

HOUSEHOLD VARIABILITY AND INEQUALITY IN KOFYAR SUBSISTENCE AND CASH-CROPPING ECONOMIES

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Social scientists have argued that the change from subsistence to market-oriented production leads to the development of socioeconomic inequality in generally egalitarian agrarian societies. A reanalysis of data on households and production among the Nigerian Kofyar suggests that the relation of population to resources is a more important determinant of inequality than the subsistence/market distinction. The Kofyar homeland, with its traditional system of intensive subsistence farming, has distinct regions characterized by differing levels of land pressure associated with population density, per capita production, household size, household developmental cycles, migration rates, and economic inequality. Households voluntarily moving to plentiful land on the frontier and adopting cash-cropping substantially increase their labor forces and money incomes without raising the level of inequality.

MODERNIZATION AND DEPENDENCY MODELS of Third World economic change appear to share certain assumptions concerning the nature of traditional societies and the socioeconomic effects (though not the relative benefits) of movement from primarily subsistence to more market-oriented agricultural production. Both tribal societies and the peasant sectors of state-level societies are portrayed as fundamentally egalitarian (Hirschman 1981; Hyden 1980; Rostow 1960; Sahlins 1960). Differences in access to resources and wealth are not large and can be explained principally by factors of age, sex, personal qualities, and stage in the family developmental cycle (Fried 1967; Hart 1982:136). Institutions such as the lineage mode of production (Terry 1972) or the closed corporate community (Wolf 1957) operate to share rights to the means of production and to redistribute surplus, thereby leveling incipient economic differentiation. With the production of cash crops and involvement in a money economy, inequality increases and a more stratified society inevitably results. As Polly Hill (1982:55) puts it in characterizing rural Hausaland and Karnataka (in south India), "laissez-faire rural economies, where most interhousehold transactions and services involve cash, and where land resembles a saleable commodity, are necessarily innately inegalitarian; such rural economies invariably operate in a way which tends to favour richer households at the expense of poorer." While a minority of families or groups accumulates property and capital, most of the peasantry falls into debt, loses an adequate land base, and becomes progressively impoverished as smallholders, sharecroppers, or laborers. The countryside becomes socially polarized and economically exploited in a process already visible in Ghana (Howard 1980), Tanzania (Feldman 1975), and Nigeria (Watts and Lubeck 1983).

Is the simple opposition of egalitarian and stratified a meaningful socioeconomic distinction, or is it one of the many unexamined assumptions built into the classic evolutionary dichotomies of Gemeinschaft/Gesellschaft, traditional/modern, tribe/state? Are subsistence farmers in a folk society necessarily homogeneous, while market-oriented agricultural producers become increasingly unequal? It is possible

that the "barefoot empiricism" of the ethnographer can question not only anthropological stereotypes but also the neo-orthodoxies of the modernizers and the world systematists.

Economic differentiation among peasant or subsistence farmers has only recently become an issue in the anthropological literature (Berreman 1981; Cancian 1976), and inequality was rarely measured in the past even when adequate data had been collected. With this point in mind, Netting's household censuses, gathered from the Kofyar of northern Nigeria in 1961 and 1966, were reanalyzed for quantifiable evidence.¹ These two thousand censuses included information on household size and composition, crop production, and domestic animal ownership for both self-sufficient homesteads in traditional Jos Plateau communities and for seasonally migrant Kofyar engaged in cash cropping on a frontier some 50 km to the south.² Only portions of this material had previously been tabulated. The recent computer coding of the standard interview schedules has allowed more complete access to Kofyar sociological, economic, and settlement data, with new spatial and temporal dimensions.

The presumption of homogeneity among independent, self-provisioning Kofyar in traditional settlements was an unexpected early casualty in this reanalysis. In an attempt to understand migration rates to the cash-cropping plains, Johnson and Stone (1983) had discovered significant differences in agricultural production and household size between regions, or village clusters, within a day's walk along the plateau escarpment and in the hills. The hypothesis of differential land pressure between these regions not only began to account for divergences in households and their agricultural production, but also suggested a basis for the study of inequality.

Earlier published work had made a case for lumping these autonomous villages under a single ethnic term, based on cultural similarities of language, house type, dress, ritual, and a common myth of origin (Netting 1968:35-43). More importantly they shared an ecological pattern of small homestead farms with a dispersed settlement pattern; an exemplary system of permanent intensive cultivation, with terracing, ridging, manuring, stall-fed goats, and mixed grain, legume, and tree crops; and a population density about six times that of neighboring swidden cultivators in the same savanna environment. The small size of Kofyar households and the comparative lack of multiple families appeared neatly adapted to the labor needs of intensive agriculture (Netting 1965). The only striking contrast was between the traditional subsistence villages and the migrant bush farmers moving south to grow yams, sorghum, and millet for the market on a frontier of almost vacant land and, in the process, changing household size, marriage, and residence patterns in ways that more effectively mobilized labor (Netting 1968:193-210). Other recognized differences included the obvious diversity in settlement density between villages in the hills and those below the escarpment; different precolonial warfare alliances (Netting 1974); and a greater exposure to Western influences by Kofyar living near the road, missions, and schools on the plains. But in most published analyses, the Kofyar homeland was treated as relatively homogeneous; Netting's ethnographic perimeter radiated unevenly from Bong village, where he lived in 1960-62, and from the town of Kwande (on the plains frontier to the south), where he spent some time in 1966-67. Since no other investigators have worked among the Kofyar, this view has gone unquestioned.

The new model of variability within the traditional system is partly based on the recognition of five regions with distinct patterns of covariation in crop production, animal ownership, and household size and composition. These regions are also distinguished by physical-geographic characteristics (see Figure 1).

The Valley Region (including the villages of Latok, Dep, Gonkun, and Mangbar) is located near the southern edge of the plateau. The Precambrian granites here are overlain by weathered basalts, likely dating to the early Tertiary (see Grove 1952:3; Pugh 1955:18-23). The landscape is characterized by high stream density and by slopes which are inhabitable and farmable, although fairly steep. Homesteads are scattered relatively sparsely across the ridges and valleys of the region, with a population density of $36.7/\text{km}^2$ ($95.1/\text{mi}^2$) in 1961.³ The Bong Region (including the villages of Bong and Koepal) occupies the west-central portion of the Kofyar homeland. Surface lithologies include Precambrian granites and basalts from early and late Tertiary volcanism. Topography is highly variable, including the 100 m high Bong Peak and an extensive area of rolling hills north of Bong village used for local bush farming. Homesteads are dispersed in the valleys and low hills of this region, with a population density of $36.0/\text{km}^2$ ($93.2/\text{mi}^2$).

The Ridge Region (including the villages of Bogalong and Lardang) is situated directly north of the Hilltop Region. It consists primarily of a broad-backed ridge, bounded to the east by the plateau escarpment and on the north and south by deeply incised rivers occurring in faults in the Precambrian granite. The agricultural catchment area also includes hillslopes to the west. Topography is characterized by low hills of weathered granite, moderately dissected by shallow streams. Homesteads are packed fairly densely across the ridge, with a regional population density of 67.0 km^2 ($173.5/\text{mi}^2$).

The Hilltop Region (including the villages of Kofyar, Pankurum, and Longsel) extends westward from the east-central edge of the plateau, and overlooks the savanna plains below the escarpment. While the complex geology of this region has yet to be interpreted, the topography is dominated by extremely steep sided, irregularly shaped hills. Settlement is dense and is confined to hill summits, and agricultural catchment areas are sharply constrained by hillsides too steep even for terrace farming. Although these slopes can be used as pasture, their inclusion in the agricultural catchment area should be seen as causing a somewhat artificial reduction in the population density figures. The calculated density of $92.0/\text{km}^2$ ($238.3/\text{mi}^2$) should therefore be considered a minimal density for the region.

The Plains Region surrounds the plateau base to the east, southeast, and south.⁴ Settlement is continuous in this region, although political boundaries of villages such as Kwa and Kwang are recognized. Topography is generally flat, with sedimentary deposits intermingled with basalt flows probably resulting from late Tertiary volcanism (Geological Survey of Nigera 1962). Contiguous homesteads are very densely packed, especially across the sedimentary deposits, forming a strip of settlement extending several kilometers out from the escarpment. Since the census for this region was not exhaustive, population density cannot be determined precisely; however, it is known to exceed $200/\text{km}^2$ ($518/\text{mi}^2$) and may exceed $300/\text{km}^2$.

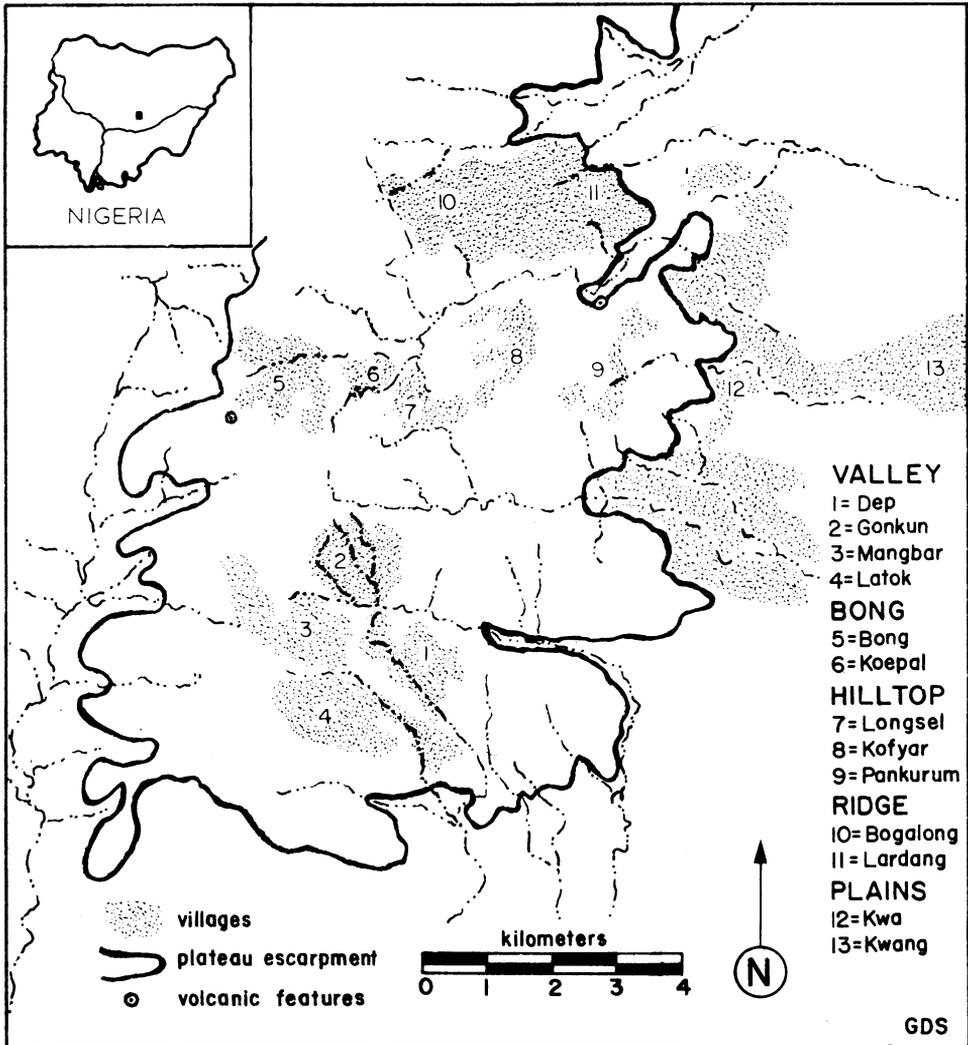


Figure 1. Map of Kofyar Homeland.
 (For a more complete map of the area, see Netting 1968:28, Figure 2)

HOUSEHOLDS AND ACCESS TO RESOURCES: THE TRADITIONAL SYSTEM

The five regions tend to be internally homogeneous in terms of household size and composition, levels of agricultural production, and ownership of domestic animals; interregional variation is considerable, however, forming ranked series with demonstrable relationships to population densities (see Table 1).

Of particular interest are patterns in household size that, based on a larger and more representative sample (including censuses from both 1961 and 1966) showed a considerable range of variation from the earlier stated average of 5.3 (Netting 1968: 117). Households in the Valley Region had only 3.47 people in 1961, while the Plains mean was 6.29. The Bong Region was close to the Valley, both spatially and in household size, while Hilltop and Ridge villages more closely resembled conditions on the plains.

The economic data were also consistently patterned, but the correlation was reversed (see Table 2). The crop indices (based on bundles of staple millet and sorghum from both homestead and local bush farms) were highest in the Valley and Bong regions, declining toward the Plains Region. Goats followed the same trend, but it is interesting that the ranges in both mean crop indices (21.76 to 18.58) and goats (8.76 to 4.99) are not large, suggesting a fairly uniform homestead farm subsistence system. Because appreciably larger households were associated with somewhat smaller crop production and goat herds, there was a real difference in per capita subsistence possibilities, with Plains and Hilltop regions being disadvantaged in comparison to Valley, Bong, and (in 1966) Ridge regions. The weighted animal index combines the goats (that every homestead needs to produce composted manure for fertilizer) with the less universally owned wealth animals, including sheep, pigs (introduced mostly between 1961 and 1966), dwarf cows, and horses (the cows and horses considered equal to five of the small stock). Again the index declines from Valley to Plains, but the Ridge and Hilltop villages, surrounded as they are by steep, uncultivated grassy slopes for grazing, show the greatest abundance of domestic animals.

Differences in relative scarcity of agricultural resources affect the composition of households through time. In the Plains Region, settlements are dense and villages are not separated by waste or fallow land for cutting grass to feed goats. The lack of woodland means that sorghum stalks must substitute for firewood. Larger households on less land (see Table 1) suggest that the marginal productivity of labor may be less, and that young adults may be constrained to remain in their natal households because they lack the resources to establish a new homestead.⁵ In Bong, on the other hand, there were a sufficient number of vacant homestead sites for young people to set up housekeeping independently at marriage or shortly thereafter. Some polygynous elders even established individual wives and their adolescent sons in separate homesteads before the sons married. The Kofyar claim that it is better for a young couple to found a separate nuclear family household, and they justify this pragmatically by citing the need for the pair to work hard for their own food, to be free of parasitic dependents in the extended family, and to avoid conflict with parents. Where farmland and house sites are readily available, as in Bong and the Valley Region, households are characteristically smaller and are rarely composed of multiple families (see Table 1), whereas the larger Ridge, Hilltop and Plains

TABLE I
Regional Variation in Households and Population Densities

| Population Density (per km ²) | 1961 | | | 1966 | | |
|---|--------|---------------------|----------------------------------|--------|---------------------|---------------------|
| | Number | Mean Household Size | Percent Multifamily ^a | Number | Mean Household Size | Percent Multifamily |
| 200+ | 186 | 5.42 | 11.7 | 177 | 3.86 | 4.5 |
| Hilltop | 97 | 4.78 | 11.7 | 84 | 4.69 | 7.7 |
| Ridge | 187 | 4.65 | 11.7 | 202 | 4.97 | 13.7 |
| Bong | 76 | 4.05 | 10.5 | 68 | 4.00 | 14.0 |
| Valley | 109 | 3.47 | 0 | 146 | 3.55 | 0 |
| | | Nonmigrant | Nonmigrant | | Nonmigrant | Nonmigrant |
| | | All Households | All Households | | All Households | All Households |
| | | 6.29 | 15.9 | 177 | 5.62 | 15.8 |
| | | 5.96 | 17.5 | 84 | 5.88 | 17.9 |
| | | 4.76 | 12.8 | 202 | 5.95 | 19.8 |
| | | 4.05 | 10.5 | 68 | 4.32 | 13.2 |
| | | 3.47 | 0 | 146 | 3.72 | 1.4 |

a. Multifamily households contain two or more married couples

TABLE 2
Regional Variation in Crop Production, Animal Ownership, and Agricultural Strategy

| Region | Crop Index ^a | | Goats | | Animal Index ^b | | Percent Migrant Farming Households | |
|-------------------|-------------------------|-------|-------|------|---------------------------|-------|------------------------------------|------|
| | 1961 | 1966 | 1961 | 1966 | 1961 | 1966 | 1961 | 1966 |
| Plains | 18.58 | 17.63 | 4.99 | 3.44 | 7.75 | 5.37 | 45.5 | 76.3 |
| Hilltop | 19.45 | 16.45 | 7.88 | 7.35 | 13.22 | 11.54 | 38.1 | 69.0 |
| Ridge | NA ^c | 21.31 | NA | 9.05 | NA | 15.70 | 13.4 | 42.6 |
| Bong | 21.22 | 21.50 | 5.37 | 3.29 | 8.43 | 8.17 | 0 | 26.5 |
| Valley | 21.76 | 26.85 | 8.76 | 9.12 | 10.56 | 12.39 | 0 | 7.5 |
| Entire Population | 19.93 | 21.50 | 6.53 | 6.81 | 9.65 | 11.01 | 22.4 | 45.5 |

a. Crop Index equals the total number of bundles of sorghum and millet from homestead and local bush farms. A bundle yields approximately 50 lb. of threshed grain (see Netting 1968:89). The low crop indices in the Plains and Hilltop regions are not due to the large numbers of migrants from these regions neglecting their home farms to pursue cash-cropping. Home production by traditional and migrant farmers does not differ significantly in these regions.

b. The Animal Index is computed as goats + sheep + pigs + (cows x 5) + (horses x 5) mean per household

c. NA: data not available

households are more frequently multiple. Indeed households from the densely settled regions may exemplify an impacted or retarded developmental cycle. Under more crowded agrarian conditions, young men have more difficulty in securing bridewealth to marry, and once married it is harder for them to acquire land for an independent farmstead.

It follows that where land constraints hinder household fissioning, there is a lower percentage of households headed by young men. Table 3 shows that 27.6 percent of the households in Valley and Bong regions are headed by men under the age of thirty, compared to only 17.1 percent in the Plains and Hilltop regions. Moreover, the Plains-Hilltop group includes numerous households headed by young men who were able to establish separate domestic units only because they had opened migrant bush farms (Stone n.d.); we may assume that, prior to the movement to the plains frontier, the frequency of households headed by young men would have been even lower.

TABLE 3
Household Heads by Age Group, 1961

| | 10-19 | 20-29 | 30-39 | 40-49 | 50-59 | 60+ | n |
|------------------|-------|-------|-------|-------|-------|------|-----|
| Valley + Bong | 3.3 | 24.3 | 27.6 | 24.3 | 14.0 | 6.5 | 214 |
| Plains + Hilltop | 1.4 | 15.7 | 26.9 | 26.9 | 17.8 | 11.2 | 286 |

The high density regions are here compared collectively with the low density regions to achieve samples large enough to be broken down by age of household head. Reliable figures for birth-dates are not available for Ridge villages. Figures are from 1961 censuses.

HOUSEHOLDS AND ACCESS TO RESOURCES: THE FRONTIER

The suggestion that population pressure differentiates the various regions gains strength when we examine migration (Johnson and Stone 1983). Again the regions are regularly ranked, from a 45 percent migration rate on the plains in 1961 to zero migration from the Valley villages (see Table 2). The movement from traditional home farming to migrant bush cash-cropping increased in every region from 1961 to 1966, but the rank ordering remained the same. Most Kofyar migrants retained their home farms and continued to cultivate them intensively, while opening new tracts using slash-and-burn methods in the bush land around Namu and Kwande, some 50km to the south. With plentiful land available on this settlement frontier, farms could expand quickly to an average of 7.75 acres, compared to the 1.5 acres of the homestead field (Netting 1968:201). Using hand tools and familiar grain and tuber crops, the migrants could begin to sell their surplus in the markets or to itinerant merchants and lorry drivers within a year or two of first clearing. The crowded Plains Region was the first to take advantage of the opportunity for migration, both because its people could move south easily on dry-season roads and because their larger households with smaller subsistence resources pushed them in that direction.

The migrants came from those households we have labeled impacted. In Table 4 households that went to the bush farming area between 1961 and 1966 are contrasted with a control group that remained at home.⁶ Pre-migrants in 1961 had

significantly larger households, more adult males, more adult females, and more children than their neighbors. Of the premigrant households 24 percent had multiple families, compared with approximately 9 percent of the general population.

TABLE 4
Demographic Factors Distinguishing Premigrant from Nonmigrating Households

| | Premigrant | Nonmigrant |
|-----------------------|------------|------------|
| Number | 61 | 374 |
| Household Size (mean) | 5.8 | 4.4 |
| Multiple family | 24% | 9% |
| Composition | | |
| Adult males (mean) | 1.5 | 1.2 |
| Adult females (mean) | 2.1 | 1.5 |
| Children (mean) | 2.1 | 1.5 |

All differences significant at .01 level (t-test)

If competition for resources pushed households into migration, the returns to labor of shifting cultivation for marketable food crops caused continued growth in household size. With the constraint of land removed, production depended mainly on the labor that could be mobilized. The marriage of additional wives and the retention of married sons in the household provided a labor force that could be coordinated, massed, or divided according to the requirements of the agricultural season and task. Migrant households were regularly larger in size than households from the same communities that depended solely on their traditional farms, and this difference is seen even in those regions such as Bong and Valley that first joined the migratory stream between 1961 and 1966 (see Table 5).

TABLE 5
Household Size and Migration

| | Percent Migrant | | 1961 Mean Household Size | | | 1966 Mean Household Size | | |
|---------|-----------------|------|--------------------------|---------|------|--------------------------|---------|------|
| | 1961 | 1966 | Nonmigrant | Migrant | All | Nonmigrant | Migrant | All |
| Plains | 45.5 | 76.0 | 5.42 | 7.36 | 6.29 | 3.86 | 6.31 | 5.62 |
| Hilltop | 38.1 | 69.0 | 4.78 | 7.87 | 5.96 | 4.69 | 6.42 | 5.88 |
| Ridge | 13.4 | 42.6 | 4.65 | 5.44 | 4.76 | 4.97 | 7.57 | 5.95 |
| Bong | 0 | 26.5 | 4.05 | — | 4.05 | 4.00 | 5.22 | 4.32 |
| Valley | 0 | 7.5 | 3.47 | — | 3.47 | 3.55 | 5.82 | 3.72 |

The decision to migrate appears to be responsive both to the demographic push of population pressure in certain regions and households and to the pull of potential profits in cash-cropping, where household labor can be more productively utilized.⁷ When farmland is freely available and the capital costs of new cultivation are minimal, household labor is on the average less expensive than either communal work parties, which must be entertained with beer and food, or paid laborers (see

Saul 1983). Farmers growing the same crops all encounter a wet-season labor bottleneck at the same time, and if the tasks of ridging, thinning, and weeding are not done during the optimal period, yields will decline (Norman, Simmons, and Hays 1982:119; Tiffen 1976:114). The Kofyar have begun to hire workers for occasional agricultural tasks, but their primary labor strategy is that of expanding the household. When the migrant sample is divided according to the number of years the bush farm has been in operation, it is evident that total household size and numbers of adults increase steadily, as do the frequencies of multifamily and polygynous households (see Table 6).

TABLE 6
Effect of Time Spent Migrant Farming on Household Size and Composition

| Years | Number | Household Size | Adults ^b | Percent Multifamily | Percent Polygynous |
|-----------------------|--------|----------------|---------------------|---------------------|--------------------|
| | | \bar{x} | \bar{x} | Households | Households |
| 0 (1961) ^a | 552 | 4.53 | 2.96 | 8.3 | 45.3 |
| 0 (1966) ^a | 372 | 4.17 | 2.63 | 7.3 | 32.3 |
| 1-2 | 71 | 5.01 | 3.15 | 11.3 | 40.8 |
| 3-4 | 88 | 6.16 | 3.78 | 19.3 | 53.4 |
| 5-6 | 67 | 6.49 | 4.24 | 25.4 | 62.7 |
| 7-8 | 53 | 7.02 | 4.23 | 25.0 | 53.8 |
| 9+ | 41 | 8.66 | 5.59 | 31.0 | 81.0 |
| All Migrants | 320 | 6.44 | 4.04 | 21.2 | 56.2 |

a. Traditional farming households.

b. "Adults" are defined as individuals between, and including, the ages of fifteen and sixty-four. Figures are from combined 1961 and 1966 censuses. Beginning dates for migrant extensive farming are available for 320 households. This sample includes some households represented in both data sets. This is intentional; since the independent variable (years spent extensive farming) takes on different values at the two time points, a household at two points in time constitutes two separate cases.

An additional pattern emerged in the changes in regional percentages of migrants between 1961 and 1966. In general the greater the migrant percentage in 1961, the greater the increase by 1966 (see Table 2). This phenomenon has been noted in other frontier situations, being partly due to the flow of "aid and information" from migrants to their home villages (Lefferts 1977:39).

These changes in migration rates among regions are paralleled by changes in average wealth-animal ownership. While goats were traditionally a necessary element in agricultural production, such animals as sheep, cows, and horses were acquired as wealth items. Novice migrant farmers commonly divested themselves of wealth animals as they concentrated their efforts on the establishment of frontier farms. Decreases in animal ownership correspond to increases in regional migration rates (see Table 7).

TABLE 7
Migration and Domestic Animal Ownership

| | Percent Migrant | | Wealth Animal Index ^a | | Percent Change in Wealth Animal Index | Pig Ownership Among Traditional Farmers (Household mean) |
|---------|-----------------|------|----------------------------------|------|--|--|
| | 1961 | 1966 | 1961 | 1966 | | |
| Plains | 45.5 | 76.0 | 2.7 | 1.7 | -37.0 | 0 |
| Hilltop | 38.1 | 69.0 | 5.3 | 4.0 | -24.5 | .04 |
| Ridge | 13.4 | 42.6 | 6.0 | 5.8 | -3.3 | .21 |
| Bong | 0 | 26.5 | 3.1 | 4.9 | +58.1 | .31 |
| Valley | 0 | 7.5 | 0.9 | 3.2 | +255.6 | .25 |

a. Wealth animal index = sheep + pigs + (cows x 5) + (horses x 5) per household

By contrast the sparsely settled, nonmigrating regions substantially *increased* wealth-animal ownership between 1961 and 1966. These increases were due to the acquisition of traditional wealth animals as well as pigs, which were largely absent throughout the Kofyar area in 1961 (see Table 7). Pigs were valued for their rapid reproduction and the profitability of pork in local markets. They could be kept in huts and fed small tubers, pot scrapings, and grass. Pig raising was a means to transform local agricultural surpluses into a high-value commodity. For the Bong and Valley regions, where there was an adequate land base, pig raising was an attractive economic alternative to migrant cash-cropping.

Divergent indigenous economic development strategies in the Kofyar case appear to be contingent on regional differences in population pressure. Scarce land and large household labor forces in traditional Plains Region villages encouraged migration to frontier cash-cropping areas. The relatively less densely settled Bong and Valley communities chose instead an increase in wealth animals and the production of pigs for the market.

INEQUALITY IN TRADITIONAL AND FRONTIER SYSTEMS

Regional diversity in the home Kofyar area and the changes associated with migration do not in themselves tell us anything about inequality in the traditional society or the dynamics of stratification as migrant farmers enter the market economy. We cannot even predict a priori whether food crops or domestic animals are the principal measures of wealth under subsistence conditions. Do the crowded Plains Region villages exemplify "shared poverty," to use Clifford Geertz's memorable though misleading phrase (Alexander and Alexander 1982)? Do some Kofyar on the frontier get rich quick, while their hapless fellows become rural proletarians?

If we look only at traditional farmers in 1961 and 1966 (Table 8), we find that a crop index based on total bundles of sorghum and millet harvested per household on homestead and nearby bush fields varied little in the different regions. The Gini index of inequality computed for the crop indices shows the Plains Region with lower crop production to have generally (but not always) the highest inequality,

TABLE 8
Measures of Inequality: Traditional Farmers

| Region | Number | 1961 | | | 1966 | | |
|---------|--------|-----------------|-------------------|-----------------------|---------------------|---------------------------|-------------------|
| | | Crop Index | Crop Index Gini | Per Capita Crop Index | Goats per Household | Animal Index ^c | Animal Index Gini |
| Plains | 103 | 18.25 | .414 | 3.92 | 4.52 | 7.41 | .479 |
| Hilltop | 60 | 18.43 | .341 | 4.19 | 7.68 | 12.88 | .425 |
| Ridge | 162 | NA ^a | NA | NA | NA | NA | NA |
| Bong | 76 | 21.22 | .403 | 6.06 | 5.37 | 8.43 | .435 |
| Valley | 109 | 21.76 | .271 | 7.61 | 8.76 | 10.56 | .393 |
| 1966 | | | | | | | |
| Region | Number | Crop Index | Crop Index Gini | Per Capita Crop Index | Goats per Household | Animal Index | Animal Index Gini |
| Plains | 44 | 17.77 | .347 | 5.50 | 3.59 | 5.32 | .573 |
| Hilltop | 26 | 17.79 | .333 | 4.98 | 7.36 | 13.00 | .378 |
| Ridge | 117 | 21.79 | .312 | 5.06 | 9.06 | 15.37 | .458 |
| Bong | 47 | 22.32 | .516 ^b | 5.24 | 3.52 | 9.02 | .592 ^b |
| Valley | 134 | 27.52 | .223 | 9.80 | 8.70 | 11.92 | .416 |

a. NA: not available

b. High 1966 Ginis in Bong due to two wealthy households coupled with otherwise low village means

c. Animal index = goats + sheep + pigs + (cows x 5) + (horses x 5)

while the food-rich Valley Region clearly has the most equal distribution.⁸ Furthermore the favored Valley people in their small households had almost twice the per capita food supply of their Plains neighbors.

Because goats are a necessary part of the intensive farming system, with its annual composting from the goat corral, every household has at least a few animals. Again the Valley villages are well endowed, but the Ridge and Hilltop regions also have good-sized average herds, and they have the highest weighted animal indices based on the addition of sheep, cattle, horses, and pigs to the number of goats. Animals used for sacrifices and bridewealth were a more important measure of wealth than subsistence grains in traditional Kofyar society. The Ginis derived from the animal index show higher rates of inequality than those for crops, but again the 1961 tabulations put Plains high and Valley low. The impression from both crop and animal indices is that a scarcity of agrarian resources and lower mean production, both in household and per capita terms, leads to greater inequality. The same constraints that prevent early marriage and easy household fission on the plains lead to greater distinctions between poorer and richer farmers. More available resources in the Valley region make for relatively equal access to food crops, although animal wealth, which must be accumulated over time, shows greater differentiation.

The migrant Kofyar measure their market production in bags of grain and hundreds of yams. Most cash comes from these crops, especially yams; we have used the cash value when given by the farmer or a mean value if we have only numbers of yams and bags of sorghum and millet. Comparing cash income with bundles of grain or numbers of livestock in the traditional regions is obviously an apples and oranges proposition, but it is interesting that the Ginis for both 1961 (.422) and 1966 (.479) are not far apart (see Table 9) and remain within the moderate range of the animal index Ginis from the home villages.

TABLE 9
Migrant Farmer Cash Incomes and Inequality

| Year | Number | Mean Income (pounds) | Median Income | Gini |
|------|-----------------|----------------------|---------------|------|
| 1961 | 44 ^a | 42.98 | 38.00 | .422 |
| 1966 | 323 | 65.11 | 45.75 | .479 |

a. Small sample; many household censuses of migrants do not list cash crops

As farmers became increasingly involved in cash-cropping, the changes in wealth distribution do not support conventional wisdom regarding entrance into the market economy. During the first few years of migrant farming, a considerable amount of time is devoted to clearing large fields from the forest and other preliminary tasks. Production of yams requires the acquisition of seed yams which must be multiplied through several successive plantings. Furthermore during this period the average household has only begun its expansion to adapt to the labor demands of extensive farming (see Table 6), and production is therefore constrained. Over 85 percent of those households that have been cash cropping for one to three years made no more than £50 in sales the year they were censused (see Figure 2). The Gini index for this group is fairly high (see Table 10), reflecting the fact that, since most households

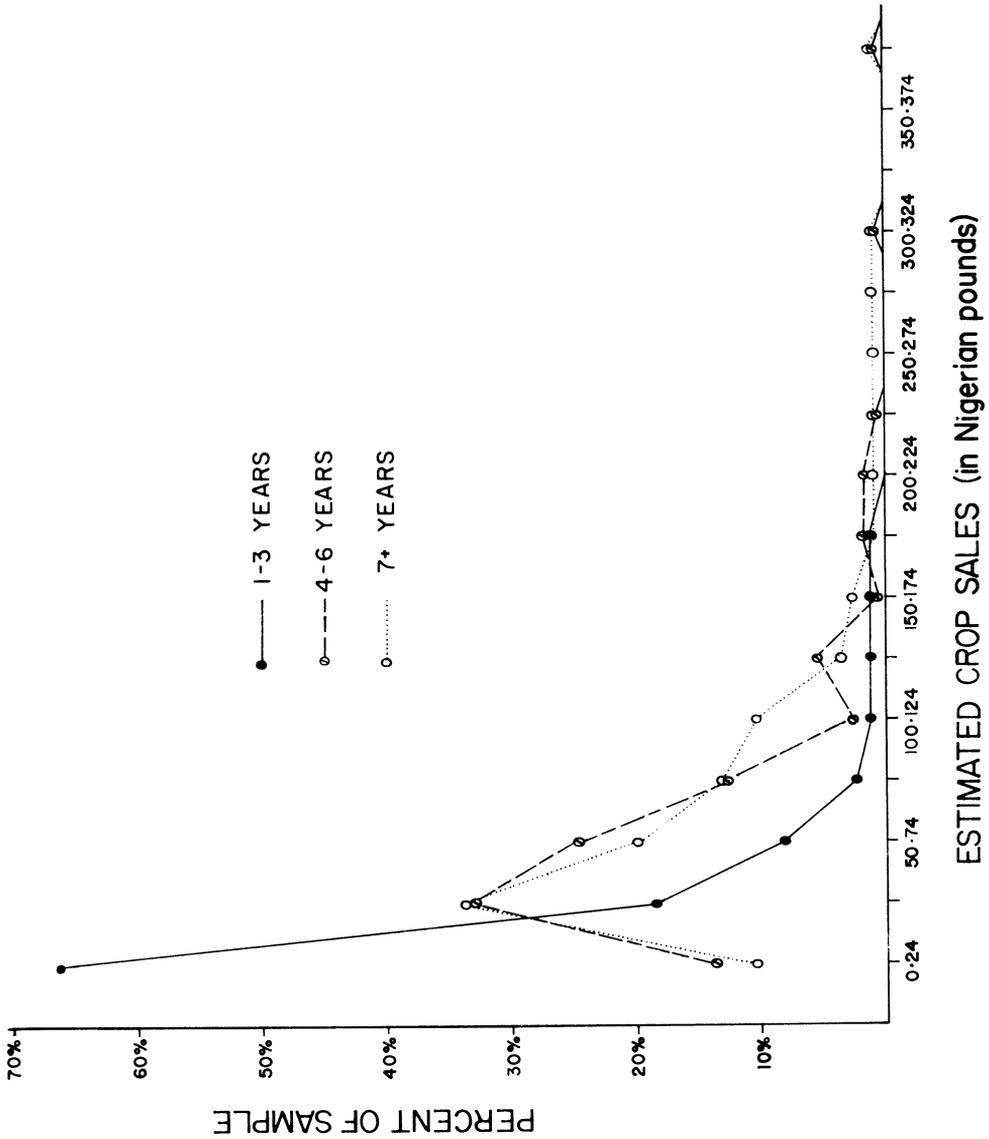


Figure 2. Distributions of Income from Crop Sales (stratified by number of years spent on the frontier; sales reported in 1961 and 1966 censuses are lumped—see Table 6)

in this situation earn little or nothing, what wealth is accumulated is concentrated in relatively few hands.

As seed yams multiply, household labor pools expand, and cash becomes available to hire workers, crop sales tend to increase sharply (see Table 10). Comparison of farms one to three years old with those four to six years old shows a change in the distribution of earnings (see Figure 2), yielding a marked reduction in wealth inequality as measured by the Gini. However, comparison of farms four to six years old with those over seven years old shows that while average sales increase modestly, wealth distribution shows little change. The Gini index is slightly lower for the latter group because, as a scale-invariant measure, it registers a decrease in inequality when mean income rises without a proportionate increase in cumulative wealth differences (Allison 1978:866-67). As measured by the Gini, then, income inequality drops sharply following a brief establishment phase on the frontier, and then continues to drop very slightly.

TABLE 10
Cash Crop Income by Years Since Bush Farm Established

| Years | Number ^a | Mean Income (pounds) | Median Income | Skewness | Gini |
|-------|---------------------|----------------------|---------------|----------|------|
| 1-3 | 86 | 27.04 | 19.50 | 2.60 | .550 |
| 4-6 | 109 | 68.99 | 55.00 | 2.68 | .403 |
| 7+ | 115 | 75.83 | 58.00 | 2.34 | .392 |

a. 1961 and 1966 samples lumped (see Table 6)

Because the necessary resources in land and labor are not strictly limited, farmers were not directly competing with one another. Land could be acquired in usufruct from the Goemai chief of the area in return for a nominal annual tribute of grain and chickens, and when swidden production declined, the farmer could enlarge his field or move to an area of virgin bush. Increased production by one household was not at the expense of another; the recruitment of labor was largely through traditional mechanisms of kinship, marriage, and coresidence; and capital was not yet a crucial requirement.⁹ On the migrant frontier, then, inequality does not increase as households move into the cash economy, while synchronic analyses of the traditional system show that inequality does correlate with scarcity of productive resources.

DISCUSSION

These findings contradict claims that market economies necessarily transform egalitarian systems into stratified ones. The migrant Kofyar continued to produce their own food, but substantial increases in money income did not contribute to widening wealth differentials. What is it then about farming on the plains, other than access to money, that distinguishes it most importantly from traditional farming in the hills? The answer, of course, is land—land that was initially abundant and fertile. Although the Kofyar may well have been responding to the “pull” of a cash income, the most powerful variable explaining not only their relative equality,

but their migration, their household size and composition, *and* their adoption of extensive farming, was the availability of land. This "frontier" situation, in which all comers had relatively equal and unlimited access to land, thus led initially to a decrease in inequality.

The strongest statement of our point would be that, all other things being equal, inequality increases with population pressure on resources, both within a society of subsistence farmers and when comparing subsistence to cash-cropping. Regardless of type of economy, agrarian groups that have adequate land resources will be more egalitarian than groups under land pressure.

Those traditional Kofyar areas under the most severe land pressure, as measured by the lowest per capita crop production and animal ownership and the largest households, are the most unequal. But the absolute differences between the "advantaged" and "disadvantaged" are never great. The capacity for the accumulation of wealth among the subsistence Kofyar is thus always limited by the land base and the lack of alternate employments. Even herd-animal ownership, the closest direct measure of wealth we have for the subsistence Kofyar, is dependent on the availability of land. Horses and cows need to be pastured; if grassland competes for space with agricultural land, they quickly become more of a liability than an advantage. The animals could be converted into bridewealth, but here again a restricted land base puts real limits on how many extra people a household could sustain. Without the possibility of fission, households may grow past the point of maximum labor efficiency. Individual permanent occupation with renting and inheritance of plots under intensive cultivation was clearly recognized, but land in the traditional Kofyar area was not bought and sold. Since neither labor nor animal wealth could be converted directly into additional land, the constraints on high levels of accumulation remained strong.

On the frontier, where land is easily acquired, additional labor is transformed into higher agricultural output. And the more a household can produce, the more labor it can afford, either through its own domestic growth or through the hiring of laborers. Lack of competition for land both lifts the constraints on wealth accumulation *and* determines an initial period of increased equality. Scholars of Western frontiers have remarked on a similar period of leveling among pioneers in areas with limited transportation and lack of community focus. These pioneers, who originate from a market economy, undergo a transitional period of subsistence farming before, by a process of filling in, they once again gain access to markets (Guelke 1976; Turner 1920). As the supply of new land dries up, productive property rises in value (Hudson 1977). Those whose land is inadequate for the dual function of subsistence and cash production must have capital to buy land or must sell their labor.

The process observed among the Kofyar in the 1960s was, of course, only the early, noncompetitive stages of a frontier. With the filling in of the frontier, we expect to see increasing differentiation in the cash-cropping population. Only when resources are scarce will agricultural incomes decisively diverge. We thus predict growing inequality among farmers and between farmers and emerging occupational groups of merchants and craftsmen. If persisting differences in land tenure, crops, cash, goods, and household labor forces appear, we can speak of stratification and

imagine the familiar spiral of accumulation and impoverishment. The preliminary evidence from the Kofyar, however, suggests to us that inequality is related to scarcity in subsistence societies, that it is reflected in both farm production and household composition, and that, when resources are abundant, entry into the cash economy may at least temporarily reduce wealth differences.

NOTES

1. Field research was originally sponsored by generous grants from the Ford Foundation and the Social Science Research Council. Coding and computer support has been provided by the Department of Anthropology, University of Arizona. For making available the equipment used by Stone in his photogrammetric analysis we would like to thank the Committee on Arid Lands Resource Sciences, the College of Mines, and the Pima College Archaeology Laboratory. An earlier version of this paper was presented at the Iowa City meeting of the Society for Economic Anthropology, April 1983.

2. These are farmers who, while maintaining traditional homesteads, migrate to the plains frontier to produce crops for market using extensive (slash-and-burn) methods. The portion of the year spent on the plains increases from an average of 5.9 months for new migrants to an average of 7.8 months after seven years. Much of the field preparation on the plains is accomplished before the preparation of home fields; scheduling difficulties that may arise during the agricultural cycle (Netting 1968:64-67) are handled by such mechanisms as commuting, hiring labor, reducing home farm production, and expanding the size of the household labor pool. The small fraction of migrants who had permanently relocated on the frontier by 1966 are excluded from this analysis.

3. Population densities are based on comparisons of 1961-62 census figures with agricultural catchment areas defined on stereo aerial photographs taken in 1963. Catchment areas include land used for homesteads and local bush plots (not to be confused with migrant bush farms; see Netting 1968:85-100). Catchment areas are in most instances readily definable on the basis of topographic features, bush fields, and paths connecting bush fields to settled areas.

4. Traditional, permanent settlements on the plains immediately below the plateau

escarpment should not be confused with migratory settlements on the plains frontier near Namu and Kwande, some 50km to the south.

5. An agricultural economic study of three Hausa villages in Zaria showed higher marginal productivity of family labor on large farms with correspondingly lower labor input per unit land (Norman, Simmons, and Hays 1982:123).

6. The premigrant sample was obtained by isolating migrant farming households in the 1966 census that were traditional farmers in the 1961 census. The nonmigrant control sample consists of households from the Plains, Hilltop, and Ridge regions that were not migrants as of 1966. Nonmigrant households from the Bong and Valley villages are not included in the control sample, since these villages contributed so little to the migratory stream (Johnson and Stone 1983).

7. Tiffen's (1976:100) interviews with expanding cash-crop farmers in another northern Nigerian frontier area, Gombe Emirate, shows that a bigger family was a main factor in over half the decisions to increase farm size, because it meant extra need for food and an increase in the labor available for cultivation.

8. The Gini index is a measure of *relative* inequality, which measures the cumulative distance among all cases (in terms of wealth units) while controlling for scale factors (Blau 1977:58-59). Numerous formulas are available for computing the index, either algebraically (e.g., Alker and Russett 1964:213; Dasgupta, Sen, and Starret 1973:186) or based on the Lorenz Curve (Gastwirth 1972:307; Morgan 1962:281). The formula used in this analysis is taken from Allison (1978:867):

$$\left(\frac{1}{n^2} \sum_{i=1}^n \sum_{j=1}^n |x_i - x_j| \right) / 2\mu.$$

For the Plains Region, which was not exhaustively censused, and for the sample of migrants, μ has been approximated by \bar{x} . A Gini of 0 indicates a perfectly equal distribution, while a

Gini of 1 indicates a total concentration of wealth in a single case. For other ethnographic examples of Gini applications, see McGuire and Netting (1982).

9. Among Gombe farmers larger families have bigger fields, and their production continues to increase as they supplement family labor with ox plows and hired workers. Both labor-

saving capital equipment and paid laborers are profitable in planting and weeding at the optimal time for savanna crops (Tiffen 1976: 102). For Zaria cultivators there is a positive correlation between household size and both cultivated hectares and disposable income (Norman, Simmons, and Hays 1982:109).

REFERENCES CITED

- Alexander, J., and P. Alexander, 1982, Shared Poverty as an Ideology: Agrarian Relationships in Colonial Java. *Man* 17:597-619.
- Alker, H.R., Jr., and B.M. Russett, 1964, On Measuring Inequality. *Behavioral Science* 9:207-18.
- Allison, P.D., 1978, Measures of Inequality. *American Sociological Review* 42:865-80.
- Bererman, G.D., ed., 1981, *Social Inequality: Comparative and Developmental Approaches*. New York: Academic Press.
- Blau, P.M., 1977, *Inequality and Heterogeneity*. New York: Free Press.
- Cancian, F., 1976, Social Stratification. *Annual Review of Anthropology* 5:227-48.
- Dasgupta, P., A. Sen, and D. Starrett, 1973, Notes on the Measurement of Inequality. *Journal of Economic Theory* 6:180-87.
- Feldman, R., 1975, Rural Social Differentiation and Political Goals in Tanzania. Pp. 154-82 in *Beyond the Sociology of Development* (ed. by T. Barnett, I. Oxaal and D. Booth). London: Routledge and Kegan Paul.
- Fried, M.H., 1967, *The Evolution of Political Society*. New York: Random House.
- Gastwirth, J.L., 1972, The Estimation of the Lorenz Curve and the Gini Index. *Review of Economics and Statistics* 54:306-16.
- Geological Survey of Nigeria, 1962, Geological map, Pankshin area (1:100,000).
- Grove, A.T., 1952, Land Use and Soil Conservation on the Jos Plateau. *Geological Survey of Nigeria Bulletin* 22.
- Guelke, L., 1976, Frontier Settlement in Early Dutch South Africa. *Annals of the Association of American Geographers* 66(1): 125-42.
- Hart, K., 1982, *The Political Economy of West African Agriculture*. New York: Cambridge University Press.
- Hill, P., 1982, Dry Grain Farming Families: Hausaland (Nigeria) and Karnataka (India) Compared. Cambridge, Eng.: Cambridge University Press.
- Hirschman, A.O., 1981, *Essays in Trespassing: Economics to Politics and Beyond*. Cambridge, Eng.: Cambridge University Press.
- Howard, R., 1980, Formation and Stratification of the Peasantry in Colonial Ghana. *Journal of Peasant Studies* 8:61-80.
- Hudson, J.C., 1977, Theory and Methodology in Comparative Frontier Studies. Pp. 11-31 in *The Frontier: Comparative Studies*, vol. 1 (ed. by D.H. Miller and J.O. Steffan). Norman: University of Oklahoma Press.
- Hyden, G., 1980, Beyond Ujamaa in Tanzania: Underdevelopment and an Uncaptured Peasantry. London:Heinemann.
- Johnson, M.P., and G.D. Stone, 1983, Social Criteria of Land Pressure and the Explanation of Kofyar Migration. Paper presented at the 43rd annual meeting of the Society for Applied Anthropology, San Diego.
- Lefferts, H.L., Jr., 1977, Frontier Demography: An Introduction. Pp. 33-55 in *The Frontier: Comparative Studies*, vol. 1 (ed. by D.H. Miller and J.O. Steffan). Norman: University of Oklahoma Press.
- McGuire, R.H., and R.M. Netting, 1982, Leveling Peasants? The Maintenance of Equality in a Swiss Alpine Community. *American Ethnologist* 9:269-90.
- Morgan, J., 1962, The Anatomy of Income Distribution. *Review of Economics and Statistics* 44:270-83.
- Netting, R.McC., 1965, Household Organization and Intensive Agriculture: The Kofyar Case. *Africa* 35:422-29.
- Netting, R.McC., 1968, *Hill Farmers of Nigeria: Cultural Ecology of the Kofyar of the Jos Plateau*. Seattle: University of Washington Press.
- Netting, R.McC., 1974, *Kofyar Armed Conflict: Social Causes and Consequences*. *Journal of Anthropological Research* 30:139-321.
- Norman, D.W., E.B. Simmons, and H.M. Hays, 1982, *Farming Systems in the Nigerian*

Savanna. Boulder: Westview Press.

Pugh, J.C., 1955, *The Geomorphology of the Northern Plateau of Nigeria*. Ph.D. diss., University of London.

Rostow, W.W., 1960, *The Stages of Economic Growth*. Cambridge, Eng.: Cambridge University Press.

Sahlins, M.D., 1960, *Political Power and the Economy in Primitive Society*. Pp. 390-415 in *Essays in the Science of Culture* (ed. by G.E. Dole and R.L. Carneiro). New York: Crowell.

Saul, M., 1983, *Work Parties, Wages, and Accumulation in a Voltaic Village*. *American Ethnologist* 10:77-96.

Stone, G.D., n.d., *Effects of Subsistence Change on Household Organization among the Kofyar: A Preliminary Report*. Ms. on file, Department of Anthropology, University of Arizona.

Terray, E., 1972, *Marxism and "Primitive"*

Societies: Two Studies. New York: Monthly Review Press.

Tiffen, M., 1976, *The Enterprising Peasant: Economic Development in Gombe Emirate, North Eastern State, Nigeria, 1900-1968*. Ministry of Overseas Development, Overseas Research Publication No. 21. London: Her Majesty's Stationery Office.

Turner, F.K.J., 1920, *The Frontier in American History*. New York: Henry Holt.

Watts, M., and P. Lubeck, 1983, *The Popular Classes and the Oil Boom: A Political Economy of Rural and Urban Poverty*. Pp. 105-44 in *The Political Economy of Nigeria* (ed. by I.W. Zartman). New York: Praeger.

Wolf, E.R., 1957, *Closed Corporate Peasant Communities in Mesoamerica and Central Java*. *Southwestern Journal of Anthropology* 13:1-18.