

traditional agriculture, central places, and postdisaster urban relocation in Peru¹

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The tendency for people to remain in or return to live in areas which in the aftermath of disaster continue to be dangerous has been documented in numerous cases in widely disparate cultures (Schwimmer 1969; Oliver-Smith 1974; National Academy of Sciences 1970). The insistence of disaster victims on remaining in environments which are overtly threatening has occasionally been interpreted as an example of the nonrational in human behavior, referring to such metaphorical expressions of the man-land relationship as "the maternal roots" and the "native soil" (Zwingmann 1973). In fact, from a psychological standpoint, there seems little doubt that the process of maze-way resynthesis, hypothesized by Wallace (1957) as crucial for survivors in their adjustment to the changes wrought by disaster, would be enhanced by remaining in familiar surroundings. It is not the purpose of this paper to contest the psychological interpretation of what might be termed the "stay-put" syndrome among disaster victims. Causation and explanation of a single phenomenon may derive from numerous sources without necessary contradiction. Rather, this paper is an attempt to show that other factors of a socioeconomic and geographical nature are equally important to an understanding of postdisaster reluctance to relocate. Specifically, we wish to show that central place theory from geography is, with certain qualifications, useful in explaining important problems of postdisaster urban relocation. Further, we wish to show that for our case study in highland Peru, folk perceptions of relocation issues parallel quite closely the basic formulations of central place theory.

In May of 1970, a massive earthquake struck the coast and Andean region of North Central Peru. While incredible damage occurred in the coastal areas, the most catastrophic effects of the earthquake were felt in the Callejon de Huaylas. The center of this devastation was the city of Yungay, which was buried by an immense avalanche loosed from the north peak of Huascarán by the tremors of the earthquake. Yungay, the capital of the province of the same name, was a city of some 4,500 inhabitants, nestled in the curve of a hill which protected it from the landslide from Huascarán that buried the village of Ranrahirca in 1962 (see Figure 1). Immediately after the 1970 disaster, the

In the aftermath of the 1970 earthquake-avalanche disaster in Peru, survivors of the devastated city of Yungay refused to let their city be relocated in a safer area. Research suggests that as well as having strong emotional ties to the site of their destroyed home, the survivors' refusal to relocate demonstrates a rational assessment of the functional prerequisites for urban growth. These folk perceptions of urban settlement parallel closely the basic formulations of central place theory from geography.

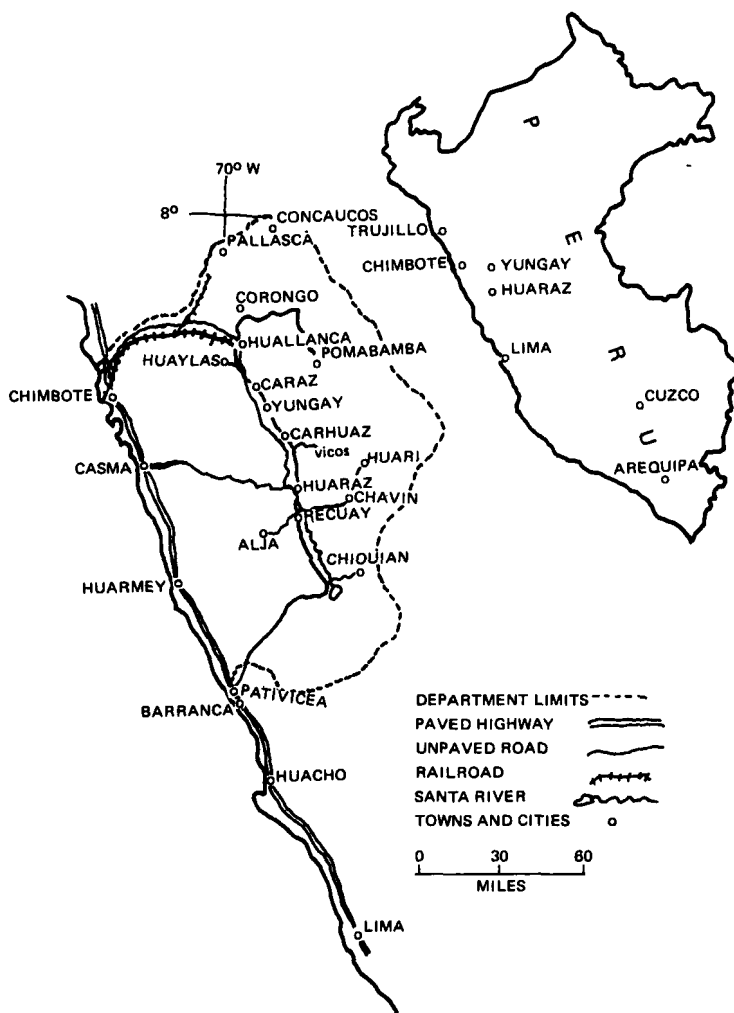


Figure 1. Peru and the department of Ancash (Doughty 1968:frontispiece).

survivors of Yungay City sought shelter in a number of locations that eventually became the sites of four of the major refugee camps of the rehabilitative system which was established in Yungay Province. The four sites were Pashulpampa (later to be called Yungay Norte), Aura, Yungay Sur, and Tingua; all were within a fifteen kilometer radius of each other (see Figure 2). Yungay Norte became the most important of the four camps.

the predisaster situation

Although Yungay was slightly north of the geographic midpoint of the valley, it was traditionally considered to be a central place for the region (see Figure 1). In addition, as the capital of its province, the city was the seat of most of the important institutions of the province. The vast majority of the province's educational, economic, political, and religious institutions were located in the city. The population of the province, indeed of

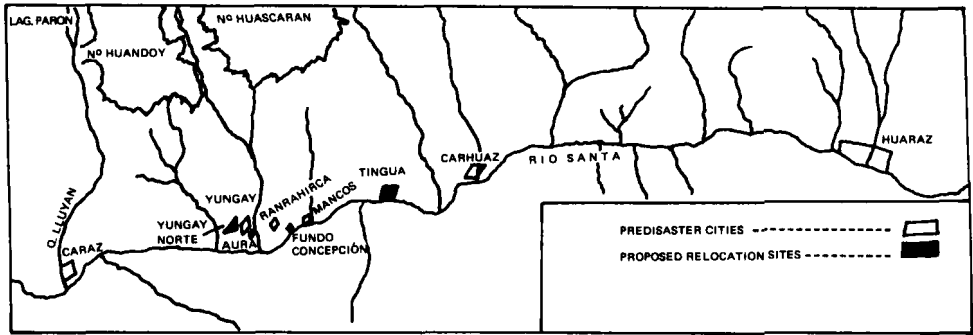


Figure 2. Predisaster cities, refugee encampments, and proposed relocation sites in the Callejon de Huaylas (El Comercio 1970:1).

the entire region, is composed primarily of a small, powerful urban elite, a small urban service and commercial sector, and a vast rural peasant population engaged in traditional agriculture. Thus, the city serviced not only an urban population but was also a regional center for a large rural population. In order to understand fully the nature of Yungay's centrality and its role, particularly in the socioeconomic system of the province, it is necessary to elaborate a bit on the agricultural basis of livelihood of the residents of the area.

Most of the inhabitable land of the province is located in the ecological zones called *quechua* (an arable zone between 2,500-4,000 meters) and *jallca* (natural pasture land above, roughly, 3,500 meters) (Walton 1974:8). Within these zones basically two areas are distinguished ecologically, but they have great sociocultural and economic significance as well. The valley bottom lands and low foothills, known as *campiña*, are relatively rich, and the temperate climate lends itself to the cultivation of a wide variety of crops. Generally speaking, the inhabitants of this zone tend to be indigenous peoples who are relatively more acculturated to the local variety of the national culture of Peru. Except in the valley floor where a small amount of mechanized agriculture is practiced, production techniques are limited on the whole by the ascending slopes, the numerous outcroppings of large rocks, and the small size of landholdings which characterize the *minifundia* type of land tenure typical of the region. The principal tools employed are the foot-plow and the traditional Mediterranean scratch plow drawn by a pair of oxen. Guano fertilizer from the islands off the Peruvian Coast is commercialized by a nationally owned and run company and is used extensively throughout the area. Chemical fertilizers, which are more costly and as yet unproven to subsistence-oriented peasants unable by necessity to take innovative risks, are only recently being introduced. Irrigation is particularly important to valley and foothill agriculture. Crops produced and harvested in the valley and foothill zone include:

Vegetables

corn	beets	lettuce	squash
potatoes	cabbage	turnips	green peppers
wheat	cauliflower	radishes	aji peppers
hops	carrots	tomatoes	rocoto peppers
sweet potatoes	celery	pumpkins	herbs

Fruits

pakay	avocado	peach
chirimoya	papaya	cherry
guava	lime	pear
apple (two varieties)	lemon (two varieties)	orange

The main crops are sown and harvested according to the following schedule:

Month	Crop sown	Crop harvested
January	nothing (heavy rain)	potatoes
February	nothing (heavy rain)	potatoes
March	wheat	potatoes
April	wheat	corn
May	wheat	corn, quinoa (a grain— <i>chenopodium quinoa</i>)
June	wheat, garden vegetables	corn, quinoa
July	potatoes, garden vegetables	olluco (a tuber— <i>ullucus tuberosas losan</i>) oca (a tuber— <i>oxalis crenata</i>)
August	potatoes	wheat
September	potatoes	wheat
October	corn, quinda	wheat, hops
November	corn	wheat, garden vegetables
December	wheat, hops, oca, olluco	potatoes, corn, garden vegetables

While November and December are the main months for harvesting *verduras* ('garden vegetables'), informants report that, in general, sowing these crops can be a year-round practice if sufficient water is available. Such crops are considered to be high-risk/high-profit ventures by valley farmers because they are particularly vulnerable to insects of the area. In addition, in the event of heavy rainfall (which is not unlikely), an entire crop may rot before harvesting. Consequently, as can be seen from the above schedule, the months of heavy rain of January and February are considered to be very risky for sowing any crops. However, once the heavy rains have terminated, it is very common to see the smallest plots of valley farmers dedicated to the cultivation of green vegetables because even a small harvest of lettuce, for example, may bring needed income at almost any time of the year.

In addition to the *campiña*, there is a second zone known as *alturas*, or heights. The people of the *alturas* are, in general, less acculturated to the patterns of the national culture, conserving Indian cultural and linguistic patterns far more than the people of the *campiña*. The crops of the heights tend to be somewhat more limited in number than valley and foothill crops because of high altitudes and lower temperatures. Agricultural techniques are much the same as in the lower region. The crops grown in the *alturas* are as follows:

olluco	broad beans
onions	peas
wheat	hops

mashua (a tuber—*tropaeolum tuberosum*)
 oca
 corn (a recent development)

pumpkins
 flowers (for sale in town)
 potatoes (a number of varieties)

The main crops of the *alturas* are sown and harvested according to the following schedule:

Month	Crop sown	Crop harvested
January	hops	potatoes
February	hops	potatoes
March	wheat	potatoes, quinoa
April	wheat	potatoes
May	wheat, potatoes	oca, olluco
June	wheat, potatoes	corn, oca, olluco
July	potatoes	corn
August	potatoes, oca, olluco	wheat
September	corn, quinoa	wheat, hops
October	corn	wheat, potatoes
November	garden vegetables	wheat, potatoes
December	garden vegetables, flowers	

Land tenure patterns in Yungay are extremely varied, ranging from large *haciendas* ('agricultural estate') to *minifundia*. It is difficult to assess the percentage of peasant private ownership versus other types of land tenancy. Most of the seventy-six communities of the province are described as groups of small landowners, but there are numerous other hamlets too small for political recognition whose inhabitants farm the land of absentee landlords. There are many formal land tenure relationships; the most common are of the sharecropper variety such as *medianero* ('halfer') or *partidario* ('percentager'), according to which the landlord supplies the place of residence, land, seed, and fertilizer, the tenant supplies labor and tools, and they divide the crop equally. The most important other forms include *arrendatario* ('renter'), *mejorero* ('improver'), *chacrate* (one who performs services on an *hacienda* in exchange for land), and *aparcerero* (one who pays the landowner in kind for use of the land).

In addition to the agricultural importance of the region surrounding the old capital, approximately 60 percent of the communities of the entire province were located within a few hours walk of the city. To determine the degree of centrality of the city in the province as a whole, forty-three of the seventy Yungay communities, including a sample of those most distant from the capital, were surveyed after the disaster. The following questions, among others, were asked:

- A. Where else do your children go to school?
- B. Where do you go to church?
- C. Where do you go to market?
- D. With what town do you have the most contact after the disaster?
- E. With what town did you have the most contact before the disaster?
- F. What is the most important town in this area?

Prior to its destruction, then, Yungay had become the overwhelmingly central place for a region, partially through geologic accident. However, Ancash's demise in 1742 does not fully explain the preeminence of Yungay in the nineteenth and twentieth centuries. There still remained two other competing towns. In 1904 Yungay had been named the capital of its newly created province. Why Yungay had been able to achieve such a status is not entirely clear, and there is little information on the matter. It can be conjectured that Yungay achieved dominance because it was the only town in the north end of the valley inhabited by Spaniards during the Colonial era. In 1571 Alonso de Santiago de Valverde, the representative of Viceroy Toledo, founded the city for the Dominican fathers who established a convent there to serve the religious needs of an immense territory, including most of the Callejon de Huaylas as well as vast areas to the east. The three other cities of what eventually became Yungay province, Ancash, Ranrahirca, and Mancos, may have been predominately Indian settlements, perhaps administered to by the Spaniards in Yungay. What is immediately apparent, however, is that one cannot trace Yungay's importance to geographical and demographic factors alone, since all four towns in the area of the present province, and many others in the entire region, had very similar attributes. It is evident that sociopolitical factors were also instrumental in conferring centrality upon Yungay. The city became a power cluster of administrative, religious, educational, political, as well as economic, services for the region encompassing all three cities (and many other towns) and the vast peasant hinterlands. The other cities remained lower-order central places, significant only for their own hinterlands.

the disaster of May 31, 1970

The most destructive earthquake in the history of the Western Hemisphere took place on the afternoon of May 31, 1970, in the coastal and mountain areas of North Central Peru. It registered 7.7 on the Richter scale and covered an area of about 65,000 square kilometers; it took approximately 70,000 lives, injured roughly 50,000 people, and damaged or destroyed an estimated 186,000 buildings or approximately 80 percent of all structures in the zone. The earthquake shook loose a slab of ice and rock about 800 meters wide, at an estimated altitude of between 5,500 and 6,500 meters, from the sheer northwest face of Huascarán, Peru's highest peak. This immense mass, constituting more than 25 million cubic meters of ice, mud, and rock at its source, careened down the Llanganuco Valley at an average velocity of between 217 and 435 kilometers per hour, picking up on its way huge masses of morainal material and hurling literally thousands of boulders, some weighing thousands of tons, down the valley. The momentum of the slide carried it the sixteen kilometers from its origin on Huascarán to the valley floor in four minutes. The avalanche developed three separate lobes as it extended itself over the lower parts of the valley. One of these lobes leapt a protective ridge some 200 meters high and buried, in seconds, the entire town of Yungay. Four minutes after the earthquake had ceased its tremors, there remained only four palm trees where the main plaza had been, some 300 terrified survivors who had escaped by reaching high ground, and an immense expanse of dull grey viscous mud, interrupted by huge boulders which appeared to grow in size as the mud settled around them in the days that followed. The total volume of ice, mud, and rock which descended from Huascarán upon Yungay and other neighboring villages is estimated to be approximately fifty million cubic meters (Erickson, Plafker, and Fernandez Concha 1970:1-12).

the postdisaster situation

Agricultural patterns in general were upset by the disaster. The landslide and

earthquake swept away many of the irrigation canals and outlets; and for this reason, agriculture (in particular that of garden vegetables) was limited. In November of 1970, a full five months after the disaster, more-or-less normal patterns of agriculture began to be reestablished in the majority of the communities. After the disaster each community had undertaken the task of rebuilding its irrigation system, and by November of the same year sufficient water was reaching a good many of the fields. However, many of the good bottom lands of the valley belonging to individuals from the communities close to Yungay were still without irrigation due to the fact that the avalanche had destroyed the main artery of the water supply from the Llanganuco River. The path of the landslide had taken it right over the main system of irrigation canals. Work by peasant farmers under the system known in Yungay as *acción cívica* ('civic action') had commenced shortly after the immediate postdisaster emergency stage of recovery. Irrigation water is the lifeblood of the whole section of Yungay district which is located too high above the Santa River to draw water from it and in between its tributaries, the Llanganuco and the Ancash rivers. This area surrounding the former location of the city of Yungay, now including the refugee camp of Yungay Norte, depended upon the two main arteries of the irrigation system for water for crops. With water, this area represented a kind of breadbasket of Yungay. Without irrigation water, it would be reduced to depending upon winter rain, which would cut its agricultural cycle in half and reduce it to one harvest season a year. When the national aid organization began to fund labor for community reconstruction projects, the two main outlets of the irrigation system were major projects. Both irrigation canals were considered to be top priority projects as much, or more, by urban survivors as by rural agriculturalists. It was fully realized by all that, if Yungay Norte was to survive economically, the system of irrigation outlets and canals had to be reestablished with all haste. Thus, by November of 1970, while neither of the main arteries was as yet functioning, makeshift and temporary canals had been built by peasant labor under civil action to supply the communities with a bare minimum of water for their agricultural necessities. Nonetheless, the agricultural output of the year following the disaster was considerably short of normal production. Peasant informants related that after the disaster, planting was postponed because of the lack of water and because of "nervousness."

The landslide brought about one other important variation in the patterns of agriculture in the province. The total area covered by the landslide of Yungay is approximately twenty square kilometers. While much of that area was taken up by the urban area of Yungay, a considerable portion of it was occupied by dispersed peasant settlements and their agricultural lands. In fact, a total of ten peasant hamlets and their lands were buried by the landslide, thus depriving Yungay of approximately 14 percent of the peasant communities which contributed to the Yungay market. The government of Peru has declared all lands covered by the landslide to be public domain and has forbidden any reclamation efforts by their former owners, thus making permanent this reduction in already scarce agricultural land available to the population. This measure has caused no little dissatisfaction among the survivors of the peasant communities, since they have been deprived of their means of livelihood. To be a peasant deprived of land in Yungay Province is not an enviable state at this, or any, time.

When the Yungay survivors were split into four separate groups within the confines of the province, it soon occasioned more than a little conflict over the distribution of aid which arrived not long after the tragedy. Most of the aid programs which were implemented in the Yungay area faced many difficulties with the badly traumatized population. Aid personnel were virtually unanimous in their assessment of Yungay Norte

as the most problematical place to work. Most of the survivors had taken up residence there, as it was only 700 meters north of the buried city, and, consequently, the population of Yungay Norte had suffered the greatest loss and had undergone the most intense shock and emotional disintegration in the immediate postdisaster situation. In addition, Yungay Norte was soon the target of a wave of migration from the peasant highlands surrounding the area, so that within one year of the disaster, the camp of 300 ragged survivors had grown to a town of almost 2,000 people. However, urban and rural survivors alike faced a continuing ordeal in that the rehabilitative system at that time did not guarantee stability or permanence for the camp. Yungay Norte offered protection from further avalanches from Huascarán on its immediate right and from Huandoy on its left in the form of a 4,000-meter-high Atma Hill. However, the triangular area formed in between the avalanche from Huascarán and the steep-sided canyon from Huandoy was quite reduced, and aid personnel speculated that if the capital of the province were relocated there, it would soon outgrow the safe area and spill over into dangerous zones. Consequently, it was projected by the authorities that the new capital of Yungay would be relocated in the camp called Tingua, some fifteen kilometers to the south.

The reaction to this project was immediate and definite rejection on the part of the urban survivors residing in Yungay Norte. Almost immediately after notification of the plans, hand-painted signs appeared on the road leading into the refugee camp saying, "Yungay Stays Here" and "Yungay is Reborn Here!" Aid personnel attempted to explain, at length, the need for such a step and declared that all services and institutions of old Yungay would be fully reconstituted in the new capital in Tingua, but the Yungainos were not swayed. Yungay Norte was the place where the majority of urban survivors had settled; it was the location of the reconstituted institutions of the capital; and it was close to the original site of the buried city of Yungay. In addition to strong emotional ties to the location close to the old city, Yungaino leaders compiled an impressive list of practical reasons to oppose the move to Tingua, illustrating a sophisticated appreciation of the importance of sociological and economic variables in their lives. The Yungaino leaders reasoned that Yungay Norte would thrive because it was centrally located in the network of peasant villages of the district. These peasant villages were the life force of a town because they provided food as well as a market for commercial people in the town. The peasantry, as a whole, was considered by the urban survivors to be "human capital" in the sense that the city would depend on their labor for reconstruction and maintenance. If the capital were removed to Tingua, it would not be able to call upon this "human capital" because, according to Yungay Norte leaders, the Indian peasants had categorically refused to work for Tingua. In fact, in the postdisaster survey of forty-three peasant communities in the province, thirty-one stated that they maintained most contact with Yungay Norte, and forty-one of forty-three surveyed acknowledged that Yungay Norte was the most important urban settlement in the province. They further reasoned that tourism would continue to be one of Yungay's chief industries, as Yungay was now world-famous since the disaster, and people would come to see the site of the landslide and the famous palm trees that had appeared in all the newspapers and magazines of the world. Tingua was distant from the landslide, while Yungay Norte was only 700 meters away. And, lastly, they argued that Yungay Norte offered a greater extension of land for urban development than Tingua—an argument that was probably erroneous.

The ultimate consequence of this confrontation of the urban survivors and their leaders with the aid personnel was a stalemate and postponement of action and decision which only exacerbated the insecurities of the already deeply traumatized population.

Aid agency authorities were awaiting geological studies made by the University of Strasburg before pronouncing a final word on the relocation decision. For over a year the people of Yungay had been waiting for final word, locked in by the lack of decision of the authorities, "never knowing where they were going or whether it was safe to go to sleep at night."

The significance of this conflict lies in the fact that Yungaino leaders were resisting, with all their effort, a project which in their perception was doomed to failure. Tingua had none of the prerequisites for the support of a traditional urban center. The Tingua location simply did not dispose of as much "capital humano" as did Yungay Norte. Were the capital to be relocated in Tingua, the entire structure of rural-urban relationships would have to be redefined, and urban life would be radically restructured. No longer would the provincial capital be able to call upon peasant resources for their maintenance. The provincial capital would be forced to work out new solutions to the problems of food supply, commercial activity, and local maintenance. "Here there is everything," the residents of Yungay Norte would say, referring to the wide variety of crops grown in the hinterland by the peasants of the district. Community leaders reasoned with certain accuracy that a provincial capital without a rural population to support it would be forced to undergo even more radical change than it had already experienced from the forces of disaster. Relocating the capital in Yungay Norte would minimize the structural readjustments that would have to be made. The Tingua site for the new capital would have disrupted traditional social, economic, and political patterns of interrelationships within the capital as well as between the rural and urban sectors of the society. The Yungaino leaders were determined to avoid this disruptive project at all costs. Thus, their opposition to the relocation of the capital (for reasons of safety) to Tingua was based on a very real and rational appreciation of the structural pillars of their social order as well as deeply felt emotional ties to the site of their destroyed homes and deceased families.

The importance of the peasant population and traditional agriculture in the decision to relocate the provincial capital of Yungay was clearly underestimated by the authorities in charge of the program. The primary motivation on the part of the authorities was to get the population moved to a safe area, out of the way of potential landslides. However, the survivors of the urban area, who were resident in Yungay Norte, were more than aware of the importance of the peasant population and traditional agriculture for the survival of a provincial capital. Their resistance to the attempt to relocate the capital was based primarily on their knowledge that without the peasant labor force and the volume of agricultural produce which the peasant population could supply, a provincial capital in the traditional understanding of the term was clearly impossible. The new capital of the province of Yungay would have to be located within the village network of the bulk of the peasant population. The best place available, according to their values, was Yungay Norte.

central place theory and urban relocation

There are a number of specific issues behind the Yungay-Tingua conflict which are of considerable theoretical as well as applied interest to anthropologists, geographers, and urban planners, particularly those concerned with projects in transitional societies. Most significantly, the Yungay case speaks directly to the nature of urban settlements and their mutually dependent relations with the hinterland. The relocation conflict provides an illuminating example of folk as well as analytical perceptions of dependency. In this context, central place analysis from geography, if properly handled, provides an especially

useful and interesting theoretical framework with which to view the problem of urban relocation in post-disaster Yungay. Furthermore, central place theory is now beginning to be viewed as having considerable relevance to numerous matters of mutual concern to anthropologists and geographers.²

Briefly, central place theory is formulated in terms of the idea of a hierarchy of importance of urban settlements in the analysis of their geographical locations. The hierarchy ranges from lower-order central places providing few services to a series of higher-order central places which provide all the services of the lower order together with a broader spectrum of specialized functions (Wheatley 1972:15). "The chief profession . . . or characteristic . . . of a town is to be the center of a region," according to Christaller, the initial formulator of classical central place theory (as quoted in La Lone n.d.:3). He was particularly concerned with the nature of the relations between the central place and its hinterland, emphasizing the importance of mutual dependency between the two. In its briefest possible expression, the central place is dependent on the hinterland for agricultural goods, while the hinterland relies on the central place primarily for services and manufactured goods. Furthermore, the size of a central place (or city), in terms of population, goods, and services offered, is highly correlated with the size and population of its hinterland (La Lone n.d.:3).

The crucial role of a city for central place theory is economic. In the context of peasant society there are many anthropologists who share this emphasis. Firth, for example, maintains that the term "peasant" describes an economic relationship with social and cultural corollaries. A peasant is a small-scale producer with a simple technology who relies primarily for subsistence on what he produces. However, his economy is often strongly dependent on the market of an urban settlement (Firth 1963:87-88). Mintz states that the marketing system is one of the major mechanisms of social articulation among the various strata of rural and urban society (1959:20). Skinner, in his important analysis of the spatial attributes of Chinese markets and social structure, maintains that "marketing structures inevitably shape local social organization and provide one of the crucial modes for integrating myriad peasant economies into the single system which is the whole society" (1967:63).

Two elements, agriculture and markets (actually aspects of the same general institutional field—the provisioning of society), are basic to the mutuality of dependence between city and hinterland. In Yungay, as in many transitional societies, mobility is hindered by infrastructural deficiencies, and transportation is both time and energy consuming. Consequently, the old city was located near arable land with a high population density for easy access to productive agriculture. In like fashion, a large peasant population practicing intensive agriculture found it convenient for marketing and other purposes to be close to the city (Trigger 1972:580). Convenient access to water supplies was also an important factor in the region as a whole. It is important to point out here that the economic emphasis of central place analysis is relevant only in the context of the market-money aspect of the peasant economy. As soon as a population participates in a money oriented economy, centrality of place becomes extremely important. It is less crucial when we speak of interzonal trading, which has existed in this area of the Andes since pre-Incaic times, and in which ecological variation and commodity become the important variables.

In the Andes, the marketplace is one of the principal loci of economic exchange; a place as well as a state of affairs in which buyers and sellers communicate and supply both prices and commodities to be offered in exchange (Belshaw 1965:2). While both aspects of this interpretation of a marketplace are of interest, the "place" aspect is of

primary concern at this juncture. The “place” of a market or market center is the location to which consumers and producers travel to undertake the exchange process. All economic systems consist basically of actors who are “consumers of what is produced, and producers of what is demanded” (Berry 1967:3). A market is an assembly point for outside goods demanded by the surrounding consuming regions, as well as goods produced by those regions which may be consumed by the market center itself, or transported to other assembly points for further distribution. As such, these centers are, among other things, clusters of retail and service establishments in a location providing a convenient “point of focus” for producers and consumers (Berry 1967:3).

Central place theory defines the *range* of a product as the maximum distance a consumer is willing to travel to obtain the product (La Lone n.d.:4). This idea may also be expressed in terms of the central place as the *economic reach* of the city (Berry 1967:15). Another similar concept, also useful for our analysis, is the *threshold* of a product: “the minimum in population (buying power) necessary to support the provision of a good” (La Lone n.d.:4). Considering the mutual dependency relations between Yungay and its hinterland, at the urban end the good, or product, involved is a service—a marketing service provided by the city. On the rural side of the relationship, the good is food, provided by the hinterland. The distance between the city of Yungay and peasant agriculture was well within the range of the goods that were bought and sold. However, after the disaster, the decision to locate the capital (with its market and other key institutions) in Tingua would clearly have placed both food and market service, as well as other institutional functions, outside their respective ranges for both sets of consumers. Peasants, complaining that transportation to Tingua would be too expensive, declared that they would market their products in Caraz, the capital of the neighboring province to the north. The city to be relocated in Tingua would have no customers for their marketing service and producers from whom to buy food, since the smaller population of the area prefers to market in Carhuaz, the capital of the province immediately to the south (see Figure 1). Essentially, the move to Tingua would have extended valuable products and services beyond their ranges for the bulk of the population. In addition, the lighter peasant population in the hinterland of Tingua was well below the threshold of both the food product and the marketing service. The Tingua location did not have the peasant population necessary to produce a sufficient volume of food for a provincial capital, much less supply workers for its construction and maintenance, as Yungainos continually pointed out. In addition, market rents were an important source of local revenues, constituting 80 percent of Yungay Norte’s total income derived from sources within the province. Thus, the large Yungay area peasantry refused to market their products or attend Mass in Tingua and stated their intention to market their agricultural production in neighboring Caraz. Separated from the majority of its provincial population, and denied the necessary functions of market and religious centrality, the capital of Yungay province in Tingua would have become solely an administrative center, dependent on Carhuaz for subsistence and the national government for revenue.

However, as has been pointed out, cities have broader functions which add to, or complement, the economic aspect of their centrality. In highland Peru, the city is not only a market, but is also the locus of religious ritual, social power, education, and district, provincial, or departmental administration. With these ideas in mind, a city may be conceived of as an urban settlement which performs a variety of functions for surrounding hinterlands as well as for their own populations. They are, in a sense, responses to a need to concentrate in one place a variety of activities whose scope is larger in context than the single village, such as markets, religious shrines and rituals, or regional

administration (Grove 1972:560). Specifically, a town may provide a market center which fulfills only partially the total economic needs of the population, but its identity as an economic central place may endow it with the other institutions and services which complement its economic centrality. Cities are "service centers" for a network of satellite communities, and, in turn, they draw their own specific needs from these satellites (Grove 1972:561). Yungay was a higher-order central place for its region, which included most of the area within its provincial boundaries as well as some abutting areas. The neighboring provincial capitals of Carhuaz to the south and Caraz to the north are also higher-order central places for their provincial hinterlands. All three cities, as well as those district capitals under them in the hierarchy, were subordinate in the *sierra* region only to Huaraz, the departmental capital (see Figure 1).

The proximity of the central places of other microregions, such as Carhuaz and Caraz, offers another dimension to the problems of relocation. In this context, central place theory proposes a basic similarity between places that provide the same goods and services (La Lone n.d.:4). As they are similar in function for their respective areas, it would seem logical that competition between places occupying similar positions in the hierarchy would be, in large part, determined by location, so that there is no overlap in function. For example, a large market complex in Tingua would be superfluous because the area is already in the marketshed of nearby Carhuaz. In addition to being market centers, provincial capitals are administrative, educational, religious, and social foci of power for the network of communities in their province. However, research has shown that economic and religious functions draw people more consistently and in greater numbers than administrative functions. Thus, we have Yungay peasants threatening to abandon Tingua for nearby Caraz, Yanama peasants marketing in nearby Huari, and Quillo peasants going to Casma, all without regard for political boundaries and affiliations.³ The relocation of the provincial capital in Tingua would result in the duplication of functions in an area already dominated by one central place, Carhuaz, and without sufficient population to warrant it. Tingua would function only as an administrative center, an imposed institution with little functional rationality in the context of the province, needlessly and hopelessly duplicating other nonadministrative services offered by Carhuaz. The point is that none of the functional prerequisites for urban growth exist in the Tingua area in sufficient quantity, and there is little way that these can be imposed artificially without relocating a large part of the rural population of the province which lies within the valley's confines. If only from a demographic perspective, relocation on such a massive scale would be a supremely difficult task, given the dense population in the Yungay area and the limited resources around Tingua.

The only aspect of the proposed relocation site that was reasonably firm was the geological security. It was unlikely that Tingua would ever be threatened with landslides. However, this fact seemed not to be a convincing argument to either rural or urban people in Yungay, whose knowledge and experience indicated that building and maintaining a provincial capital there was a task with little promise of success. In essence, it seems that the people would rather run the risks of natural hazards than the socioeconomic risks involved in the radical change implicit in the relocation of their capital city.

Ultimately, the confrontation between the people of Yungay Norte and the reconstruction authority seems to have ended in a victory for the Yungainos. Half a decade has passed since the disaster and the foundation of the ragged refugee camp in Pashulpampa. Aid has poured into the encampment, which soon came to be called Yungay Norte and now, five years later, is called simply Yungay. The new city has an

electrification system, a potable water system, a day clinic, a Cuban prefabricated hospital, several new schools, and ninety-two wooden chalet-style cottages donated by the U.S.S.R. The Yungay market has steadily improved since its first halting steps in August of 1970. Indian peasants returned in great numbers to market in Yungay (from Caraz) shortly after the provisional market buildings were built in November of 1970. The Yungay parish has been given a new church, and the old fiesta system of the province is functioning for the majority of peasants close to the city. The population, five years after 99 percent mortality, has grown to within 70 percent of the old city. In short, Yungay Norte has retained or recovered virtually every formal and informal function which the old city had prior to the disaster. Tingua, on the other hand, as of 1974 was still a collection of barracks houses with a rather meager little market consisting of, at most, a dozen vendors. A major educational complex which was destroyed in the earthquake has been reconstructed there, but it appears as though its effect on population growth in the urban area has been slight.

Yungay Norte, then, in the postdisaster period, has become a higher-order central place for the province of Yungay. It seems apparent that the Yungainos of Yungay Norte, while acting out of self-interest, possessed an implicit understanding of the general functions of cities. Indeed, they seem to be very much in line with what is known about the spatial attributes of urban settlements as outlined by central place analysis.

In sum, the reluctance of Yungainos to leave the general area of their destroyed home for an ostensibly safer location was based on an accurate understanding of the structural prerequisites of their urban socioeconomic order. Their perception of the functional requirements of urban growth is paralleled and supported by the basic formulations of central place analysis. Moreover, the position taken by the Yungay population is one based on rational examination of available alternatives and subsequent choice of the most adequate. While sentiment was an important motive, theirs was hardly an irrational clinging to a dangerous site solely because of its emotional link to the "native soil" of a tragically lost past. The risks of both alternatives were weighed, and removal to a safe but unpropitious site for urban growth was clearly rejected in favor of a site, which, while less safe from geologic accident, was far better suited to the growth of a new city.

notes

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²Although I have used central place theory in other contexts (Oliver-Smith 1974), its use in this particular instance was stimulated by Darrell E. La Lone's interesting and informative paper, "The Folk-Urban Hierarchy: Central Place Theory in Anthropology," delivered at the Annual Meeting of the American Anthropological Association, November 19-24, 1974, in Mexico City.

³This phenomenon has been documented in a number of instances, including Anthony Oliver-Smith's *Yungay Norte: Disaster and Social Change in the Peruvian Highlands* (1974:450) and Scott Robinson and Peter Weldon's "Una Esquema estructural para la explicacion del desarrollo social en la provincia de Yungay" (1967:201).

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