public eye, fixed on the path, are neatly encapsulated in the etymology of the doublet: *be / ileb*, 'path / place of seeing'.¹³⁸ In the following fragment of an anti-witchcraft prayer, the shaman asks that the witch's prayer be silenced as he walks the public paths, where he is, that is, exposed to public view.

(24) petucure04

makbiluk ta be / ta ileb	may it be blocked on the path / on the place for seeing
ti ye / ti sti`e kajval	his mouth / his lips, my Lord

On the other hand, judging by the imagery of place in prayer, even staying "home" is in itself no protection from danger. The standardized doublets of prayer characterize home as bounded by its corners and its roof (*ba te` / ba texa*, 'top of the rafters / top of the tiles'), as a place to guard ones possessions (*na / k`uleb*, 'house / place of wealth'), as a place to rest in comfort (*chotleb / vutz`leb*, 'place to sit / place to be bent over') or to take nourishment (*ve`eb / uch`eb*, 'place to eat / place to drink'), and as a set of linked domestic spaces (*o`lol yut na / o`lol amak*, 'middle of the interior of the house / middle of the yard'). As we have seen in fragments of prayer, home is secured by shamanistic ritual designed to seal it against intruders of all sorts. Yet encounters with such demons as *j`ik`aletik*, 'blackmen' (see Blaffer 1972, Laughlin 1988) show that one can be a target while at home as well. My goddaughter Mal had gone only a few meters from her house one dark night when a supernatural blackman came bursting through the fence around her yard, striking her dumb and leading to a prolonged illness.

(25) Video 93.06, 47:18:19, cepmalps.trs

352	ch;	<i>we heard something while we were squatting</i>
356		<i>there was a strange noise down by the house</i>

¹³⁸ See also Haviland and Haviland 1982, 1983.

358		<i>It went like this</i>
359		((knock knock knock knock knock))
360	m;	<i>Just like that, a knocking sound</i>
378	ch;	<i>I didn't pay much attention</i>
380		<i>but just a moment later...</i>
381	m;	<i>I didn't pay attention either</i>
383		<i>I just heard the noise</i>
385		<i>"Where is that coming from?", I thought.</i>
387		<i>At that moment my brother Mariano's child was crying</i>
389		<i>"Why perhaps the baby got frightened", I thought</i>
392		<i>I thought maybe that woman had frightened her child.</i>
393		<i>"Perhaps she's come out to comfort it", I thought.</i>
395		<i>There was a knocking sound.</i>
397		<i>I turned around this way to have a look.</i>
399		<i>That's when I heard it come with a crash!</i>
400		<i>It came right up to the tree.</i>
401	ch;	<i>We have a gate there</i>
402	m;	= <i>Our gate is there</i>
404	ch;	<i>It banged its arms on it</i>
407	m;	<i>It did like this to the plank fence. ((spreading it wide))</i>
409		<i>It's awful belly was white</i>
410		<i>And the rest of it was black</i>
413		<i>I screamed</i>
414		<i>Though I wasn't aware of screaming.</i>

In their narrative about this encounter Mal and her husband paint a picture of the enclosed domestic space—the house, the yard, the sitio enclosed by fence, the gate, a familiar tree, the nearby yards of the neighbors— and juxtapose this image with the violation of the space by the demon who bursts upon the scene.

To summarize: in this first part of the paper we have seen how the stylized Tzotzil of Zinacantec ritual portrays geography, both quotidian and sacred. This geography starts with the notion of *balamil*, the earthly surface upon which human lives are played out, but imbued with a life of its own, the ability both to nourish and to destroy the people who dwell

upon it. Fragile souls may become detached from bodies and remain trapped on the *balamil*, as a result of fright or from the malice of others. The *balamil* is also the domain of the Lord of the Earth, whose creatures both feed and assail humankind, and whose appetite for souls to work his subterranean fields is voracious.

Prayer further distinguishes and attributes powers to specific aspects of the surface of the earth. Mountains and caves are places of special access to the beings, both well- and ill-intentioned, that inhabit earth and heaven. Forest and waterhole are similarly singled out for respectful treatment and care, as domains of the Earth Lord. Cornfields –carved from this domain– also require special protection, among other things against the destructive forces of the earth itself: devastating winds, earthquakes, thunder and lightning, all of which receive conventional ritual doublets and frames in prayer. Finally, even the most domesticated of spaces –paths trod by human beings, houses and yards where they dwell– receive special ritual attention, crystallized in the stacked images of parallel language.

The physical terrain of a curing ceremony

Let me now turn to the specific use of space in the process of shamanistic curing itself. Once a sick person or his or her relatives decide to mount a major curing ceremony –known variously as, among other things, *-ich' illel*, 'receive a "seeing"', *-al -ba vokol*, 'say to oneself a "difficulty"', or *-ich' jok'anel*, 'receive "hanging"' (that is, a ceremony in which a sacrifice is offered at a mountain shrine)–, costly and elaborate preparations must be made for a ritual which may last many hours and involve visits to several churches, crosses, and caves across the territory of Zinacantan and sometimes beyond. The shaman, once contracted, must make a series of geographical decisions –which sites to visit– along with a set of calculations about candles, flowers, sacrifices, food and drink to be dedicated to each place.

Work on Tzeltal prayer (Breton and Becquelin Monod 1989, Monod Becquelin 1993, 2000) long ago demonstrated that shamanistic prayer itself can recreate a virtual sacred geography of a community. When a

curer recites the names of saints and shrines that circumscribe (or expand) ritual space he or she reproduces in words the ritual circuit traced either in fact or in principle by the curing party. Although I have never encountered such an elaborated spoken map in prayer in Zinacantan, there are similar manifestations of a virtual, imagined geography in Tzotzil curing, with a few twists.

There are, first, long sequences in prayer in which the shaman calls out the names of saints and sacred shrines (the verb in Tzotzil for such naming is *tij*, 'beat, strike, play'), involving them in the action of the moment. Audiences to such prayer are not always able to follow the logic of the progression, in the context at hand. For example, the following extract is from a ceremony to secure a new corn crop against wind; it was performed far from Zinacantan, at a small ranch called Nuevo Guerrero near Villa Flores, in the central plateau of the Grijalva Valley where a group of Zinacantecs had established farming operations over several years. The curer invokes a progression of saints, some of whom are familiar to Zinacantecs in their highland home, others who relate specifically to other lowland ranches where Zinacantecs have farmed. The curer thus both appeals to the guardian deities of Zinacantan itself, in various manifestations, and at the same time acknowledges local places and their patron saints.

(6) t88b45–4th cross at Nvo. Guerrero

ch'ul rey / ch'ul anjel / ch'ul-	holy king / holy angel / holy-
komon me xak'opon abaik	speak together
chi`uk i ch'ul sinyor sansalvarol	with holy Sir St. Salvador, my father /
tot / xchi`uk i ch'ul sinyor	with holy Sir St. Salvador, my lord
sansalvarol kajval	
chi`uk i ch'ul sinyor san mikel /	with holy Sir St. Michael /
chi`uk i ch'ul sinyor san Manve	with holy Sir St. Manuel
chi`uk i ch'ul me` santamaria jme` /	with Virgin St. Mary, my mother /
santamaria jkaxayil	St. Mary, my lady
chi`uk i ch'ul santo meriko jtot /	with the holy Doctor my father /
meriko kajval	Doctor lord
komun k'opuk bi / komun ti`uk bi	May the words be shared / may the
	mouth be shared

Here the curer invokes the power of quite specific saints, in this case, as it turns out, exactly the saints that this shaman keeps and consults at his own personal household altar. That is, he starts with his own divine familiars, starting his homage with those closest to him personally.

chi`uk i ch`ul kalvaryo ta o`lol ch`ul vinajel / chi`uk i ch`ul pagre eterno jtot	With holy Calvary in the center of holy heaven / with the Holy Eternal Father, my Lord
chi`uk i ch`ul vaxakmen to o`lol ch`ul vinajel / chi`uk i ch`ul vaxakmen ta o`lol-	with the holy creator in the center of heaven / with the holy creator in the center of —
chi`uk i ch`ul santo (???)	with holy St. (???)
komun k`op un / komun ti`uk	may the words be shared / may the mouth be shared
chi`uk i ch`ul sinyor sanvisente jtot / sinyor san visente kajval	with holy St. Vincent my father / Sir St. Vincente my lord
vaxakmen jtot / vaxakmen kajval...	Creator my father / creator my lord...

The shaman proceeds to name several generic saints, finally invoking the saint for whom the distant place where they currently find themselves is named: St. Vincent.

chi`uk i ch`ul sinyor iskipula jtot / iskipula kajval	with holy Sr. Esquipulas father / Lord
santorenso / santorominko	St. Lawrence / St. Dominic
tzauke ch`ul marya rosaryo / marya kandelaria	take heed holy Mary Rosary / Mary Candelaria
nichimal ch`ul jmanvanej / nichimal ch`ul jtojvanej	Flowery holy buyer / flowery holy payer
santo ta trapich jtot / santo ta trapich kajval	Saint in Trapich father / Saint in Trapich Lord

The shaman goes on to name the most important patron saints of Zinacantan, their home community –the Señor of Esquipulas, St. Lawrence, St.

Dominic, the Virgins of the Rosary and Candelaria, and Christ himself—before again returning to local patron saints. The logic, if one is to be discerned, seems to be that of a mnemonic test: all saints, far and near, that may be relevant to the task at hand –protecting a young cornfield from wind and storms. The shaman must identify the supernatural protectors of local space, and *tij* them along with the protectors of home, in an apparent mixed sequence.

By contrast, in the following extract from a curing prayer performed at a roadside cross called *ch`ul ton*, ‘holy rock’, to the west of Zinacantan center on the path that leads from the sacred salt wells of Atz`am to the cabecera, the shaman anticipates exactly the shrines which she will shortly visit as the curing ceremony proceeds. She invites the deities of those sites in the valley of Zinacantan (the cross atop Calvary –the last stop of the curing party in Zinacantan Center– and the chapel of the Sr. de Esquipulas) to await her arrival.

(27) *ch`ul ton*

ch; ta to la me jkejan / ta to la me jpatan	I will make (my patient) kneel / I will prostrate (her)
ti ta kalvaryo ch`ul vinajel / ti ta kalvaryo ch`ul balamile:	at Calvary, holy heaven / at Calvary, holy earth
ti ta sakil ch`enal ch`ul vinajel / sakil ch`enal ch`ul bamil	at the white cave, holy heaven / holy earth
ti ta sinyor iskipula trapich jtot / ti ta sinyor iskupula trapich kajval	before Sr. Esquipulas of Trapich father / before Sr. Esquipulas of Trapich, lord
te smala yu jlumal / te smala yu kach`ela:l	There is awaited my earth / there is awaited my mud
k`usi ora kejelon k`otel / patalon k`otel	Whenever I arrive kneeling / whenever I arrive prostrate

There may also be retrospective acknowledgement of the shrines visited on a curing circuit. For example, on arrival at the house of the patient, after a grueling 36 hours trek from shrine to shrine, the shaman in the following extract recapitulates the major sites she has visited, or passed near

to, closing the circuit of prayer at the house where her patient will now recuperate for the next three days and nights.

(28) v9610150, Apas, house	
ch'ul marya rosaryo jme` /	Holy Mary Rosario mother / Lady
ch'ul marya rosaryo jkaxayil	
ch'ul tonal ch'ul me`obtakil /	Holy Rock, holy mothers /
ch'ul tonal ch'ul vixobtakil	holy sisters
isak' ch'ul maretik /	Potato, holy seas /
isak' ch'ul ajvetik	potato, holy lords
...	...
sakil ch'enal ch'ul vinajel /	White Cave, holy heaven /
sakil ch'enal ch'ul lorya	White Cave, holy glory
kalvaryo ch'ul vinajel /	Calvary holy heaven /
kalvaryo ch'ul lorya	Calvary holy glory
sinyor san kixtoval ch'ul vinajel /	Sir St. Christopher holy heaven /
sinyor xanxixtoval ch'ul lorya	Sir St. Christopher holy glory
apasil ch'ul vinajel /	Holy heaven of Apas /
apasil ch'ul lo:rya	Holy glory of Apas
sakil ch'en vinajel /	White cave holy heaven /
sakil ch'en ch'ul lorya	white cave holy glory
...	...
kalvaryo ch'ul totil /	Calvary holy father /
kalvaryo ch'ul me`il	Calvary holy mother
kalvaryo ch'ul k'ulebal /	Calvary holy treasury /
kalvaryo ch'ul kuxebal	Calvary holy resting place
mi o chajtaik ta k'op un /	Have I reached you with words /
chajtaik ta yu ti` uk	with talk
yu`un ti jchamele une /	For the sick person /
yu`un ti jlajel une	for the hurt person
chamalabon li ora une /	Await for me the hour /
chamalabon li k'ak'al une	await for me the day
sinyor sankixtoval jtot /	Sir St. Christopher father /
sinyor san kixtoval kajva:l	St. Christopher lord

marya sisil jme`—	Mary Cecilia mother
ich'o	[drink!]
marya sisil jkaxayil	/ Mary Cecilia lady

At the point in the prayer marked with *, the shaman briefly breaks frame and answers another participant who has toasted her, using the standard response *ich'o*, 'drink!', but barely missing a beat in her parallel recital of the relevant saints and their shrines.)

bik'it sisil jme` / bik'it sisil jkaxayil	Small Cecilia mother / Small Cecilia lady
sakil ch'enal ch'ul maretik /	White Cave holy seas /
sakil ch'enal ch'ul ajvetik	White Cave holy lords
k'usi ti nopbile / k'usi ti p'isbile:	What has been decided / what has been measured
ch'ul nek'eb vitzal jme` /	Holy Shoulder Mountain mother /
ch'ul nek'eb vitzal jkaxayil	lady
ch'ul jch'abiej-chon /	Holy guardian of animals /
ch'ul jch'abiej-`osil	holy guardian of earth

A different strategy is available to relate a curing circuit to the sacred geography. The curer in the following extract mentions a series of sacred sites in the cabecera of Zinacantan that would be relevant to this particular patient; then she acknowledges, with a somewhat extemporized doublet (shown with an arrow on the transcript), that in this particular ceremony she intends to visit only a few ("only one / only two") local crosses. She thus acknowledges a site which she plans to omit from a given ceremonial circuit, simply by incorporating it into her prayer.

(29) v9522037	
na jojal yij / na joj k'on	old Crow's Nest / yellow Crow's Nest
muxul jme` / muxul jkaxayil	Snub-nosed mother / Snub-nosed lady
ba ni`o` jme` / ba ni`o` jkaxayil	Top Spring mother / Top Spring lady

mu xa bu atek'el / mu xa bu axanel	You will not be stepped on / not be walked
alavatinajebe / alatzebinajebe kajval	Your washing place / Your shampooing place, lord
alatz'elik / alavich'onik kajval	Your edge / your front, lord
li` no me june / li` no me chibe ←	Here only one / here only two [shrines]

A curing ceremony is thus conceptualized, via prayer, as a journey from one sacred place –abode of a powerful force– to another. The house of the patient, starting and ending point of the curing circuit, is sacralized by the process of curing itself, especially via prayer. Indeed, the prayer emanating from the curer's mouth and embodied in his or her voice may represent the journey more faithfully or more fully than the physical bodies of the human participants as they trek across the face of the earth.

Virtual spaces

It is perhaps worth a short digression to examine the geography of virtual spaces, those which human beings cannot experience directly, because they are not found *ta sba balamil*, 'on the face of the earth', the realm of the universe available to waking souls. As I have mentioned, however, these other spaces can be visited in the journeys of the soul called *vayich*, 'dreams'.

These other spaces are also represented graphically in prayer. Ancestral deities are said to keep the animal spirits, which correspond to and represent individual human beings, inside great corrals inside the mountains topped by shrines. In prayer, these virtual spaces are referred to with the doublet *yut mok / yut koral*, 'inside the fence / inside the corral'.

(30) kalvayo01

mi li` to la xavak'bon ta ye /	Will you here offer to her mouth /
mi li` to la xavak'bon ta sti`	will you here offer to her lips
ala ch'ul xojobal e /	Your holy sunbeam /

ala ch'ul nak'ubale:	your holy shadow?
mi chavak'bon to ta yut amokik /	Will you place her for me inside
mi chavak'bon to ta yut akoral un	your fence / inside your <i>corral</i> ?
mi chavak'bekon to ta toyol /	Will you place her for me on high /
chavak'bekon to ta kajal	above?

In parallel with earthly scribes, who keep important records (lists of prospective office holders, fiesta contributions, dates, offerings at church, and so on) *ta sba balamil*, prayer invokes a divine scribe who keeps lists of mortal men. The doublets again combine Tzotzil roots with Spanish loans: *vun / lapis*, 'paper / pencil', and *libro / tz'ib*, 'book / mark'.

(31) petucure05

kajval / sinyor sekretario	My Lord / Sir Secretary
o`lol ch'ul vinajel / o`lol ch'ul gloria	In the middle of holy heaven / holy glory
ak'o ta avun / ak'o ta alapis /	Put in your paper / Put in your pen
ak'o ta alibro kajval / ak'o ta atz'ib	Put in your book, my lord / in your
kajval	writing, my lord

Ritual speech also incorporates a series of virtual places, names for which are productively formed from verb roots combined with the suffix *-eb(al)*, which implicate a sacred geography rarely made explicit beyond the discursive realm of prayer. For example, from the standard doublet *tzob / lot*, 'gather / form a pair', which is used in a variety of morphological guises to talk about gatherings and groups of any sort, one can form the place-doublet *tzoblebal / lotlebal*, 'gathering place / meeting place', which denotes a virtual venue for the communal deliberations of various deities. Similarly, in the following fragment of anti-witchcraft prayer, the curer conjures the image of the enemy witch, who is in turn praying to ask that his or her victim be brought to an untimely demise. This death of the victim is conveyed by among other things a reference to a virtual journey to *lajebal / k'otebal*, 'ending place / arrival place' –that is, ones final resting "place", death.

(32) petucure03

ak'o chamuk mi xi / ak'o lajuk mi xi	"May she die", have they said / "May she end", perhaps they have said
ak'o sk'u`un lum mi xi / ak'o sk'u`un ach`el mi xi	"Let her wear dirt", have they said / "Let her wear mud", perhaps they have said
ak'u – ak'u batuk ta lajebal mi xi / (ak'u batuk ta k'otebal mi xi)	"Let her go to the ending place", have they said / "Let her go to the arriving place", perhaps they have said.

Many aspects of this virtual geography are expressed in prayer by reference to a virtual sacred anatomy, in which deities are possessed of virtual bodies and bodily needs. A patient is put into divine care by being dispatched verbally *ta yolon yok / ta yolon sk'ob*, 'under the foot / under the hand', of a relevant deity. He or she is presented to the deity's attention by appearing *ta sba / ta sat*, 'before its face / before its visage', or perhaps *ta stz`el / ta yichon*, 'at its side / at its front'. The shrines themselves –scenes of sometimes prodigious consumption of candles, flowers, food, and drink– are sometimes described as 'the deities', *ve`eb / uch`eb*, 'place of eating / place of drinking'.

(33) *ch`ul ton*

x`elan ti kunen k'ope / ti kunen ti`e	Thus is my little word / thus my little speech
ti bu chixanave / ti bu chibeine	Where I walk / where I travel
jchi`uk i jchamele / jchi`uk i jlajele	With the sick person / with the hurt person
ja` no la yech sta ta yu lave`eb / ta yu lavuch`eb	Only thus has she found your eating place / your drinking place

Or they may be described as *vayebal / ta`lebal*, 'place of sleeping / place of stretching out'. (In [34], both the curer and her patient echo such a reference in their simultaneous prayer.)

(34) *isaksmul*

x; mu me xamajbekon un / mu me xavutbekon u:n	Curer: Do not beat her / do not scold her
ti ta ch`ul vayebal une / ti ta ch`ul ta`lebal une	Here in the holy sleeping placed / in the holy stretching out place
m; ta ch`ul vayebal / ta ch`ul ta`lebal	Patient: In the holy sleeping place / the holy stretching out place
ta atz`el une / ta avichon une	At your side / at your front
mi oy to li jmul une / mi oy to li jkolo` une	Have I still a sin / have I still an evil?

Or in a final bodily image, in cornfield ritual asking for divine guarantees of rain, the reference is to the gods' *atinajeb / tzebinajeb*, 'washing place / shampooing place'.

(35) *kkrus1c*

mi li` to xul ta p`ajel yo lavatinajebik / yu latzebinajebik	Will drops still arrive at your washing place / at your shampooing place?
sjaxobil yu lavokik / sjaxobil yu lak`obik uk une:	For rinsing your feet / for rinsing your hands
mi chamak`lantas to ti bik`ite / michamak`lantas to ti muk`e	Will you still feed the small / will you still feed the large?
mi chamak`lantas to ti p`ejele / mi luchul uk une	Will you feed the round / the perched?

Verbal geography: spoken representations of place in Tzotzil ritual speech

Let me turn, finally, to a closer examination of the representations of place in Tzotzil prayer. The semantics of Tzotzil, especially the deictic system, affords the curer a delicate instrument for tracking the movement of the curing party, and the stages of the ceremony, in both word and deed. That is, deictic elements which keep the ritual firmly anchored in an (albeit con-

stantly shifting) here-and-now are incorporated into prayer, providing a continually revised verbal map of the terrain as the ceremony proceeds.

Zinacantec Tzotzil makes use of a set of motion verbs that link topological configurations with deictically anchored perspectives and vectors. Productive morphology allows these verbs to appear in different guises, including auxiliaries and directionals, with the result that aspects of motion and direction can be incorporated into descriptions of many types of events and situations whose main verbs or predicates do not themselves encode direction or motion (see Haviland 1990). The resulting delicacy of deictic expression allows interlocutors to maintain a spatial perspective, and to trace shifting deictic centers and transpositions (Bühler 1934, 1982; Hanks 1990, 1992) in a wide range of discourse contexts where such spatialization is somewhat unexpected. Ritual discourse is no exception. Thanks to directional and auxiliary elements ubiquitous in Tzotzil grammar, prayer also remains deictically anchored, affording us a somewhat different view –with which I will end this exploratory essay– of the paths of curing and the geography of sickness and health, safety and danger in Zinacantan.

Several topological motion verbs are prominent in curing prayer. The first is *kom*, ‘remain’, which denotes the absence of motion and which is frequently anchored deictically by an explicit demonstrative (*li*, ‘here’, or *te*, ‘there’). Several prayer frames center on the root *kom*, and they emphasize that –while the circuit of curing (and of life) will continue– some things are to be left behind in the indicated space, most commonly *ti jun chamele / ti jun lajele*, ‘the one sickness / the one illness’. Thus, while praying in the cave at Isak’tik, a curer beats her patient with pine boughs, intoning the following lines:

(36) *majisak’*

pero li` chkom tave`ebe / tavuch`ebe:	But here will stay at your eating place / your drinking place
li` la xkom i ipe / li` la chkom i k`ux une kajval	Here will stay one sickness / one pain, my lord

(37) v9521310: praying for Lol

mi li` ta x`olin komel /	Will he recover to stay /
li` ta la x`olin ech`el	will he recover to leave
ti jun chamele / ti jun lajele	(from) the one sickness / the one injury
li ta spate / li ta xokone	on his back / on his side?

The place of the moment thus becomes the receptacle for the patient’s unwanted illness. Reversing the image, in the following extract from a house dedication ceremony, it is the owners themselves who will remain ‘seated / settled’ in the place of utterance, the center of the new house.

(38) comit113

chanib eskina jtot / chanib eskina kajval	four corners, father / four corners, lord
ch`ul balamil / ch`ul vinajel	holy earth / holy heaven
ch`ul rey / ch`ul anjel	holy king / holy angel
yajval lum / yajval osil kajva:l	lord of earth / lord of land, lord
li` ta jchotan komel / ta jvutz`an komel	here I leave seated / I leave kneeling
lavalabe / lanich`nab une kajval	your child / your offspring, my lord

Another topological motion verb is *lok*, ‘exit’, whose semantics imply passage from inside to outside of a bounded space. In (39) the shaman conceptually laminates two spaces conceptualized as bounded; she prays that her patient not be ejected from either. The patient in question is the son-in-law of a Zinacantec who himself comes from another, somewhat poorly regarded Tzotzil township. Having married into the village, he has fallen ill, presumably because of the jealousies of his brothers-in-law. The curer prays for the man not to be expelled, in the first instance from the “corrals” of the ancestral deities, but by implication, from the village as well.

(39) v9522037

mu xach`ayik lok`el / mu xatenik lok`el	Do not drive out / do not chase out
---	-------------------------------------

yutuk amokik un / yutuk akoralik un	May she stay inside your fence / inside your <i>corral</i>
avilojik li svokoilik / avilojik li yik'ti`	You have seen the suffering / the misery
tavalabe / tanich'nab une kajval	of your child / of your offspring

Deictically anchored motion verbs, used as auxiliaries and directionals in curing prayer, provide a constant tension between two contrasting places, the two end points of a vector anchored at one end in the here-and-now (Tzotzil *li*, 'here') and at the other in some there-then (Tzotzil *te*, 'there'). Individual roots differ with respect to the deictic orientation (toward or away from 'here') and to the focus on different parts of the vector (setting out *vs.* arriving).

For example, the root *k'ot* means 'arrive there'. In curing prayer it frequently anticipates arrival at future places on the curing circuit, with promises of visits to be made, sacrifices to be offered.

(40) pcvb00450	
chijil me yu labaik une / chijil me ti yu lasatik une	May your face shine forth / may your visage shine
k'usi yepal un jtot / k'usi yepal un kajval	How much, my father / how much, my lord
te me chk'ot ta jlikel / te me chk'ot ta cha`-likel	It will arrive in a moment / in two moments
ta xvinaj / ta x`osilaj	It will appear / it will dawn
i yu stoj / ti u skantela	Her lowly pine / her lowly candle

The semantics of *k'ot* encapsulates the telos of curing: reaching certain places, and thereby achieving certain states. Typical frames which incorporate *k'ot* refer to the arrival at a shrine for the sacrifice of a rooster (*jelol / lok'ol*, 'replacement / substitute', for the patient, which will *tajin / muyubaj*, 'play / rejoice', that is, flop around after its neck has been wrung), or of the anticipated arrival of such offerings as candles (*toj / kantela*, 'pine / candle') and incense (*pom / ch'ail*, 'incense / smoke'), considered food for the gods (Vogt 1976). They may anticipate the trajectory of

curer and patient, who will arrive at the new place *kejel / patal*, 'kneeling / prostrate'. Or, such *k'ot* frames may introduce the image of a witch who is expected to head for some unnamed not-here to perform acts of evil.

(41) petucure03	
te xa me kejel ik'ot	I suppose someone has arrived kneeling
mi o much'u sa`son sjol / o much'o sa`son yo`on	If someone has sought with his head / with his heart
mi o much'u stij ta ajole / (mi o much'u stij tavo`on) / mi o much'u xi`xon k'otel / mi o much'u xpojaj k'otel, kajval	If someone has called on your head / your heart If someone has arrived crying / if someone has arrived banging, my lord

The verb root *tal* means 'come'. It expresses a vector oriented towards 'here', but focused on setting out in this direction, anticipating but not yet arriving 'here'. In curing prayer, frames involving this verb are appropriate to expressing motivations for one's visit to the present place. Such frames may describe the shaman's or the patient's intentions or motives for visiting a given shrine:

(42) sample frames with <i>tal</i>	
tal jok'antik un / tal jtzyoyantik un	I have come to hang up / I have come to attach (i.e., entrust my patient to your care)
lilijem xa tal un / kokojem xa tal un	He (i.e., the patient) has come broken in pieces / he has come fallen to pieces
ja`ti svokol talel une / ati ti yik'ti` talel une	His (i.e., the patient's) hardship coming / His suffering coming

Or they may call the addressed deities forth, to surround and protect the curing party and its patient.

(43) calls to deities
 joylan talel un / chijlan talel un **Come** surround us / come enclose us!
 te xa me tal sk'elel / tal yilel He (the patient) has **come** to be watched / has **come** to be seen

Several of these lines can be seen in the context of a curing prayer offered inside the church of San Lorenzo, the patron saint of Zinacantan.

(44) inside Santorenso: t992a00
 k'u si yepal how much
 tal jok'antik un / tal jtzyoyantik un we have **come** to hang up / we have **come** to suspend
 ti li` ta yu lak'ob une / ti li` ta yu lavok une here at your hand / here at your feet
 ti yu lavalab une / ti yu lanich'nab une your humble child / your humble offspring
 abol xa sba / utz`utz xa sba un she is suffering / she is in pain
 pagre santorenso / pagre santorominko father St. Lawrence / Father St. Dominic
 ...
 skiloj xa tal ti spate / skiloj xa tal ti xokone: She has dragged **forth** her hack / her side
 ja` ti svokol talel une / ati ti yik'ti` talel une She has **come** in suffering / she has **come** in pain
 yech'o un jtot / yech'o un kajval Thus it is, father / thus it is, lord
 joylan talel un / chijlan talel un **Come** surround us / come shine forth
 mi li` to la x`olin li chamele – Will the sickness stay here?
 mi chajoyp'inbon tal ti xch'ulel / Will you round up the soul for me /
 mi xajoyp'inbon to tal ti yanimae will you round up the spirit for me?
 ...
 k'elavil un li` une jtot / k'elavil un li` un kajval Look here, father / look here, lord

ati svokol ta xmale / ati svokol ta sakubel li`une She is suffering at dusk / suffering at dawn
 ja` me yat o tal ti sjolike / yato o tal ti yo`onik une li`une She has **come** with worried head / she has **come** with worried heart
 abol xa li sba une / utz`utz xa li sba une: She is suffering / she is in pain
 lilijem xa tal un / kokojem xa tal un She has **come** broken / she has **come** falling apart
 ayjanel xa tal un / uyjanel xa talel une She has **come** saying "ay" / she has **come** saying "uy"

The root *yul*, 'arrive here', is somewhat the reverse of *k'ot*, focusing on the endpoint of a vector that ends in the here-and-now. In curing prayer, frames built around *yul* suggest the immediacy of arrival, and the power of the current place. Thus, for example, when the shaman arrives at the final stop of her circuit –her patient's house– in the following fragment, she emphasizes that she has returned, and that she now approaches the house cross, on bended knee, to make the final offerings on her patient's behalf.

(45) v9610150, Apas, house
 livalk'uj o / lisutp'ij o talel I have come back / I have returned
 ti ta yolon yok une / ta yolon sk'ob une Under the feet / under the hands
 ti marya rosaryo / ti marya xinulan une of Mary Rosario / of Mary the ladina
 mi lekil ch'ambil un / mi lekil nopbil un Will it be well received / will it be well
 ti yu stoj une / ti yu skantela une thought of Her lowly pine / her lowly candle?
 ja` no me kejelon o yulel / ja` no me patalon o yulel For that alone am I arrived here kneeling / am I arrived here prostrate

The image of immediacy and power in the place where one now is can also be transposed to other actors. In the following extract from anti-witchcraft prayer, the curer invokes the image of a witch coming to the very same spot to sell souls

(46) kalvayo01

mi ta utz xa tal / mi ta kolo`xa tal Have they come for good / come for evil

mi oy van bu tijbil yu lajolic / Has your head been summoned /
mi oy van bu tijbil yu lavo`onik has your Heart been summoned
ti kilil xa yulel / ti votzol xa yulel Have they arrived dragging / have they arrived huddled

...
mi oy van much`u sa`son tal sjol / Has anyone come looking [for
mi oy van much`u sa`son tal yo`on trouble] with head / has anyone
come looking with heart

mi oy van much`u staojoxuke ta Has anyone reached you with
k`op / -mi oy van much`u staojoxuk words / has anyone reached you
ta na`el with longing
ti jk`ak`al o`on e / ti jtzajal o`on e The jealous heart / the red heart
mi oy van bu yalem yok / mi oy Has someone`s leg descended / has
van bu yalem sk`ob someone`s hand descended?

Because the places of curing are more powerful than ordinary places, deictic manipulations of these spaces are themselves powerful. When specific heres or theres are endowed with supernatural force, their invocation through spatial language and in particular these topological and deictic verbs (see diagram) in prayer brings their power into the deictic center where prayer takes place and relates it to the curing party's trajectory across the territory.

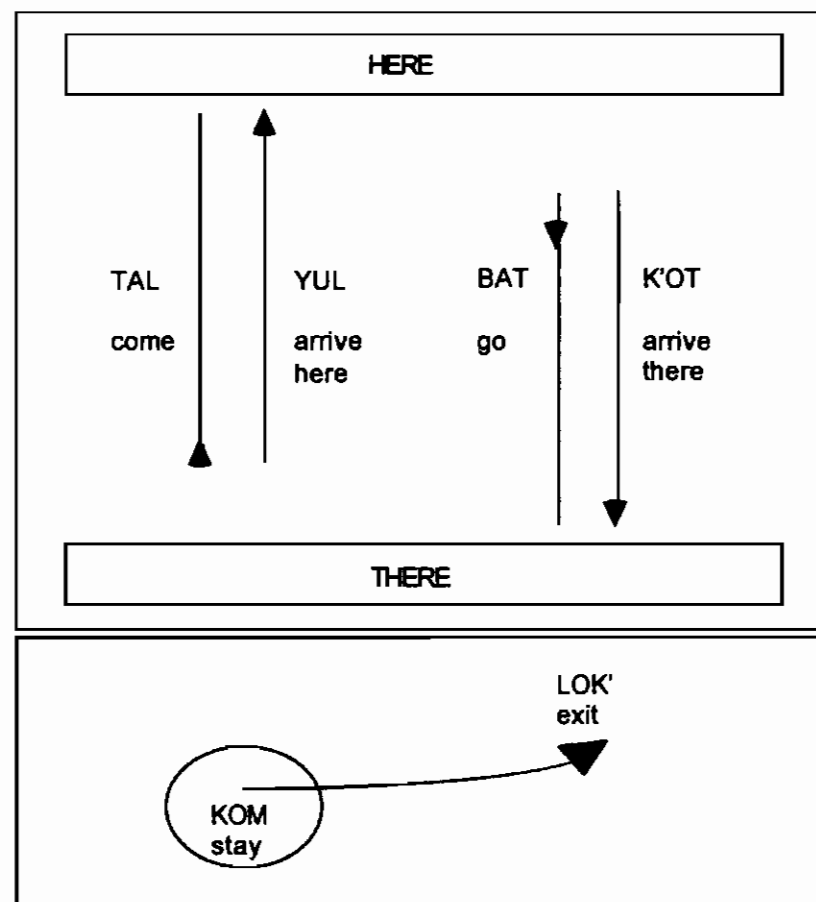


Diagram. Tzotzil deictic verbs

Conclusion: the linguistic enactment of space and the semiotics of indirection

Tzotzil prayer, like other genres of ritual language, makes a virtue out of not quite saying what it means: it is indirect, roundabout, divided in its imagery, and evasive in accepting responsibility for its own words (DuBois 1986). It alludes, invites inferences, comes around through back doors. Its

conventional frames and doublets both encapsulate standardized concepts in the matrix of social activities where prayer occurs, and also permit a semiotic flexibility to apply the genre in new ways. I have tried to exploit both the standard and the creative here.

As with most of our analytical categories, space and place are largely projected onto the world via the interactive discourses that constitute the bulk of social life. Zinacantecs, of course, talk about space all the time, and the semantic resources that ground this talk have been the subject of considerable previous research. I have chosen to look at place as depicted in Zinacantec ritual language first because shamanistic prayer focuses explicitly on place and the physical terrain of the community, and because the language juxtaposes conventionalized stereoscopic imagery –encapsulating cultural stereotypes of kinds of places, and ways of talking about them– with semiotic malleability in the creative tailoring of ritual talk to the precise moment of its production.

What emerges is a view of space and place suffused with a profound ambivalence, an ambivalence that underlies much of Zinacantec cosmology and in turn grounds Zinacantec theorizing about illness and healthy. A place may be at once nurturing and dangerous, a site both for performing and for reversing witchcraft, a house one to inhabit in peace and in which one guards ones wealth in, or in which to tremble in fear and look high and low as the walls collapse. The dangerous mountaintop / hilltop, is at once an exposed graveyard, a vulnerable cornfield, and the abode of gods, ancestors, and the Lord of the Earth with his snakes, clouds, and thunder following close behind. The earth itself, *balamil*, where all the places humans live are to be found, exhibits the same ambivalence: source of wealth and sustenance, but infinitely dangerous and potentially hostile; subject to exploitation and use, but treacherous and vengeful.

The method, I submit, also recommends itself. Prayer is the most specialized of speech –so specialized, indeed, that by Zinacantec theory, it cannot be learned, but must instead be bestowed directly on its practitioners by divine inspiration, normally in a dream. Its semantic tools have been honed by centuries of poetic tradition, and they thus dissect the world into its most carefully worked bits and pieces. Prayer is also the most efficacious talk imaginable: it is pure performative, unalloyed speech act,

first and foremost doing things with words. In curing, it conveys the desires and tracks the actions of its protagonists. Therefore, just as a curing party makes its way deliberately across the landscape, so too does prayer follow the spatial progress of the ceremony, giving us an elaborate if sometimes oblique verbal map of the sacred geography of the process of the cure. Prayer also affords us glimpses of those virtual spaces which are beyond the reach of ordinary powers of perception, acting thus as a unique lens on aspects of Zinacantec geography not otherwise accessible. It is also through prayer that Zinacantecs guarantee the irrelevance of place, and secure the protection *kajvaltik*, ‘Our Lord’ (if not of the Lord of the Earth), in whatever place they may find themselves, whether near or far:

(47) *ch'ul ton*

bu xixanav / bu xitzunet

wherever I travel / wherever I am
huddled

ilon to me un / k'elon to la me un

continue to see me / to watch me

...

...

x`elan ti kunen k'op / x`elan ti

thus are my few words / thus is my
little mouth

kunen ti`

ti bu chixanave / ti bu chibeine

wherever I travel / whatever my path
my father / my lord

jtot / kajval

References cited

Aissen, Judith

1997 “On the syntax of obviation”, *Language*, 73: 705-750.

Blaffer, Sarah

1972 *The Black-man of Zinacantan*. Austin: University of Texas Press.

- Breton, Alain et Aurore Becquelin Monod
1989 "Mais j'ai transmis l'espérance..." *Étude d'une prière de guérison tzeltal (Maya du Chiapas, Mexique)*. Paris: Association d'Ethnolinguistique Amérindienne, Chantier Amerindia, 14.
- Bühler, Karl
[1934] 1982 *Sprachtheorie: Die Darstellungsfunktion der Sprache*. Jena: Fischer (Reprinted 1982, Stuttgart: Gustav Fischer Verlag).
- 1982 "The deictic field of language and deictic words", in R. Jarvella and W. Klein (eds), *Speech, Place and Action*. Chichester: John Wiley, pp. 9-30.
- DuBois, John W.
1986 "Self-evidence and ritual speech", in W. Chafe and J. Nichols (eds.), *Evidentiality: The Linguistics Coding of Epistemology*. Norwood, N.J.: Ablex, pp. 313-336.
- Fox, James J.
1974 "Our ancestors spoke in pairs: Rotinese views of language, dialect, and code", in R. Bauman and J. Sherzer (eds.), *Explorations in the ethnography of speaking*. London: Cambridge University Press, pp. 65-85.
- 1977 "Roman Jakobson and the comparative study of parallelism", in D. Armstrong and C. H. van Schooneveld (eds.), *Roman Jakobson: Echoes of his Scholarship*. Lisse: Peter de Ridder, pp. 59-90.
- Gossen, Gary H.
1985 "Tzotzil literature", in V. R. Bricker and M. Edmonson (eds.), *Supplement to the Handbook of Middle American Indians*, Vol. III: pp. 65-106. Austin: University of Texas Press.
- Hanks, William F.
1990 *Referential Practice*. Chicago: University of Chicago Press.

- 1992 "Metalanguage and pragmatics of deixis", in J. Lucy (ed.), *Reflexive language: reported speech and metapragmatics*. Cambridge: Cambridge University Press.
- Haviland, John B.
1990 "The grammaticalization of space (and time) in Tzotzil", *Working Paper 2*, Cognitive Anthropology Research Group at the Max Planck Institute for Psycholinguistics, Nijmegen, The Netherlands.
- Haviland, John B. and Leslie K. Haviland
1982 "Behind the fence: the social bases of privacy in a Mexican village", *Estudios de Cultura Maya*, XIV: 323-352.
- Haviland, Leslie K. and John B. Haviland
1983 "Privacy in a Mexican village", in S. I. Benn and G. F. Gauss (eds.), *Public and Private in Social Life*. London: Croom Helm, pp. 341-361.
- Laughlin, Robert M.
1977 *Of Cabbages and Kings: Tales from Zinacantan*. Washington, D.C.: Smithsonian Institution.
- 1980 *Of Shoes and Ships and Sealing Wax: Sundries from Zinacantan*. Washington, D.C.: Smithsonian Institution.
- 1988 *The people of the bat. Mayan tales and dreams from Zinacantan*. Washington, D.C.: Smithsonian Institution Press.
- Laughlin, Robert M. (with John B. Haviland)
1988 *The Great Tzotzil Dictionary of Santo Domingo Zinacantan with Grammatical Analysis and Historical Commentary*. Washington, D.C.: Smithsonian Institution.

Monod Becquelin, Aurore

1993 "Monologues polyphoniques. Les discours rituels mayas", in N. Revel and D. Rey-Hulman (eds.), *Pour une anthropologie des voix*. Paris: L'Harmattan, pp. 295-329.

2000 "Polyphonie thérapeutique: une confrontation pour la guérison en tzeltal", in A. Monod Becquelin and P. Erikson (eds.), *Les rituels du dialogue. Promenades ethno-linguistiques en terres amérindiennes*. Nanterre: Société d'ethnologie, pp. 511-553.

Vogt, Evon Z.

1969 *Zinacantan: A Maya community in the highlands of Chiapas*. Cambridge, MA: Harvard University Press.

1976 *Tortillas for the gods: A symbolic analysis of Zinacanteco rituals*. Cambridge, MA: Harvard University Press.

A GARDEN EXPERIMENT IN THE MAYA LOWLANDS

Scott Atran

CNRS-Institut Jean Nicod, Paris

I. Introduction and Overview: The Garden Experiment

Using a variation on an experimental paradigm from biology, we distinguish the influence of certain socio-cultural factors (cognitive models, social networks) from economic, demographic and ecological factors (resources and level of income, family and population size, habitat and species) in environmental management and maintenance. In a "garden experiment," when members of a species have different phenotypes in different environments, samples are taken from both environments and replanted in only one. If the differences still exist, they are likely genetic (two genotypes); if not, then they are probably environmental (one genotype producing two phenotypes). Similarly, plausible evidence for the importance of culturally transmitted factors on behavior is data showing that groups of people who have different social histories and collectively identifiable mental make-ups behave differently in the same physical environment.

Physical and psychological measures show that three groups living off the same rainforest habitat manifest strikingly distinct behaviors, cognitions and social relations relative to the forest. Only the area's last native Maya (Petén Itzá') reveal systematic awareness of ecological complexity involving animals, plants and people, and practices clearly favoring forest regeneration. Spanish-speaking immigrants prove closer to native Maya in thought, action and social networking than do immigrant Maya (Q'eqchi'). There is no overriding "local", "Indian" or "immigrant", relationship to the environment.