

Chapter 5

The cascading divisions effect and salient level in the collapse of states

In Chapter 3, I defined a mechanical state as having a population that is uniform in culture or ethnicity, as opposed to empires composed of distinct, pre-existing groups that have been conquered or otherwise incorporated into the state. An empire is built up of formerly independent units which are typically in part preserved as the lower levels of the larger state hierarchy of control (Doyle 1986; D'Altroy 1992). A mechanical state, on the other hand, is divided up into a structurally similar hierarchy for purposes of administration and control, but the divisions are more arbitrary and arranged for efficiency, convenience, or other reasons not necessarily related to any fundamental social boundaries among the individual members of the state. To the extent that a mechanical state's hierarchical structure follows kinship or other real social divisions among the population, these lines still trace relatively subtle group differences compared to the established ethnic or political boundaries along which an empire typically splits its hierarchy.

When an empire or state collapses, it breaks up into smaller social units (Tainter 1988; Kaufmann 1988). The process of collapse might start for any reason, but in the scenario of interest here, the root causes eventually bring about the critical symptom, which is a breakdown of control, communication, and social connections between some high hierarchical level of the administration of the empire and the next lower level. As the elites at the top of a segment of the administrative hierarchy separate from the superstructure of the hierarchy, their social sphere contracts both through the loss of relations with the individuals formerly above them and through the loss of lateral relations with elites at their own level that were effected through shared

contacts with higher officials. The social sphere size effect predicts that these diminished social spheres will tend to subdivide such that the equilibrium group number remains constant. This process feeds on itself, progressively cutting off smaller and smaller pieces of the hierarchy, in what I called the cascading divisions effect (Chapter 4).

Yet this cascading process does not go on indefinitely. In the case of empires, the subdividing typically stops at a point that preserves the units that were originally incorporated into the empire and partially maintained within the administrative hierarchy, or combinations of them (see Yoffee 1988:11,15; Simon 1965). This point might be called the "salient level" of the hierarchy: the level at which the shrinking social spheres attain sizes that are maintained through processes independent of the former state. In a collapsing empire, the salient level will tend to be that at which each social sphere includes a traditional ethnic or political unit and such of its neighbors as the human geography and traditions of communication, travel, and exchange bring into contact with it. Unless the empire has succeeded in moving large numbers of people, changing preexisting group affiliations through ideological or political manipulations, or altering traditions or technologies such that natural lines of social contact are affected, the resulting social spheres and the groups within them will tend to be similar or identical to those that formed independently prior to the empire's growth.

The salient level for a collapsing mechanical state will be at a smaller social sphere size, because as the cascading process advances in a collapsing mechanical state, the resulting groups are not based on natural, preexisting divisions that correspond to traditional allegiances and practical considerations. Instead, they are relatively arbitrary divisions that were established for the convenience of the state and

maintained by the state control structure that is no longer present. The cascading process may not encounter independent factors that maintain the size of social spheres until it reaches the level of restricted geographic areas that include just a few individual towns, large kin groups, or perhaps topographic or micro-ecological zones. These will be social spheres in which groups are defined by factors that are independent of state policies and do not refer to pre-existing group traditions or cultural differences, since neither were significant aspects of the recent past of the members of the defunct mechanical state. If the officials of the former state hierarchy are sufficiently discredited or irrelevant, then the salient level may represent simply the overlapping social spheres of the common people, settlement-level leaders, or kin group leaders of each town or lineage, potentially setting the geographical size of the social spheres down to something on the order of a radius of one day's walk, or all the arable terrain visible from the vicinity of the town, or one town plus a single layer of neighboring towns through the terrain of which a stranger may not freely pass.

The salient level specifies the endpoint of the cascading divisions effect, which in turn describes the self-reinforcing structural process of collapse. The cascading divisions effect and the corresponding salient level neither depend upon, nor imply anything about, what initially caused a state to be breaking up. They do, however, assume that the organizational problems first manifested themselves as losses of contact, communication, and control between upper levels of the hierarchy, that is, between large subdivisions of the state joined near the apex of the state hierarchy, rather than between the smaller units joined at lower levels. At a proximate level, this pattern of collapse focusses attention on the upper echelons of the state's nobles, on court politics, structural pressures, and large-scale, fundamental faultlines in the makeup of the state.

The alternative assumption is that the breakup of the state is composed of a series of failures of connections at low levels of the hierarchy, each pruning off a separate branch representing one or a few minimal groups. In such a case, the breakup does not propagate down the hierarchy, but rather accumulates laterally from a series of parallel or analogous, but structurally independent, failures. This "lateral pruning" process is an equally plausible model of state collapse that may apply in some cases, but it requires an additional layer of argument to show why the low level links of the hierarchy should tend to fail at the same time. At a proximate level, the lateral pruning effect suggests local, small scale structural weaknesses that are repeated in region after region, possibly reflecting popular discontent or widespread mismanagement of local resources or officials.

The assumption that the structural failure begins at a high level of the hierarchy means that the applicability of the cascading divisions effect can, at least in theory, be tested against archaeological evidence. The cascading divisions effect is an appropriate model when the state appears to have broken up first into large, regional units. It is inappropriate when the state collapsed through the accumulated loss of small units, which will typically be located around the periphery, since individual minimal groups are unlikely to be able to maintain independence when surrounded by state territory. In the case where the first splits are into large subunits of the state, we should find more cultural uniformity among the minimal groups in each of the resulting regional subunits, since remaining traces of the state regional hierarchies would have facilitated a greater degree of communication and cultural exchange within the regional units during, or perhaps after, the process of collapse. In the case where small units split off one by one, we should find more variability between these

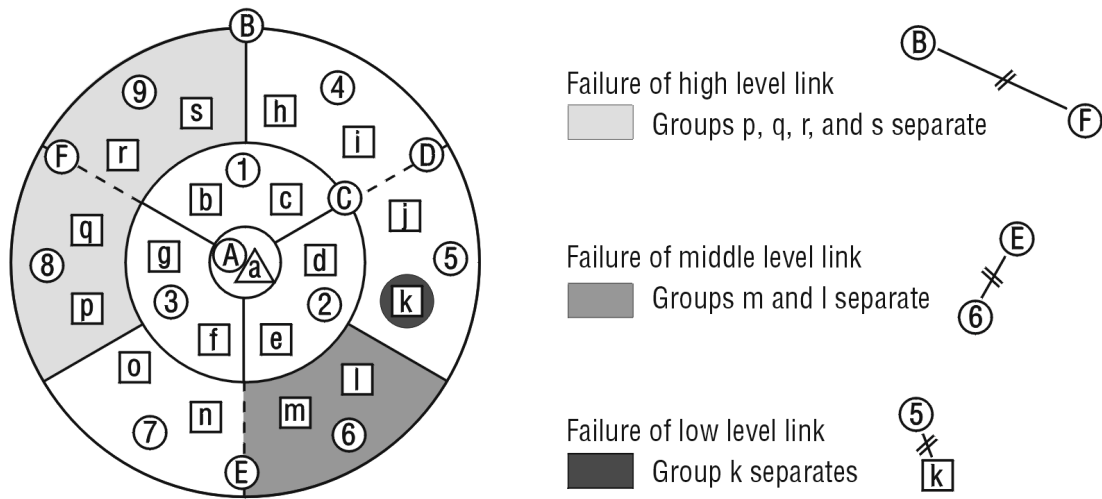
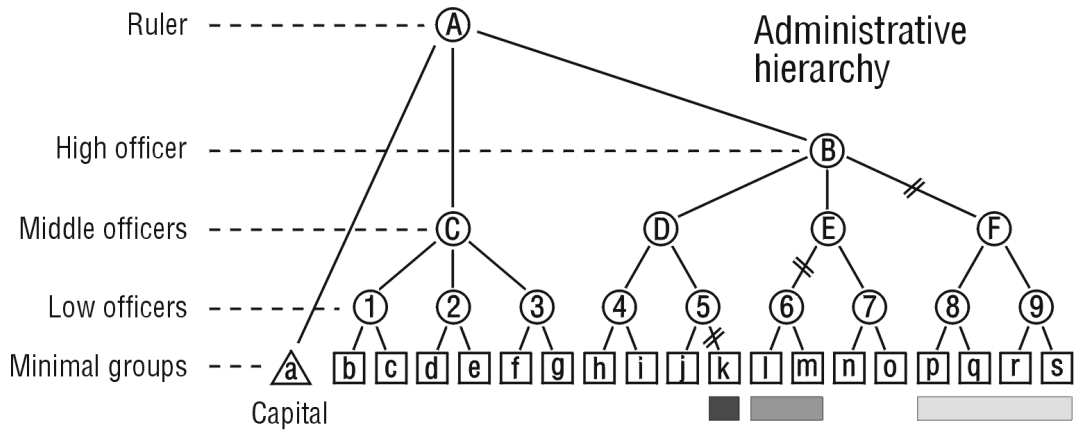
units because they were relatively more isolated from the very beginning of the process.

In addition, when the split begins at a high level of the hierarchy, to the extent that the hierarchy reflected geographical divisions, we should find patterns of similarity in the resulting subunits that are arranged in large contiguous areas, without any necessary pattern relative to the former core; groups that share cultural similarities may be found in areas that extend from more peripheral to more central areas. When the splits accumulate from the periphery inward, groups should be increasingly culturally similar as we look closer to the core, since the outer margins of the state broke off first and had longer to differentiate than did those closer to the center. Rather than large areas of similarity that disregard distance from the core, there should be a concentric pattern not of similarity, but of *degree* of similarity, between the post-state groups. These patterns may be difficult to demonstrate in practice, especially when the collapse occurred rapidly.

Note that the *geographic* sequence of the separation of groups from the collapsing state, whether it proceeds from the geographic periphery inward, the center outward, or along any other spatial-temporal lines, does not directly indicate whether the *organizational* breakdown began near the bottom or the top of the administrative hierarchy. Intuition might initially suggest that when the first groups to separate from the state are geographically peripheral and the process of balkanization moves from the outside inward, the breakdown in the administrative hierarchy likewise started at the bottom and moved upwards towards the highest levels, which are typically associated with sites that are physically located near the state's geographic center. Such an intuition would be incorrect, or at least incomplete without further supporting arguments.

The minimal social groups that make up the state are not at different levels of the control hierarchy; they are nodes at the same level that are joined by a hierarchy of lines of communication and control with higher nodes represented by offices or other decision-making bodies (Figure 5-1). When a single group breaks away from the state, the rupture is at a low level of the administrative hierarchy, regardless of the group's geographic location. When the hierarchy splits at a high level, a large number of groups united below that level separate from the state at once. If the hierarchy reflects geographic divisions, as in many or most cases it probably did, then such a split results in all the groups within some region breaking off from the state at the same time. Even if the region is geographically peripheral, the split still represents a loss of connections high in the administrative hierarchy. What is determinate is not the location of the defecting group or groups, but the number of groups defecting at the same time due to the same break in the hierarchy. The more groups, or perhaps better the more individuals, that are affected, the higher in the hierarchy the failure must have been. In order to evaluate whether the organizational failure began at a high level of the administrative hierarchy and cascaded downwards until reaching the salient level, or began from the bottom and proceeded laterally by pruning branches off the hierarchy one by one, it is necessary to consider either the chronology of the breakup in great detail -- more than can generally be expected of archaeological reconstructions -- or the "regionality" or "discreteness" of variation in the resulting groups, rather than the general geographic progression of the state's breakup.

In fact, it should now be clear that *all* organizational patterns of collapse will tend to manifest themselves as loss of geographically peripheral groups first, and advance inward towards the core, varying principally in the size of the regions defecting at the



Schematic Geography

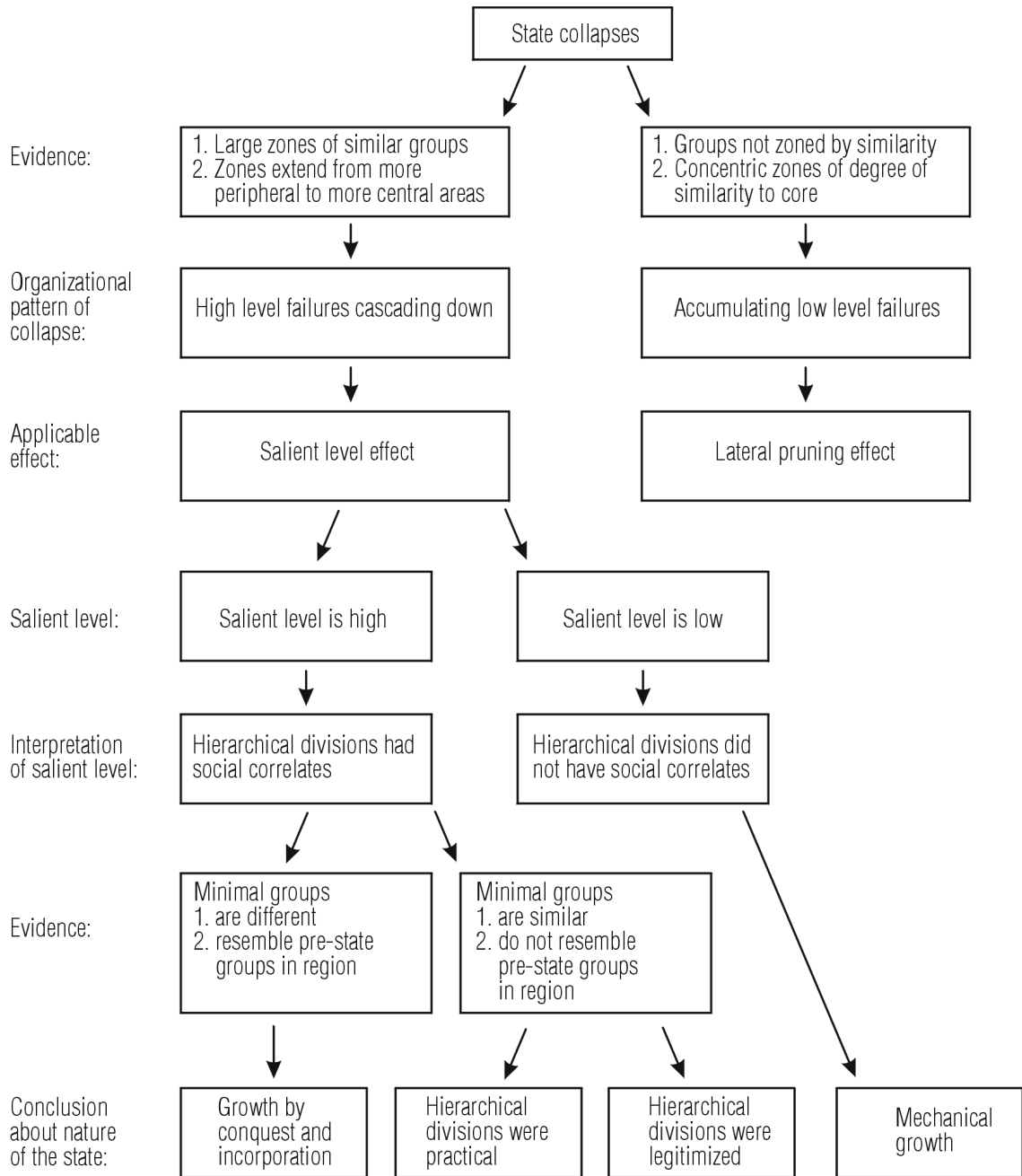
1. Failure of an administrative link at any level can cause geographically peripheral groups to separate from the state.
2. The higher the failure is in the administrative hierarchy, the more groups separate at the same time.

Figure 5-1. Geographic patterns of separation resulting from failure at different administrative levels

same time. Failure of a link at any organizational level can cause one or more groups at any geographical location to split off from the state. However, splinter groups largely or completely surrounded by state territory, that is, towards the geographical center of the state, will tend to be both perceived as more threatening to the state and more vulnerable to military, economic, political, or ideological pressure to reincorporate or not split off in the first place. Geographically peripheral splinter groups will be less dangerous for the state to cede, and more costly for the state to recover. Regardless of the organizational pattern of collapse, then, tendencies for centrally located groups to secede will generally be suppressed, while tendencies for peripheral groups to secede will more often succeed. The spatial process of collapse will always tend to progress from the outside in.

The salient level can be used in reverse, to infer something about the nature of a state from the manner in which it collapsed. If the salient level concept is applicable (the organizational failure began at a high level and cascaded downwards) and if the salient level was low (the state broke up into very small units), then we may be able to infer that it was composed of relatively arbitrary subunits with little to maintain them in the absence of the state. This in turn suggests that the state may have grown mechanically, through population growth, migration, or profound, effective diffusion or indoctrination, rather than by conquest and the incorporation of hierarchies that had already developed in accordance with local needs.

On the other hand, if the salient level concept is applicable and the state broke up into larger, more organized subunits that persisted for a reasonable period of time, then the salient level must have been high, that is, the internal divisions must have corresponded to social groupings that had means of maintenance independent of the



Logical structure of arguments based on salient level effect

Figure 5-2. The logical structure of arguments from the salient level effect.

state. Such a high salient level might imply that the state grew by conquest and maintained the subsumed groups in whole or part as a functioning branch of its hierarchy, but it could also indicate that the state managed to create original internal divisions that were sufficiently practical or ideologically legitimized to survive on their own. Additional evidence would be necessary to distinguish between these possibilities. The groups resulting from the breakup of a conquest empire, for example, might be expected to be relatively culturally homogeneous internally, while differing markedly from each other. The groups resulting from the breakup of a well-structured mechanical state or an empire in which the hierarchy substantially rearranged the preexisting groups might be expected to be more similar to each other in material culture and traditions. The logical structure of these arguments is illustrated in Figure 5-2.

The collapse of Tiwanaku

The collapse of Tiwanaku around AD 1000 was, like its growth, a patchy, variable phenomenon. The monumental core of the city of Tiwanaku was largely abandoned, and burials of modest rank were dug in ceremonial areas that formerly had been inappropriate for tombs (Kolata 1983; Bermann et al. 1989). In the rest of the Tiwanaku valley, settlement dispersed into a proliferation of small, rural sites with no notable size or locational hierarchy (Albarracin and Mathews 1990). Albarracin and Mathews do not note any spatial differences in the Pacajes ceramics of this period that might indicate sub-valley sized groupings, and the implication is that the core of the state dissolved completely down to a limited kinship or small regional level; Graffam (1992) comes to substantially the same conclusion.

The pattern in the larger Titicaca basin is shaded differently by different scholars.

Kolata (1983) describes the former state breaking up into several competing "kingdoms," including the Colla, Lupaqa, and Collagua, that by the end of the Late Intermediate Period were large, powerful polities that resisted Inka conquest. These kingdoms may correspond more or less specifically to the groups that Tiwanaku conquered and subsumed in this region during its period of growth (Stanish 1992; Browman 1992). On the other hand, Graffam (1992) sees these groups, which he names slightly differently and to which he adds a substantial number of additional ethnicities, as similar to those in the Tiwanaku valley in their low level of kinship-based, decentralized organization. He suggests that even by the end of the Late Intermediate Period, these were *allyu* (extended kinship) groups rather than political organizations.

Exchange contacts between people of the southern Titicaca basin and San Pedro de Atacama apparently declined but continued until perhaps AD 1200 (Orellana 1985). Orellana sees this contact as a matter of individual traders, travelers, and pilgrims, rather than consistent connections between distant elites or San Pedro and the Tiwanaku state as such. What became of the Tiwanaku settlements in the Cochabamba area is unknown.

In the middle Osmore valley, the breakup of Tiwanaku at the end of the Chen Chen phase and the beginning of the Tumilaca phase (Figure 1-5) seems to have been a dramatic event. The three-tiered platform mound and room complex at Omo, the only known Tiwanaku ceremonial structure outside the Titicaca basin, was abandoned and either casually looted or intentionally destroyed (Goldstein 1989a,b, 1991). Some of the platforms' finely cut rectangular facing stones were used together with ordinary fieldstones to line Tumilaca phase cylindrical tombs. Chen Chen phase habitation

sites were not only abandoned, but were systematically churned up and reduced to what Moseley, Goldstein, and others have called "pitted stone piles" (Moseley et al. 1991; Goldstein 1989a). This destruction is found only at Chen Chen sites, and seems too thorough, too massive in scale, and too focussed on ordinary habitation areas where little of value is likely to be found to suggest ordinary looting. In fact, at the site of Trapiche, the disturbance stops at a very clear boundary, leaving the corners of a few terraces relatively intact. The impression is almost of a coordinated work project that was abandoned just before completion. Goldstein (1985, 1989a,b) found that the eagle and front-faced deity motifs, two of the premier icons of Tiwanaku, completely dropped out of the decorative repertoire in the Tumulaca phase. Tiwanaku iconography and ideology appear to have fallen from favor. Whether the apparent upheaval in the middle Osmore valley was the cause of Tiwanaku's collapse there or a result of it remains to be seen.

At the same time, canals in the middle valley were abandoned, settlement shifted somewhat away from undefended sites near the irrigated valley bottom and up onto the more defensible hillslopes (Goldstein 1989a,b; Bermann et al. 1989; Moseley et al. 1991). The Tumulaca phase occupation at Omo was protected by a circumvaling wall and ditch, while the Tumulaca phase habitation area at the site of Yaral was located on a high, inaccessible mountain saddle, with vertical terrace walls blocking the steep ravines that give access to the site from the valley. No monumental architecture or obviously central site replaced the Omo of Chen Chen times. Formerly unpopulated areas in the upper valleys were settled and farmed on terraces cut from precarious slopes and watered by long canals (Stanish 1985, 1992a). As we will see in Chapter 6, settlers also moved down to the coastal valley, which, like the upper valleys, had been sparsely, if at all populated during the time of the Tiwanaku state.

Long-distance exchange seems to have dropped off with the collapse of the state. While shell imported from the coast composed over 3% of the weight of faunal remains from Goldstein's (1989a) excavations at Chen Chen phase Omo, they dropped to less than 1% in the Tumilaca phase. Goldstein (1989a) believes that some decorated ceramics in the Omo and Chen Chen phases were imported from the altiplano, while the ceramics of the Tumilaca phase seem to be locally produced. The decline in exchange suggests an associated decline in mobility and long-distance social contacts.

The ceramics of the Tumilaca phase seem to be more variable than those used under the Tiwanaku state. Goldstein (1989a,b; Bermann et al. 1989) notes at least three variants within the middle Osmore valley, which he calls the upper valley focus, middle valley focus, and Maria Cupina-lower valley focus (Pari 1980, 1987; Garcia 1988). This sub-regional variation concords with the decline in exchange to suggest reduced contacts between people living in different parts of the valley, and along with the evidence of emigration to formerly unappealing areas both up and down the drainage, the shift to defensible sites, and the destruction of recently abandoned settlements, tends to imply a division of the middle valley population into several smaller groups and an atmosphere of tension, if not actual conflict, in the vacuum left by the withdrawal of Tiwanaku state administration.

The overall patterning of the events comprising Tiwanaku's collapse in different regions is still unclear, because both the details of the regional processes of collapse and their dating are vague. Albarracin-Jordan and Mathews (1990) cite five calibrated radiocarbon dates that they interpret to suggest that the maximum expansion of the Tiwanaku urban center fell between AD 800 and 1000. They visualize the collapse of

state organization in the Tiwanaku heartland as a gradual process starting after the city's maximum expansion in the later years of the Tiwanaku V style (maybe around AD 900?) and lasting until that style disappeared around AD 1100. Kolata (1983; 1986; 1991) appears to agree with this view, although he consistently cuts off both the Tiwanaku V style and the Tiwanaku state somewhat earlier, around AD 1000. Graffam (1992:885) sees "a rapid disintegration at some point between A.D. 1100 and 1200, when the state fragmented into a number of competing regional polities". Current opinion is divided, then, over whether Tiwanaku's collapse in the altiplano was rapid or gradual, and whether it started as early as AD 900 (or earlier) or as late as perhaps AD 1150 (or even a little later).

The breakdown of the Tiwanaku state in the middle Osmore valley, as described above, was dramatic. Whether the drama was protracted or rapid, however, is still unclear. Goldstein (1989a,b; Bermann et al. 1989) dates the collapse of Tiwanaku near Moquegua to around AD 950, or the end of the Chen Chen phase. He associates the balkanization of the region with the Tumilaca phase, which he places around 900 or AD 950 to about AD 1050. These date estimates are reasonable but somewhat speculative, since they are based on three radiocarbon dates from the multicomponent site of Chen Chen that were published without associated cultural material, and two radiocarbon dates from Goldstein's excavations. Goldstein's Chen Chen phase calibrated date falls at AD 900 \pm 60, as expected, and his Tumilaca phase date calibrates to AD 850 \pm 70, sufficiently early that he suggests the dated post might have been salvaged from a house of the Chen Chen phase and reused. Part, if not most, of the Tumilaca phase represents the post-state occupation of defensible settlements in relatively isolated subregions of the valley, so the process of collapse would have occurred around the beginning of the Tumilaca phase or even immediately before.

Two of PCCT's calibrated radiocarbon dates for the Ilo-Tumilaca style in the coastal Osmore (Appendix C) help verify Goldstein's dating. Both of these dates fall around AD 1000, and with the error terms I estimate that the Ilo-Tumilaca style falls between about AD 950 and 1050. Like the Tumilaca phase in Moquegua, the Ilo-Tumilaca phase seems to be associated with the collapse of the Tiwanaku state and/or the time immediately thereafter, so the actual process of state collapse in the middle valley would have begun either at or shortly before the beginning of the Ilo-Tumilaca style. The only other relevant absolute dates are from the Azapa valley area (Rivera 1978,1985; Berenguer and Dauelsberg 1989). Unfortunately, some of the Azapa area dates both for this and other periods are confusing, and I suspect that their cultural affiliations are problematic. For present purposes, I prefer to leave the Azapa dates in abeyance.

All the estimated starting and ending dates for these time periods and styles are only reasonable guesses based on very few radiocarbon dates, and may well have to be adjusted by as much as 50 or 100 years in either direction when more data are available. Even without such adjustments, the uncertainty in the dating allows for all three possible interpretations of the geographic sequence of Tiwanaku's collapse, at least in respect to the middle Osmore area. First, the Tiwanaku administrative structure in the middle Osmore valley could have begun to break down while the altiplano core of the state was still intact, if not perhaps robust. Second, the entire state could have fallen apart more or less at the same time. Third, perhaps least likely but still possible, the state could have begun to break down in the altiplano slightly before the middle Osmore region split up. In short, whatever the other strengths of Berenguer and Dauelsberg's (1989) reconstruction of popular uprisings in the

periphery, the absolute chronology is still too vague to show that the collapse actually began in the geographic periphery of Tiwanaku.

Fortunately, we saw above that the geographic patterning of a state's collapse is not particularly tied to the patterning of the breakdown of its organization. Even without consulting the data, one can suggest that Berenguer and Dauelsberg (1989) are probably correct in the geographic aspect of their reconstruction, simply because any pattern of organizational collapse will tend to manifest itself in that way.

A more fruitful line of inquiry concerns the level in Tiwanaku's administrative hierarchy at which the breakdown began, and the process of its multiplication into full-blown collapse. According to the discussion above, if the initial failure of communication and control was relatively high in the administrative hierarchy, then two conditions should be met. One, the post-state minimal groups should be arrayed in large geographical zones of relatively similar culture. Two, these zones should be unconstrained in their location relative to the core, that is, they may extend from more to less peripheral areas (Figure 5-2).

Graffam (1992) illustrates the areas in the altiplano occupied by named ethnicities after the dissolution of Tiwanaku. Four of these areas, including the Pacaq area of which the Tiwanaku valley is a part, are over 250 km from one extreme to the other, and one is twice that. Since some or all of these areas comprised dispersed small settlements organized only on a kinship basis that presumably could not extend across such large areas (Graffam 1992; Kolata 1983; Albarracin-Jordan and Mathews 1990), it is reasonable to suggest that they represent large zones of cultural similarity encompassing multiple small groups, as specified in condition one. The middle Osmore valley represents another such zone, encompassing at least three groups

marked by their distinguishable but extremely similar variants of the Tumilaca pottery style. Each of these large zones can be imagined as the product of a relatively high-level failure in the state hierarchy, splitting away from Tiwanaku as a short-lived unit. Minimal groups within these units would have remained at least temporarily more interconnected and homogeneous than groups in different units because of residual formal or informal state hierarchical structures within the zone.

Unfortunately, none of the zones are large enough relative to the state territory and well enough known across their entire area to test for the second condition.

On the other hand, if the collapse was an accumulation of failures that started relatively low in the administrative hierarchy, then two other conditions should be met (Figure 5-2). One, the minimal groups should not be notably patterned in zones of similar culture; two, the minimal groups should be arranged concentricly by *degree* of similarity, such that groups close to the core are more similar to each other and to the core, while groups on the periphery are more variable and different from the core.

The first condition has already been discounted by showing that the minimal groups were zoned by similarity. The second condition does not seem to be met, either. The data are not strong, but among ceramics from relatively widely separated peripheral areas in the middle Osmore Tumilaca phase (Goldstein 1985; 1989a,b) and what I take to be contemporary material from the Azapa (Santoro and Ulloa 1985; Dauelsberg 1985; collections at the Azapa museum) and Arequipa areas (Linares 1989; collections at Universidad Nacional de San Agustín, Arequipa), the variability is not great. Moreover, much of the presumably collapse-era Tiwanaku V material (Albarracín-Jordan and Mathews 1990) from the altiplano is also closely related to the ceramics from these peripheral areas, and most of the design variants in the peripheral

assemblages seem also to be present in the altiplano material. These judgements are subjective, and the patterning is not strong or clear because a relatively small sample of ceramics have been illustrated and much of the material is not precisely dated, but at least the available ceramics do not clearly indicate that the peripheral post-Tiwanaku material is markedly more variable than that found near the core.

In balance, such evidence as there is tends to favor the scenario in which the collapse of Tiwanaku began relatively high in the administrative hierarchy and propagated downward, rather than accumulating from a series of low-level ruptures. More research could clearly be done, but I will use this as a working hypothesis.

Assuming that the organizational collapse did start by splitting off big chunks of the hierarchy that then subdivided further, the salient level may allow us to draw some conclusions about how the state was organized and grew before disaster struck. Specifically, at least in the middle Osmore valley, the Tiwanaku valley, and in Graffam's reconstruction all of the Titicaca area, the salient level appears to have been quite low. A low salient level suggests that there was little to maintain more than small social spheres or more than the lowest levels of the administrative hierarchy other than the power of the state itself. The higher levels of organization and longer distance social ties did not serve enough of a practical or ideological function to persist independently of the state. These larger organizational structures might have been more durable had they been based on pre-existing political units, as in a conquest empire, had they been effectively designed to serve practical needs of the minimal groups they integrated, or had they been sufficiently legitimated in an ideology that survived the state. Instead, the low salient level suggests that the hierarchy was a relatively arbitrary imposition on a relatively homogeneous population, as is the result

of the growth of a mechanical state.

One possible exception to this pattern is the northern Titicaca area, where Kolata (1983) imagines that Tiwanaku broke down into large, organized polities, rather than small, kin-based units. If Kolata is correct, then these large remnants of the state are a strong hint that the collapse did indeed start high up in the administrative hierarchy. If the Lupaqa and Colla, for example, really represent intact fragments of the shattered Tiwanaku state rather than new polities that formed from the smaller units left by a total collapse, then they could only have split off from the state by means of a failure high up in Tiwanaku's hierarchical organization. If these "kingdoms" resulted from high-level failures in the hierarchy, then the smaller fragments in the middle Osmore and the Tiwanaku valley itself could have been products of similar failures. The different outcomes would reflect differences in the forces that acted to maintain the hierarchies and social spheres after they split off from the state. The Lupaqa and Colla hierarchies and social spheres evidently were self-maintaining, possibly because they had developed independently to satisfy local needs and simply had been subsumed into Tiwanaku as it grew like an empire, by conquest or incorporation, in the northern Titicaca area. The smaller, less organized post-collapse groups of the middle Osmore and Tiwanaku valley would have resulted from the cascading divisions effect that followed an initial high-level failure and did not cease until it reached a much lower salient level.

In light of the model proposed so far, the limited evidence is consistent with several conclusions about Tiwanaku and its collapse. First, Tiwanaku grew mechanically in the Tiwanaku valley, middle Osmore, and perhaps other regions, through intrinsic population increase, migration, and possibly some form of diffusion.

In other areas such as the northern Titicaca region, Tiwanaku may have conquered and incorporated smaller, existing states. Second, Tiwanaku's collapse was not an accumulation of small losses around its periphery, but rather the result of one or more failures high in the administrative hierarchy, for which the causes are still unknown. Third, these failures propagated downwards through the hierarchy in the cascading divisions effect until they reached a low salient level in the Tiwanaku valley, the middle Osmore, and probably elsewhere such as the Azapa and Arequipa areas. The salient level may have been much higher in the northern Titicaca area, where large fragments of the Tiwanaku state organization corresponding to the formerly conquered polities may have survived the collapse intact. More research on the collapse of Tiwanaku is desperately needed to evaluate and expand these conclusions. The following chapters will bring more concrete data to bear on the repercussions of Tiwanaku's collapse, especially in the coastal Osmore valley.