

Original articles

Relatedness, class, and social organization in a village in
southern Thailand

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Abstract

Darwinists still do not have a full theory of human social organization. Relatedness is a key idea in evolutionary theory. Yet, despite some pioneering studies, few Darwinists have used formal measures of relatedness, and even fewer have used them to describe social organization. Nobody has used relatedness to explain the rise, coherence, and decline of classes, class composition, and class relations. This article does that for one village in southern Thailand over a period of about 120 years. Each class had its own characteristic family type and relations between families, which varied over time. This article also uses the incidence of marriage between kin to show the need to take into account different perspectives on relatedness and social organization. © 2000 Elsevier Science Inc. All rights reserved.

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... the settlement histories were compiled primarily to ingratiate myself with the elders, who maintained ... that without a grasp of tradition and history, my ethnography would be rotten ... Second ... how does this study show how evolutionary thinking can help sociocultural anthropology, the discipline to which I have always wanted to contribute? As I look at it today, not very much! ... we still have both a very poor understanding of the social and ecological constraints that shape behavioral options and, more worryingly, almost no methodology for characterizing those constraints.

(Borgerhoff Mulder, 1997: 115–116)

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1. Background

Borgerhoff Mulder underestimated her contribution because she correctly estimated the problem. Anthropologists in the field usually feel a strong sense of another coherent way of life, a social organization that has built up over time. Among peasants, class is a key aspect of social organization even at the local village level (Popkins, 1979). For one village in Thailand, this paper explains the role of class in social organization through the key but little used Darwinian idea of relatedness.

I was able to obtain complete genealogies on all households in one Thai agricultural village from its founding in about 1780 through 1984. This article documents the changes in kin relations and social classes due to changes in demography and land holdings over a period of 120 years, from the time the village was well established (1845) until modernization began to change it (after 1964). These analyses of kinship and class extend the Darwinian approach to social dynamics.

1.1. Relatedness

The concept of relatedness has accounted for some patterns in social organization. Morgan (1979) and Smith (1985, 1997) described social dynamics of the Eskimo (Inuit) according to degrees of relatedness. Smith found that whaling parties were more closely related than would be expected on the basis of the relatedness of the local population. Van den Berghe and Mesher (1980) invoked formal relatedness to explain royal incest. Boone (1986) showed that medieval élites in Portugal coalesced around inheritance and kinship. Daly and Wilson (1988) showed that the intensity of violence often depended on relatedness. Physical anthropologists have used isonymy (“same [last] name”) to approximate relatedness measures (Relethford, 1988). These measures account for some aspects of social organization, such as historical ties between villages (Koertvelyessy, 1995) and mating patterns (Koertvelyessy and Nettleship, 1996). However, few physical anthropologists have looked at social organization comprehensively by incorporating modern Darwinian theory.

Chagnon (1981, 1992), a pioneer in applying Darwinism to ethnology, showed that relatedness played a significant part in village factions, village coherence, and village fissioning among the Yanamamö. People aligned themselves with the group in which they had the most kin and the closest kin. Hurd (1983b) showed similar effects when an Amish congregation split. Hurd (1983a) also analyzed isonymy and relatedness in the same group to check the accuracy of isonymy analysis. Berté (1988) showed how work groups in Belize depend on relatedness and how the personal relations formed in work groups help to replicate the kinship relations on which the work groups are based. Johnson and Johnson (1991) showed that conflict and support among early northern European nobility depended on kinship. Grayson (1994) showed that among the people most at risk in the ill-fated cannibalistic Donner Party were those with the least kin.

The fullest work is by Hughes (1988). He did not offer a complete Darwinist theory of social organization, but he does show that relatedness is key to a variety of problems in social organization, from a family feud to the organization of the state. He did not offer analyses of class, although some of the kin group relations he discussed are almost like class. He based

most of his analyses on various extant, if sometimes small, groups wherein the putative relatedness of parties was known.

1.2. Thai society and Caravel village

This article focuses on a Thai village where kinship and class were integral to social organization (Polioudakis, 1989). Traditional Thai society had three large classes: (1) lords; (2) free commoners; and (3) people bonded to lords, so-called “serfs.” It also had powerful soldiers and rich merchants who sometimes intermarried with the lords. Lords, soldiers, and merchants were the true aristocracy of Thai society. (The Thai have several categories of servitude other than “serf” (*phrai*), but all are usually called by that term in the literature, and the distinctions do not affect the results reported here, so I follow the convention.)

Caravel (pseudonym) is a Thai Buddhist settlement on the eastern coast of southern Thailand. Before 1975, it was fairly isolated (no electricity or paved roads until 1983) and was oriented toward a traditional economy of rice farming. After 1975, the Western-style market capitalist economy played an increasingly important role there. Buddhist Caravel was founded about 1780 when natural drainage changes opened up a small port and allowed swampland to be cleared. Nearby commoners moved in first to claim large tracts of land and, by virtue of their new land wealth, entered the upper class. Within a few years (by 1800), lords, soldiers, and merchants came to claim their own land and to marry the daughters of the former commoners who had claimed land. The aristocracy brought in some serfs. Afterwards, other commoners trickled in to claim small land tracts, and other aristocrats continued to marry with the growing high class in Caravel. Bureaucratic offices began to replace lordly titles after 1900. Villagers thought of the offices as a continuation of the lordly title system and treated office holders in much the same way as previous lords. Serfdom gradually was abolished after 1889, but the social relations of the system persisted for at least two generations afterwards and the categories persist into the present.

The southern Thai have an ideal of equal inheritance distributed among all their children. Thus, the originally large plots of land at Caravel were steadily cut up for inheritance until about 1920, when most plots were only just large enough to support one family. After then, parents usually chose one main heir for the land; the other children had to find alternative careers. Population growth continued, but only slowly as people used land more intensively and subdivided ever more carefully.

Some wealthy, powerful, or clever people practiced serial monogamy leading to reproduction through several spouses, and a very few men practiced limited polygyny. But the amount of all such plural marriages was small compared to the number of monogamous marriages (always less than 10% of all unions), the reproductive advantages gained were small, and plural marriages did not have a very strong influence on social organization. The total descendants of any one polygynous man by all his spouses tended to be a more cohesive social unit than his descendants by any one spouse. Contrasts were between families rather than within them.

The categories for various kinds of wives in Thailand are sometimes confused in the literature, and the confusion leads to misunderstandings of Thai social organization, so it is important to clarify the categories here. Normally, only aristocratic men had more than one

spouse at a time, and their practice determined the categories: (1) the main (primary or major) spouse (*mia luang*), who very often was an aristocratic woman; (2) a secondary spouse, who usually was an aristocratic woman; (3) a secondary spouse, who was a commoner woman; and (4) a serf spouse (*mia noi*). These categories are not completely distinguished by Thai terms, which may be a source of the confusion.

Secondary aristocratic wives had fairly good rights, and their children shared fairly equally in inheritance and status with the children of main wives. Secondary commoner wives got land sufficient to raise a stem family, and their children usually remained in the middle class. Serf wives got little land and their children fell into the low class. After emancipation, high and middle class people almost never married low class people who had any serf ancestry, regardless of land holdings. Middle class people sometimes married low class people provided there was no serf background.

Class membership was based on multiple criteria of land wealth, occupation, kinship to a lord or office holder, or kinship to a serf. Still, I use the terms “low,” “middle,” and “high” throughout because they were natural to the situation of land holdings and because the people themselves thought that way. A member of the high class had access to power and/or had more land than her or his own family needed, and often had a good occupation. A member of the middle class had enough land for his or her family and/or a good job. A member of the low class rarely had enough good land, often had a poor job if any, and often had some serf ancestry. Marginally poor people who had serf ancestry fell into the low class, whereas marginally poor people who had aristocratic ancestry could rise into the middle class.

All three classes had stem families, but each class had its own variation on the stem pattern and on relations between families (Polioudakis, 1991). The middle class had the most-nearly typical stem family system in which nuclear families lived with the parents of one of the spouses. These families usually had just enough land to support themselves comfortably, and they gave the land nearly intact to only one or two heirs. Middle class families tended to marry among each other so as to preserve stable plot sizes and access to land. They married within Caravel whenever possible, but sometimes they married outside. The middle class was composed of many small families with cross-cutting ties extending back several generations. The high class had extended (stem) families in which several close kin lived nearby, often groups of brothers and/or cousins with their families. They had wide marriage ties to other high class families. They also had many kin ties of moderate depth with the middle class because the middle class was derived from the high class and because these two classes sometimes intermarried. The low class had expanded (stem) families in which a mixed variety of fairly close kin lived nearby. Low class families did not marry among each other as much as did the other classes. Unlike the high and middle classes, low class people often married outside of Caravel because they had little to preserve by marrying other low class residents and because they might gain access to jobs by marrying outside. The low class was composed of large, loose, expanded families with some, but not many, ties between them.

Class has made a difference at Caravel. Since Caravel began, until recently, most lower class people lived in one ghetto. At first, the high class dominated political and religious leadership. It built the Buddhist temple on its own lands, and its sons were the only abbots for 150 years, until about 1990. Starting about 1900, the middle class began to supply the village headmen and other leaders. The middle class was the mainstay of village social

organizations, such as the school and temple committees. The middle class even supplied most of the successful criminals until recently. The high class and middle class cooperated to get electricity and paved streets to all parts of the village except the low class ghetto. When low class men stole from the other classes, they sometimes wound up dead even while middle class men often got away with it. Yet in the 1990s, with some help from astute politicians in other classes, the lower class has been able to invade the school committee, get one of its sons appointed abbot, get electricity and paved streets, engage in lucrative businesses such as shrimp farming, and invite outside agencies to help set up farming and fishing cooperatives.

Class endogamy was always a strong force in maintaining classes. People married not just according to social rules about class but also in pursuit of partners and other resources that would further reproductive success. These strategic actions strongly helped to build the class-relatedness patterns described in this article, and these patterns formed the contexts for fairly persistent, but slowly changing strategies.

2. Methods

2.1. Fieldwork

My first field residence totaled about 27 months between April 1982 and August 1984 (I left during the 3-month rainy season in 1983–1984). Since 1984, I have returned many times for short stays of up to a few weeks. These visits did not involve any systematic genealogical research, but data previously collected were updated and checked. I got complete genealogies for all people who lived in Caravel in 1984 from the time they or their ancestors immigrated. The genealogical analyses presented here extend from 1845 to 1964.

In my first 6 months (April to September 1982) in Caravel, I made a complete scale map of the area, including all fields, orchards, houses, roads, waterways, and public buildings. I used a compass, I counted paces, and I had a tracing of a small aerial photograph from the local land office. Small maps derived from the master were used to facilitate data collection during household interviews. In the next year, I was able to identify all land holdings, trace all land holdings back to the original owners, and sketch much of the household family histories.

During the first 18 months, I visited each house several times to talk informally about ownership, occupation, and kinship, including genealogies. I talked to at least one adult member of each house. I filled in most of the gaps left from the genealogies taken while researching land. During this time, I systematically inquired of the old people about the earliest history of Caravel, which enabled me to identify the earliest settlers and the next generations of powerful men.

In the last 6 months (March to August 1984), I revisited all 160 households in Caravel at least once, talking to at least one resident adult. I got standard demographic information on all household members. For all residents, I asked for the name, place of birth, age and/or birth date, marital history, parents, and children. For natives of Caravel and for immigrants who might be related to Caravel residents, I also asked for as much genealogical data as they could give. I did not repeat detailed questioning of siblings if I had already cross-checked the data

and I felt it was reliable and adequate. I asked for as much information about emigrants in both present and past generations as residents could provide.

Buddhist Thais strongly stress birth order both in their own cohort and in ties to other cohorts, an attitude that helped them to remember genealogies well. Also, many of the households in Caravel had some tie to a titled person in their background and could recall kinship fairly well back to the most recent titled person even if they could not recall it further back. From links to titled ancestors, I was able to deduce cross-links and other ties. I confirmed these deductions with the old people. Data on birth order was useful in gauging when ancestors of different lines were in similar cohorts and thus related by descent or linked by marriage. Except for the most recent generations, I could not get reliable data on age at death or age at marriage. However, the Thai have distinct terms for periods of life, including terms for late adolescence. I often was able to find out at what period of life a person died even if not the exact age or year.

2.2. Kinship terminology used here

Actual counts of people according to kinship for the purpose of computing various kinship measures usually begin by searching back for common ancestors. Only between direct ancestors and descendants is the common kin (the ancestor) in the kinship dyad itself. A father is the common kin-ancestor in father-child dyads; a grandmother is the common kin-ancestor in any grandchild-grandmother dyad. For other types of kin, we have to trace back along genealogical links to find a first common ancestor, then count the links through that common ancestor. Kin of the same generation usually share a common nodal ancestor about an equal distance back from each. A grandmother is the common nodal ancestor linking her various grandchildren to each other; they count their kinship (as cousins) through her. To calculate indices of relatedness, we search back to find someone in common through whom to measure. In the case of an uncle (U) and nephew (N), he is uncle (e.g., mother's brother) to his nephew (e.g., sister's son). The common ancestor is not the woman who is U's sister and N's mother; it is the person who is both the parent of U and the grandparent of N. That common ancestor is one link back from U and two links back from N.

How we look at genealogical links affects what kinship we see. For instance, searches for common ancestors usually are done within a limited number of links back that define the potential universe of relevant kinship. Counting four or more links back catches the common ancestors for third cousins. If fewer links were included, their common ancestry would be missed. Unfortunately, many people do not know their kinship four generations back, even though the kinship relations might still indirectly affect them. Often, it is possible to correctly infer the genealogical links even if we can find them only through other informants or by reconstruction. Genealogical "depth" refers to the number of generations up (back) or down from an ego or other focal person.

Lineal kin are direct ancestors and descendants, such as parent and child, or grandparent and grandchild (Table 1). They have one "way" of kinship ("Ways-per-Kin") between them. A "way" is one complete trace of kinship through a common ancestor between any two people, also sometimes called a "loop" or a "path." A grandmother and her grandchild have one way of kinship between them, composed of two links (the first link from the child to

Table 1
Kinship index statistics for some typical kin

Relationship	No. common ancestor(s)	“Ways”	Links per way	Links back to common ancestor(s)	Total “r”
Parent to child	1 parent	1	1	1	0.5
Full siblings	2 parents	2	2	1	0.5
Half-siblings	1 parent	1	2	1	0.25
Niece to aunt	2 ancestors	2	3	2	0.25
Aunt to niece	2 ancestors	2	3	1	0.25
Grandparent to grandchild	1 grandparent	1	2	2	0.25
First cousins	2 grandparents	2	4	2	0.125
Second cousins	2 great grandparents	2	6	3	0.03125
Third cousins	2 great-great-grandparents	2	8	4	0.00781

the intervening parent, the second from the parent to the grandmother). In contrast, collateral kin (such as full siblings, uncles and nieces, and cousins) are on different lines from the same common ancestor(s). Usually collateral kin have two ways of kinship in common because they are descended from a pair of common ancestors. Full siblings share two parents and thus two ways of kinship between them. Full siblings are related through one link up and one link down by each parent, or two ways of kinship, each way with two links. Full first cousins share a common grandmother and a common grandfather, or two total ways of kinship also. However, they have four links per way between them, two up to each grandparent and two down from that grandparent to the counterpart cousin (Table 1). Thus, the same kin can be related in more than one way. People sometimes think that some kin are related directly through links sideways, but technically a link is up or down only.

One widely used index is the coefficient of relatedness “r” as computed following Wright (1922, 1969). Strictly speaking, it is the probability that two kin share particular genes in common, but it has long been used as a general measure of relatedness. Each pair of kin has an “r” figured by raising 0.5 by the total number of links back to a common ancestor and down to the counterpart kin, for each way of kinship, then summing the “r” for each way to get a total “r” (Table 1). For parent-child dyads, $r=0.5$ by direct descent of one link in one way. For full siblings, $r=0.5$ also, but by a different calculation. Each pair of full siblings has two ways of kinship between them (one through each parent), each way composed of two steps (one up from the original sibling to the parent and one down to the counterpart sibling), with $r=0.25$ per way. Full first cousins also are kin through two ways, one way through each grandparent, but each way has four links, two up (to a common grandparent) and two down (to the counterpart cousin), with $r=0.0625$ per way for a total $r=0.125$ (0.5 raised to the fourth power equals 0.0625). To compute “ways”, “r,” and other indices of relatedness, I wrote computer programs in Borland[®] Turbo Pascal 6.0 to run on an IBM Thinkpad 720. The core algorithm for values of relatedness was derived from “Kindecem” written by James Bryant and Napoleon Chagnon.

Marrying a relative increases the number of ways of kinship and the value of “*r*.” Cousins whose grandparents themselves shared some kinship have more than two ways of kinship between them through the extra common ancestor(s) in the background. Plural marriage and remarriage lower the number of ways of kinship and reduce the coefficient of relatedness (“*r*”) between kin. Half-siblings, for example, have only one way of kinship between them through one parent for a total $r=0.25$, in contrast to full siblings who have two ways between them with a total $r=0.5$.

Most kin are collateral. Focusing on lineal kin highlights the relations within families, whereas focusing on collateral kin highlights relations between families and between higher-order social groupings. In the absence of marrying a relative, remarriage, or plural marriage, lineal kin have exactly one way of kinship between them and a fairly high value for “*r*,” whereas collateral kin have exactly two ways of kinship between them and a lower value for “*r*.” With lineal kin and collateral kin in the same sample of people, it is hard to interpret indices such as the average number of “Ways-per-Kin” or the coefficient of relatedness. The average number of “Ways-per-Kin” does not center around one or two, and the average “*r*” does not clearly point to any typical degree of relatedness in the group such as the prevalence of siblings or of cousins. The indices would mask differences due to the number of linear or collateral kin and to the effects of marrying kin, remarriage, and plural marriage. In general, wide patterns of kinship relations are most clear when looking only at collateral kin.

The best way to focus on collateral kin is to manage cohort size. A cohort extending more than one generation (defined as 20 years) includes both collateral and lineal kin. A cohort just one generation wide is more likely to contain only collateral kin who are of approximately the same generation compared with a cohort extending beyond one generation. One can limit the analysis of kinship dynamics to people born in a cohort or extend the analysis to include all the people alive in a cohort regardless of when they were born. Looking only at the people born within a particular cohort allows one to “control” for age and to better see social development by comparing changes between cohorts. To count all the people alive requires knowing not only when people were born, but also when they died; unfortunately, data on mortality were not usually available for the people of Caravel. To capture only collateral ties, and yet to find all the possible links among collateral kin, most of the analyses presented here are based only on the people born within a 20-year cohort. The analyses include all people born in the cohort, and they are based on searches for common ancestors who might extend an effectively unlimited depth of up to eight generations back.

Table 1 outlines kin terminology for different categories of kinship, as well as the indices of kinship for the present analysis. An “ego” (for example, cousin A) is a person for whom one figures kinship to “alters” (for example, cousins B and C). A group can be compared to itself to find out how its members are related among themselves by using it as both egos and alters in computations (for example, when we figure how X, Y, and Z are all kin to each other). When an ego is also a member of the alters, calculations are adjusted to compensate for the pseudo-replication of ego.

With individual egos and alters, the direction for comparison of kinship indices does not affect most results, but when making group comparisons the direction of kinship reckoning does affect the outcome. The indices when comparing one family (the egos) to another family (the alters) would not be the same if the comparison were reversed. Simple statistics, such as

average number of kin per person (“Kin-per-Ego”) and percent of alters to whom ego is kin (“Ego-Kin-to-Percent-Alters”), are the arithmetic mean among a specific set of egos when the egos are compared to a specific set of alters. If group A is the group of egos and group B the group of alters, then the average value of “Kin-per-Ego” for Group A is the mean number of kin that egos in Group A had among the people in Group B. Most statistics, such as “Ways-per-Kin”, describe the mean of the set of means among a group of egos when compared to a group of alters. For those indices, first, for each ego, the mean for each person is calculated; then the mean of those means is calculated to obtain the overall mean for the set of egos in Group A. Where a class-cohort had no egos with kin, the other kin-based indices were omitted.

Because a major focus here is the comparison of kinship dynamics associated with class, each cohort has four potential comparison groups within the same cohort: the whole village, as well as low, middle, and high classes within the cohort. Comparing all these groupings (as egos) to themselves (as alters) and/or to the other groupings (as alters) would yield 16 comparisons per cohort. However, to see relevant social organization it was necessary to make only three comparisons, one for each class within a cohort as egos to itself as alters, for example, to calculate how the people in the low class in a cohort were related to each other.

3. Results and discussion

3.1. Population and cohorts over 1845–1964

Table 2A summarizes the number of people born into each 20-year cohort and each class, whether they were born in Caravel or elsewhere, provided they also survived through adolescence and resided in Caravel (thus the analysis excludes emigrants). Table 2A also shows how many people in each cohort and class had at least one relative in their own cohort and class (“N with kin”). The people without kin were mostly in-marrying spouses. Table 2B is derived from Table 2A. Without full data on mortality, it was not possible to specify the total adult population of Caravel at any one time. However, given the data on “total born” per cohort (Table 2A) and assuming that all people lived exactly 60 years, it is possible to approximate the total population closely enough to show the relevant trends. By this estimation procedure, the total population of Caravel grew to 559 people at the end of cohort VI in 1964. An entry for Table 2B is figured by adding the last two corresponding cohort entries and the present cohort entry from Table 2A, to make up a total period of 60 years. For example, an entry for Table 2B, Cohort IV is derived by adding the results from Table 2A, Cohorts II, III, and IV. A typical stem family has about four resident adults. The approximate total number of households for any cohort-class was computed by dividing the estimate of the total population by four. The resulting estimated number of households in 1964 for the low class is 49, for the middle class is 69, and for the high class is 22. These estimates are realistic when one considers that 20 years later, in 1984, my census of Caravel revealed about 60 low class households, 85 middle class households, and 15 high class households.

Table 2
Basic demographic data for caravel 1845–1964

Cohort	Whole population	Low class	Middle class	High class
(A) Number of people born and number with kin in Caravel in each class for consecutive 20-year cohorts				
I. 1845–1864				
No. born	39	9	4	26
No. with kin	26	1	2	23
II. 1865–1884				
No. born	86	24	20	42
No. with kin	49	0	8	41
III. 1885–1904				
No. born	127	47	32	48
No. with kin	84	16	24	44
IV. 1905–1924				
No. born	179	46	86	47
No. with kin	143	25	73	45
V. 1925–1944				
No. born	184	62	91	31
No. with kin	145	41	76	28
VI. 1945–1964				
No. born	196	87	100	9
No. with kin	165	66	90	9
(B) Estimates of total population, people with kin, and number of households, according to class and cohort				
I. 1845–1864				
No. of people	39	9	4	26
No. with kin	26	1	2	23
No. households	10			
II. 1865–1884				
No. of people	125	33	24	68
No. with kin	75	1	10	64
No. households	31	8	6	17
III. 1885–1904				
No. of people	252	80	56	116
No. with kin	159	17	34	108
No. households	63	20	14	29
IV. 1905–1924				
No. of people	392	117	138	137
No. with kin	276	41	105	130
No. households	98	29	35	34
V. 1925–1944				
No. of people	490	155	209	126
No. with kin	372	82	173	117
No. households	122	39	52	31
VI. 1945–1964				
No. of people	559	195	277	87
No. with kin	453	132	239	82
No. households	140	49	69	22

According to my estimates and my interviews of elderly people in Caravel, the total population of Caravel rose rapidly at first, and then grew more slowly beginning in Cohort IV (1905–1924) when available land became scarce. At first when land was relatively abundant, people preferred to stay and marry within Caravel. Later, people left. Kin ties built up among whichever groups stayed persistently.

The birth rate of the high class rose quickly at first but declined steeply in Cohorts V and VI (Table 2). The amount of land was limited, so those families who wished to maintain a high position did not risk dividing land too much further. Because the absolute number of high class egos born was steady or declining while the rest of the population grew, its relative proportion in the population declined. The high class always had a higher proportion of members who had kin because they were the initial large landholders and because they arranged marriages within the local population whenever they could. By Cohort VI (1945–1964), members of the high class preferred to forge alliances outside of Caravel and had begun to leave.

The middle class began as an outgrowth from the high class due to the division of land through inheritance, starting most obviously in Cohort III (1885–1904). The steady growth of the population as a whole came mostly from this growth of the middle class and secondarily from the growth of the low class (Table 2). When the middle class began to dominate numerically in Cohort IV, it had about as many kin in Caravel as the high class because the middle class had come out of the high class. The middle class, like the high class, maintained a high proportion of people with kin because middle class people married among themselves to ensure access to land. Middle class parents sometimes divided their holdings between two children who individually would have only marginal holdings but who would have access to more than enough if they could marry other middle class children in similar circumstances. Some middle class people who had little or no land but who had good jobs (usually men) were able to marry other middle class people who had land but only poor jobs (usually women), especially if the alliance between kin groups also was worthwhile.

The low class started out in 1845 with more members than the middle class (Table 2) but almost none were kin to other people in Caravel, with the possible exception of “illegitimate” children of the upper class by serf wives. With few assets in Caravel, low class people sought spouses elsewhere and the number of new additions to the class grew fairly slowly but steadily. Also, the percent of the low class who had kin rose steadily, but neither the number or percent of those with kin rose to equal the figures for the middle class. The growth of the low class declined when land ran out in Cohorts IV and V but recovered as low class people increasingly turned to alternatives such as working on fishing boats.

3.2. Changes in class-specific kinship over 1845–1964

The results shown here were calculated by using the people from the cells for “With Kin” from Table 2A as a basis for the egos and alters. For example, because the low class for Cohort IV was both egos and alters, the “n” for both egos and alters was 25. When a class-cohort had zero “Kin-per-Ego” (Fig. 1A) in a particular cell (for example, the low class in Cohorts I and II) and thus had zero “Kin-to-Percent-Alters” (Fig. 1B), the cells for other

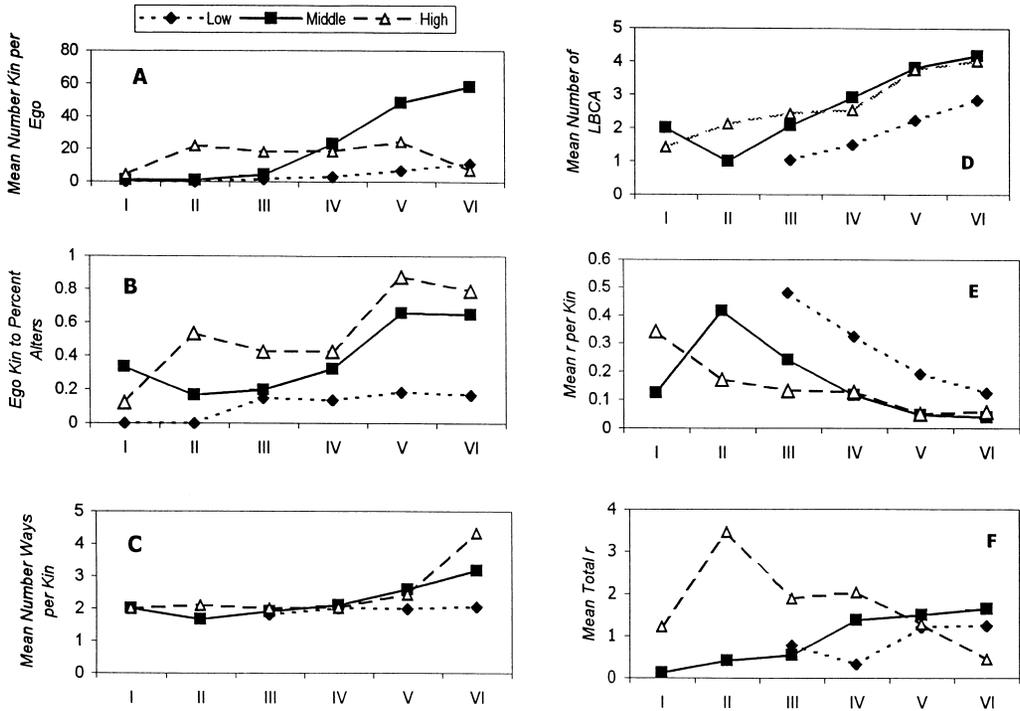


Fig. 1. Changes in class-specific kinship over 1845–1964. (A) Mean number of “kin-per-ego.” (B) “Ego-kin-to-percent-alterns.” (C) Mean number of “Ways per kin.” (D) Mean number of “links back to common ancestor” (LBCA). (E) Mean “ r per kin.” (F) Mean “Total r .”

variables are omitted from subsequent graphs for other variables (for example, “Ways-per-Kin”, Fig. 1C, for the low class in Cohorts I and II).

After 1845, particular high class and middle class egos soon had many kin residing in Caravel (mean number of “Kin-per-Ego,” Fig. 1A). Low class egos always had fewer kin per ego resident in the village. The average number of “Kin-per-Ego” for the high class remained steady from Cohorts II through V (Fig. 1A), when it decreased due to the decline in total numbers of births and total population for the high class (Table 2). The average value of “Kin-per-Ego” for the middle class starts out low but rises rapidly along with the increase in class size because its members had descended in common from the upper class. That “Kin-per-Ego” rises in this manner can only occur if the middle class also had been marrying among themselves. Although the average “Kin-per-Ego” for the low class rises, it does not rise in accord with the population growth or nearly as quickly as did that index for the middle class. This relative slowdown in growth could only occur because low class people did not marry among each other within Caravel.

Because middle and high class people had, on average, more “Kin-per-Ego” than low class people, they were also kin to a greater percentage of their own class, on average, than were low class people (“Ego-Kin-to-Percent-Alterns,” Fig. 1B). The number of people with kin among a set of alters increased noticeably over time for the middle and high classes, primarily due to marriage within the classes. By later cohorts (V and VI), middle

and high class egos were kin to over two-thirds of their class fellows. In contrast, low class egos were never kin to even one-fifth of their class fellows because their families did not intermarry, and low class egos remained comparatively isolated. The broad network of kinship links of the high and middle classes facilitated their solidarity in contrast to the low class and helped assure that leaders arose largely from within the middle and high classes.

On average, the low class had two ways of kinship among members. The middle and high classes showed nearly two mean ways of kinship among members until Cohort V (mean “Ways-per-Kin,” Fig. 1C). The low class rarely married kin (Tables 3 and 4), and only occasionally did people remarry because resources were limited. When people remarried after the death of a spouse, the subsequent spouses often had very few children and those few children often left Caravel. In contrast, the average number of “Ways-per-Kin” quickly rose for the middle and high classes in Cohorts V and VI, primarily because of a few cases of marrying relatives to conserve land holdings and other resources (see later).

“Links-Back-to-Common-Ancestor” (“LBCA,” Fig. 1D) is the mean of the mean number of links back to the common ancestor of an ego and all his alters for each ego in a class-cohort. Because low class people in the first two cohorts had no kin among themselves and therefore no common ancestors, there could be no “LBCA” in those cohorts. The “LBCA” for the low class did begin to increase after Cohort III as families

Table 3
Effects of generational depth on indices of kinship dynamics

(A) Indices calculated for people in Cohort V (ego) through three links: adjacent ascending (Cohort IV), contemporary (Cohort V), and descending (Cohort VI) generations			
Egos (V)	Low	Middle	High
Alters (IV–VI)	Low	Middle	High
No. Egos with Kin	47	81	28
No. Alters with Kin	142	249	77
Kin per ego	15.57	30.93	18.25
Ways per Kin	1.72	1.85	1.84
LBTC Ancestor	1.77	2.28	2.28
“r” per Kin	0.27	0.16	0.16
Total “r”	2.94	2.95	2.44
(B) Indices calculated for people in Cohort V (ego) through two links: adjacent ascending (Cohort IV) and contemporary (Cohort V), or descending (Cohort VI) and contemporary (Cohort V)			
Egos (V)	Low	Middle	High
Alters (IV–V or V–VI)	Low	Middle	High
No. Egos with Kin	47	81	28
No. Alters with Kin	142	249	77
Kin per Ego	7.98	7.95	5.65
Kin per Ego (class per whole)	10.15	11.75	14.72
Ways per Kin	1.68	1.75	1.80
LBTC Ancestor	1.33	1.49	1.31
“r” per Kin	0.37	0.16	0.16
Total “r”	2.54	2.05	2.04

Table 4
Married couples by cohort and class

Cohort	Class	No. couples	No. “inbred” couples	Ways per couple	LBCA	“r” per couple
I and II (1845–1884)	Low	21				
	Middle	9				
	High	35				
III (1885–1904)	Low	26				
	Middle	15	1	2.00	4.00	0.00781
	High	19				
IV (1905–1924)	Low	25				
	Middle	45	3	4.00	4.00	0.00781
	High	19				
V (1925–1944)	Low	29	1	2.00	5.00	0.00195
	Middle	42	11	2.82	4.47	0.00790
	High	16	7	2.29	4.50	0.00586
VI (1945–1964)	Low	34	3	3.50	3.94	0.03158
	Middle	34	8	2.63	4.33	0.00891
	High	4	2	2.00	4.50	0.01978

began to grow and stay in Caravel. However, “LBCA” never exceeded three, or about the distance back to a great grandparent. In contrast, the average “LBCA” for the middle and high classes increased from the beginning and reached considerably higher levels than that for the low class. The high levels for “LBCA” for the middle and high classes indicate that families in those classes were linked considerably by distant ancestors. Although middle and high class people intermarried, the number of recent ties formed by intermarriage did not predominate over the ties that had been formed on the basis of common descent from the beginning of Caravel history. A common tie of four links back is equivalent to a genealogical link through a great-great-grandparent. People might remember those ancestors as historical figures, but they rarely remembered them as real people. Such distant ties might be enough to affect status or class, but they often did not affect the basis for daily affairs among particular families.

The value of the coefficient of relatedness (“r”) usually decreases as the value of “LBCA” increases, but variations in “r” depend on the depth of common ancestry under consideration. When increasing numbers of people are kin to each other mainly through distant ancestors, then “r” declines steadily over generations (mean “r-per-Kin,” Fig. 1E; also compare $r=0.5$ for full siblings who share parents with $r=0.01325$ for second cousins who share great grandparents; Table 1). The greatest mean value for “r-per-Kin” was achieved with the low class in Cohort III ($r=0.48$) when only 16 people had kin in their own class-cohort group, and before this time none of the low class members had any kin present in Caravel. This value of $r=0.48$ reflects a few sets of full siblings in a few families, along with some children from the previous generation of unrelated people. The average “r-per-Kin” for the low class never fell below the value of “r” equivalent to first cousins ($r=0.125$). The average value of “r” for Cohorts III through VI reflects the increase in average number of links back to a common

ancestor (LBCA, Fig. 1D). In contrast, the average “r-per-Kin” for the middle and high classes declined earlier and to a noticeably lower level, reflecting the increase in the number of distal links back to a common ancestor among these classes (LBCA, Fig. 1D). The average “r-per-Kin” finally fell to a level about that between second cousins ($r=0.03125$).

These patterns, taken together, reinforce the idea of different family types and relations among the classes. The changes reflect the fact that the low class was composed of expanded family blocks with people who were closely related to each other (high “r”) at a close distance (low “LBCA”). The few kin that low class people had among their own class were mostly other members of their own expanded families. A middle class ego had many kin, but they were mostly spread thinly throughout the village among the whole class, linked by ties forged some time ago through ancestors in the high class. This is a pattern typical of small widely connected stem families. The high class appears much the same as the middle class. The extended families of the high class were not obvious except indirectly in the low but persistent values for average number of kin (“Kin-per-Ego,” Fig. 1A).

The idea of relatedness entails not just a single self but a genetic identity expressed among many people. The total number of kin in a cohort-class, weighted by the coefficients of relatedness of a focal person to each of his or her kin, is equivalent to that person’s “genetic interest” in the group. Such genetic interest tends to accumulate over time. This accumulated genetic interest might affect a person’s sense of power and options. One index of genetic interest is the “Total “r” per ego” in a cohort-class group (“Total-r-per-Ego,” Fig. 1F). It is based on the coefficient of relatedness between any pair of kin, “r-per-Kin,” Fig. 1E), but instead of averaging all the coefficients of relatedness of a focal person to each of his or her kin, the various coefficients of relatedness are summed first, and then a mean of those sums is figured (it is a mean of sums of “r” rather than a mean of means). This index of genetic interest is a hypothetical construct that has not been correlated with the subjective perceptions of people or with any objective measures of their behavior. Still, in the case of Caravel, this index suggests that high class egos may have “seen more of themselves out there” than did middle and low class egos during the period when the high class dominated Caravel political life, at least until Cohort IV. In Cohorts IV and V, when political dominance was taken over by the middle class, a middle class person clearly had as much or more external genetic interest within his or her class-cohort than did a high class person, as measured by this index. By Cohort VI, when the low class was on the verge of asserting itself politically, a low class person “saw him/herself out there” almost as much as a middle class person and clearly more than a high class person. I believe that this index of “seeing more of one’s self out there” was consistent with a greater sense of class consciousness and greater class solidarity.

3.3. *Genealogical distance and stem family variants*

Previous results were based on 20-year cohorts and on exhaustive searches of up to eight generations back. These kinds of analyses are useful for summarizing the many possible links among classes as wholes, but these quantitative indices do not always bring out the immediate family dynamics that can underlie social class dynamics. For example, the previous data suggested, but were insufficient to isolate, three aspects of family dynamics. First, variations in stem family types between the classes are not described by single indices. Second, some

“inbreeding” occurred among the middle and high classes, but the indices do not indicate the incidence or the combinations of relatives. Third, extensive genealogical links among the middle class came from a mixture of recent links based on intermarriage and distant kinship links from the far past, but it is unclear whether recent kinship was enough to account for class cohesion.

Moreover, exhaustive searches might exceed local knowledge. Exhaustive data on kinship were obtained only because a few old people who remembered deep kin links were alive at the time of my initial fieldwork. After the old people all had died, their descendants did not preserve full knowledge of kinship but instead remembered only about three or four generations back, although people who had important titled men in their backgrounds tended to remember farther back, albeit rather indistinctly. This new threshold of memory corresponds to what most people needed to figure rights to small land plots that were not likely to be further subdivided, to sustain relevant kinship relations between particular families, and to preserve general class relations. It would add to our understanding of social organization at Caravel, and to our stock of Darwinian methods, if we could use alternative searches on the same population to illuminate family types, the mixture of kin ties, inbreeding, and genealogical memory.

The data in this section derive from taking Cohort V as the egos and taking the combined populations of Cohorts IV to VI as the alters. We can thereby see how one particular cohort was related to its immediate elders, peers, and descendants, that is, to its most relevant family members and other reasonably close kin. Everyone born was included in calculations because there were not enough data on mortality by which to exclude people by date of death. As the total extended cohort width of the alters is only 60 years, this procedure is not unreasonable. Because a cohort this wide mixes lineal and collateral kin, the results are not directly comparable to the previous analyses (Fig. 1), but the trends are similar enough so that a general comparison is relevant and useful. The percent of alters to which ego was kin (Fig. 1B) was eliminated as redundant.

The indices for “Links-Back-To-Common-Ancessor” when computed with unlimited generational depth (Fig. 1D) indicate that kinship indices would be sensitive to numbers and categories of kin up through four generations back for the high and middle classes. The effects of less generational depth are illustrated with indices calculated for three links back (Table 3A) and two links back (Table 3B).

For a generational depth of three links, the middle class had the highest average number of “Kin-per-Ego,” but the difference between this value and that for the low class is less than when similar values were computed for unlimited generational depth (Fig. 1A, cohort V) because the old kin ties that increased the values for the middle class have now been eliminated. The values for the average number of “Ways-per-Kin” for all classes are less than two (Table 3A) compared with the values of two or more when calculated on the basis of unlimited generational depth (Fig. 1C). This change reflects both the mixing of lineal kin with collateral kin and the cutting away of distant kin ties. “Ways-per-Kin” is not reduced much for the low class in this alternative view because low class families never had many distant kin ties to affect the index. “Links-Back-To-Common-Ancessor” is expected to be lower with three or fewer links back and, in fact, is lower. However, this index did not decline much for the low class for the same reason that “Ways-per-Kin” did not decline much. LBCA was still

higher for the middle and high classes than for the low class. Although a significant portion of the kin ties revealed in previous data for the middle and high classes had been forged in the distant past, still at least as many ties were forged for cohort V with the immediately ascending and descending cohorts. The average “r-per-Kin” for the low class in Cohort V remained fairly high (about equivalent to half-siblings) with a depth of three generations rather than the unlimited generational depth, whereas comparable values for the middle and high classes (about equivalent to first cousins) were somewhat higher with the three-generational constraint than with unlimited generational depth. In other words, as distant kin dropped out of the calculations, the relations between close kin had a bigger impact on the index. In the case of the low class, kinship ties were limited to the expanded stem family, whereas the mix of kin for the middle and high classes extended to related sets of stem families. Even though the average “r-per-Kin” for the middle and high classes was not as high as that for the low class, it would likely be sufficient to indicate a basis for strong ties among the people who were kin. The persistence of complex kinship, including recent kinship, among both the middle and high classes within the three-generational limits of kin reckoning underscores the importance of ties between families and within-class relations. The ties were not based on a dim quasi-mythological past alone, but also on kinship that could be seen and felt.

When reckoning is limited to only two steps back (Table 3B), many of the general class differences disappeared even while some of the stem family patterns typical of the classes became more evident. With a two-generational depth, we see only grandparents, parents, siblings, and children. Two differences stand out. First, low and middle class egos had an average of about eight kin each (“Kin-per-Ego”), whereas high class egos had an average of six kin when alters were defined as the same class. However, if one were to compare each class as egos to the population-as-a-whole as alters, the “Kin-per-Ego” for the low and middle classes did not change appreciably but the value for the high class almost tripled. Hence, the apparently “missing” kin of the high class when only high class alters are considered were those members who had moved down into the middle class. Second, the low class had high average values for “r-per-Kin,” equivalent to that of half- or full siblings. The middle and high classes showed a smaller average value for “r-per-Kin,” equivalent to that of first cousins. The average number of “Ways-per-Kin” was somewhat higher for the middle class than for the other two classes. These results indicate that middle class families had a greater ratio of lineal kin (parents and grandparents) to collateral kin (siblings) than the other two classes, an outcome that reflects a closer approximation to the vertically integrated nuclear stem family pattern. Furthermore, in the two-generational view, the average “Total r” for the low class was higher than the values of the middle and high classes. Although the low class did not begin to assert itself politically until Cohort VI, the growing equality represented by the average “Total r” foreshadows the rise of power and influence at least within close kinship.

3.4. “Inbreeding” and genealogical distance

Caravel residents stated that people with any common ancestors should not marry and insisted that people with common grandparents would not marry. Attitudes toward

marriage between kin revealed how people felt about kin ties. Over its history, Caravel had 369 married couples in which the wife lived in Caravel. Among these couples, 36 spouses were kin. Counting through eight links back, the “inbred” couples totaled 36, compared to 34 for five links back, 22 for four links back, and 3 for three links back. In the following analysis (Table 4: calculations based on unlimited generational depth), couples were assigned a cohort and class according to the wife. (Technically, the children were “inbred” rather than the couples themselves, but I refer to the couples as “inbred” for convenience.)

Following their expressed ideals, people did not marry kin until fairly late in Caravel history. The mean “r” per “inbred” couple for the 36 couples was equivalent to that of second or third cousins and the overall mean “Ways” per “inbred” couple was 2.8. The “LBCA” exceeded four. People usually could find someone to marry from another lineage or could find someone from outside the area. When they did merge close family lineages through “inbred” marriage, the last common ancestors were distant. Thus, “inbreeding” took place beyond the limits of usual kinship reckoning (three links) and was based on a common ancestor that neither spouse would have remembered personally even if they would have known of that person as an individual.

Although they condemned inbreeding, residents also bragged that “we are all kin here.” At least for the middle class, many deep and wide ties made life warm, safe, and kinder. Despite the distance of many kin relations, nearly all the couples who shared a common ancestor knew of it. All said that they married anyway so as to preserve resources and/or family status. That so few people married kin unless their common ancestor was at least four links back shows that kinship constrained their behavior. Yet, people acted to create their social networks within the limits of good situational strategy. People were ambivalent about shared common ancestry of spouses.

4. General comments

The relatedness results given here hardly tell the whole story of class and social organization at Caravel. Still, these data illustrate how social organization depended on class and kinship. Social organization changed when the political and wealth bases for class changed, and when the relative numbers of members in the classes changed. Indices of kinship varied with class structure, the incidence of stem family variants, the relations between families, and people’s constructions of genealogy. I do not wish to imply that the patterns of social organization and kinship found in Caravel are representative of peasant communities generally; rather, I expect interesting variation among communities.

I imagine that if kinship and census data were available regionally rather than for just one village, we would see a “spreading out” geographically of a powerful high class and we would see ties between low class families among villages. I imagine that regionally the patterns found in Caravel would be replicated. The middle class in Caravel intermarried extensively with the middle class in nearby villages but not much in distant villages.

Looking at one particular time in Caravel history, the patterns of kinship and class might have appeared differently than they did looking over its whole history. Knowledge of lineages over several generations and knowledge of the local traditions are essential in understanding the dynamics of kinship and social life, just as the elders had warned Borgerhoff Mulder.

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