A DAY'S JOURNEY

PORTERS, ROADS, AND TOWNS IN PREHISPANIC MESOAMERICA

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A DAY'S JOURNEY: PORTERS, ROADS, AND TOWNS IN PREHISPANIC MESOAMERICA

INTRODUCTION:

Many years ago, while doing archeological fieldwork in Peru I was introduced to the strength and speed of porter-based transport by the local Quechua speaking laborers hired for our team. Starting early in the morning and hiking up the steep, narrow trails along the terraces and slopes of the Canyon del Colca, I can vividly recall how Leonidas, Gregorio, and Dionysius, our guides, loaded themselves up with gear, insisting on leaving little for our crew to carry. They then set out and reached the dig site in half the time as we *norteamericanos*. Often at the top they would call down to us, jokingly recommending cigarettes. I can still recall them crying down from the heights above -- "*David, David, quieres uno cigarillo*"? I always made a point to light up when we made it to the top. But they certainly impressed me with their endurance. They each weighed about 80-100 lb., yet could carry almost as much as they weighed up steep slopes, in thin air over 12,000 feet above sea level. At the time it was clear we came from different worlds- ours that of mechanized transport, and theirs that of foot. But their speed and efficiency of hauling, without roads or trucks, left a vivid imprint on my memory.

That recollection was revived by the current project, which began with the intention to compile a map of Mesoamerica at the time of European contact, circa 1519. While there are many maps of parts or fragments of that world, few presented the pre-conquest indigenous names of the towns and peoples, and none showed the complete area. Yet the location of city-states, provincial capitals, towns and trade routes appeared

to be a straightforward, empirical, and descriptive way to depict the Mesoamerican world. The "Aztec Empire" or "Aztec Triple Alliance" was central to most trade contacts in Mesoamerica, and its known limits appeared to be a good place to map out the spatial interactions of population, economy, and landforms in that region.

Upon close examination while compiling the map, the shape of the Aztec Triple Alliance (Gerhard 1972, Barlow 1949) revealed intriguing features. The boundaries of the realm appeared irregular, porous, and loosely connected. Some factor or factors had to have been at work in defining the lack of geographic contiguity of the Triple Alliance. It is possible the causes were of a topographic, cultural, military, or a political origin. But perhaps something more mundane was at work as a determinant.

The recollections of Peru resurfaced and the hypothesis emerged that somehow the constraints of porter-caravan transport defined the shape and limits of the commercial, military, and political reach of the Triple Alliance. That is, the transport capacity or lift capability of the existing porter-borne technology figured in the political, economic, and boundary shape of the Triple Alliance.

What today we call the "Aztec Empire" was actually a triumvirate of three allied city-states. It will be argued in this paper that the Aztec Triple Alliance was a collection network largely managed by its diaspora of merchants, projected from a dense "point of initiation" (Vance 1970) in the Valley of Mexico, towards the sources and collection points of valued commodities. An outward projection of demand for distant commodities by a growing elite, combined with the constraints of porter caravans in procuring those commodities, defined the shape of the Aztec Triple Alliance in Mesoamerica. The shape of this network was based on the daily constraints and advantages of porter transport, and the support systems that porter transport entailed, as managed by the merchants and princes of the Aztec world.

Chapter One presents an overview of the Mesoamerica in 1519. Several factors will be introduced that interacted with porter-borne lift. Mesoamerica contained dense populations that provided a huge potential human lift capacity. However, the Valley of Mexico is situated on a high, ruggedly mountainous plateau cut by rivers and large lakes into many insular valleys, that are effectively islands separated by high ranges and narrow passes. Nearby regions were not linked by excellent communications, and thus the connectivity of the Mesoamerican heartland, and particularly of the Aztec core areas, to adjacent areas was very limited. The Aztec Triple Alliance ruled the latter regions as efficiently as possible, however indirectly in a "hegemonic" empire (Luttwak 1976, Hassig 1984). Hegemonic empires are sustained indirectly by implicit threat of force and terrible retaliation, rather than direct occupation.

The role of the merchants (or *pochteca*) in that diverse, decentralized political order was to establish commercial enclaves for procuring and distributing bulk commodities to meet the demands of the growing nobility of the Aztec Triple Alliance and neighboring polities. But the *pochteca* procured luxury commodities both within and beyond the boundaries of the Alliance to enhance their own status, power, and especially wealth. The *pochteca* actually predated the Triple Alliance, and constituted an independent network with related but separate agendas than that of the Triple Alliance.

Chapter Two shows that the far-flung pochteca commercial system was intriguing and peculiar in that it was held together by the limited-capacity trails for porter-borne traffic, which linked high-efficiency zones of waterborne canoe transport. An analysis of actual known data for porter-borne capacities will be conducted. There is some debate as to whether large porter loads could be carried great distances or were confined to local regions and polities, or whether long-range traffic was conducted by more lightly laden porters making shorter, easier one day journeys. The distinction between the relative

efficiency of these two sorts of movements is important. If heavily laden porter caravans could travel hundreds if not thousands of kilometers efficiently, then we could infer huge and distant movements of cheap bulk commodities of bulk foodstuffs. If conversely, only lightly laden porters transferred goods long distances, then bulk-foodstuff commerce would have been mostly local, while luxury commodities would have constituted long-range commerce. In practice both types of porter-borne traffic appear to have been employed in hauling between Mesoamerican towns and cities. Local, heavily laden traffic is known to have traveled great distances within regions, in daisy chains of down-the-line transfers. In addition, lightly laden porters traveling on long journeys appear to have averaged shorter daily distances.

Chapter Three analyzes quantities of bulk foodstuffs versus straight-line distances from provincial tribute paying capitals, to their destination at the Aztec Triple Alliance capitals to detect any correlation. The tribute list of the Aztec Triple Alliance provides detailed insights into the economy and structure of the transport system. Further, it provides a testable sample of data concerning quantity of the bulk foodstuffs hauled by porter caravans, versus the minimum distance traveled for delivery in the Alliance capitals. The tribute list provides exact quantities of bulk foodstuffs in the indigenous denomination of "bins" delivered. (There is some debate as to exact bin size, but the unit is used consistently). The list also provides the name and relative location of each provincial capital that provided items as tribute, and thus yields accurate distances to the destinations of tribute, the capitals of the Triple Alliance itself.

The Concluding Chapter extracts insights into the capacities of the porter system and its interaction with commerce, towns, and the mercantile system of the Triple Alliance. Some possible directions of further study will be examined. The Mesoamerican mosaic of nations and peoples rested on a commercial economy managed by a diaspora

of professional merchants, subject to very specific capacities, requirements, and limitations of the porter. Mesoamerica was a landscape divided, yet also linked by alliances of commerce and merchants.

Several maps have been compiled to illustrate the relative locations of cities, commodities and routes in the Mesoamerican world. There is also a larger more detailed 33"x 48" wall map to tie together some of the geographic complexity of transport, commerce and polities in the Mesoamerican landscape.

But first, an overview of Mesoamerica is in order. That landscape was divided by complex political, religious and military orders, rugged geography, and a lack of paved roads.

I. THE AZTEC AND MAYA WORLDS

Introduction

Mesoamerica at contact in 1519 contained dense populations that provided a huge potential labor pool. However, the Valley of Mexico is situated on a high, rugged plateau cut by many steep-gradient rivers and inwardly drained lakes. This hydrography created numerous insular valleys that are effectively islands separated by high ranges and narrow passes. The internal connectivity of the Mesoamerican world, not to mention the links between Aztec core areas and adjacent regions were thus limited. Hence the Aztec Triple Alliance ruled adjacent districts indirectly, but as efficiently as possible given its inability to easily reach and garrison all locales. The conquered polities were stitched together in a "hegemonic" empire, sustained by implicit threats of force and terror, and further cemented by marriage alliances. The Triple Alliance was presided over by an Emperor, the "First Speaker", whose powers were checked by both a governing council and large class of hereditary noble peers.

Merchants (or *pochteca*) constituted a far-flung diaspora residing in commercial enclaves that procured luxury items for the nobility, in this autarkic, almost feudal decentralized order.

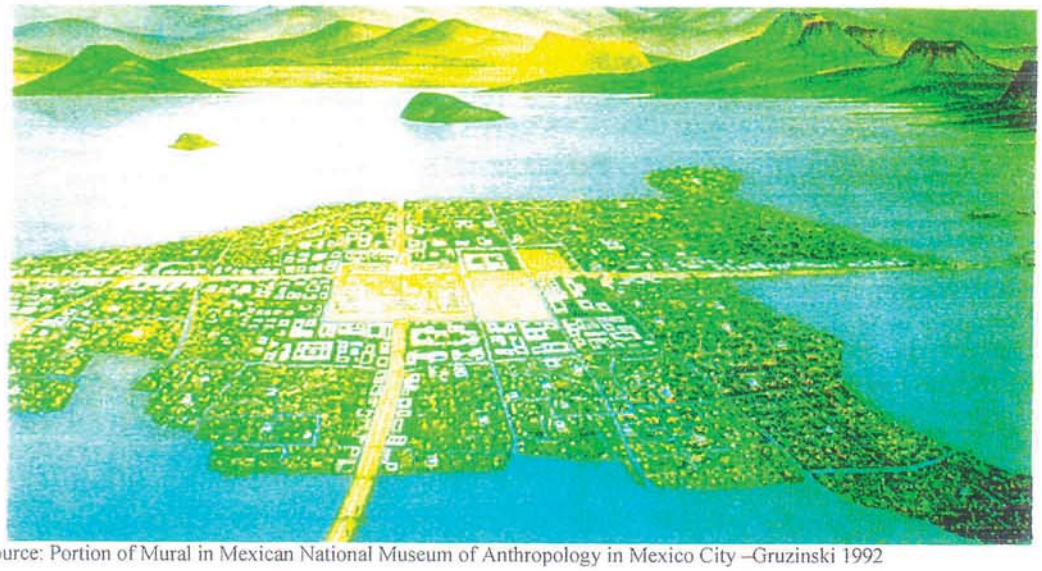
A Populous Landscape

Upon seeing the entrance to the Valley of Mexico for the first time, Bernal Diaz del Castillo wrote:

> During the morning we arrived at a broad causeway and continued our march towards Itzapalapa, and we saw so many cities and villages built in the water and other great towns on dry land and that straight and level causeway going towards Mexico, we were amazed and said that it was like the enchantments they tell of in the legend of Amadis, on account of the great towers and cues and buildings rising from the water, all built of masonry. And some of our soldiers even asked whether the things that we saw were not a dream. It is not to be wondered that I here write in this manner, for there is so much to think over that I do not know how to describe it, seeing things as we did that had never been heard of or seen before, nor even dreamed about. (1956, p.190)

The Conquistadors were greatly impressed by the numbers, sophistication, wealth and culture of the dense cities and populous townships they encountered in Mesoamerica, especially the capital city of *Tenochtitlan* (see Figure 1). They were in awe of the pyramids, causeways, wide thoroughfares, plazas, markets, and palaces they observed inside the great cities in the Valley of Mexico; and the system of canals and raised fields, or *chinampas*, was on a scale like none they had ever seen (Thomas 1993).

Figure 1: Artists conception of Tenochtitlan and Tlateloco



Source: Portion of Mural in Mexican National Museum of Anthropology in Mexico City –Gruzinski 1992

What the Spanish saw clearly amazed them, but what they saw was not a dream world, nor a monolithic empire, but a complex, populous landscape linked by trade and commerce.

Modern estimates of Mesoamerica's pre-contact population range from as few as ten million, up to as many as fifty million people. However, most estimates figure the population as roughly between seventeen and twenty-five million, based on projecting backwards from later post-conquest populations (Lovell 1992). The Valley of Mexico alone held as many as two million inhabitants and the main cities of Tenochtitlan and Tlateloco together held about 200,000 people. Dense populations of humans cultivated, irrigated and multi-cropped the valleys, transforming it into a highly productive landscape (Deneven 1992). Tended terraces ran up to the tree lines of the mountains and down to the coastal lowlands and the bottoms of the valleys, where swamps were drained and fields were irrigated with canals, dikes and sluices (Whitmore and Turner 1992).

There was thus no shortage of human labor in the Aztec and Maya worlds, which allowed those societies to rely on individuals to carry goods over the often mountainous, rugged terrain. This porter transport hauled cargo to a vast network of waterways, on numberless trails and footpaths. But there were few of what we would define as roads today. Although a massive infrastructure of monumental causeways canals, bridges, and thoroughfares filled the centers of the many Mesoamerican polities, the paved roads mostly ended at the edges of the cities.

Outside of the dense major urban concentrations of the Valley of Mexico much of Mesoamerica was a land of small towns of 2,000 or less. These more evenly dispersed hamlets formed the basis of many regional networks centered by larger towns of 10,000 people, rather than a landscape of huge major cities (Santley 1991). The immediate hinterland of most communities was limited to a radius of 22-28 km (10–15 miles). The

distance a porter or farmer could walk and carry in a day, carrying goods to and from the surrounding farmlands dictated such limited hinterland for towns and cities, outside zones of waterborne transportation (Hassig 1985).

Worked land was a function of the distance time (in this case on foot) out from the center of the village or town. If the distance out to cultivated lands is too far, it becomes prohibitively inefficient to farm them. Intensive farming, irrigation, multi-cropping, and fertilization closer to the town centers becomes more profitable, rather than walking farther out to fields. (Boserup 1973, and Von Thunen 1966, make this case. At a certain point cultivation becomes prohibitively inefficient without founding a nearer town site to the cultivation area. Essentially, there is a threshold hinterland size beyond which a town cannot expand without more efficient transport). That relationship kept the basic unit of most townships in Mesoamerica, and the cities they supported small. Thus the landscape was teeming with small communities for maximum exploitation of the land; routes of paths and trails followed patterns that linked together these many small towns. Everywhere, in hinterlands beyond the cities, terraced well-tended farmlands and hamlets filled the valley landscapes linked by trails.

A Divided Land

Outside of the larger city-states and the Valley of Mexico, however, true road infrastructure did not exist. Little mention was given by the Spanish, except complaint, of the roads that connected those magnificent cities. They were said to be narrow and very hard to follow. Indeed it was relatively easy for Emperor Moctezuma to deceive the Spanish as to the best and safest track or trail route to the capital. On the path of Spanish march to the Valley of Mexico, the route was hidden with ease by the hostile Triple

Alliance, who camouflaged the path by planting some maguey plants and logs to cover it (Diaz del Castillo, 1956). Clearly this was not an impressive road if it was so easily concealed. (The deceit was overcome only by the advice of Cortes' native allies, who knew the path all too well. In spite of the effort to block this trail, the Spanish allies quickly cleared it for use). Blocking roads and diverting paths into ambushes was a common defensive tactic in Mesoamerica, and was not difficult due to the rugged terrain, and narrow, temporary construction of paths and trails (Hassig 1991).

While trails prevailed, in some key locations fine highways did exist. Hassig (1985 after Sahagun 1959) writes of a wide variety of trails both direct and crooked:

> ...This did not mean that roads were undeveloped everywhere. The *ochpantli* linked nearby cities and are recorded in early accounts as leaving Tlaxcala, Cholula, Huexotzinco, Texmelucan, Chalco, Atenco, and Tlalmanalco and going on to Tenochtitlan. The *ohquetzalli* was a royal highway linking the cities of the Valley of Mexico and more distant cities...Beyond the confines of major centers in central Mexico, roads were not well developed. There were however a variety of types: *ohtli* or road in the general sense, *ochpantli* or main road, wide but rough, with holes, muddy spots, and curves...

So, clearly, the construction of fine roads between the towns, city-states and polities of Mesoamerica was physically possible, but except in a few tightly connected points around such densely populated areas such as Tenochtitlan and the Valley of Mexico, they did not exist.

Routes used by foot traffic have their own tendency toward directness that do not avoid slopes or grades. The most direct path is often the best, even if up slope, if there are no wheeled vehicles. However, while Mesoamerican routes tended to ignore slope and gradient in favor of directness, they were indirect in that they attempted to run through every possible town along the way, rather than straight as direct-line highways to distant points. Since the on road or "online support" (Hassig 1985) --services of food, sheltering rooms, additional porters, and markets to trade in -- were in the towns, the

routes naturally flowed through the towns wherever possible. This produced a trail network that was direct in ignoring slopes, but indirect in that it meandered through as many towns as possible.

Several geographic factors besides bad roads further ensured that Mesoamerica's populated regions were difficult to connect. First, running generally north to south are the towering ranges of the Sierra Madre Occidental, and the Sierra Madre del Sur, both long and rugged ranges running from the northwest to southeast. Second, although several rivers drained to the east and west from the high plateau of the Central Highlands, these rivers mostly fall in relatively fast and steep gradients into the Pacific and the Gulf of Mexico, making water transport difficult in upland areas (Whitmore and Turner 1992).

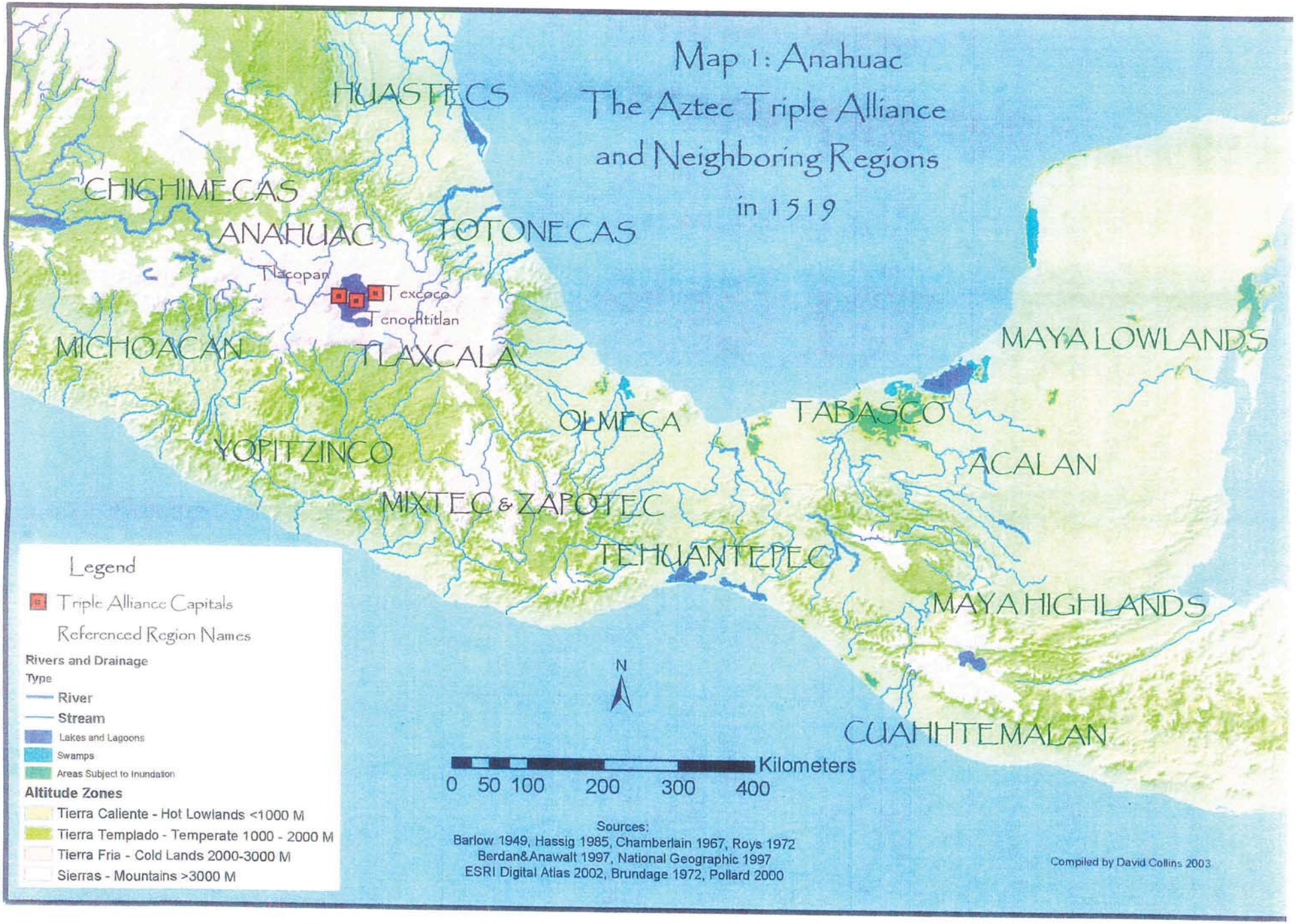
Further, the central highlands of the Mesa Central that include the Valley of Mexico consist of a series of basins and ranges that enclose fertile volcanic valleys and plateaus. These are internally drained into lakes in many locales. Although rainfall could be irregular, irrigation and terracing make these valleys arable and fertile (Whitmore and Turner1992). Sharp volcanic ranges bound these valleys, effectively enclosing upland valleys such as Mexico, Tlaxcala, Cholula, Michoacan, Toluca, and Oaxaca into islands connected by narrow passes. These high passes connected the densely populated small towns and villages scattered across the arable volcanic landscapes of the uplands.

More importantly the range of variation of relief along even short horizontal distances could be large, and rises and descents steep. The only gently graded routes fall along river valleys and the passes that connect valleys, and some of the arid upland plains. Indeed, this type of Sierra terrain was largely unsuitable in many places to wheeled traffic until the advent of graded rail lines. Hence, porter transport over steep, land bridge and valley trails was the most logical solution to make Mesoamerica a divided but still connected land.

Lastly, the landscape was separated into four distinct climate zones. Altitudes of sea level to 1000 meters are the *tierra caliente* or hot coastal lands, altitudes of 1000 – 2000 meters are the *tierra templada* or temperate lands, the highest habitable altitudes are the *tierra fria*, or colder highlands, and finally the highest inhospitable *sierra* mountain peaks. The altitudes range from 6000-meter peaks, over 2000 meters through the Central Highlands plateau, to zero meters at sea level on the Gulf coast, with every micro-zone gradation of climate and rainfall existing in between (Whitmore and Turner 1992). These different climate zones limit interaction between the zones. The wide range of altitudinal differentiation--humidity, temperature, barometric pressure, and precipitation -- made it hard for the populations to adjust to quick transit between zones (Hassig 1992).

The Aztec Triple Alliance and Noble Demand

The term "Aztec" actually connotes a *Nahuatl* speaking ethnic group of clans or lineages that traced their origins to a mythical home known as *Aztlan*. There were actually many Aztec *Nahuatl* speaking city-states outside of the control of the "Aztec Empire" (or Triple Alliance). The name Mexico is derived from that of an Aztec group, the *Culhua Mexica*, whose capital was *Tenochtitlan*, now Mexico City. The *Culhua Mexica* presided over a large inland realm with their allies. However the "Aztec Empire" was not a consistent, monolithic entity. It was a triumvirate, an alliance of three powerful city-states, called the "Triple Alliance", or sometimes the "Three City League" (Brundage 1972). The Triple Alliance was held together by implicit military force, not direct occupation. (Hassig 1984, *ibid.* 1992). Each of the three cities managed their own sub-portions of the empire, though much tribute was also shared (see Map 1). The


Map 1: Anahuac
The Aztec Triple Alliance
and Neighboring Regions
in 1519
HUASTECS
CHICHIMECAS
ANAHUAC
TOTONECAS
Tlacopan
Texcoco
Tenochtitlan
MICHOACAN
TLAXCALA
MAYA LOWLANDS
TABASCO
OLMECA
YOPITZINCO
ACALAN
MIXTEC & ZAPOTEC
TEHUANTEPEC
MAYA HIGHLANDS
CUAHHTEMALAN
Legend
Triple Alliance Capitals
Referenced Region Names
Rivers and Drainage
Type
River
Stream
Lakes and Lagoons
Swamps
Areas Subject to Inundation
Altitude Zones
Tierra Caliente - Hot Lowlands <1000 M
Tierra Templado - Temperate 1000 - 2000 M
Tierra Fria - Cold Lands 2000-3000 M
Sierras - Mountains >3000 M
N
0 50 100 200 300 400
Kilometers
Sources:
Barlow 1949, Hassig 1985, Chamberlain 1967, Roys 1972
Berdan&Anawalt 1997, National Geographic 1997
ESRI Digital Atlas 2002, Brundage 1972, Pollard 2000
Compiled by David Collins 2003

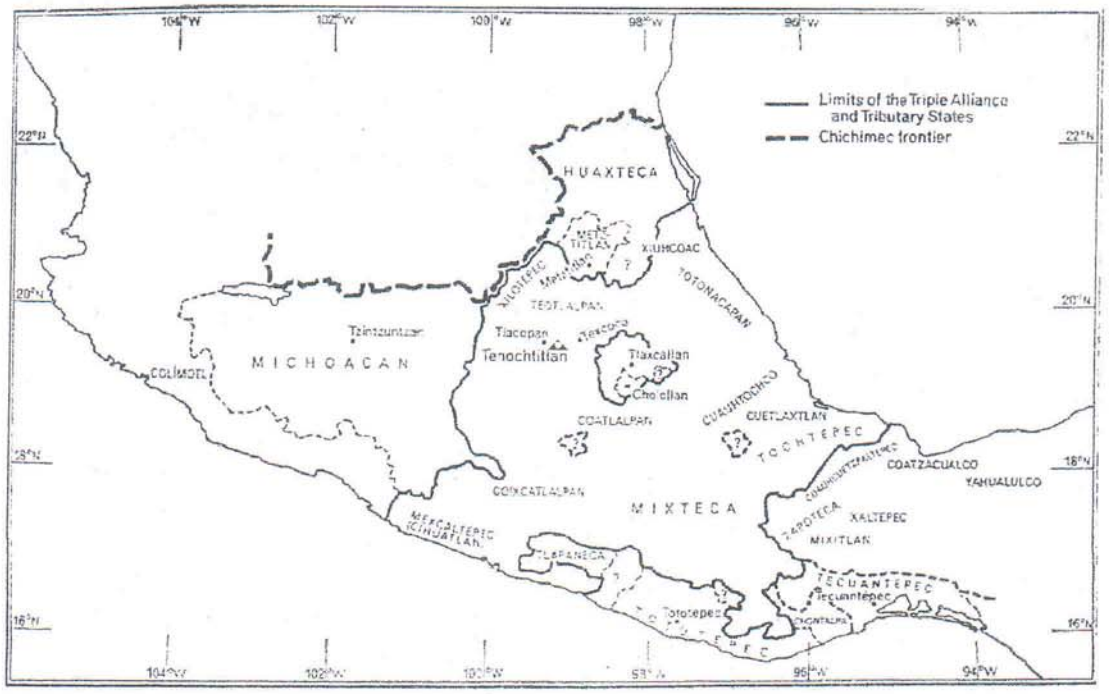
borders of the realm were porous and contested in many places, and had various degrees of integration, defined by tribute obligations of local city-states to the Triple Alliance (Barlow 1949). The realm itself was really a confederacy of three coequal partners, each with its own territory, ruling jointly over many diverse subjects. There were also internal dynastic rivalries between the three allies.

The *Culhua Mexica* of *Tenochtitlan* thus ruled jointly along with their allies *Texcoco*, and *Tacuba* (sometimes called *Tlacopan*). Only together did they comprise the Aztec Triple Alliance of city-states. The Alliance collected tribute over largely self-governed subjects. The Alliance was not an integrated, centralized territorial unit, nor was it administered and governed in a universal set of laws. It was not a "territorial" empire that totally incorporated subject peoples, but was a "hegemonic" empire governed by letting local elites rule, provided they had submitted to tributary obligations (Luttwak1976, Hassig 1984). Hegemonic empires do not attempt to garrison, fortify, and man the entire frontier of the realm. Instead, outside a core of direct control they employ zones of diplomatic and indirect control by client nobility in states that have submitted. Hegemonic empires rule indirectly and distantly though local elites. The Triple Alliance controlled the populations by the threat of implicit force backing friendly clients, rather than complete and direct occupation (Hassig 1984). The Alliance was efficient in the sense that it controlled the largest area possible in which to collect tribute with the least possible cost of expensive force. But the Triple Alliance was just that: a realm held together by threat of force, alliances, mutual obligations, tribute, and safe passage given by its subject's routes (Hassig 1985).

The Triple Alliance was thus a relatively loose and shaky edifice of tributaries, subjects, and allies, bounded by numerous hostile, and neutral, neighbors (see Map 2). The Alliance fought many bitter and inconclusive conflicts on its borders as it expanded

outward against neighboring peoples and confederacies. Directly to the southeast of the Valley of Mexico lay a smaller rival alliance led by the city-state of *Tlaxcala*, which stoutly resisted the Triple Alliance. To the west in *Michoacan* was the Empire of the *Tarascans*, (or *Puripecha* peoples) that had checked Triple Alliance advances in a series of bloody wars. Northwards were the arid upland deserts of the *Chichimecas* or "dog people", a nomadic, uncivilized, and dispersed people, that were never conquered by the Triple Alliance. To the south were the lands peopled by the city-states of the *Zapotecs* and *Mixtecs* in Oaxaca, only partially conquered as tributary subjects (Hassig 1992). Southeastwards were the coastal *Olmeca* (or "rubber land people"), and the *Chontal* Maya. Beyond these were the Maya *Quiche* of Chiapas who were often hostile to the Triple Alliance. To the east the *Huastecs* and *Totanacs* on the Gulf coast had been mostly subjugated as tributaries. There was no single political order across the land. Hundreds of statelets and alliances, large and small, existed side-by-side. Dozens of languages--from *Nahuatl* to *Tarascan* to *Huastec* to Maya to *Otomi* -- were spoken (Gerhard 1972)

Map 2: Triple Alliance Boundaries in 1519 (From: Gerhard 1972)



Though the Triple Alliance did extend great influence abroad, its power was hardly secure from internal civil conflicts. There was a great deal of tension between the three core city-state members of the alliance. In addition, the leadership was not absolute. The highest authority of the Triple Alliance was the "First Speaker", or *tlatoani* who presided over a council of four branches: that of War, Arts and Sciences, the Treasury and the Supreme Legal Council (see figure 2). The position of *tlatoani* was not hereditary but selected from the ranks of the council nobles. He sat on a council of these high noble peers, one of whom would eventually be designated his successor. The "Snake Goddess", a religious high priest or minister who legitimized decrees, also limited the First Speakers' power. Power was decentralized and dispersed amongst hereditary nobility, or *pilli*, so the *tlatoani* was merely the first among a large number of aristocratic peers in his own and other city-states (Brundage 1975).

Figure 2: The *tlatoani* of Texcoco --Source: Berdan and Anawalt 1981--Codex Ixtililxochitl

This pattern of dispersed power was mirrored in most other Aztec city-states. Each city-state of the Triple Alliance had its own *tlatoani* speaker and council, and assemblage of landed nobles. Each of the three Alliance cities had their own realms that were governed independently, though linked together in confederacy (Offner 1984). Further, there were a large number of promoted chieftains of merit, or barons, the *teuctli*, who had their own appointed and delegated offices.

City-states in Mesoamerica were ruled by lineages that were linked by marriage alliances. Lordship-- i.e. noble ownership of the land -- defined the city-state. There were intricate alliance relationships among the elites of cities cemented by marriages. Subject cities tried to "marry up" princesses to the Triple Alliance nobility, while its dominant Alliance *pilli* nobles intermarried with local nobles to solidify control. Which cities paid tribute, traded, and aided in war or defense, were largely defined and mirrored by the web of lineage marriages. Thus the connections that linked alliances, partners and empires were based more on blood ties than actual physical linkages such as roads. In particular, it was the local nobles, who were tied by marriage to the Triple Alliance that would permit transit through a subject city-state. An innovative part of the Triple Alliance was incorporating local nobility into its lineage system to create larger orders. This system was partially flexible in that the offspring of nobles, even if they were illegitimate, outsider, or partially noble, were eligible for entry into the nobility under certain conditions (Brundage 1975).

The distinction between the *pilli* and the *teuctli* is thus important. The *pilli* were aristocratic nobility descended from ancient lineages that one could only be born within. However, the *pilli* were also allowed to take several wives, so the hereditary nobility grew in size. The *teuclti* were a relatively new institution of the Triple Alliance and could derive from either noble or common blood – they were appointed by earned merit or noble actions, and joined into warrior or religious orders. Many of the *teuctli* had some aristocratic *pilli* blood in them, but not all *teuctli* were *pilli*. The *pilli* tended to own land and administrate tribute, and be part of lineages, while the *teuctli* filled the growing warrior orders, merchants and priesthood, based on Alliance expansion. *Teuctli* membership had its privileges, after a series of difficult tests of courage (see figure 3). Once promoted, the *teuclti* and his family could wear soft cotton instead of rough clothes,

drink cacao, wear fine feather cloaks and ornaments, and eat human flesh (Brundage 1972).

What is noteworthy about this system of earned nobility through merit is that during the rise of the Triple Alliance the class of *teuctli* also grew as the Alliance made conquests. The *teuctli* were recruited into the warrior and priestly orders with the promise of promotion and rise in status. This meant that the Alliance, like earlier *Toltecs* and *Teotihuacan*, created what has been called a "meritocratic" system, one based on merit, not birth. However, this meritocracy was neither egalitarian nor democratic, it simply allowed and encouraged talent to rise through competition. It was an aristocracy of warriors, priests, and administrators promoted on the basis of furthering the power of the Triple Alliance (Hassig 1992). Nobility outside the Alliance could be rewarded, further integrating local, elite elements of newly conquered city-states into the Alliance's expanding hegemonic system. The Triple Alliance also employed mass conscription of commoners into field armies. But both this conscripted force and the *teuctli* warrior orders created tensions with the aristocratic *pilli*. Additionally the children of the *pilli* aristocracy, who could take many wives, increased the ranks of the high born (Brundage 1972). While successful for expansion, this swelling meritocracy created something of an

Figure 3: Nobility – *Teuctli* -- with finery of feathers, cotton and precious stones (Source: Tsouras 1995)

inflation of nobility. More importantly, this inflation of an already large class of nobility inevitably created a huge demand for luxury items. The demands of this swelling nobility fueled an engine for outward military and mercantile power. For example, feathers for capes and headdresses of Quetzal and Macaw defined rank and wealth. Cotton was for the soft finely woven clothing worn by the elite, and was also used to make quilted armor to protect accomplished warriors. Obsidian blades, jade, and metals, were the weapons and adornment of the nobility. Salt was prized both as a spice and staple necessity, due to its preservative and nutritional qualities. Incense was used in the temples, while the drink made from cacao was prized for stimulation. Nearly all these goods were found outside the Triple Alliance, (see Map 3), except obsidian, and most were found on the coastal foothills of the *tierra templada*, and the hot coastal lowlands of the *tierra caliente* (Brundage 1975, Santley 1991). The growing needs of new nobility of *Tenochtitlan* and the Valley of Mexico created a dense core zone of demand (Chapman 1957). This kind of core -- a dense population and large nobility requiring luxury goods-- formed a "point of initiation" for a mercantile system (Vance 1970). The valley projected just the sort of push (demand) and pull (luxury item supply outside) factors needed to get a commercial engine moving.

The neighboring city-states surrounding the Triple Alliance had difficulties resisting this expansion, because they were mostly ruled by hereditary, conservative, exclusive, and aristocratic lineages. They constituted loose alliances of city-states whose hereditary nobility, and their immediate retainers, solely constituted their armed forces. The other city-states did not equip the mass armies that would have allowed them to defend themselves effectively. These aristocratic city-states have been called "territorial states" in that they were relatively integrated and homogeneous, consisting of related clans and lineages that shared the same tongue and culture. Conservative aristocracies


Map 3:
Altitude Zones, Routes
& Luxury Commodities of the
Aztec Triple Alliance
Tenochtitlan
Tlacopan
Texcoco
Obsidian
Salt
Cotton
Serpentine
Gold
Jade
Silver
Red Shell
Copper
Cacao
Feathers
Rubber
Slaves
Honey
Copal
Chert
Amber
Legend
Routes Overland
Lakes, Estuaries, Rivers
Type
River
Stream
Rivers, Lakes, and Lagoons
Swamps
Areas Subject to Inundation
Commodity
Altitude Zones
Tierra Caliente <1000 M
Tierra Templado 1000-2000 M
Tierra Fria 2000-3000 M
Sierra - Impassable >3000 M
Anahuac
The Valley of Mexico
Triple Alliance Capitals
N
Sources:
Barlow 1949, Hassig 1985, Chamberlain 1967, Roys 1972
Berdan&Anawalt 1997, National Geographic 1997
ESRI Digital Atlas 2002, Brundage 1972, Pollard 2000
Compiled by David Collins 2003
0 50 100 200 300 400
Kilometers

ruled such city-states. Social mobility was very limited. Although they sometimes supported *teuctli* and warrior orders, they did not raise mass conscript armies that could fight far away from their home areas, so they were not numerous or united enough to threaten the Triple Alliance (Hassig 1992). They tended to be small (10,000 inhabitants or less), tied into loose confederacies, and inward looking in the various valley systems. Because of the fortifications they constructed and the often-difficult terrain surrounding their city-states, many were able to resist total conquest, often partially submitting to alliance or tribute, but retaining independence.

The shifting alliances of the *Mixtecs*, *Zapotecs*, *Huastecs*, Maya city-states, and *Tarascans* shared aristocratic, inward looking, territorial natures, but they were difficult to totally conquer and integrate. Each city-state was potentially able to hold out locally, and often cut Triple Alliance communication lines, so both noble marriage alliances and the implicit threats of retributions were needed to keep the shaky structure of control firm. (Brundage 1972, Hassig 1992). In many cases these local city-states blocked direct access to distant sources of prized commodities such as cacao, feathers, or jade.

Diaspora of the *Pochteca*

Mesoamerica at contact in 1519 was divided and fragmented into many local orders, yet a relatively stable economic order existed among its polities. Both long distance commerce and local trade linked the lands of various peoples. The local trade and distant commerce was conducted by the *pochteca*, or professional merchants, who moved goods by caravans of porters (see figure 4). The wheel was not used for carrying

goods, and there were no domesticated pack animals for traction. The only means of carrying goods overland was by human labor -- on the backs of porters.

The mercantile twin city of *Tenochtitlan* was *Tlateloco*, which shared an island home with the political capital. *Tlateloco* was a major center of commerce and trade and exerted nearly as much influence throughout Mesoamerica as the political and religious capital of the *Mexica*, *Tenochtitlan*. Though technically subject to the *Mexica* of *Tenochtitlan* and the Triple Alliance, the *Tlateloca pochteca* boasted the largest marketplace in the Mesoamerican world. It was said to be filled with as many as 60,000 visitors per day and it is estimated over 100,000 canoes plied the waters of Lake Texcoco in the Valley of Mexico surrounding that emporium (Hassig 1985, Thomas 1993). It

Figure 4: *Pochteca* and subordinate traders – note staff of authority
Source: Codex Florentine – Sahagun 1959

clearly rivaled its adjacent twin city *Tenochtitlan* in both size and economic power. *Tlateloco* was both the center of the trade networks of retail markets for the vast population of the Valley of Mexico, and the nexus of long distance commerce of bulk commodities imported from abroad.

The *pochteca* merchants ranged both inside and outside the borders of the Aztec Triple Alliance. They occupied a special position distinct from that of either commoners or nobility. Within the empire, they kept to their own districts (or *capulli*), separate from

others. In cities beyond the realm of the Triple Alliance, they occupied their own distinct districts or enclaves that predated the Triple Alliance and may have gone back to distant *Toltec* times (Santley 1991). Many *pochteca* transactions and commerce were based inside the boundaries of the Triple Alliance. However, as the size of the tribute area of the Triple Alliance grew, so too did the safe escorted external commerce range of the *Tlateloca pochteca*, possibly at the expense of other *pochteca* groups (Chapman 1957, Hassig 1985). Some of their commerce was actually the internal collection of tribute in the many city-states, polities and valley regions subject to the Triple Alliance. In the subsequent resale for commerce of this collected tribute, the ownership still remained with the *pilli* or imperial lords of the Triple Alliance, although the commercial transaction was actually conducted by *pochteca.* This commerce may have involved a cut for the intermediaries, but that is not recorded. However, at the very least, it must have given the *pochteca* of the Triple Alliance considerable leverage with their own private transactions. It also gave the Triple Alliance the commercial advantage of large quantities of essentially free commodities and manufactures (tribute) to sell to offset their military and administrative costs (Hassig 1985).

Separate *pochteca* associations were spread out amongst at least eight major cities of the Triple Alliance including *Tenochtitlan*, *Tlateloco* and *Texcoco*. The *pochteca* had a separate legal status, their own code of laws separate from Aztec civil law, and could only be judged or punished for crimes in special courts by other *pochteca* (Prem 1989). The *pochteca* even had their own patron god of travel and traders, *Yacateuctli*, associated with a universal code of traveler rituals and ethics, and hospitality and protection of visitors (see figure 5). The god is the idealized trader (Chapman 1957). Legal codes of the Triple Alliance provided in great detail for keeping the roads clear of banditry and witchcraft (Offner 1984).

Figure 5: *Yacateuclti*- The Traveler God

Source: Codex Florentine

The Maya, too, had special patron god of travelers, made oral contracts, loans and had a system of payment for food and lodging. Aztec merchant *pochteca* had many enclave colonies in the Maya lands, and Maya traders did business in Triple Alliance border towns such as *Tochtepec* and *Coatzalcoalcos*. (Roys 1972, Chapman 1957). This indicates rules and standards shared across much the Mesoamerican world by the *pochteca* and other traders.

There were many different types of traders that fell within the pochteca associations. Sahagun describes five types of *pochteca.* First were the top ranking officers. "The *pochteca tlatoque* presided at important feasts and ceremonies and provided also the judges among the *pochteca*". These were a seasoned hereditary elite that had made fortunes, success and repute. They maintained close contacts with the governors, nobles and imperial leadership of the Triple Alliance (Chapman 1957). The *pochteca tlatoque* constituted a merchant class outside the nobility that implemented its own set of laws amongst itself.

Slave traders, or "those that bathe slaves", were a privileged class greatly valued by the emperors Ahuizotl and Moctezuma II. Sahagun (1959) notes they were among the most prestigious of all the merchants, their wealth being in men themselves. Such slave traders, in order to be nearer to sources of slaves, domiciled half the year in *Tlateloco*, but actually resided also in distant *Tochtepec*, on the frontier of the Triple Alliance near the Maya lands (Chapman 1957).

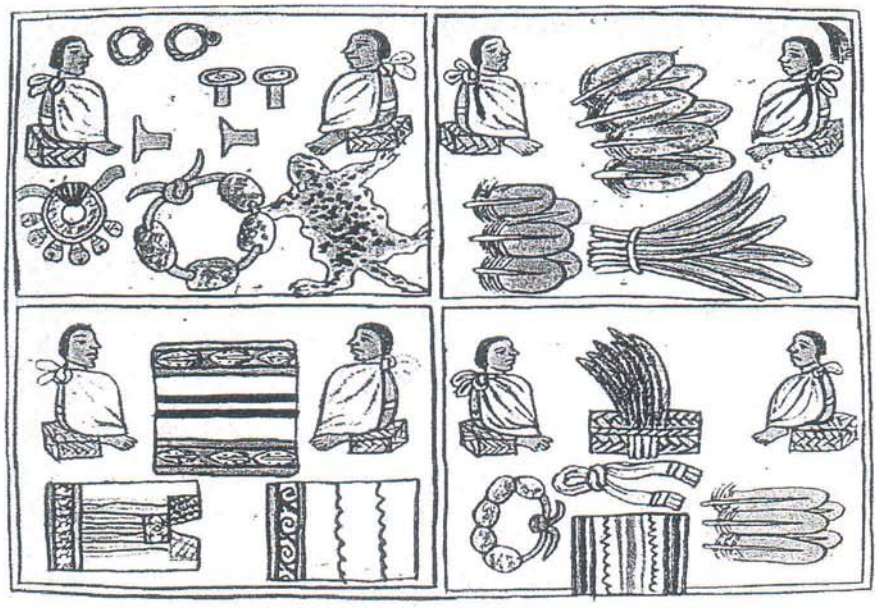
According to Chapman (1957), King's Traders seem to have been tribute collectors and emissaries. These were called the *teucunenque* (*teuctli*- lord, noble, person

of quality; *nenque*- traveler, messenger). They were held in high esteem by the *tlatoani* Emperor as a source of income and prized goods. The *teucunenque* were probably royal administrative tribute officials. In at least one case they extended the size of Triple Alliance with independent military action.

Trader Spies or *naualoztomeca,* were the eyes and ears of the Triple Alliance and the *pochteca* themselves. They could observe and predict unrest and rebellion, and spot weaknesses and rivalries. Many were killed or tortured in the line of duty abroad. However, the bulk of merchants and traders were more ubiquitous and mundane. The simple *otzomeca* or "walking merchants" comprised the bulk of traders that worked for pochteca. These lower level pochteca may have been the dealers in many smaller local transactions (see figure 6).

It is important to note that the commerce of the *pochteca* associations certainly predated the Triple Alliance by at least a century. The *pochteca* of *Tlateloco* were associated with the *Tepeneca* who had been conquered by the Mexica of the Triple Alliance. They also were rivaled by an envious Mexican nobility and priesthood, and ruled by a military governor (Brundage1975).

Figure 6: *Pochteca Otzomeca* Merchants dealing in feathers, pelts, ornaments, and fine cotton Source: Sahagun 1959, Codex Florentine



The *pochteca* also operated widely outside the Triple Alliance. Their interest in trade often superseded local political and military considerations in most cities and towns they did business with. They maintained *Nahuatl* speaking enclaves in many major towns throughout Mesoamerica, even those of peoples hostile to the Triple Alliance. They constituted an Azteca "diaspora", comparable to that of many in the Old World. Curtin (1984) notes:

> The Merchants who might have begun with a single settlement abroad tended to set up a whole series of trade settlements in alien towns. The result was an interrelated net of commercial communities forming a trade network, or trade diaspora – a term that comes from the Greek word for scattering, as in the throwing of grain…The term "trading diaspora … a nation of socially interdependent, but spatially dispersed communities" (p. 2)

The *pochteca* thus closely fit the model of a diaspora of spatially dispersed but connected communities. Resentment, tolerance and encouragement marked the history of the *pochteca* in the Triple Alliance, not unlike that of many other diasporas in history. One of the four major branches of government in most typical Aztec city-states would be the Treasury, largely run by kings' traders, the *teucunenque*, and by other *pochteca*. The other branches were the Council of War, the Council of the Priesthood and the Supreme Legal Council (Offner 1984). In the Triple Alliance, and especially in Tenochtitlan, there was considerable rivalry between *pochteca* and the noble warrior classes, and sometimes the priesthood and the *pochteca* of the treasury. The *pochteca* leadership was greatly valued by the political leadership of the empire at various times, even while they were at the same time also detested in some quarters (Padden 1967). At one point their wealth and power became so flagrant that the envious warrior orders nobility seized portions of it. But the *pochteca* were not without influence.

Emperor Moctezuma II and others extended them protection and power as a counterbalance to the *pilli*, or nobles. Sahagun writes:

> "Moctezuma, who was a native of Tenochtitlan, was then installed as ruler. In the same manner he continued the customs, followed the way, honored well the calling of the merchants, the vanguard merchants. He especially honored the principal merchants, the disguised merchants, those who bathed slaves, the slave dealers. He set them right by his side, even like the noblemen, the rulers, like all who had died, who had governed the cities of Mexico and Tlatilulco, he rendered them honor…And when Moctezuma commanded the merchants, vanguard merchants, the reconnoiterers, to enter, no matter where, if they were besieged (or) slain there, when the foe no longer respected the message of Moctezuma, then he swiftly declared war…The vanguard merchants went in the lead, accompanied by the principal merchants…(Bk 9 p23-4)

What the above confirms are several things. First, by the reign of Moctezuma II those *pochteca* were being sent far abroad for prized luxury goods, and they were founding outposts and colonies to gain access to goods, under Triple Alliance protection. Second, the pochteca were reconnoitering neighbors and goods for the Triple Alliance. And finally, Moctezuma gave them great prestige and power, outside the sphere of the nobility. This appears to give the Triple Alliance a very commercial orientation as well as its famous military nature.

In addition to enjoying privileged status, the pochteca seem to have maintained armed retainers and guards, and even small independent armies to guard convoys and trade routes. At times they sent private armies to conquer towns, regions, and provinces. Again Sahagun (1959) writes regarding merchants mounting independent expeditions to conquer provinces and open up trade routes to towns around the Isthmus of *Tehuantepec*:

> And Auitzotzin ruled in Tenochtitlan. Now in his time the merchants had entered the provinces of Ayotlan and Anauac, and there had been besieged. Four years they remained encircled in Quahtenaco. In that place war was waged. Those who made war upon them were the people of Tehuantepec, Izuatlan, Xochitlan, Amaxtlan, Quahtzontlan, Atlan, Omitlan, and Mapachtepec. These afore mentioned cities were all large…And not these alone contended and (and) fought against them, but indeed they massed together all the people of Anauac to fight those besieged in Quahtenaco…(Book 8 p3-4)

Nevertheless, after a difficult campaign the merchants returned to the capital *Tenochtitlan* in triumph with gifts for the emperor, who was duly impressed with the commodities obtained. (Berdan and Anawalt 1997). Apparently new routes to these goods were also achieved as well.

Modern writers have often observed that bad treatment, torture or expulsion of Aztec *pochteca* from independent neighbors was merely a pretext for wars already planned by the Triple Alliance (Tsouras 1996, Hassig 1988, Brundage 1972). The decision to attack a neighboring state had already supposedly been made, and the treatment of *pochteca* (who were probably spying or stirring up trouble) was merely an excuse by the devious leadership of the Triple Alliance to make war. The assumption is that pochteca were some sort of lightning rod, or fifth column intended to stir up provocation.

There is another related, but different, possible explanation for the execution of pochteca in neighboring independent polities. It is entirely possible that the *pochteca* were engaged in their own arrangements, procuring tribute or commerce under favorable conditions. If so, in negotiating trade practices that were unwelcome or unfair with local polities, they may have occasionally gone too far and were punished by the local leaders. The *pochteca* leadership may then have protested or complained to Triple Alliance leadership, which then declared war to protect its commerce and tribute. Certainly there was a close and yet semi-independent relationship shared by the pochteca and the leaders of the Triple Alliance. There was evidently a complex relationship among the emperor, ruling councils, the nobility and *pochteca* (Offner 1984). Certainly the *pochteca* were greatly valued for their ability to bring in precious exotic commodities from outside the realm of the Triple Alliance. Many of the wars of the Triple Alliance were triggered by

attacks on trade caravans. (Brundage 1972) Much of the expansion of the Triple Alliance can be explained as efforts by pochteca to protect the trade routes and commerce zones they operated in (Hassig 1985).

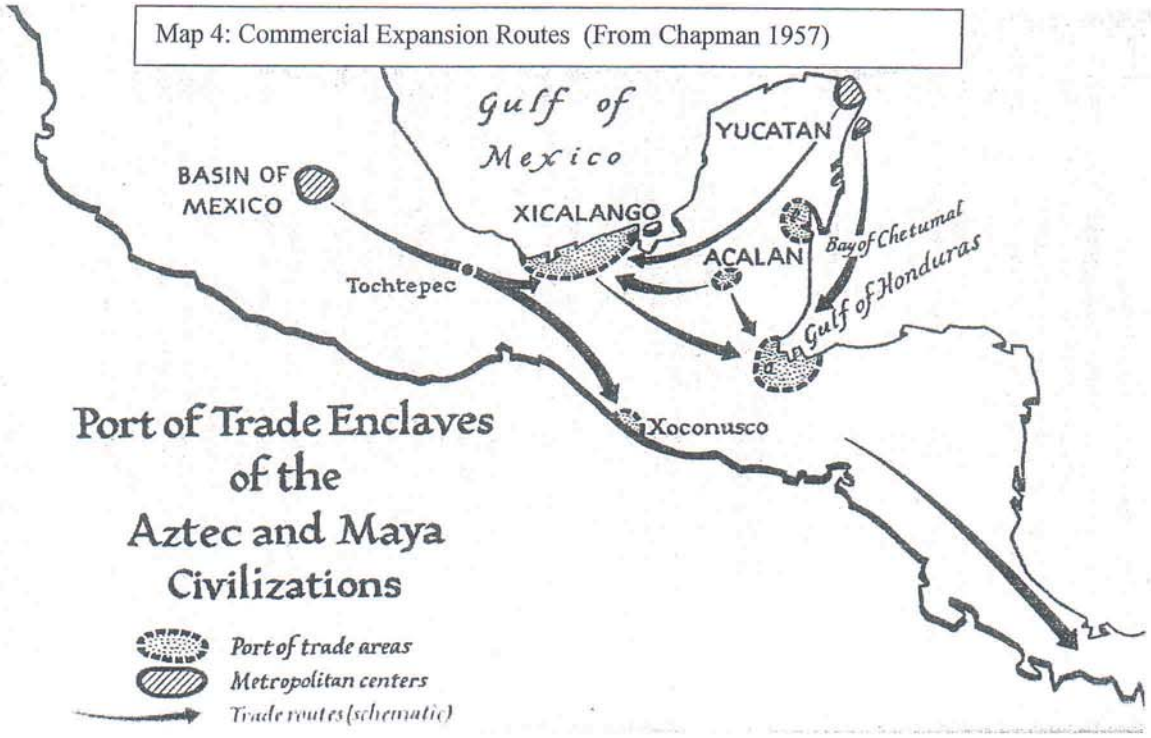
Throughout history diasporas have carried on their own foreign policies, and relations with polities distant from their homelands. Regarding the range of status of other known African and European diasporas abroad in foreign ports Curtin (1984) writes:

> Trade communities of merchants living among aliens in associated networks are to be found on every continent and back through time to the very beginning of urban life... These networks were organized in many different ways, some so informally that the individual settlements were linked by little more than the solidarity of a common culture. Others like the great European trading firms of the seventeenth and eighteenth centuries, were formally organized, chartered by European states, granted certain monopoly rights, empowered to govern as well as to trade, and to use their own military and naval forces... At the extreme end of this spectrum were the European trading post empires in Asia from the sixteenth century through the eighteenth centuries. They sought not only to have trade enclaves under their own military control; they also tried to use coercion to control Asian trade and to shift the terms of trade in their favor.... Whatever the balance of power between the traders and their hosts, the relationship was necessarily asymmetrical. The traders were specialists in a single kind of economic enterprise, whereas the host society was a whole society, with many occupations, class stratification, and political divisions between the rulers and the ruled. (p5)

It is known the *pochteca* had enclaves in Tabasco province outside the empire, and even ruled the city-state of *Xicalango* independently (see Map 4). There is also Maya record (at *Mayapan* in the Yucatan) of *Nahuatl* speaking mercenaries arriving in the Yucatan to fight for Maya lords against other Maya chiefdom factions to prop up their waning power (Landa 1978). These Aztec mercenaries were not from the Triple Alliance, this event dating from the early 1400s before its expansion, yet must have come from some other Aztec, *Nahuatl* speaking groups. The *Quiche* Maya were conquered and ruled by northerners from Mexico by 1350 AD. They are perhaps indicative of a separate

foreign policy beyond the borders of the Triple Alliance, carried out and equipped by the Aztec merchant *pochteca*. (Chapman 1957, Hassig 1992).

Map 4: Commercial Expansion Routes (From Chapman 1957)



There was a very complicated interaction between the *Chontal* Maya, and the *pochteca* from the Triple Alliance. Here other earlier *Nahuatl* speaking groups of *pochteca* settled at *Xichilango*, the frontier edge of Aztec lands, alongside the Maya lands in the province of Tabasco. There were close trade, marriage alliances, and dynastic ties between the Triple Alliance and the *Chontal* Maya of Tabasco. (*Chontal* is *Nahuatl* for "foreign"). Indeed a Nahuatl speaking Aztec nobility ruled trading towns such as *Xichilango*, alongside a largely Maya speaking population. Although not controlled by the Triple Alliance, the Tabasco region was both economically tied, and friendly to, the Triple Alliance. In many ways it appears to be almost colonial in nature (Scholes and Roys 1968, Gadadz 1979).

It is notable that there are important distinctions and interactions between local trade, long range commerce, and coerced tribute. A great deal of "trade" in pre-modern

times was conducted in and around villages, towns and cities that was strictly local and endogenic, in such items as firewood, building materials, bulk foods, etc. But much was hauled for "commerce" as well, here denoting bulk long-distance trade in commodities and manufactures between distant towns that was managed by specialized merchants. In the Old World, European commerce was often closely associated with bulk and luxury commodities, water borne transit and specialized factory plantations run by slave or indentured labor (Fox, 1971). This seems to be the case with Mesoamerica as well, with the caveat that bulk porter commerce was difficult. Luxury commodities such as cacao, cotton and feathers were harvested and hauled in bulk lots (Chapman 1957, Santley 1991).

In the New World a great deal of goods were certainly moved as tribute as well. This tribute was coerced tax, both by the local aristocracies and by the Triple Alliance. However though the amount of tribute collected by the Triple Alliance was impressive, it was not sufficient for the needs of the Valley of Mexico (Santley 1991).

Only a portion of goods that made it from the regions of Mesoamerica arrived as "free" tribute in the capital, *Tenochtitlan*. Of that a great deal were given back to the *pochteca* by the leadership, to use to trade locally and abroad to procure wealth for the nobility, the priesthood, and the emperor (Hassig 1985). A much greater proportion of goods from outlying provinces and regions was traded separately from tribute, and mostly under the auspices of the *pochteca* associations (Santley 1991). It has been estimated, for instance, that the tribute that arrived annually in Tenochtitlan would have sufficed to feed only one percent of the population of the Valley of Mexico. The rest of the necessary goods must have been grown locally, taxed locally or traded from outlying regions (Drennan 1984a). That other ninety nine percent of large-scale trade -- and commerce -- was certainly at least partially managed by the *pochteca* associations, along

with tribute exacted locally by rulers outside imperial tribute. Certainly heavily laden traders and local market fairs on special calendar days were ubiquitous throughout Mesoamerica (Chapman 1957, Hassig 1985)

Conclusion: A Diaspora for a Demand

From the factors noted above, several things can be concluded. Though the Mesoamerican world was not linked together by paved roads it was linked by the commercial activities of the *pochteca.* The *pochteca* constituted a class largely outside the often-rigid aristocratic order of nobles and commoners, and they were allowed upward mobility based on merit. Furthermore, they maintained a far-flung diaspora of enclaves and supported outposts (both peaceful and military). *Pochteca* commerce was an outreaching force propelled by the demand of luxury items for a growing class of nobles, warriors, the priesthood and the imperial houses in the Valley of Mexico. They gathered intelligence for both commercial and military expansion amongst distant sources of valued commodities amongst neighboring polities. Part of the porous nature of the Triple Alliance can be explained by the commercial needs of the *Tlateloco pochteca* (and other *pochteca*) in procuring commodities. It was not necessary-- or possible -- to control every polity, town, or village encountered, merely the ones that controlled the commerce routes to commodities the *pochteca* valued for trade and commerce (see Map 5).

Finally, the *pochteca* managed a network of local colonies for the long-range commerce of commodities alongside of, and beyond, the boundaries of the Triple Alliance. To do all this, the *pochteca* employed several distinct systems of transport. We shall now examine these systems.


Map 5: Aztec Triple Alliance in 1519
Tributaries, Allies, Garrisons and Provincial Capitals
Triple Alliance
Influence and Control
Triple Alliance Capitals
Triple Alliance Garrisons
Tributary Provincial Capitals
Tributary Totonaneca
Tributary Zapotec and Mixtec
Allied to Triple Alliance
Chontal Nahuatl Allies
Tlacopan
Texcoco
Tenochtitlan
Legend
Routes Overland
Rivers and Drainage
River
Stream
Lakes, and Lagoons
Swamps
Areas Subject to Inundation
Altitude Zones
Hot Lowlands <1000 M
Temperate Foothills 1000-2000 M
Upland Plateau 2000-3000 M
High Mountains >3000 M
N
Kilometers
0 50 100 200 300 400
Sources:
Barlow 1949, Hassig 1985, Chamberlain 1967, Roys 1972
Berdan&Anawalt 1997, National Geographic 1997
ESRI Digital Atlas 2002, Brundage 1972, Pollard 2000
Compiled by David Collins 2003

II. THE PORTER BASED SYSTEM

Introduction

Porters, or *tlamemes*, formed the basis of transport in Mesoamerica. Expeditions were complex affairs carefully organized by senior *pochteca* in elaborate codes of formality and ritual gravity, for great potential returns. Many types of transport required the support of local communities for security en route, supplies, rest and maintenance. There were several types of porter, covering various distances and lading various weights of loads. The *tlamemes* were only part of a transit system that relied heavily on the greater efficiency of canoe-borne travel. Further, porter caravans presented a path of advancement for both commoners and merchants when successful.

There is some debate as to whether large porter loads could be carried great distances and were confined to local regions and polities, or whether long range traffic was conducted by more lightly laden porters making shorter, easier single-days journeys. These are important questions. If heavily laden porter caravans could travel hundreds if not thousands of kilometers efficiently with cheap bulk commodities or bulk foodstuffs, then we could infer huge and complex bulk commerce. If, conversely, only lightly laden porters transferred goods long distances, and then bulk commerce would have been mostly local, while luxury commodities would have constituted long-range commerce. In practice both types of porter-borne traffic may have been employed. Local heavily laden traffic is known to have traversed great distances within regions, in daisy chains of

down- the-line transfers; but lightly laden porters traveling on long journeys also appear to have been employed.

Porters: the Means of Traffic

Moving the commerce of the *pochteca* were the porters, or *tlamemes,* that were the basic lift capacity for overland traveling in Mesoamerica (see figure 7). In essence two relatively simple innovations greatly increased both the range and capacity of the porter transport (Hassig 1992). First, the porters carried goods in a framed reinforced basket called a *petlacalli* attached by a tumpline to the bearer's head. This greatly increased the stability and weight a porter could carry. Secondly, by early *Olmec* times (900 BCE) maize was being dried and ground into tortilla flour on stone grinders called *camales*. To sustain them on journeys, travelers also mixed ground maize with water, called *pinole* (Sahagun 1959).

Figure 7: Porter with staff and *petlacalli* pack and tumpline.
Source: Anawalt 1981, Lienzo Tlaxcala

On the road warriors carried a special maize mix called "*yoyotl*", or "the broth of bravery" (Brundage 1972). The tumpline, in conjunction with this dried parched maize (for food on the march) enabled the hauling of greater weights over longer distances. (Hassig 1985)

Both commoners and slaves were used as *tlamemes*, but the modern consensus is that being a porter was a crucial, though low-prestige, occupation (Hassig 1985). It was probably a hard, dangerous and dirty work. Along the narrow and often rocky trails carrying heavy loads, falls causing broken limbs were always possible. At various

locales poisonous snakes, scorpions, or alligators might be more than a nuisance (Landa 1978). Exhaustion over long journeys might set in along with reactions to changing altitudes and climate zones. Fear of the known and possibly unknown dangers and enemies might often have slowed the march rates (Chapman 1957). Travel was commonly organized in long caravans of porters in single file on narrow trails barely wide enough for one bearer. Keeping in marching order at the same speed over long distances must have been difficult, and rearranging the burdens among the able after injuries, was probably a constant problem (Hassig 1985).

However, being a porter could also be an opportunity in some sectors of Aztec society, for it was a way to travel and trade. In a society where the lines were drawn between the nobility (*pilli*) and commoner (*macehualli*), joining a trading expedition was viewed as a path of advancement for the lucky and successful commoner. *Macehualli* commoners were subject to travel restrictions and typically controlled by the local *pilli* nobles for assignments. Women are not mentioned as porters, although they certainly hauled many goods locally and to market, and traded in commerce. No references or art describe them as part of the caravans of porters, although they may have sometimes carried goods and accompanied caravans as well. Many parents sought out *pochteca* traders to take their male children as apprentices. Sahagun (1959) wrote about recruits for merchant convoys in the Florentine Codex right after the Conquest:

> Some were to go for the first time; perchance they were yet young boys whose mothers (and fathers) had (the merchants) take with them…And this mother and father quite on their own account besought their son. They said to him: Here thou art, O my son, my beloved youth, my only child. Thou art unfortunate. What in truth shall we do? What shall we make of thee? …. Accompany them carefully… Imitate them as they go, as they travel, and then when the sauce dish and carrying baskets are placed before one, and drink is offered one. Pay good heed which one is given the first place as places are taken before the people; look well how things are arranged. (bk. 9, p14)

Assembling a long distance expedition was an elaborate, carefully organized affair. To start with the caravan departed, and returned, at night.

> And when they were about to go, when they were about to start, first in the house of the one who would lead, who would go as the leader of the youths, everything was there assembled; all the loads of merchandise, all the consignments, the possessions of the principal merchants, and the goods of the merchant women, were arranged separately. Right before them all, they were gathered, waiting until they were to start. And they assembled all the travel rations, the *pinole*. And they arranged things in the house not by day but by night. (bk 9, p 14)

This case of night travel appears to have been related to concealment of cargo, and ritual. However, night travel was probably not the norm. The only other case of night travel by porter convoys mentioned by Sahagun was that of travel through hostile countries in dire necessity, as an exception. The notion that *tlamemes* traveled normally at night is doubtful (Chapman 1957). They are recorded as lashing themselves together at night for security. Night travel would have been slower and inefficient, and also dangerous in terms of injuries and wear and tear of the porters.

Further Sahagun (Book 9 p 14-15) notes that when preparing for long expeditions, the bearers were loaded relatively lightly, not to full capacity. Very young recruits were loaded only with water. This may have been to reduce wear and tear on the porters during journeys that could last months, and even years. When on the road the porters carried rations of dried ground toasted corn flour, or *pinole*, as mentioned above. Mixed with some beans, peppers or cacao, about 2-3 lbs of this flour per day could sustain the traveler.

The journey described below began from Tlateloco on the docks of Lake Texcoco, in the Valley of Mexico. This particular Sahagun passage also emphasized an initial night departure by canoe:

> And when they had assembled indeed the loads, they thereupon arranged them on the carrying frames; they set one each on the hired burden-

> carriers to carry on their backs: not very heavy, they put on only a limited amount. And the burden-carrying merchants bore no great weight, only a measured amount. All were thus laden. And also this was as those who went as leaders, who guided the train of bearers, had ordered. But as those who were going for the first time, the small boys they loaded nothing on their backs. They placed upon their backs only the drinking vessels, the gourds. And when things had been arranged in order in their house, when all were about to go on the road, when darkness had fallen, when it was already night, thereupon all the boats were filled; two or three boats in which the goods went. (p 14-15)

When beginning a trading journey an elaborate series of rituals and procedures were undertaken. A long distance journey could only begin after the hair of the travelers head had been shaved, and the hair could not be shaved again until the trader or porter returned. This may have been a good indicator of time on the road as well as symbolic of being on the road and a neutral trader traveler. There was a special traveler god, *Yacateuctli* that protected the merchants if honored with the proper rituals and feasts. Travel could only be undertaken on certain days in calendar alignments -- one would suspect these might have been tied to the best seasonal departure dates and local fairs (Sahagun. 1959). Local fairs and markets are known to have been tied to five, eight, nine, thirteen, and twenty-day cycles. Towns and cities of varying sizes held markets for different types of goods and services, depending on demand and volume (Hassig 1985). Larger regional fairs may have been seasonally timed. Older *pochteca* traders and officials stayed behind, but were needed to provide consent for an expedition, timing, advice, contacts abroad, and safe passage for the road. A great deal of consultation and ritualized meetings with these older, more seasoned *pochteca* occurred. Messages as well as the goods would be carried to distant pochteca colleagues by caravan. The special merchant's legal, ethical and religious code were strictly observed, and enforced, when on the road (Chapman 1959). When the journey ended the *pochteca* arrived at night, deposited their cargoes with special intermediaries from the ranks of the *pochteca*, and a series of gifts, feasting, tributes and perhaps payments occurred.

Movement of goods was conducted largely in the fall and winter months of October to March. This was probably for several reasons. When the rainy season began after May, this would have turned the trails into rivers and deep quagmires in some stretches-- slippery, uncomfortable and dangerous places to be, tending to ruin any order of marching. The winter season is both cooler and drier, which would have been easier on porters carrying heavy loads. Under the summer rains, the actual weight of the porter's loads and clothing (heavy cloaks of maguey fiber) would have increased dramatically due to soaking. Further, the goods themselves might have been soaked and spoiled. Sickness, fever, and heat exhaustion became distinct possibilities in between destinations. Losing porters to unnecessary exertions might mean losing merchandise, so travel was not year round. Finally, during the other spring and summer months, much of the rural labor force would have been engaged in cultivating, harvesting and hauling in crops and thus unavailable to support porters moving through their districts. Thus the fall and winter were the months during which trade, tribute and war were conducted (Hirth 1991, Hassig 1988). The drawbacks to winter travel would have been a probable need for nighttime shelter, and hypothermia or sickness due to altitude changes.

It is a virtual certainty that the merchants, nobles and slave traders who used porters had an elaborate and clear understanding of how much a bearer could carry, and probably reckoned trade expeditions in porter days, or load per daily distance. Little evidence of any such calculations remain, but it is useful to estimate how much a porter could carry in a day, and how far, in order to determine volume of trade and how much manpower it would take to absorb the costs of commerce (see figure 8).

Figure 8: A Caravan of porters

Source: Tsouras 1996

The historical record on the details of exact lift for each *tlameme* is not totally clear, and there is some debate to this capacity. Hassig (1985) notes:

> Bernal del Castillo stated that each *tlameme* carried two arrobas (1 arroba 25.36 pounds, or 11.5 kilograms, two arrobas thus totaling 50.72 pounds, or 23 kilograms, per load) and went 5 leagues (13 to 18 miles or 21 to 28 kilometers) to the next district before he was relieved. This statement has been the subject of much repetition and considerable uncritical reliance. Despite some credence given these figures ...there are reasons for caution in accepting them. (p32)

Drennan (1984a) cites load ranges for known figures of about 20-50 kg, noting that 20 kg (45 lb.) is metabolically more efficient over long distances. This figure is for loads being carried over distances at a sustainable pace for about 36 km (about 22 miles based on modern tests) on level terrain in one day. Rugged or uneven terrain would lower this sustainable pace slightly, but not dramatically. This is because when using footpaths as opposed to paved roads gradient is not as important; thus largely direct routes instead of switchbacks become feasible, without wheeled transports which requires gentle gradient (Hassig1985).

Larger loads and longer daily distances are quite probable however. There is evidence the *tlamemes* could carry very large loads, especially locally on intraregional trips. Some writers using ethnographic data from Michoacan, Mexico, have argued that it was not unusual for a porter to travel 30-40 miles (45-60 km) per day carrying as much as 150 pounds (about 70 kg). Indeed, they were said to be more efficient than donkey or mule transport over rugged terrain. However, this was between towns in the same local region, with rest facilities and traditional hospitality at all points along the way and at either end of the journey (Kelly 2000, after Lumholtz 1902).

All loads were not equal in efficiency or value. When carrying bulk foodstuffs there was a definite point of diminishing returns that can be roughly estimated. Drennan (1984a) notes a porter would essentially consume his entire load in 31 days if it were in calories of maize. At distances of 275 km (550 km round trip) beyond the source of the foodstuffs (for example maize), a porter carrying it all the way (and then returning on round trip) would eat most of the nutritional value of the load. Even before delivering the foodstuff to destination, half would be consumed. This is not to say some luxury provisions were not carried further; it simply became exorbitantly inefficient to carry huge quantities of common foodstuffs by porter beyond this threshold. Bulk movement of foodstuffs overland had a definite limit of caloric profitability confined to less than 275 km. (Drennan 1984b). Thus it is highly likely that most bulk food commodities were produced and carried locally, not traded in convoys or caravans over distances longer than about 275 km. To carry food further by porter was simply wasteful. This view argues somewhat for local self-sufficiency, or the autarchy of many local communities, though the bulk food limit might be mitigated by water transportation, as will be seen.

As a comparison, during Triple Alliance military expeditions, one porter typically carried roughly 25 days worth of rations (about 2 lbs a day) for himself or others.

Typically one porter carried supplies for two warriors on military campaigns, making supply for eight days for the three feasible (Hassig 1988). If this was a round trip supply to hostile territory that would not yield supply, this meant an effective range of 4 days journey with adequate rations. If this campaign was to friendly supplied territories, it could be eight days distance. On commerce expeditions the ratio of supply in theory might have been one porter for each other traveler if necessary. Even if the porter was supplying only one other porter, effective range could be extended to roughly twelve days supplied journey round trip --and twenty-four days one way. So the importance of support entrepots-- "waypoint bases" to replenish-- becomes clear. In particular, the reach of Triple Alliance armies, the best-supplied in Mesoamerica, was constrained by the leash of porter resupply by friendly bases (Hassig, 1992). But this also affected the direction and ranges of commercial porter caravans. Porter transport simply could not far exceed its local resupply.

However, calorically "efficient" porter transport of commodities along the trails and routes may not always have been the objective. Moving equipment, goods, men and their provisions to far distant points of demand, may have been the goal, whatever the cost in local porter resources. This might especially have been the case with tribute.

Furthermore, support along the way might mitigate the friction of distance. The "down the line effect"- passing along foodstuffs in a chain conveyor belt - might extend the distance over which foodstuffs could be efficiently carried (Renfrew 1973). If for example, a large number of communities en route have maize stockpiled, then maize could be purchased or obtained as tribute along the way, and the effective load of food could be carried farther. Utilizing this support along the way would thus extend the effective range of porter lift considerably (Kelly 2000). This sort of along the road or

"online support" (Hassig 1985) greatly extended the possible range of foot-borne traffic, if not the total efficiency.

For local and long distance movement of goods, a relay system between towns and cities would sometimes be used. Each community had its own supply of *tlamemes* overseen by the local leader ("speaker", or *tlatoani*). These could be added to or exchanged for porters already on hand. *Tlamemes* generally carried goods not to the border of adjacent towns, but into the center of the town itself, where they would unload and pass on their loads to a new crew of local porters that would go on to the next town. Since towns were dependent on the *tlamemes* to bring needed goods in from abroad, and needed their own *tlamemes* back, this fostered a neutrality and protection of *tlamemes* on the road between different communities. Thus porters could often cross borders of even hostile polities with relative impunity. Since *tlamemes* were attached to most local polities, they themselves were often taken as tribute after submission to the Mexica, rather than goods. The porters were taken to maintain Aztec connections along various stretches of long routes. In some cases both *tlamemes* and the "*petlacalli*", or backpacks and tumplines, were taken as tribute in large numbers. (Hassig 1985, Barlow 1949).

Finally, although a single porter would lose total efficiency of energy in bulk journeys over 275 km, using such a relay system between towns described above, commodities could be transported from areas of relatively low demand to zones of intense demand. This would have been the case of such densely populated centers such as *Tenochtitlan* and the Valley of Mexico. This does not mean that the nutritional value of the load would not be consumed en route, but that the relative loss of that value would be dispersed among many communities along the way.

For example, if a single porter traveled round trip 275 km to a destination, the porter would indeed consume the load of maize. But, if along the way he each day

stopped every 25 km at a town, that itself had plenty of maize, all along the way to the final destination, the loss of the consumed maize cargo would be dispersed to communities along the way. Significantly, the cargo would still make it to the area of demand. This would not have been a calorically efficient way to deliver a cargo of food, but the food would still move from areas of relative abundance to those of scarcity and demand. On a larger scale, numerous communities, each with its own supply of *tlamemes* could have chain-relayed large quantities of foodstuffs inward toward urban cores with limited loss to themselves. Kelley (2000) notes:

> "On the assumption that commodities are reasonably common in their region of origin, a shift or substitution for a good moving in a particular direction could infuse the circulation of goods with increased flow and thereby account for greater economic dependency on the chain of exchange at either terminus… it is a model which could help to overcome the attritional effects of distance costs on the magnitude of exchange and hence could increase its economic impact on distant regions. " (p153)

Other historic data from the *Tarascan* metal mines corroborates heavier local loads. Porters hauling metal ores from the mines to smelting centers in prehispanic times carried loads weighing 32-72 kg distance of 21 to 43 km a day. Most of these mines were within four days march of the Tarascan capital, Tzintzuntzan (Gorenstein and Pollard 1991)

When carrying luxury high-value goods such cost and efficiency limits did not apply. If a good was valued enough as a precious item, its cost in food units to move was largely irrelevant. Thus true long distance commerce was probably mostly in luxury or critical items such as feathers, cacao, incense, furs, gold, and obsidian. A porter carrying these items was efficient in the sense that someone would value and pay for the cargo almost regardless of food cost, and it was probably carried and escorted more carefully than a load of ordinary goods.

Finally, efficiency was not important if one planned to sell the porters. Upon arrival at some towns, such as *Tochtepec*, many porters, who were slaves, were sold at the slave markets. This particular town was situated along the track roughly midway between the Valley of Mexico and the Maya city-states of Yucatan. Maya merchants (or *pplolom*) marched convoys of slaves northward to *Tochtepec*, delivered their loads of salt, cacao, honey, and jade, and then sold the bearers in the slave markets at *Tochtepec*. The location was so important that Aztec slave merchants from the Valley of Mexico established permanent residences in that city, as well as at home in the capital (Chapman 1957)

The trade was both ways between May and Aztec peoples. For example Malinche (or *Malinali*), the guide and translator for Cortes' expedition in 1519, was of Aztec nobility from *Coatzlcoalcos*, sold into slavery to the Yucatecan Maya (Thomas, 1993). Like many other cultures, captives and slaves were a part of the economy. We do know that slave traders were held in high repute in the Triple Alliance. The supply of slaves seems to have been fed by local skirmishes and feuds, poverty, and the various wars of expansion of the Triple Alliance.

Below is a summary of the various types of possible loads and distances described above (see Table 1). The important notion to take away from the data in Table 1 is that the apparently contradictory estimates are actually complementary. The lighter estimates presume longer ranges at more efficient energy rates. There may be a correlation between lighter laden porters on long trips carrying luxury goods, and more heavily laden porters on short local trips bearing bulk goods. It may be inferred that if heavy loads were carried, they were probably carried locally in bulk commodities. On longer more dangerous trips into partially known regions, lighter loads may have been used.

Table 1. Low, High, and Averaged Estimates of Porter Capacity and Distance

Porter Description	Estimated Load in Kg and (Lbs)	Daily Distance	Range
Bernal Diaz del Castillo (1957)	23 Kg (50.6 lbs)	20 – 35 km (12.5 - 22 miles)	Long Range
Drennan (1984a)	20 Kg (45 lbs)	36 km (22.5 miles)	Long Range
Gorenstein and Pollard (1991)	72 Kg (158.4 Lbs)	21-43 km (13- 27 miles)	Local
Kelley (2000)	68 Kg (150 lbs)	56 km (35 miles)	Local
Old World Average (Engels 1978)	29 kg. (60 lbs)	23 km (15 Miles)	Average
Modern US Army (US 1971a)	28 kg (61.6 lbs)	9-31 km (6-20 miles)	Average
An Averaged Porter Range	45.55 Kg (100 lbs)	23 miles (37 km)	Average

Waterborne Capacities and Efficiencies

Transport by canoe (or *acalli*) was employed wherever possible in prehispanic Mesoamerica (see Figure 9). Many important riverine waypoints, such as *Acalan*, and *Acatlan*, were named after canoes (Chapman 1957). The *Nahuatl* name for the Aztec world, *Anahuac,* which refers to parts of the Aztec world such as the Valley of Mexico, and the Gulf and Pacific Coasts, translates roughly as "the lands beside the waters". (Brundage 1972),

Waterborne transport by canoe on calm waters greatly extended the effective efficient range of transport of bulk staples such as maize. This was at a similar speed to land traffic but at an incredible twenty to forty times more efficiently (Hassig 1985, Drennan 1984a). However, there were relatively few lakes, gentle rivers, and estuary zones suitable for such transportation. Feasibility also varied by direction of current. Such locations, where they did exist, though, were enormously more efficient commercial avenues than areas that possessed only overland trails. (Drennan 1984a, Hassig 1985).

Navigable zones included Lake Texcoco, the estuaries of Southwest Yucatan near *Xicalango*, Southeast Yucatan, and Lake Patzcuaro in the center of the Tarascan State. They exhibit several important points. First, all three represent dense local populations with central place hierarchies. Second, all were connected excellently internally by canoe-borne transport supplemented with porter borne hinterlands (Santley 1991; Gadacz 1979; Pollard 1993).

Figure 9: Canoes or *acalli* hauling goods to the market of Tlateloco

Source: National Geographic 1980 vol. 158

Shallow coastal waters contributed to this canoe-borne system, seasonally, for part of the year in hauling bulk goods long distances. There was an extensive seaborne Maya trade in salt, obsidian, honey, fish, and other commodities that plied the coasts (Andrews 1983, Roys 1976). Indeed, seagoing canoes were spotted (and plundered) by Columbus off the Yucatan coast described, each as being "great as a galley, eight feet wide", with a crew of twenty-five. The canoes were paddled in the shallow coastal waters within sight of land, and were loaded with salt, cotton clothing, cacao beans,

maize beer, onyx, copper, and obsidian bladed wooden swords (Sauer 1966). They were indicative of a thriving coastal trade before contact.

Historic sources also describe lake and river canoes up to 15 meters long. In such craft one man could pole a ton of cargo such as maize as fast a man could carry a single load, or *carga* (roughly two arrobas or 50 lbs, conservatively), as described by the Spanish (Hassig 1985). However, one-man canoes could be poled with 20, 35, or 50 of these cargoes of maize, flour or lighter goods-- many times the one cargo a single porter could carry. Essentially the canoe could carry twenty to forty times as much bulk cargo as a porter, greatly increasing the connectivity around lakes, river valley shorelines, and estuaries (Drennan 1984a).

However, most of the Aztec and other Mesoamerican regions were not connected by such waterways. Where they ran, the gradient of the streams was often steep and the currents fast. On such swift rivers, the going by canoe was difficult and portages at rapids became very frequent. This then rendered porter borne trade more efficient. Indeed, many waypoint regions or towns, such as *Acalan* (or "place of the canoes"), grew up at such "break of bulk" points where waterborne transport began or ended (Chapman 1957).

One of the reasons the Valley of Mexico supported around two million people and Tenochtitlan 200,000 souls at contact was the efficiency of the local lacustrine canoe fleet. In a typical city or town in Mexico the limits of rural support were based on the 23 –70 kg a porter could carry in a day outward or inward. In the Valley of Mexico however, the lake system provided the multiplier effect of canoe lift to augment the limited capacity of porter-borne goods. The net effect greatly enhanced the size of the hinterlands available to Tenochtitlan and Tlateloco. The lake served as "a large and efficient conduit of goods, the flow being rural to urban, and predominantly into food deficient Tenochtitlan"(Hassig 1985).

Long distance journeys probably combined both land and water transport, but waterborne transport could not be used everywhere. Instead, bulky goods changed hands at points along these combined routes of transport and were passed on down the line (Kelly2000). The role of *tlamemes* in many parts of Mesoamerica may perhaps have been viewed as vehicles for portaging between the many water routes that existed. The latter connections may have been analogous to the portages of the French fur trade in seventeenth and eighteenth century North America. The rivers and lakes were like highways, the narrow trails like feeder lines that fed into them. However, the fact remains that there were never enough low-gradient or level, low-lying and gentle, waterways in Mesoamerica. Where they existed they constituted a huge resource that seems to have been exploited vigorously. Population density around such areas seems to have been disproportionately high, at least partially due to this transport efficiency. Overland commerce by porter was often closely intertwined with riverine routes for this reason (Hassig 1985, Chapman 1957).

Conclusion: Support of Several Systems

From the data above it should follow that a day's journey on a *pochteca* caravan would vary by the distance, objective and modes of lift used to move the goods. It is entirely possible that the distinction between heavily laden local loads and lightly laden long distance loads may simply reflect the different needs of long range commerce, versus local trade mentioned above. There were probably several types of loads for different types of journeys based on trade-offs of attrition, efficiency, and costs. First, heavy-laden porter traffic was probably for relatively short internal trips between friendly centers. On local journeys of 100 km or less, *tlamemes* were probably heavily laden with

up to 70 kg (150 lb.). They carried bulk local goods such as maize, salt, ceramics, firewood and foodstuffs, not lighter luxury goods. Such heavily laden bulk trips could have maintained granaries and support for towns along the journey route (Hassig 1992). Second, canoe-borne transport would have greatly augmented local bulk hauling in some lacustrine, riverine and estuary conditions. Where canoe-borne travel was possible heavily laden porters would have been used in conjunction with and around dense high demand local centers (Hassig 1985). Third were the more lightly loaded long distance caravans of commerce, the porter traffic of "Vanguard Traders" on expeditions described by Sahagun (1959). Fourth, local relay systems of porters and supplies could augment caravans of long distance trade. Finally, one way slave porter traffic was sold off at central destinations such as *Tochtepec* or Tabasco along with their loads (Chapman 1957).

The key to all these types of delivery methods was some sort of support system along the way. One of the key advantages of the Triple Alliance in securing a new province by alliance or conquest was that it would provide for a supply of local porter that could augment long distance commerce. Without such local porters for support, loads would have had to been inevitably much lighter as they were carried farther. Whether by conquest, marriage, alliance or agreement, one of the key aspects of Aztec Triple Alliance policy would have been to procure towns that supplied local porters and friendly support (Hassig 1988).

So journey length mattered. Porters on long-distance commerce expeditions were probably more lightly laden than those porters making shorter trips. They could probably have purchased provisions along the way with cacao or other currency (Chapman 1957).

Local journey loads might have been very heavy - up to 150 lb. (68 kg). In some areas, a feeder line of local heavily laden porters might funnel bulk goods into

waterborne canoe zones where still heavier loads could be laded to cities, greatly augmenting the original lift of the porters. The local tlamemes of each town or city could have shuttled goods in a relay down the line from town to town, rather than cover the entire journey with the bulk goods.

Since both heavily and lightly laden porters were probably used, it might help to average both to get a general figure. Taking the low and high end figures, results in an raw averaged figure of the porters moving around 100 lb. (45.55 kg) a day about 23 miles (35 km). But the "friction" of weather, exhaustion, relief changes, and pure inertia would probably lower this average. There is also extensive Old World data from historical rates of long marches in pre-modern campaigns, it might be safer to arrive at a more cautious, sustainable, overall average of about 24 km. (15 miles) a day carrying 27 kg. (60 lbs) (Engels 1978, Hassig 1992).

But the question still remains, were bulk food commodities hauled long distances using these methods, or was long range commerce mostly in lighter luxury commodities?

III. ANALYSIS

Introduction:

The tribute list of the Aztec Triple Alliance provides insight into the economy and structure of the transport system. Further, it provides enough data to test the correlation between quantity of bulk foodstuffs hauled by porter caravans, and the distance traveled to the Alliance capitals. The tribute list provides exact quantities of bulk foodstuffs in the indigenous denomination of "bins" delivered. (There is some debate as to exact bin size, but the unit is consistently used). The tribute list also provides the name and relative location of each provincial capital that furnished items as tribute, and thus yields accurate distances to the destinations of tribute, the capitals of the Triple Alliance.

The question will be examined whether porter caravans carried bulk foodstuffs great distances. A comparison of the quantities of bulk foodstuff items with the distances traversed will reveal whether there is any correlation between bulk foodstuffs hauled and shorter, regional journeys. Since tribute was a form of coerced traffic that cost very little to its recipients, it seems logical to infer that if food was not used in tribute collection, it was not used in long distance commerce. Was it possible the porter caravans were able to overcome the logistical leash of supplying columns across great distances, or were they tied to the inertia of local bulk transport?

The Tribute List of the Triple Alliance

To examine the transport of bulk and luxury goods versus distance, it is useful to look at some hard data of what was actually hauled by porters in the Triple Alliance.

The Tribute list of the Triple Alliance is derived from a detailed document, The *Matricula de Tributos*, originally composed sometime around 1511 or 1512. It was probably later recompiled for Cortes and the Spanish Crown as an ongoing inventory of the captured wealth. The remnants of the original are in the National Museum of Mexico, and parts of several copies were also made in later centuries. Though written in a partially European format it still retains the original *Nahuatl* names of the towns and provinces of the Aztec Triple Alliance, and with them the items each provincial capitals were responsible to deliver to Tenochtitlan. Later it was partially incorporated into the *Codex Mendoza* (Barlow 1949).

The *Matricula de Tributos* provides a clear insight into the structure and layout of the realm of the Triple Alliance. There are myriad kinds of tribute defined, falling mainly into three categories. First there are bulk foodstuff items such as maize, beans, *huatla* (amaranth), and *chia* (sage). This tribute was measured in bins, or *troxes*, conservatively estimated at three metric tons per bin, although the actual exact dimensions of the bins are debatable. Drennan (1984a), notes that the upper range is as much as 100 metric tons. Regardless of scale, the bin was a standard measure in the tribute list. Secondly, there were numerous luxury commodities, with varying measurements. These included quetzal, macaw, and hummingbird feathers; shells, jaguar and other pelts, gold, silver, copper, raw cotton and especially cacao beans. Indeed cacao beans were a staple currency as well as stimulant in the Mesoamerican world. Finally there are a wide range of manufactures ranging from ceramics, to copper axes, to jewelry, to baskets and *petacalli* backpacks. (Barlow 1949). Although the *Matricula* is only a

slice of the Mesoamerican economy it documents a complex system. Taken as a whole, it would be truly difficult to overestimate the complexity and diversity of the Mesoamerican tribute and commercial system.

The names of many if not most of the towns coincide with modern known cities and towns of Mexico, and most others have been incorporated into the modern toponomy. For example, Cuernavaca was *Quahnahuac*, modern Oaxaca was the garrison town of *Huicacac* , Toluca was *Tuluca*, Chalco and Cholua were of the same names. So the near exact locations of 38 provincial capital towns giving tribute can be fixed. The rest have been pieced together over the years by researchers and travelers. Piecing the locations together Barlow (1949) put together a map that corresponds to the original tribute list. There is thus a relatively reliable way to measure the relative correlation of the bulk commodity transported versus distance to delivery.

Analysis of Bulk versus Distance

At the heart of the matter are the ranges versus capacities and efficiencies of goods carried on the backs of porters. The assertion by many (e.g. Drennan 1984a) has been that porter traffic was simply too inefficient for bulk long-distance trade, thus limiting such long distance commerce to precious and lighter luxury goods. Porter transport would have effectively hobbled the transportation net and thus expansion of commerce.

A digital map in ArcMap 8.2 was compiled using a base of relief and drainage (ESRI Digital Atlas 2000 Albers projection) and Barlow's (1949) map of the tribute list of the Triple Alliance. Locations of the tributary provincial capitals were plotted on the map, using the latitudes and longitudes from the Barlow map. The locations were cross-

checked with those of modern towns as a control. These provincial capitals were the collection points from which tribute was hauled to the Triple Alliance capitals in the Valley of Mexico from the provinces.

A correlation coefficient was derived from two measurable criteria of the tribute list: the straight-line distance hauled versus amount of bulk foodstuffs hauled by porters. The straight-line distance to *Tenochtitlan* was measured in kilometers. The bulk amounts of foodstuffs were measured in metric tons, derived from the bins used as measurement for the tribute collection. The question was asked, is there a correlation between longer distances and bulk foodstuffs? Were less bulk foodstuffs hauled as distance increased?

There are two possible theories the data could correlate with. First there is Kelly's (2000) and others assertion that even bulk goods can be hauled long distances using a chain of porters in a "down the line" effect to offset distance. The expected result for this line of thought would be either a positive or no correlation between greater distances carried and the bulk amount. This argument holds that distance did not greatly limit the porter system form hauling goods.

Second, the other possibility was the assertion by Drennan (1984a) and others that round trip distances of greater than 275 kilometers were energetically wasteful and inefficient, and thus not employed in hauling bulk low value commodities such as maize and beans.

The two viewpoints are important because they define the potential volume and range of hauling for tribute, trade and long range commerce. It is important to note that since tribute was coerced and not a cost to its recipients, then tribute was not totally subject to efficiency. This is because the cost of delivering tribute was borne by the tributary province. Although there could be other factors, if bulk goods were not hauled

for long distances as tribute, then it is highly unlikely they were hauled long distance for commerce.

If distance was a strong limiting factor in hauling bulk foodstuffs then most Mesoamerican bulk trade was *endogenic*, local and inward looking towards numerous local centers. Long distance commerce would have been limited to luxury commodities and manufactured goods. Indeed this argument has been made that places like the Valley of Mexico were largely self-contained central place networks with small hinterlands (Santley 1991).

Conversely, if distance could be mitigated based on local support systems and efficient chains of porters, then much more complex *exogenic* commerce of bulk goods could have existed.

The results were intriguing with some caveats, (please see Table 2). The correlation coefficient of bulk foodstuffs to distance was negative – with a value of -.41. This means that the amount of bulk foodstuffs hauled clearly declined as distance of the tributary capitals increased from the destination of the Triple Alliance capitals. A test of the slope of the regression line revealed a significance of less that .01, indicating high significance.

When the towns were plotted on a chart by bulk and distance, three distinct clusters emerged (see Table 3). One cluster consists of bulk goods taken as tribute from less than 100 km. A second cluster is of two very close towns that gave 36 bins. The rest were clustered at longer distances up to 800 km that gave only luxury commodities or manufactured goods as tribute.

Nearly all tributary-capital towns that were more than 100 km away from the Valley of Mexico had no bulk foodstuffs transported as tribute. Tributary towns that were 100 km or less had an average of 12 metric tons – or the mean average – of bulk

Table 2 : TRIBUTE: BULK FOODSTUFFS VS DISTANCE FROM TENOCHTITLAN

Control ID#	Province Capitol	Distance Km from Tenochtitlan	Metric Tons Foodstuffs
26	CHALCO	33.00	36
3	TOLUCA	51.00	36
4	QUANAHUAC	52.00	12
8	TEPECQUACUILCO	110.00	12
11	OCUILAN	80.00	12
12	MALINALCO	89.00	12
13	QUAHUACAN	10.00	12
14	XOCOTITLAN	65.00	12
15	ATOTONILCO	75.00	12
16	QUAHTITLAN	38.00	12
17	XILOTEPEC	67.00	12
18	AXOCOPAN	81.00	12
19	HUEYPUCTLA	66.00	12
25	ACOLHUACA	29.00	12
28	HUAXTEPEC	55.00	12
36	TEPEACAC	128.00	12
41	COYOLAPAN	363.00	12
42	PETLACALCO	1.00	12
10	TLACHCO	394.00	6
20	OXITIPAN	261.00	3
1	TLATELOCO	1.00	1
2	TACUBA	0.50	0
6	CIHUATLAN	590.00	0
21	CTZICOIC	213.00	0
22	TUCHPA	258.00	0
23	ATLAN	198.00	0
24	TLAPACOYAN	173.00	0
29	TLALCOCAUHITLAN	160.00	0
30	QUIAUHTEOPAN	171.00	0
31	TLATLAUHQITEPEC	180.00	0
32	QUAHTOCHCO	236.00	0
33	CUETLAXTLAN	300.00	0
34	TOCHTEPEC	360.00	0
35	XOCHONOSCO	884.00	0
37	YOALTEPEC	197.00	0
38	TLAPAN	185.00	0
39	TLACHQUIAUCO	287.00	0
40	COAYXTLAHUACA	260.00	0
	CORRELATION COEFFICIENT OF DISTANCE VS BULK	**-0.45**	

foodstuffs. (It is possible though unproved that 12 bins were some sort of imposed standard). Furthermore, a very few tribute towns that were very close to Tenochtitlan—Toluca and Chalco -- gave 36 metric tons, the largest amounts in bulk foodstuffs as tribute. This distribution strongly suggests that there was a zone around the Valley of Mexico where it was both feasible and useful to haul foodstuffs into the capital, and this zone was as far as 100 km, but not much more.

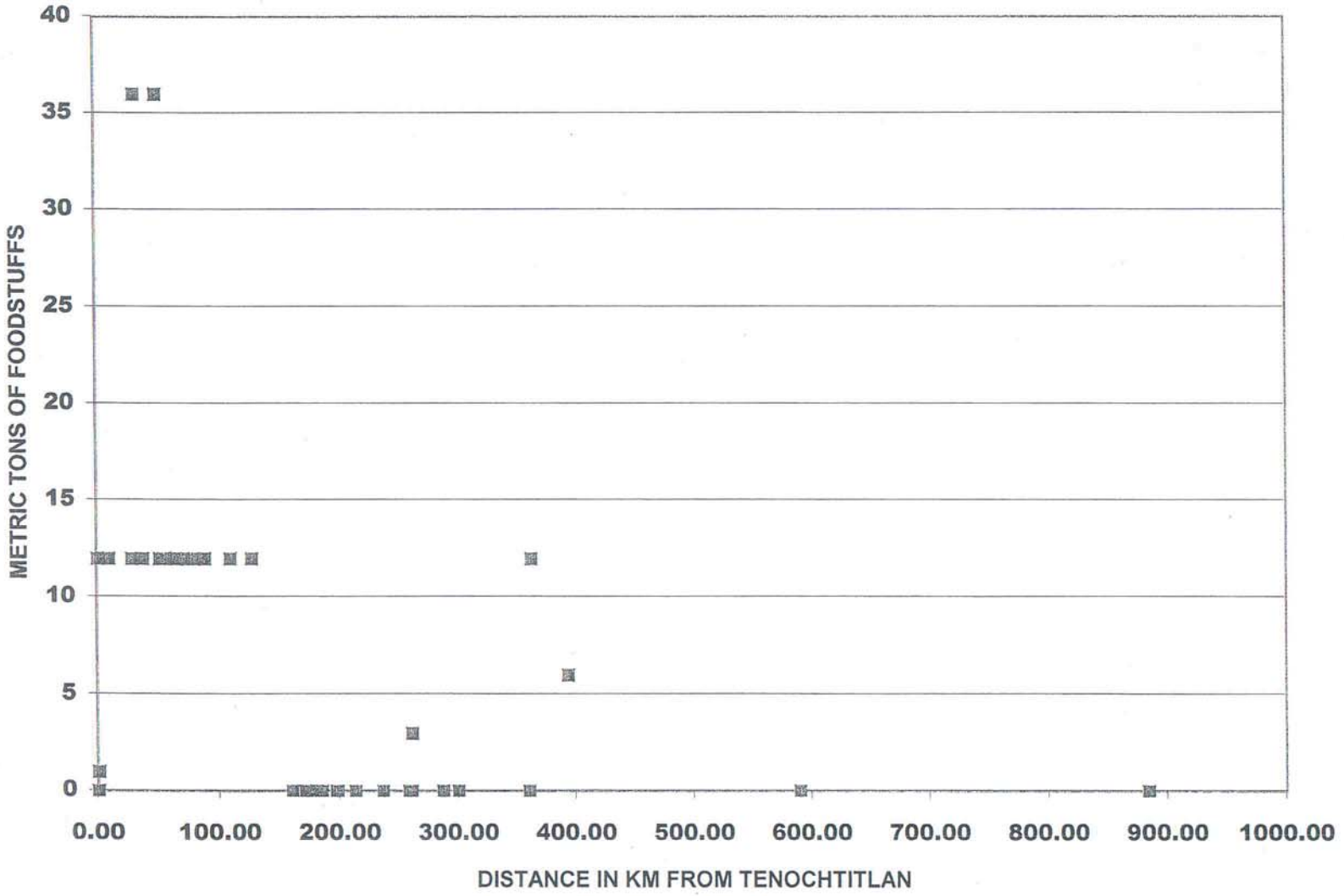
The existence of such a zone might mean that demands in the urban core of Tenochtitlan and the Valley of Mexico made hauling bulk foodstuffs necessary and feasible over shorter distances. Luxury commodities and manufactures were clearly valuable enough to haul great distances, but bulk foodstuffs were not.

Finally, there was a very large cluster of towns – nearly one half – that gave no bulk foodstuff tribute at all, and nearly all of these were 200 km or more distant from Tenochtitlan. These towns gave manufactures and luxury commodities as tribute (Barlow 1949). So a pattern emerges of luxury commodities hauled long distances, and bulk foodstuffs hauled at distances less that 100 km.

Several caveats must be noted that could affect the data. The distances measured were not precise due to several factors. While there were often dozens of towns in each province, only data for the provincial capital was available. The exact locations of provincial capitals were probably off by a few kilometers. There may have also been sufficient trade or commerce regionally to feed Tenochtitlan without collecting food as tribute (Santley 1991).

The actual size of the bulk foodstuffs bins has been debated, with Drennan's (1984a) more conservative estimate – three metric tons – the one being used in this test. If the bin can be shown to have been bigger – i.e. twenty or more metric tons – the bulk foodstuff traffic was considerably more vast than here shown. But, regardless of bin

Table 3: BULK FOODSTUFFS VERSUS DISTANCE FROM TENOCHTITLAN ON THE TRIPLE ALLIANCE TRIBUTE LIST COLLECTED FROM PROVINCIAL CAPITALS



estimate used, the numbers and thus the ratios are the same, as the bin was used as standard measure for all tribute listed on the tribute lists.

The relative resistance due to relief was not factored in, although this could be estimated. A good estimate is the distance on the ground may have been as much as twice the straight-line distance. Indeed this would be a fruitful area of future study—to do a cost distance analysis model in ArcGIS using rasters of elevation and vegetation to estimate truer difficulties of transport.

Further, cultural, military, or other economic factors, may have affected the distribution of bulk tribute goods collected. For example luxury goods such as cacao beans, feathers or gold may have been used to purchase foods in other commerce not recorded. Tribute may have been levied as punitive damage for revolt rather than practical considerations.

The cases of Toluca and Chalco, the two cities that gave the most tribute --36 bins -- are particularly instructive. Both were located in rich agricultural valleys that were well watered, populated, and quite close to the core cities of the Triple Alliance. Both were also conquered in a series of long and brutal campaigns, and were both pillaged and resettled a generation earlier than 1519. Chalco fought for decades to stem Triple Alliance advances, and Toluca was on the border of the Tarascan State and the area revolted frequently (Brundage 1972).

Another interesting case was *Coyolapan*, which was outside the inner 100-km ring of bulk tribute, but gave 12 bins as tribute. But on closer inspection, the town was located very near (less than 10 km) a major Triple Alliance garrison city -- *Uaxyacac* – modern Oaxaca, which watched over the recently conquered *Zapotecs* (Brundage 1972). It is entirely possible that this bulk tribute went to feed the garrison, or support its convoy communications with the Valley of Mexico.

Conclusion: Limits of Bulk Foodstuffs

There seems to be a strong indication in the tribute list that bulk foodstuffs moved locally, with luxury commodities hauled greater distances. Caution must be exercised factoring out political and cultural factors. Nevertheless, the correlation is highly suggestive. The three major clusters are too distinct, and separated by great distance factors, to be explained by any margin of error. A conclusion that can be reached is that there was an outside logistical limit to effective porter travel with bulk foodstuffs, and that a tribute zone existed closely around the Valley of Mexico that funneled some bulk foodstuffs into it. Bulk foodstuffs were being hauled relatively locally, though luxury commodities were moving great distances. As mentioned before, this may tie into heavily laden bulk traffic, and lighter laden long distance traffic. This could indicate porter transport was very closely tied to support systems along the way.

IV. CONCLUSION

The Triple Alliance, Commerce, and Porters

With a demand at the "point of initiation" (Vance 1970) in the Valley of Mexico, the Triple Alliance expanded as far and as fast as it could toward sources of luxury raw materials and precious commodities, within the constraints of porter transport. The peculiar needs of the porter system of the Triple Alliance explain the lack of a network of paved roads in the Mesoamerican world. It also helps to account for the patchwork irregular shape of the Triple Alliance.

To the north of the Triple Alliance the *Tarascan* state, the *Chichimeca*, and arid deserts hemmed in any expansion. But to the south and southeast more valued commodities could be reached along easier routes. Expansion of the Aztec Triple Alliance was in the direction of easiest access to those valued commodities, under the direction of the *pochteca* for procurement (for the benefit of the elites of the Triple Alliance). Routes of easiest access to luxury goods under the constraints of the porter system defined the shape of the hegemonic Triple Alliance. The interaction of the mountainous and divided lands connected by porters, constrained by very real human limitations of a day's journey, defined the shape of the Triple Alliance.

A form of Aztec mercantile commerce existed separate from the Triple Alliance expanding out from a point of initiation. However the mercantile expansion was constrained by porter-borne lift, in the inability to project lift without local support and porters. Rather than "trade following the flag", in Mesoamerica commerce preceded the banners of the Triple Alliance armies. Indeed many of the military campaigns were

possibly designed to open access to commerce to distant coveted commodities. Often declarations of war followed interruption of the porter caravans.

A dendritic network, ending in "gateway communities" – colonies and especially enclaves - extended out towards commodity sources (Hirth 1978, Burghardt 1971). Rather than being planned out, routes seem to have grown up organically between the towns and cities they serviced. In Mesoamerica routes ran through and along towns, cities and densely populated areas rather than directly between them. This is an important distinction.

The limitations and advantages of the porter system determined the shape and extent of the Aztec Triple Alliance, along with the local trade and long distance commerce it rested upon. Since the higher averaged range and lift of porter lift was about 37 km (23 miles) carrying 45.5 Kg. (100 lbs) per man, for about 10 days or less, there was a limit to bulk commodity movement. This logistical leash of diminishing returns could not be exceeded, except in a few areas where waterborne lift existed. However there were no such limitations on hauling luxury commodities, even in bulk, except that of enforcing open routes. The real cap on bulk transport was porter transport, not the presence of paved roads. A way to think of it is if the cost of the porter's rations exceeded his loads' value, then distance would make bulk wasteful and expensive.

Something kept the triple Alliance from building better roads. Aztec leadership and pochteca were quite capable of building a centralized road system, but it was probably not necessary for the business of obtaining commodities. Expansion by war, in general, led to dislocation of the existing routes, though it extended tributary control of the Triple Alliance. The existing trail based commerce and tribute collected was good enough to maintain the noble *pilli*, *teuctli*, and military, in luxury goods. Roads were not

necessary to collect it. Nor was creation of large administration and expensive bureaucracy needed to maintain foot trails, while it was for paved roads.

Several courses of further study opened up from the analysis. One was the long-range transport of luxury commodities, especially such as cacao, which was used as currency in both Maya and Aztec culture areas. Much of the cacao harvested in Mesoamerica was far beyond the border of the Triple Alliance. Further, of that harvested outside of the Aztec world a small fraction- perhaps 5 percent was taken as tribute, and the rest traded in commerce or consumed (Bergman 1968).

Another option would be to plot commodities by types, and number of loads. A potential problem would be that many different commodities were not mentioned in porter-loads, or *cargas* (Barlow 1949). Another course of study would be to measure the relief resistance of tributary porter journeys, in addition to simple straight-line distances.

Today we tend to think of roads as direct means of connecting towns that are planned and laid out for maximum efficiency. But Aztec and Mesoamerican roads, with few exceptions were simply series of continuous interwoven tracks that flowed through the population zones. The routes and tracks that existed outside of major population centers were chosen for easy access by porter-borne transport. Routes were hooked on to waterborne transit wherever possible. The routes did not need to be wide and paved for the needs of caravans of porters carrying on trade or long distance commerce. Indeed the local rulers and powers may have done whatever possible to resist construction of such efficient means of entering their territories -- wide roads mean the efficient movement of large armies (Hassig 1991, Hirth 1991). Those areas outside the highways and waterways of the Valley of Mexico were thus less integrated into the Triple Alliance realm. For their part the Mexica of the Triple Alliance never seem to have forcibly constructed good roads. This ties into the hegemonic nature of the Triple Alliance.

What was very planned and regimented in the route system was the support network of allied or subject tributaries that provided porters, shelter, and cultivated lands that supported the *tlamemes* as they hauled goods. The Triple Alliance certainly constructed forts, colonies, and garrisons in places as far away as *Toluca*, *Otzuma*, *Xichilango*, and near *Cempoala*. And they certainly had big armies to move, feed and supply. Perhaps alliances and roundabout routes of local support were in some way more efficient than straight roads, and easier to maintain.

One tends to think of greater trade and wealth as leading to a progression of greater and more centralized polities, linked by more efficient transport, but this is not always the case (Hassig 1991). The presence of *pochteca* with their own commercial agenda, operating outside the bounds of the Triple Alliance, may have inhibited political centralization. The *pochteca* connection to *Tlateloco*, a former rival of *Tenochtitlan*, could certainly have encouraged them to slow the rate of the Triple Alliance expansion rather than to have always aided it.

Routes and corridors of friendly towns, colonies and garrisons were maintained to gain and keep access to prized luxury commodities. These were subject to the constraints of the porter convoys ability to reach, and followed chains of friendly resupply and local support systems. The logistical porter leash also limited the number of distant larger city-states that could be conquered. This made alliances with locals on the ground, facilitated by marriages and commerce agreements, very important.

As Hassig notes, the hegemonic meritocratic systems of the Triple Alliance (and its predecessors *Tollan* and *Teotihuacan*) allowed them to expand farther than local based, central place modeled, tribute collection aristocratic systems based on kinship, lineages, and allied chiefdoms. However, aristocratic elite territorial city-states often blocked routes to desired goods, and further shaped routes of porter transport. These

local territorial states themselves could not project force or commerce along as great distances as did the Triple Alliance and *pochteca*. But many of the territorial, aristocratic states were difficult to absorb, conquer or integrate. This was also partially due to the difficulties of projection of force and commerce inherent in the porter system. Large-scale commerce, and large enough armies, could not be supplied long enough to totally pacify and absorb local aristocratic statelets such as the *Zapotecs*, *Mixtecs* or various Maya kingdoms. The absence of wide extensive complete road systems on the ground reflects this inability to project force and totally dominate those statelets. Other solutions had to be found. The Triple Alliance utilization of numerous patchwork quilts of alliances and marriages helped create its irregular shape.

The shape of the Triple Alliance thus reflects the commercial expansion of the pochteca toward valued commodities, acquired for the demands of a growing elite, subject to the limiting obstructions posed by local polities, and most certainly by a hegemonic empire supported on the shoulders of porter transport.

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