The Economics of Inequality in an Agrarian Society: Landownership, Land Tenure, Population Processes and the Rate of Rent in 1930's China

DISSERTATION

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May 9, 1996

Accepted in partial fulfillment of the requirements for
the degree of Doctor of Philosophy in Sociology
in the Graduate School of the
State University of New York
at Binghamton
1996

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April 25, 1996

Professor Mark Selden
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Dear Mark,

I have now had a chance to read Linda Gail Arrigo's dissertation, although not as thoroughly as I eventually want to do. Thoroughly enough, however, to be able to say with confidence that it is a major and ambitious research effort that more than meets the usual requirements for a Ph.D. at an institution of quality. I am impressed by the breadth of issues Arrigo raises and of paradigms and research traditions she commands. She seems thoroughly familiar with the relevant literature, both new and old. One has the sense that she has mastered a broad spectrum of topics that are nevertheless closely interlinked. It is this appetite for comprehensive socio-economic-demographic analysis -- as opposed to the fragmented and partial analysis so familiar to economics -- that distinguishes Arrigo's work and makes it valuable. In addition, the dissertation gives proper consideration both to theory (often based on thought experiments and followed by computer simulation exercises) and to relevant empirical data. Arrigo's ability to find structural social equilibria (e.g., land ownership distribution) in the interplay of conflicting social processes (partible inheritance vs. the competitive advantage of wealth) is both more cogent in explanatory power than earlier and simpler accounts, and also intellectually and esthetically more pleasing.

This is a dissertation that engages the reader. Arrigo wants the reader to follow her reasoning, step by step, and to share her reactions of satisfaction, or surprise, at its conclusions. There is no question that there is a potentially important book here. Editing (and editing down) will be needed. In addition, I would like to see a greater use of mathematics, if possible, to describe models. The discursiveness of the writing, and the natural ambiguity of language, make it difficult for all but the most attentive reader to keep in mind all of the variables being juggled at one time and the relationships that are supposed to hold among them. Algebraic formulation would provide a compact checklist, clarifying exactly what the model says and does not say.

I think this dissertation is an impressive accomplishment and I support its acceptance in fulfillment of the Ph.D. degree.

Sincerely yours,

Carl Riskin
Adjunct Professor of Economics
Senor Research Scholar
Professor of Economics, Queens College, CUNY

THE ECONOMICS OF INEQUALITY IN AN AGRARIAN SOCIETY: LANDOWNERSHIP, LAND TENURE, POPULATION PROCESSES AND THE RATE OF RENT IN 1930'S CHINA

by

Linda Gail Arrigo
B.A. University of California, San Diego, 1973
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DISSERTATION
Submitted in partial fulfillment of the requirements for
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The Economics of Inequality in an Agrarian Society: Landownership, Land Tenure, Population Processes and the Rate of Rent in 1930s China

ABSTRACT

Overview

This dissertation bridges historical economics, rural sociology, demography and some aspects of geography and anthropology. It addresses central questions of social theory for an agrarian society with private ownership of land:

> the determination of landownership distribution and its reproduction from generation to generation, both in physical population and in social relations of production;
>
> the manifestations of landownership distribution in geographically-shaped patterns of land tenure and occupational structure for the population; and
>
> the determination of the rate of exploitation, i.e. the rate of rent on agricultural land.

These are broad questions that seem hardly accessible to operationalization. Yet in this dissertation they have been addressed both by quantitative modelling and by comparison of the models against empirical data, specifically for the case of an agrarian society with private ownership of land and partible inheritance. These are models abstracted from historical and cultural context, but they also have the potential for casting new light in historical and cultural analysis by revealing the necessary links between phenomena previously thought unrelated or culturally specific.

The case considered in detail is "traditional" China, a land with dense population and soil close to exhaustion: a social and ecological system that has been centuries in development and that can with some plausibility be treated as the product of an equilibrium of dynamic forces. These features are relevant because the explanatory models are basically equilibrium models. The main source of empirical data is J.L. Buck's Land Utilization in China, a survey of over 16,000 farms carried out in 1929-32 that measured agricultural output in kilograms of grain-equivalent; an earlier large survey by Buck and several other contemporaneous investigations complement the picture of traditional China. However, parallel phenomena are found in survey data from South Asia and even turn-of-century Russia, and these fill out details of the

picture, especially those of demographic processes, and indicate that the models have more general applicability.

The thesis is composed of three parts.

Part One: How population processes determine landownership distribution.

The first model shows how the pattern of inequality in landownership, the most fundamental basis of the social structure, is transmitted and reproduced generation after generation. Repeated partible inheritance does not lead to equality, but rather to a particular profile of landownership inequality in which the top quarter of population owns 60-75% of the land — inequality not so severe, however, as under European feudal systems.

Inequality of ownership is the basis for extractive social relations of production, such that large owners of land can live off the labor of others. Their higher income also allows them to acquire more land. However, the tendency towards accumulation and concentration of ownership is countered by class differentials of reproduction: the rich reproduce more sons and divide their estates among more heirs. The counterpart to such overreproduction of the rich is underreproduction of the poor, with high adolescent M/F sex ratios preventing the marriage of poor men. It is apparent in the data that rich areas raise few daughters, but take in brides at marriage age; poor areas raise daughters and lose them at marriage age, while sons are lost as well in out-migration. The high adolescent sex ratios result mainly from female infanticide, not merely a deplorable custom but a linchpin of the class relations of reproduction.

Adolescent sex ratios, implying levels of female infanticide and neglect, can be conceptually linked to the rate of surplus extraction: higher rates of accumulation of land are countered by higher class differentials of reproduction. The paths of causation can be understood within the total agrarian economy. As seen in Part Two, markets for young male labor are an intervening factor in stimulating farm families to reproduce more sons than daughters.

Part Two: ***How landownership distribution, productivity and population density determine the land tenure pattern.***

Although we cannot directly see the landownership distribution in surveys which are compiled by size of farm, we can still observe it indirectly in land/labor relations: the extent of land farmed by other than the owner, whether that is by hired labor or by tenants. One finding from Part One is that repeated partible inheritance creates a particular profile of landownership distribution that is more-or-less constant relative to the average, no matter what level of production that average represents (which provides a standard for interregional comparison of the Chinese data). But the absolute level of production is that relevant for 1) minimum subsistence and for 2) the level of landownership at which an owner will choose to decrease his physical labors, and hire labor instead. The latter determines the extent of land farmed by non-owner; factors affecting export of the surplus, such as population density, determine whether hired labor or tenant labor will predominate.

The analysis is substantiated by comparing land tenure patterns and occupational structures in ten areas of China. It is found that the extent of land farmed by non-owner, whether hired labor or tenants, is directly correlated with the surplus per hectare — production per hectare over minimum subsistence for the populace. This has broad implications for anthropological speculations on the rise of state societies. In addition, the extent of land farmed by non-owner, especially tenants, is directly correlated with the amount of product sold by the rural producers, indicating an extraction of the surplus that leaves many of the producers below subsistence.

Regional variation in demographic patterns of migration, marriage age, marriage forms and rate of reproduction are further analyzed in terms of occupational overlap for rural households and of rural and urban labor markets, which are believed to be shaped by outflow of the surplus. This also provides a framework for analysis of core/periphery differentiation.

Part Three: ***How the rate of rent is determined.***

The same factors of landownership distribution, productivity and population density likewise lead to a solution for the rate of rent on agricultural land, which is a central determinant of surplus extraction from the agricultural sector. Given the

landownership distribution model and a level of average product, there is a set percentage of the population that owns too little land to afford subsistence, and the shortfall can be quantified. The shortfall explains the demand for rented land on the part of the land-short population, but of course the higher the rate of rent, the more rented land they need. There is no such set class of landlords, but the higher the rate of rent, the greater the number of large landowners who can live off rents, and the more land that is rented out. The solution to this interplay of supply and demand is curvilinear in relation to different levels of production; in fact it traces an inverted "V" with the highest rates of rent falling at average production of about one-and-three-quarters times subsistence, leaving tenants with no surplus. Above that level of average production, tenants retain some surplus, though most goes to landlords. As the rate of rent falls at higher levels of production, however, total extraction from the producers still increases slightly.

The surprise of this solution is that the rate of rent does not equal the average surplus, nor does it equal the surplus of renters. It is different from either neo-classical economics or Marxist analyses of the rate of rent, and it matches the limited empirical data in several unexpected aspects, including the effect of population density. The greatest outflow of surplus is generated by higher population density even with lower levels of production, which gives a cast to issues of historical overpopulation in East and South Asia that is more Marxist than Malthusian. The quantitative analysis developed in Parts Two and Three could be applied to any peasant society with private ownership of land, even if landownership distribution differs.

Summation

The scope of this dissertation is very broad; its greatest significance lies in its integration of observations from disparate fields of rural ecoonomy, demography, and geography into a coherent picture, one that affords comparison with empirical data and setting of concrete orders of magnitude for societies long gone. Quantification is achieved in the three interlinked models of the agrarian economy. The findings have implications beyond China, indeed for study of evolution of historical economies and preindustrial societies worldwide.

DEDICATION

'Don't razz me,' I said to him gruffly in my Taiwanese-accented Mandarin.

'Sure, people think a U.S. Ph.D. is the road to fame and fortune, just like the old imperial examinations. Nowadays it'll hardly get you a minimum-wage job.

'So what if I'm not finished yet. If you could go to jail twice and spend twenty-five years for the sake of your political convictions, and still refuse amnesty rather than admit guilt, I can just as well spend twenty years on my Ph.D. because of my intellectual ideals. You know my women workers research project was confiscated in 1979 when they came to arrest you.'

This dissertation is dedicated to my ex-husband, Shih Ming-Deh, appreciating that he unintentionally took me off the usual academic track a long time ago.

ACKNOWLEDGEMENTS

First I must express my deepest appreciation to my major advisor, Professor Mark Selden, Department of Sociology, who encouraged and shepherded me along, even editing the manuscript in considerable detail. The sense that he was impatiently awaiting the next chapter kept me moving towards completion of the dissertation, despite detours into contemporary Taiwanese political issues.

However, all of my committee have borne the heavy burden of reading and commenting on this work: Professors Martin Murray and John Casparis of the Department of Sociology, and Professor Richard Moench of the Department of Anthropology. In addition, Professor Carl Riskin, a senior research scholar at Columbia University East Asian Institute and an economist specializing in modern China, served as external examiner.

In a more general sense, I am indebted to my advisors of two decades ago, Professors G. William Skinner and Arthur P. Wolf of the Department of Anthropology, Stanford University, for a thorough grounding in Chinese studies, although they might hesitate to recognize me as their intellectual progeny. Others of my teachers there, particularly Professors Bridget O'Laughlin and Jane Collier, shaped the theoretical direction in economic anthropology that informs this analysis of Chinese peasant society. Aside than that, many years of freedom from an academic track gave me more leeway to chart an intrepid course in exploring basic questions of social science in a manner more akin to natural science.

Several friends and family members, many of whom are mathematicians, helped me master the computational skills to carry through my theoretical reasoning. Professor John Donald, Computer Science, San Diego State University, formerly my brother-in-law, wrote an early program simulating partible inheritance, as seen in Part One of this dissertation. Dr. Michael Fochler carried the program further, and coaxed me to learn to use one of the earliest home computers available over a decade ago, the Commodore 64. Nellie G. Amondson, Department of Mathematics of Mesa College in San Diego, — my mother — created the mathematical approximation to the landownership distribution that is seen in Appendix I. Roger Jinteh Arrigo Chen — my son — gave me the Macintosh SE on which I have completed this research.

Professor Hsieh Ing-Hsiung, National Taiwan University Department of Biostatistics, and Mr. Huang Nien-Yi, a computer science tutor in Flushing, New York, also contributed, respectively, to the earliest and the latest versions of the computer simulation of population processes.

Over the past three years Michael Vercolen, a teacher of global history at Broome Community College, Binghamton, New York, has been my sounding board in developing the means to express the ideas in this dissertation. He has patiently edited and evaluated the manuscript and helped me overcome the frustrations of criticism and revisions.

It is appropriate also to recognize the financial assistance I have received over my graduate education, both before and during this research: one year funding from National Defense Education Act ('73); three years' funding from the National Science Foundation ('74-'76); an award for fieldwork in Taiwan from the Rockefeller-Ford Foundations' Research Program on Population and Economic Development ('77-79); and three years' funding from the Department of Sociology, State University of New York at Binghamton ('83-'85).

Finally, it is ironic that my previous departure from academic detachment and my foray into political action and human rights activism, 1977-81, have led in the end to extended support for my writing and academic pursuits. Since 1989 I have been supported by Shih Ming-Deh, a Taiwanese political prisoner I married in 1978. This was possible while he was still imprisoned due to sales of his book Spring in Prison, and since 1993 due to his salary as a National Legislator in Taiwan. I have all of the supporters of the Taiwan democratic movement to thank for this, and I have appreciated their warm personal concern.

HOW TO READ THIS THESIS

This thesis has a lenthy title, "The Economics of Inequality in Agrarian Society: Landownership, Land Tenure, Population Processes and the Rate of Rent in 1930's China", and a ponderous volume of paper and statistics to go with it. However, it need not be as difficult to cover as it might appear.

The theoretical framework is composed of three interlocking models with a small number of variables; a few major features arise in the interaction of the models. The investigation of the empirical data is intended to substantiate the correspondence of empirical observation with the predictions of the theoretical framework. However, it is easy to get lost in the details of the survey analyses; often I have included more material than is strictly necessary for the argument, to meet the interests of a audience of specialists in disparate fields.

The presentation is organized in a modular structure. In each of the three parts of the thesis, a chapter laying out the simplest form of the model is followed by one or two chapters of empirical analysis. The chapters are broken down into sections; generally each section deals with analysis of a particular source and/or issue, but some of the sections are integrative. The integration of economic and demographic analysis is the most important point of this work, and for integration it is important to keep the big picture in mind.

I suggest that the reader first cover the basic models, and then start again to read pieces of the empirical analysis according to the reader's particular interests. The conclusions chapter, Chapter 10, gives a list of thirty-two conclusions with references to the chapters and sections where the topic may be found. But this list functions more as an index, because the concise structure and determinative force of the models cannot be conveyed through a dissected list of their parts.

For the overview reading, the following sequence is proposed:

PART ONE

Chapter 1 A Model of How the Differential Reproduction of Classes Determines the Landownership Distribution.

Section 2.9 of Chapter 2 "Poor Women are Wives for the Rich, Poor Men are Labor"

Section 2.10 of Chapter 2 "The Whole Picture, On the Ground"

PART TWO

Chapter 4 A Model of How Productivity and Population Density Determine Land Tenure Patterns.

Section 5.4 of Chapter 5, especially Datasets (figures) 5.4.8 and 5.5.3, "Toward a Grand Interpretation of the Relationship between Productivity and the Extent of Land Farmed by Others"

Section 6.1 of Chapter 6, "The Parasitic City Model and Implications for the Flow of the Surplus"; plus Dataset (figure) 6.2.2.

Section 6.5 of Chapter 6, "Land Tenure and Population Processes"

Sections 7.0 and 7.1 in Chapter 7, "Introduction" and "The Valuation of Freedom from Physical Labor in an Agrarian Society"

PART THREE

Chapter 8 (Model Three), The First-Stage Solution of the Rate of Rent: The Leisure of the Rich versus the Hunger of the Poor

But reading the text is complementary to understanding the models and the data through their quantitative relationships; the text alone is not sufficient for thinking through the meaning of these relationships. Quantitative reasoning is important, though not essential, to understanding Model One and Model Two; Model Three is somewhat more abstract and more demanding mathematically.

For me quantitative understanding and reasoning requires spatial representation. This dissertation has about a hundred graphs. These serve both to depict the relationships of the models and to reduce the empirical data to the form that is simplest to grasp. Both tables and graphs are subsumed under the term "dataset", and are numbered in a single system. The reason for this is that for empirical analysis I often give numerical tables of the data, to preserve the data and make it accessible to others as well, and then present graphs to explain the relations in it. Also a unified listing is easier to keep track of.

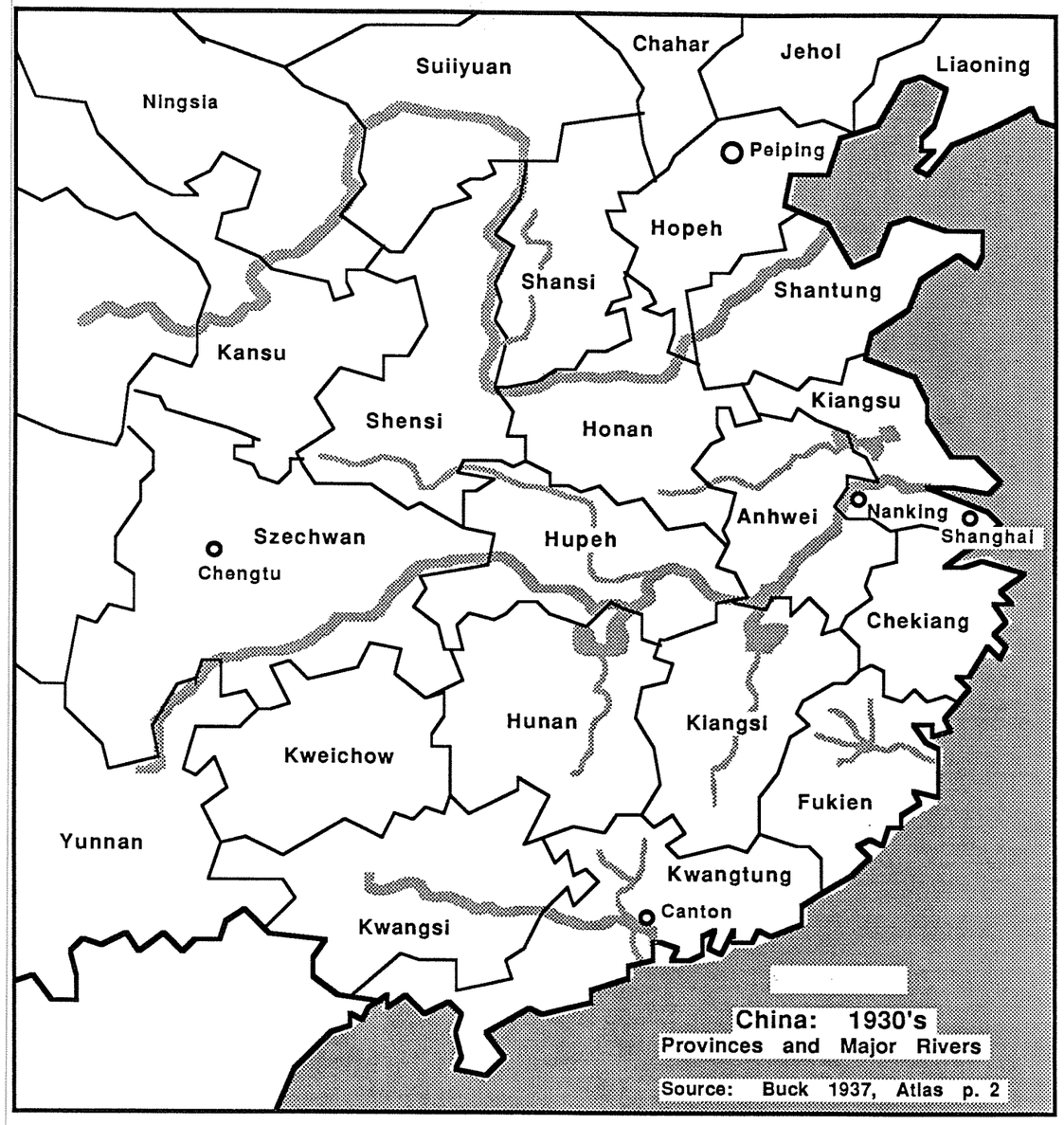
Continuing a system of decimal points as often used in natural science monograph, the dataset labels (example: Dataset 3.8.12) indicate the chapter, the section of the chapter, and the order of the dataset in the section. The header across the top of each page gives the section number and its shortened title as well. With the headers running all the way through the dissertation, it is easy to flip back and find a dataset directly without looking it up in the list of datasets at the beginning of the thesis. This is useful because I often refer forward and backward to related sections of discussion and evidence in various datasets.

Finally, I have tried to lighten up the task of reading this heavy work by means of cartoon figures of the characters who populate this imaginary Chinese peasant landscape: the landlord/scholar, the big farmer who manages hired labor to till his estate, the self-sufficient peasant, the smallholder or tenant who is just barely getting by, the agricultural laborer, the coolie, and the artisan. I drew the cartoons myself and scanned them into computer graphics. Given my penchant for decoration, I could not resist placing Chinese papercut designs in the spaces where a half-page was unoccupied. The source of these is W. M. Hawley, Chinese Folk Designs, a collection of designs for embroidery that was originally published in 1949 and re-issued by Dover Publications in 1971. These give some respite to the eye and a more whimsical folk art view of the past generations of Chinese peasants — perhaps not much different from their descendants, still laboriously transplanting rice shoot by shoot in terraced, flooded paddy fields — who are the subject of this study.

LIST OF DATASETS

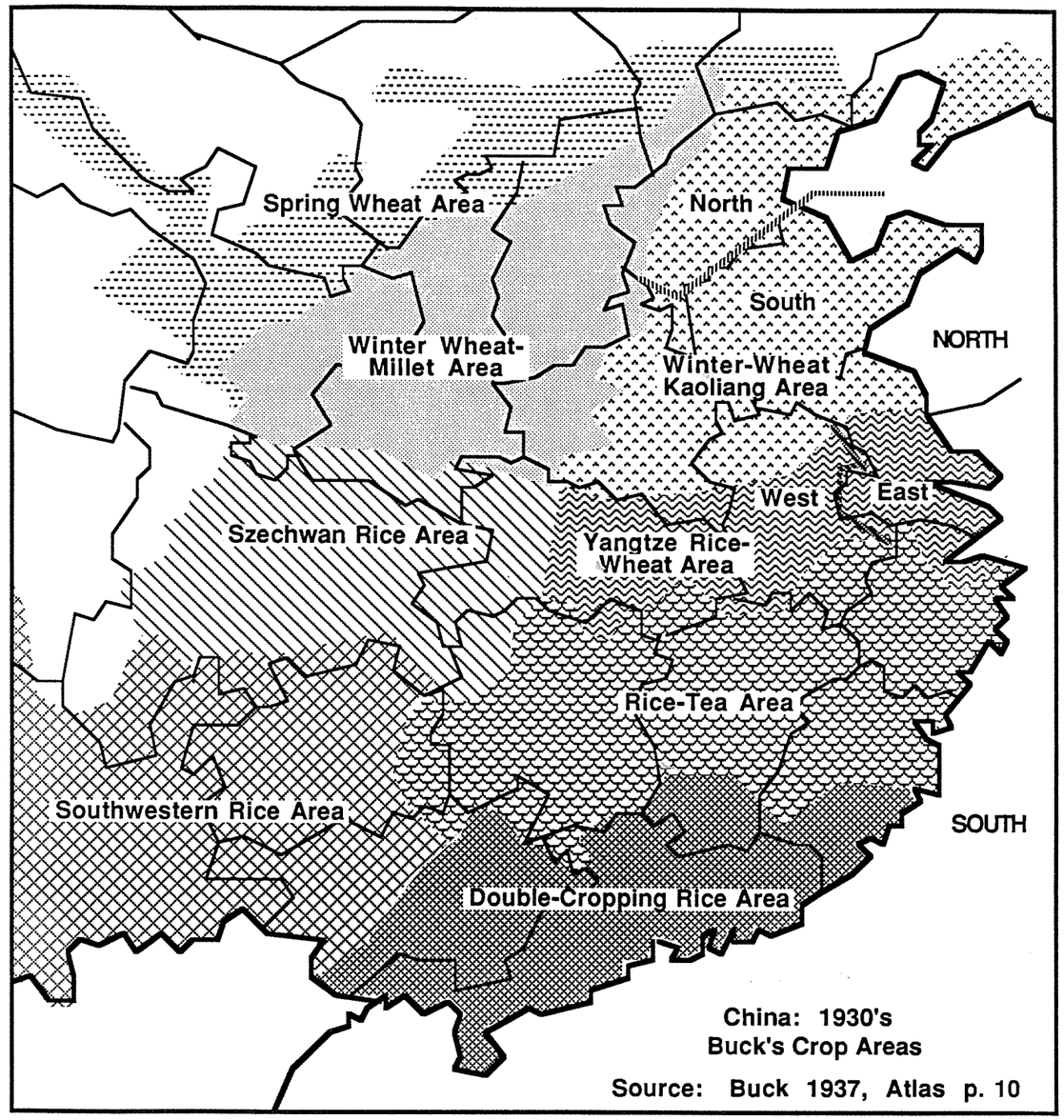
In this dissertation "dataset" is used as a term encompassing both tables and figures. In the decimal system of the numbering, the first number is the chapter, the second is the section in the chapter, and the third is the dataset number within the section. This keeps figures and the data from which they are derived together. Many of the datasets have several parts (e.g. A, B, C). The structure of these parts is usually a table of numbers followed by figures that chart the relationships of several variables in the data; or the same type of chart for several geographical areas, e.g. North China and South China. If all parts are on one page, the page number is given below in the first line of the dataset listing. If the parts cover more than one page, the page numbers are given with each part.

PART ONE



China: 1930's
Provinces and Major Rivers

Source: Buck 1937, Atlas p. 2



China: 1930's
Buck's Crop Areas

Source: Buck 1937, Atlas p. 10

INTRODUCTION

The Subject of the Research: A Holistic Analysis of Agrarian Society

The subject of this thesis is a large one, and it reflects philosophical and epistomological struggles over basic issues in social science. Let me tantalize the reader with a few of the questions it pursues: What is the source of inequality in peasant society? What relationship does inequality have to the underlying conditions of productivity and geographical concentration? What determines the portion and the absolute quantity of surplus production that is extracted by a ruling class? What mechanisms might hold a peasant society together, despite the antipathy engendered between classes in the process of exploitation?

These are the general questions. The thesis cannot answer all of these questions for the generality of all peasant societies, but it claims to answer some of them for the specific case of traditional China, with implications for the generality as well. "Peasant society" is a very general term, a society composed predominantly of agriculturalists on fixed holdings of land, who produce most of their own subsistence but who are also subject to state authority and class domination, such that they submit part of their production in taxes and/or rents. That does not preclude considerable commercialization and the possibility that some fraction of agriculturalists may produce primarily for the market, who might thus more properly be called farmers. The case I address here is a peasant society with private ownership of land and a long historical record of markets and commerce. But land is the major form of productive capital, and the peasantry is the major source of the social surplus.

The subject of this dissertation is, in a nutshell, the reproduction of the social relations of production in an agrarian society with partible inheritance. This reproduction includes both the physical replication of the human population, and the continual renewal of a stratified socio-economic order. The term "social relations of production" is shorthand for a concept of society as an amalgam of interdependent but conflictual sectors, tied together in a system of production that entails coercion and exploitation. It implies a great deal for how this subject has been studied and analyzed in this thesis. "Agrarian society" is also a shorthand for a particular object of study: a pre-industrial society with a settled peasant population and plow agriculture (as opposed to slash-and-

burn or other nomadic livelihoods), and a hierarchical social order with a political authority that enforces the extraction of product from the rural producers in taxes, rent, and tribute.

The specification of an agrarian society with partible inheritance has further implications. The institution of private ownership of land is attendant on its scarcity relative to population, i.e. a high ratio of population to land resources, such that productivity is mainly limited by the availability of land rather than by labor. Otherwise control of land would not be in contention; land could be assigned according to labor power as in the traditional Russian *mir* or the Vietnamese communal village. But the institution of private ownership indicates a high valuation of the land, and partible inheritance codifies the form of transmission of land rights across generations, a code that is a link in the total social relations. Although many preindustrial societies, for example the Ottoman Empire, have been based on direct or indirect taxation of a subjugated peasantry, and this would provide a surplus directly to a ruling class, private ownership of land provides a mechanism both for differentiation within the peasantry and for the domination of a ruling class. With private ownership, the extraction of surplus appears to be merely the outcome of an impartial market, a market that is legitimized in the eyes of the small peasant by his own petty holdings, to which he clings tenaciously as both the source of sustenance and the sacred bequeathal of his ancestors.

The other characteristic of partible inheritance is that it also continually dissipates the power of portions of the ruling class by dividing the source of revenues. It does not support the continuity of a landed nobility as by primogeniture. This is another aspect of social legitimation that eases class contradictions. The system of partible inheritance may be seen as congruent with a bureaucratic central state, theoretically a meritocracy, rather than a state that is a coalition of hereditary feudal domains; however, substantiating this congruence is beyond the scope of this thesis.

China is the premier example of an agrarian society with land under private ownership and partible inheritance. It is a vast territory and population with remarkable historical continuity. That continuity was traditionally embodied in its elite scholar bureaucracy, which according to cultural myth was imbued with both intellectual and moral superiority, but not hereditary status. Lowly peasants could look to scholar ancestors, and dream that their descendants will one day pass the imperial examinations. But the imperial examinations were of course the door to landed wealth through

bureaucratic privilege, and the bureaucracy was the link between landed and political power.

China provides most of the material for analysis in this thesis. But I persist with the generalization of "agrarian society" because Chinese society is here envisioned in the general context of peasant society, and because many of the crucial insights and evidences are supported in studies of South Asian and Russian societies. Some of the more densely populated Middle East societies might be found to fall into the same patterns as well, but for Southeast Asia and many other parts of the world population density has not been comparable to China's and India's until the last century, and so I would not assume that the forces of population, ecology, and social hierarchy have reached comparable configurations. This broad anthropological vision leaves some room for cultural elaboration, but not for cultural determinism.

The perspective of this thesis originated in anthropology, known for taking on the big picture, the "holistic" view. It is more situated within peasant studies and rural sociology than within late Qing/Republican period studies. From the vantage of an inquiry into general principles of agrarian economy, the comparison with studies of Russia and South Asia, even across a wide historical period, is appropriate; the parallels and divergences of such comparison cases will be discussed in due time. The South Asian studies are particularly valuable in that they often confirm, with much more detail and reliability of explanation, patterns that appear weakly or ambiguously in less complete Chinese data of the period before the communist revolution of 1949, which eradicated private ownership of land.

The thesis is an analysis of the processes ongoing in the reproduction of the social relations of production. This is an ahistorical analysis, showing the logic of the system, as if seen at equilibrium in a slice through a point of time. Explanation of geographical and ecological variation is central to the analysis. The outcome of this research has been crystallized in three linked models, and these are the body of this thesis:

- ❀ Model One. How population processes shape the landownership distribution.
- ❀ Model Two. How land tenure patterns are determined by the landownership distribution, productivity, and population density.
- ❀ Model Three. How the rate of rent on agricultural land is set by the subsistence demands of the land-short population and the leisure preferences of the land-surplus population.

The common foundation of these three models is the landownership distribution. The integration of many disparate observations on agrarian society into a unified, functioning whole is the major contribution of this research. Together, these three models constitute a novel paradigm, qualitatively different from those that have preceded it.

Topics that are parts of these three main models and are also explored empirically are:

The functions of female infanticide and marriage hypergamy in maintaining the balance of class relations and controlling population growth.

Pre- and post-marriage age sex ratios and age at marriage explained in terms of the forms of land tenure and migration.

The rationale for the predominance of hired labor or of tenants in the agrarian relations of production, depending on conditions of productivity and population density.

The interrelationships among outflow of the agricultural surplus, urbanization and commercialization, and the occupational structure in the rural sector.

Why there may be a discontinuity in social forms or leap between levels of surplus extraction as population density increases.

Under what conditions tenants retain some of the surplus, or surrender more than their surplus, and what governs the distribution of rented land to poor or to rich farmers.

These are large but more specific topics that fit within the paradigm of the three main models. Most major features of the agrarian economy are accounted for. The models bring proposals of social and economic relationships to a new level with quantification that can admit a much greater precision for sociological reasoning and testing. I believe they could spawn many more studies for other parts of the world.

Issues of the Research Framework

Does Man Live by "Exploitation" or "Efficiency"?

The assumptions behind any intellectual endeavor, no matter how vigorous the attempt to clarify them with definitions, are often elusive. Much of the issue of assumptions is not just how they are spelled out in definitions, but how they work with a bundle of concepts and verbiage, while only barely acknowledging their more specious uses. However, I will be as clear as I can about the set of assumptions that shapes the perspectives of this research. The most important assumption is that "exploitation" is inherent to the relations of production of class societies. The term carries the implicit moral sense that exploitation is unjust.

The usual opposite position is the assumption that efficiency and/or technological progress are the highest values for human society, and are best for the long-term collective good.

On "exploitation" versus "efficiency", this thesis sees itself as squarely in the camp of historical materialism.[1] A note of caution may be voiced in one aspect, though: one can embrace Marxist premises of social analysis without ascribing to the apocalyptic and utopian prophecies of Marxism, and without accepting as gospel its various earlier conventions concerning modes of production and progressive social stages.

Loren Brandt's 1989 book Commercialization and Agricultural Development: Central and Eastern China, 1870-1937 provides a typical and articulate statement of one position in the debate. Loren Brandt follows in the footsteps of free-market enthusiast Ramon Myers. The following excerpts are taken beginning from the section on "Distribution of Land Ownership" in Chapter 6, "Distributive Consequences of

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[1] In the context of the current major debate on pre-1949 China, the two positions might be called "distributionist" versus "technological" or "free-market". For readers who wish more than is presented below, parts of the debate are to be found in Huang 1975, Myers 1991, and in a special issue of Republican China, 1992 Vol. 18(1), "New Perspectives on the Chinese Rural Economy, 1885-1935: A Symposium".

Commercialization". This example is chosen because it also has a bearing on some specific issues in this thesis.

> During the late nineteenth and early twentieth centuries, commercialization is thought to have exacerbated the inequality of landownership in several ways. (Note 3: See Philip Huang's The Peasant Economy and Social Change in North China (Stanford, 1985) for a recent expression of this viewpoint.) The argument goes that producing for the market introduced new risks. Small farm households faced a highly cyclical demand for cash crops and had to buy grain on the market; at times, they had to borrow to cover capital requirements associated with cash cropping. Sudden shifts in the market or a less-than-average crop could be devastating, forcing small farm households to mortgage or sell land to repay debts and cover immediate consumption expenditures. Meanwhile, landlords, urban entrepreneurs, and capitalists invested the enormous amounts of capital they had earned in commercial-related activities in land, buying up the parcels the small households had to sell. ...(Brandt 1989, p. 139)
>
> The rapid commercialization of the rural sector generated new opportunities both on and off the farm. Not only were new cash crops and cropping systems more labor-intensive, but the demand for many kinds of auxiliary services related to marketing and distribution increased as well. Although access to land was only partially equalized through land rental, how much any one farm household benefited from these opportunities still depended for the most part on the decisions it and other households made with respect to the crops it grew, how much to market, and how to allocate resources (especially labor) more generally. ...
>
> Huang's work excluded, however, the consensus now emerging is that markets in the late nineteenth and early twentieth centuries worked reasonably well and were relatively free from the kinds of distortions so common to other low-income countries. Implied in this view is that farm household behavior should have differed only modestly. Even allowing for differences in risk aversion, farm households of all sizes should have been making similar decisions about crops and inputs and should, therefore, have been equally efficient and profitable. (Brandt 1989, p. 144-147)
>
> By all indications, factor markets in localities such as those surveyed in North China and in the commercialized areas of rural Central and East China were well established, competitive, and effectively used by all households to offset any imbalances they faced in resource endowment. (Brandt 1989, p. 155)

Let us review the reasoning of the author of these paragraphs. First, although there was inequality of landownership (p. 139), access to land through renting provided comparable opportunities (particularly so because of rights of permanent tenancy, p. 140), in addition to the opportunities of labor, etc. Second, comparable opportunities under market equalization provided comparable profitability. Third, labor outside the household and other income sources could make up for lack of land and capital. Fourth is

the implication that this is a proper and moral social order, because it supposedly yields the greatest efficiency.

My own perspectives should appear sharper for the contrast to the above. My terminology is that any surrender of the product of labor due to a structure of property rights or political domination is exploitation. By this I mean exploitation in the Marxist sense, an extraction due to the enforced social order, not exploitation according to the everyday usage of immiseration. Exploitation may or may not be accompanied by obvious suffering, though the term carries the unspoken sense of moral injustice. But exploitation is also a value-neutral concept of analysis in that it locates the central relational structure of the society in an expropriation or transfer of essential products from the class of producers to the class of dominators, a transfer that governs the pattern of further relations of exchange as well. [2]

It follows then that even if income were completely equalized under some mythical arrangement of land and labor, with all land owned by landlords and farmed by tenants, but tenants receiving just as much income as landlords, exploitation would still be the central relationship of the society, and coercion would still be required to enforce the sacred rights of private property which provide a free ride for the owners. The Marxist analysis explains that the market operates on the basis of conditions set and maintained by explicit or implicit coercion, while all the time the market appears to be an impersonal force, as if divinely ordained and guileless.

But the findings of this research in Chapter 6 are that income followed closely on resource endowment; and commercialization, while it did provide relatively higher

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[2] The questions listed in the previous section, e.g. "If tenants were exploited, why were some tenants rich and some owners poor?", come about and have been posed as contradictions largely because of the discrepancy in the assumptions and definitions underlying the two sides of the argument. The neoclassical side reacts to "exploitation" as if it meant gouging, raking in profits in excess of the accepted market rate of profits and interest, at the expense of another party who thereby suffers deprivation because of it. This could be said to be a commonsense view that relates income to position in the economic structure while rejecting the Marxist view that the conditions of exploitation are embedded within the market.

Perhaps the reader who agrees with Brandt's assumptions and disagrees with mine can just read these differences as a difference in terminology, and try to swallow the distaste at being continually confronted with terms like exploitation, extraction, or expropriation, while thinking of some other cap on the phenomena and some other way to explain my results. "Transfer of surplus" is a less inflammatory term and would do just as well.

wages to labor located near the core of capital accumulation, was no panacea for inequality and deprivation. Indeed, in Chapter 2 this dissertation argues that for Chinese peasants the very possibilities of satisfying basic human needs and drives like marriage and reproduction were tied to "resource endowment".

Highlighting the analysis of exploitation does not require that I concur in a radical position on another aspect of the argument, that landownership was becoming more concentrated in China in the decades before the communist revolution. In fact I suspect it was not. And I appreciate Brandt's work in evaluating the evidence that landownership distribution may not have changed significantly. Nor does Philip Huang's description of small peasant immiseration necessarily involve increasing inequality of landownership, in my view. This historical issue is of significance to the thesis, as will become apparent in Model One, which proposes that partible inheritance tended to create a landownership distribution that was more-or-less constant relative to the average. But as will be seen in Models Two and Three, the relations of production and the rate of exploitation may change significantly without any increase in landownership concentration.

I hope that this discussion has clarified the question of the central assumption of exploitation, and that the presentation of the debate has allowed the non-China studies reader to understand some of the atmosphere of the field.

How to Balance the Land/Labor Market?

Marxist and neoclassical economics start from a common frame of reasoning, a frame that will be broken out of in this dissertation.

Both Marxist and neoclassical economics start from the maximizing logic of individuals under a complete monopoly of the means of production. The individuals stand on the two sides of capital, either as the owners of capital or as those totally alienated from the means of production. The logic of their choices proceeds from that point, and it is in this logic that a myriad of mathematical models has been applied, from Ricardo to Sraffa.[3] It is a logic of benefit to the individual, though the possibility of group interest and

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[3] See for example Ben Fine, ed. The Value Dimension: Marx versus Ricardo and Sraffa, 1986.

political action exists in the realm of discussion. The additive choices of individuals are then projected to the scale of class behavior. However, as long as there is only the sketchiest notion of what will be the relative number of population or wealth in classes — as in, for example, the Marxist notion that factory owners will continually sink money into labor-saving equipment in order to assure that some numbers of workers remain unemployed and desperate, to keep wages and labor bargaining power down —, there can be no quantitative solution for the outcome of the struggle between classes. The abstraction that is behind this dilemma is the assumption of monopoly, or a complete bifurcation between labor and capital, but it cannot easily be brought towards a closer representation of social reality. The forms and sizes of productive capitals, from family workshop to mass assembly line, their rates of profit and their relationships with labor, are so varied that it seems impossible to sum them. In industrial society, moreover, technology and productivity are in a constant flux.

But this matter is much simplified for an agrarian society. Land is the most important productive capital, and its relationship with labor varies within a relatively narrow range of human and technological possibilities. Especially for the case of an agrarian society with dense population and relatively little use of animal power, the case that will be the focus of this thesis, that range is limited. As will be discussed at greater length later, intensification of cultivation through increasing input of human labor is bounded by the seasonal limitations of temperature and precipitation, and the substitution of high-value cash crops for staples generally cannot exceed the need for maintaining self-sufficiency in subsistence. In sum, the productivity of human labor in pre-industrial agricultural production in one region and with the same quality of land probably cannot vary by more than a factor of three, if even that much; and averaged over the agricultural seasons and across all crops grown by subsistence farmers, the variability seems much less than that. This is a welcome simplification that allows us to measure ownership of productive capital in land, with the further standardization that land is to be tallied in terms of its average product (controlled for labor input), not its surface area.

With this quantifiable and summable measure of capital, we can move past the assumption that capital is completely polarized between owners and labor. Even in advanced capitalist society this is patently not the case. And for the agrarian societies addressed here there is, besides a few large estate owners, a proliferation of medium and small holders. There is a smooth gradation of size of ownership from those who have

only their two hands with which to labor and feed themselves, to those who disdain to work with their two hands and live in luxury on rents. So the conceptualization of the present research differs from both Marxist and neoclassical reasoning in that it expressly deals with a distribution of capital ownership, not a polarization between haves and have-nots. And it can encompass a limited set of labor relations revolving around the land, landlord/tenant and rich farmer/agricultural laborer, which, however, are those most central to an agrarian society.

Moving past the assumption of monopoly, it is necessary to delineate the full range of the landownership distribution, and this is a central task of this thesis. Related to this point, the research evaluates the conditions of ownership and alienation from ownership in terms of its provision of subsistence: how much over, or how much under. Thence a logic is formulated for the interaction of the aggregate of each position, that is, how much land landowners own but do not want to farm themselves, and how much more land the impoverished would need to survive. This figures in the determination of land tenure patterns and in the market between land and labor that results in the rate of rent. How the aggregate interaction works out to some unexpected results will be seen in the presentation of the models.

The Question of Time — How Do You Make a Process Stand Still?

The present research is structural, not historical. It describes the interrelated processes of a system in one steady state, as if of indeterminable time. This is, I believe, a necessary preliminary to understanding how the system may change or evolve over time. An analogy may be in order here.

If we were looking at fossils in sedimentary rock, and observed impressions of the bodies of small sea creatures with systematic variations of morphology, we might assemble a series as evidence that we were dealing not with several species but with one species undergoing metamorphosis, and draw from this a picture of their life cycle. Then the relative frequency of the phases of the life cycle together with environmental indicators of seasonal temperatures, food sources, etc. might help us understand their ecology. With further samples from different layers in the sediments, we might be able to make sense of their evolution over time. The problem of materialist analysis at hand is similar, in that it is a process of reproduction viewed at one point in time. The analysis

has gone far in quantifying the logical relationships involved in the replication of the social structure. It has also analyzed the variations in the patterns and the environmental reasons for those variations. This is one layer within the rock, and at the same time it implies an evolution that came before it and an evolution that may follow.

The system of habitual production and distribution and human reproduction is the product of a prolonged social and technical evolution, embodied in an infrastructure and technology that is centuries in the making. Wars and revolutions may depopulate the countryside or redistribute land for a while, but the logic of extraction gradually re-emerges and tends towards an accustomed form, in accordance with the material base. The modes of production and reproduction are relatively stable.

This is a justification for the dealing with a peasant society as if it approximates a timeless structure. This simplifying artifice sets the condition of equilibrium that is necessary to first-order quantitative analysis. To be more specific, the paradigm is an abstraction from history. But it is also possible to see beyond that abstraction: the paradigm proposes explanations that encompass many aspects of historical change, whether long-term evolution or short-term fluctuation, because it incorporates the mechanisms of variation in many conditions — levels of production, varying population density, changing landownership distribution. The quantitative models could also be elaborated to incorporate factors of expanding population, quickening transport, etc. The synchronic analysis is a complement for diachronic historical analysis, not a contradiction of it.

Meaning from Quantitative Methods

This thesis presents a series of interlocking models linked with a consistent and concrete logic. The paradigm is a simplification and a reduction of the social reality, as is any theory: an artificial construct or image of what we might think is the mechanism behind appearances. It reduces a bewildering variety of phenomena to simple and logical patterns, which however become complex in their interplay. The question then is how much of the social reality the paradigm captures in this reduction, how much it "explains". On this count I believe it performs very well. But nature does not owe it to us to be either transparent or simple, whether in the physical or the social sciences.

The present research is complex in concept, and also calls upon complex quantification. It is not easy to grasp. Unfortunately, most sociologists and sinologists are habituated to working with mathematics only for linear relationships between two variables. And most social science models have not called for much more.

The arguments have usually been in the form "A is positively (or negatively) correlated with B", versus, "No, A is not correlated with B", and have been carried on without some larger framework of reference. But in my data analysis I have found that it is quite common for two processes to be in operation at the same time, and even functionally related, one in which A increases with B, and one in which A decreases with B, and the sum of the two processes for any particular sample will be contingent on which process happens to be prominent there, due to other factors.

An example of this may be taken from patterns of sex ratios in the present research. It is found in interregional comparisons for 1930's China that the higher the sex ratios in the farm population before marriage age (males per 100 females), the lower the sex ratios after marriage age. This appears to be a paradox, and the pattern is completely obscured if sex ratios are taken without regard to age; but this pattern of variation can be explained in terms of the agricultural economy and migration stemming from demand for urban labor.

Such an example is a plea against preemptive dismissal of puzzling or partly contradictory findings. More complex examples will be found in the discontinuous solution for the rate of rent. As an aftermath of figuring out some such apparently

contradictory relationships, I have become less rigid in the application of hypothesis testing of the sort, "Null hypothesis: A has no correlation with B" and "Hypothesis: A is correlated with B", and have rather sought to perceive the patterns that are predominant even in the midst of inconsistencies. It has been my experience that what at one stage of analysis appears inconsistent may later turn out to be a further working out of the logic of the originally observed mechanism. Also with this understanding I do not wish to conceal the empirical observations that still do not fall into place, but would rather preserve them for further investigation.

Substantial versus Formal Mathematical Modelling

I have been pleased to find that a recent text on methodology, Andrew Sayer's Method in Social Science: A Realist Approach, has chosen to critique hypothesis testing as a sterile form that usually is extended past the viability of the concepts it tests. He calls for renewed attention to the conceptualization of theory, rather than the focus on the mathematical sophistication of measurement and probability tests that is common in mainstream sociology. His critique of mathematical modelling should be quoted at greater length.

> First, the mathematical operations performed in such a model provide a way of calculating, deducing or deriving certain results from assumptions and data but not a way of causally explaining phenomena. ... Unfortunately the belief that finding a way of calculating something is necessarily the same as giving a causal explanation of what produced it is endemic in disciplines such as economics which use mathematical modelling widely. ...
>
> The use of mathematical models as an aid to causal explanation is inevitably problematic because, as a language, mathematics is acausal and astructural. It lacks the categories of 'producing', 'generating', or 'forcing' which we take to indicate causality. ... The = sign in an equation does not, of course, mean that the so-called 'independent variable' is the cause of the changes in the 'dependent variable', but merely that the quantities on either side are equal! Any imputations of causality associated with the decision to define one variable as independent and the other as dependent must be based on non-mathematical, causal criteria. ...
>
> ... Moreover, when quantified, relations which are in fact substantial (i.e. involving material connections between objects), internal and/or causal become indistinguishable from purely formal and contingent relations. These limitations help to reinforce the tendency of mathematical modelers in social science to be unaware of the social relations and structures on which the objects represented as 'variables' depend. (Sayer 1984, pp. 179-180)

Despite the severity of these criticisms, Sayer does not lambaste all mathematical modelling and testing as "positivism" or "empiricism", as has been common in Marxist academic discourse. He sees these as tools that can be either used or misused. In particular, I take cheer from his distinction between "substantial" and "formal" relations depicted in mathematical modelling. I feel I have created models that are both "substantial" in their major mechanisms and in considerable agreement with empirical data, largely because they are based in concrete quantifications such as the annual grain allotment in kilograms (or its equivalent) necessary for subsistence. But at their margins the models fall somewhat from "substantial" quality; at some points, particularly concerning the effects of geographical dispersion, where I have no physical model to link with the mathematical model, I am forced back on multiple linear regressions of the empirical data. There is room for further development.

Two aspects of Sayer's critique that I wish to carry further concern, first, the structure of social relations, and second, causality.

First the issue of conceptualizing the structure of social relations. Much of the Marxist reaction against quantitative methods comes from the common use of abstract, disembodied variables in multiple regression and mathematical modelling (e.g. curve-fitting with series of variables), as applied in much mainstream sociology and neoclassical economics. These mathematical methods treat the social landscape like a level playing field in which socio-economic and cultural influences interact, each largely independent and/or subject to analysis of the change each causes separately. An analogy could be made to the surface of a pond that is ruffled by a number of events, like stones thrown into the pond, that spread out in concentric circles and interact with each other with infinite complexity. In three or more dimensions rather than merely the surface of the ripples, the interaction would seem to be indeterminate or impossible to sum. This is a vision that is consistent with an eclectic view of society consisting of autonomous individuals making choices according to their personal preferences and interests, or society as a division of labor that is the maximization of each one's benefits. Since this perspective seems to ignore the structures that force choice and to paper over fairly obvious relations of inequality and exploitation, we might pejoratively label a social science that spins out an endless list of abstract causative variables an "industry of obfuscation". Overall, the use of mathematical methodology has come to be identified with mainstream concepts. To my chagrin, my research has on several occasions been pigeonholed with neoclassical economics on the basis of its quantitative methods.

In contrast, the Marxist vision is one of dynamic contradictions that shape all social processes in class society: a structure of inequality that coerces some part of the population, even the majority, to surrender a portion of their product to a minority. My research framework encompasses the structure on which the central social contradiction of an agrarian society rests, the landownership distribution. All else proceeds from this, and here the research is firmly rooted in the Marxist tradition. It could be called an economics of inequality for agrarian society. But quantification is quite necessary to reaching a definitive outcome, both for theoretical conclusions and for investigating correspondence with empirical materials.

Causality — Chicken or the Egg?

The models I will present do not ascribe causality from one immutable variable to another, but are rather in the nature of equilibrium models with co-varying features. As Sayer says, regularities or correlations do not in themselves indicate causative relationships. The pieces have a functional fit, but I do not dare to say which comes first, or which sets the conditions for the others. They can only be understood as the outcome of a long historical development, but insofar as that development is not historically recorded, and may have emerged independently many times over, the proposed equilibrium must seem like a functionalist explanation, that "it exists because it works". I am hopeful that there are mechanisms that reset or calibrate a rough equilibrium, but it is beyond the scope of this thesis to do more than speculate on them at present.

Despite a desire to avoid leaps to statements of causation, in the process of explication I am forced to speak in terms of sequences and, seemingly, causalities. I am concerned that some declarative simplification of the verbal explanations, for the sake of making the discussion clear to the reader, will lead to misunderstanding of what is claimed on the basis of the quantitative analysis. So I am caught between trying to flesh out what I think might be the sources and implications of these relationships, and trying to stay close to what I think can be more reliably demonstrated. With this view, I have not been overly concerned with codifying terminologies and definitions. So much of social science discourse is taken up with constructing elegant verbal categories and rigidly logical

paradigms, but that formalistic elegance does not necessarily carry over into correspondence with the object of study.

Research Tools and Tactics

The above points of methodology can only be summarized in retrospect now, long after the research questions were launched; they did not spring full-grown from the head of a methodologist. The research evolved by minute steps in attempts to conceptualize and operationalize measurements of two subjects: first, reproduction of the structure of inequality and its population in an agrarian society; and second, the extent of exploitative relations, and their determinants. This was a prolonged process of posing a rough hypothesis, seeking what data might be available to substantiate it, exploring the data, and then thinking about patterns found in the data. There were innumerable blind alleys and reshaping of specific hypotheses about the logic of small relationships in the data, but at the same time a wider framework gradually emerged.

It is possible that the models developed in the research may be rejected by some as too reductionist, or as just some possibilities among the many models that could be made to fit the data. Then there still remains the challenge to find other explanatory models to fit the many new empirical relationships discovered in the course of this research.

The development of this research has been much shaped by the available technology, specifically microcomputers with statistical software. It would hardly have been practicable for a single individual to do this research prior to the last decade or so. All the same, I have often had the sense that the technology is a quagmire, a quicksand pit that you must cross to reach a goal and which is always waiting to swallow you up. Technology has improved and allowed new ways of dealing with information, while technology's increasing complexity in itself elicits an ever-absorbing fascination and frustration. Batch processing on the old mainframe computers with card readers, available in the latter 70's, could provide correlations and cross tabulations for large numbers of cases. But these were too clumsy and time-consuming to allow intimate perusal of small portions of a data set, or for repeated "what if" modelling. Correlations across the whole body of a set of data often conceal patterns as much as they reveal them, especially when there are cross-cutting effects or the relationships are nonlinear.

So it is that spreadsheet software operating on microcomputers has been crucial to the process of this research, all the way from the early, crude versions available in 1981 for the Apple C with 64K of computing power, to my present Excel 4.0 on a Macintosh with 4 MB RAM. Most of the initial modelling and empirical data analysis, including the solution of the rate of rent, was carried through on a Commodore 64 with Multiplan software, which would now be considered hardly a child's toy. Perusal of spreadsheets is qualitatively different in feel from the mathematical methods of correlation and multiple regression. One can visually discern and separate out small subsets of the survey data, thinking over the meaning of several of the variables together, and the how and why of their characterization of a group or a class. This is a process of repeatedly sorting cases and making preliminary tests on small numbers of them, more like building a neural network of small generalizations through repetition than like grand hypothesis testing. Of course the thought process must be informed by other knowledge about the subject, such as that found in detailed ethnographies or participant observation.

The mathematical modelling was done several times over in different hardware and software media, both mainframe and microcomputer. Some of this modelling could be done with spreadsheet software with iterative features; again, spreadsheets are convenient in allowing examination of every stage of calculation. But where programming that I couldn't do myself was needed, namely the simulation of population processes, I learned how difficult it is to impart an understanding of the social process being simulated to computer scientists who deal entirely in abstractions. Even after writing out the specifications, it was necessary to personally watch the programming closely, even step-by-step, and test it over thoroughly, to get a program that operated as I planned. This was a vivid experience of the gap between mathematical mentality and social science conceptualization, and the travails of bridging it. I hope the reader does not feel I have slid towards the mathematical side of the span!

Economists, on the other hand, may be less than satisfied with the dearth of equations in this thesis. [4] For the most part I have used graphs to describe the models and the

[4] There are several reasons why equations have not played much of a role in this thesis, though it deals with quantitative relationships. First, the most daunting obstacle to a mathematically analytic solution is that the feature linking the three major models of this thesis, the landownership distribution, cannot be accurately portrayed by a simple curve, although a curve that resembles the empirical data can be generated by the computer simulation of repeated

relationships in empirical data. Graphs are much more useful than tables in imparting an intuitive understanding of the relationships, especially if they are non-linear and/or have multiple inflection points. The reader should devote nearly as much time to looking at the graphs as to reading the text.

In this dissertation I have not fully developed the implications of the findings and how they intersect with previous theories; that would be a dissertation in itself. The reader is welcome to enter into a lively debate with the framework and findings of this work.

random reproduction, which in mathematics is termed a kind of Markov process. A mathematics Ph.D. specializing in probability tried and could not predict the distribution generated by partible inheritance. Mathematical approximations of the landownership distribution have been constructed (see Appendix I), but the curves produced in this manner diverge too far from the empirical landownership distribution found for China to allow adequate modelling for comparison with the empirical data, though they might be useful in further theorization on the higher-level solutions for the rate of rent and rate of extraction (rate of rent x rented land).

Furthermore, the landownership distribution is an unevenly skewed distribution that does not yield to the mathematical methods developed for the normal bell-shaped distribution familiar to students of probability. The landownership distribution has been clearly delineated, however, and can be dealt with in increments as in calculus when those increments are supplied in a long list on a spreadsheet.

PART ONE

THE CLASS RELATIONS OF REPRODUCTION AND THE DETERMINATION OF THE LANDOWNERSHIP DISTRIBUTION

Since there is no open and easy source of income other than in agriculture, most of the small landowners must eventually become landless laborers. Some of them will remain single all their lives and then die out completely. Occasionally rural families may, through hazardous ventures in the outside world, suddenly rise to wealth; but such families are soon leveled down by the merciless pressure of population. One or two generations is quite enough to reduce the holdings of a rich family to petty units. The movement upward on the economic ladder is slow, but the movement downward is rapid. The supply of landless laborers is maintained by a constant increase in the population and a constant decrease in the size of landholdings. The traditional structure of the village is thus dependent upon the existence of two groups of people: the petty owners, who form a leisure class; and the landless laborers. This is the type of rural economy that we shall analyze in the following pages.

Fei Hsiao-Tung and Chang Chih-I. 1949, p. 20.
Earthbound China: A Study of Rural Economy in Yunnan.
London: Routledge & Kegan Paul. Field study 1939.

Chapter 1 A Model of How the Differential Reproduction of Classes Determines the Landownership Distribution

1.0 Introduction to Part One

The subject of Part One is how the relations of production in an agrarian society with partible inheritance are reproduced from generation to generation. "The relations of production" is a term for the property rights and labor obligations involved in production, the main form of which is between land and labor in agrarian society. The relationship may be between landlord and tenant or between rich farmer and hired labor, each of which has its particular characteristics. And these relationships depend on particular patterns and proportions of inequality, e.g. a certain number of hired laborers are needed to plow the acreage of a certain number of rich farmers.

It is a commonsense conclusion that disjuncture in the form of relationship between land and labor would be accompanied by serious social disruption. Continuity brings stability in planning and use of resources, a sense of soothing predictability, and cultural legitimation. Traditional peasant societies are generally known for their belief in timelessness, that the seasons move in endless cycles so thus the earth may yield its bounty, and that there should be an unbroken chain from ancestors to descendants.

It is a question then how stability in the landownership structure may come about when individual families are continually rising and falling in fortunes according to the roulette wheel of partible inheritance, aside from other random windfalls and catastrophes.

Part One, Model One of this thesis provides an explanation for the landownership distribution: its shape, its constancy despite varying ecological context, and its continuity from generation to generation. This is largely a demographic explanation: class differentials of reproduction counter continual concentration of ownership due to class exploitation. A side product of this prolonged interaction is some particular characteristics of the landownership distribution, characteristics that will be more significant for the solution of the rate of rent and further examined in Chapter 9, Section 9.6. But the demographic explanation itself is embedded in the relations of production and the inequality from which they flow. The relations of production and the relations of

reproduction are one (Harris and Ross 1987, Introduction; Goody 1976; Meillassoux 1972). That is why I have dubbed this explanation "the class relations of reproduction".

Like all models, Model One is an abstraction from the observables of social reality, a way of conceiving or imagining what may be going on as the sum of the aggregation of millions of interactions and life experiences. The model is only as useful as what it helps us to conceptualize, and to the degree that it serves to penetrate the logic of aggregated social experience and summarize the pattern of the outcome. Model One, like Models Two and Three in this dissertation as well, involves a considerable leap of inductive reasoning that must then be followed by many small wearisome steps through empirical investigations.

Chapter 1, Section 1.1, will give a simple illustration of the logic of Model One, with some description of the context to make it memorable as a parable, but without going into all the complications seen in empirical data. The crucial element is class differentials of reproduction: the rich over-reproduce and the poor under-reproduce. Section 1.2 takes Model One to a higher level of mathematical reasoning with a computer simulation of the process illustrated in the first parable. The computer simulation provides order-of-magnitude guidelines for the degree of inequality and the shape of the landownership distribution. Section 1.3 gives a brief example of a reliable survey from Bangladesh that appears to exhibit such a shape, just as a preview to coming attractions.

The landownership distribution is central to this research, as it is to agrarian society; it is the link through the three parts of this dissertation, from Part One, how population processes shape the landownership distribution, to Part Two, how land tenure patterns are the outcome of the landownership distribution under particular conditions of productivity and population density, to Part Three, how the landownership distribution underlies the conditions of supply and demand for rented land which determine the rate of rent. Chapter 1 thus is important in setting the boundaries of a plausible theoretical outcome of the processes of partible inheritance, class-differential fertility, and accumulation. In Part Two the landownership distribution that is mid-way between the upper and lower possibilities generated by the computer simulation will prove to be a powerful predictor of land tenure patterns, given certain inputs of productivity and population density.

Section 1.4 proposes what may be the major mechanism that maintains class differentials of reproduction: female infanticide and thence lack of marriage

opportunities for poor men. That is, the crucial first step in the mechanism of class reproduction is the exchange and allocation of women, an aspect of social functioning that has been more clearly realized by anthropologists than by demographers.

Chapter 1 involves three basic elements: rates of reproduction; rates of accumulation leading to concentration of landownership; and rates of female infanticide (plus other treatment that leads to greater childhood mortality for females). All of these are patterned by class in a way that, according to Model One, results in a stable though unequal landownership distribution, a balance between the concentration of landownership and its dispersal in class-differential reproduction with partible inheritance. Moreover, Model One proposes that there is an organic relationship between the two processes. This points the way to organizing and interpreting a wide range of historical data in the following chapters.

Chapter 2 deals with the Chinese case, the main focus of this dissertation. Section 2.1 describes the sources for demographic data that are also tied to at least socio-economic indicators. Section 2.2 reviews late nineteenth-century and early twentieth-century ethnographic accounts of infanticide, child sale, and adoption, in effect all forms of selecting sex and numbers of children, converting biological reproduction to the form of social reproduction. Then begins a series of sections that will first confirm the presence of the basic patterns proposed by Model One in empirical data, and then make some significant modifications to its proposals on the class relations of reproduction. These are short sections because each section deals with only one data source, for the most part, and the pieces of evidence have been gathered from disparate sources.

Section 2.3 shows that the opportunity of marriage for men is closely constrained by the ownership of land, at least where there is little alternative for livelihood through tenancy or non-agricultural wage labor; according to ethnographic accounts, full-time agricultural wage laborers rarely had sufficient means to marry. This is a first demonstration that reproduction is related to landownership. Section 2.4 shows the same thing from another angle, that there are more reproductive-age women on large farms. Women on large farms generally have slightly higher fertility over their lifetime, but the effect of births per women does not seem to be as great in class-differential reproduction as the effect of allocation of women. Section 2.8, however, shows that the child mortality rate for the poor is much higher, as would be expected from the usual dismal health consequences of poor nutrition and environment. (The sections are not organized strictly according to the logic of the topics, because I have

tried to keep all the data from one source together as much as possible. Each data source requires its own introduction as to what area of China and the size of sample it covers.)

Sections 2.5, 2.6 and 2.7 introduce an important modification to the proposal of Model One that reproduction is proportional to landownership. This modification is also related to the relations of production. Namely, where rented land is prevalent, marriage for men is not so strictly constrained by ownership of land. Moreover, the possibility of capturing rented land through control of labor power puts a different cast on strategies of reproduction: tenants seem driven to produce numbers of sons as early as possible in the life cycle. The logic for this only becomes compelling, however, after the analysis of the agricultural economy in Part Two, Chapter 6 (Section 6.5 in particular; Section 6.8 continues the theme of transition in the relations of production) and the analysis of the rate of rent in Part Three, i.e. under what conditions renters retain part of the surplus.

There is an over-determination in the drive of the propertyless to produce labor: The labor can be applied to rented land, which generates rents for absentee landlords, or it can migrate to urban labor markets which are also spawned by the flow of rents, and provide some remittances to the farm homestead. This is the picture which is tied together in several complex, integrative sections, Sections 2.9, 2.10 and 2.11, which lay out the overall geographic variation of patterns of sex ratios, movement of women in marriage (hypergamy, moving toward slightly richer areas), and movement of men for employment.

But even with this modification in the allocation of women and rates of reproduction where rented land is prevalent, the overall balance between accumulation and the class differentials of reproduction may still be operative: pre-marriage age sex ratios, implying the effects of female infanticide, are highly correlated with population density, which is in turn strongly related to the rate of rent, as will be seen in Chapter 9.

This concludes the Part One analysis of specifically demographic phenomena for pre-revolutionary China. Several of these topics will be taken up again in examination of South Asian surveys in Chapter 3, which are mostly more recent and more rigorously detailed, allowing verification of matters such as the class pattern of female infanticide.

Sections 2.12 and 2.13 seek to demonstrate the other side of Model One, that there is a continual process of accumulation and concentration of landownership that is to be countered by the class differentials of reproduction. It is a cyclic process on the level of

the individual: a farmer painstakingly enlarges his holdings, with the help of his sons' labor, over his lifetime; but at his death, the property is divided among them. Of course the larger the original holding, the greater the possibility for savings and reinvestment; small holdings tend to be lost and swallowed up by the accumulation of others. The data from China available for this analysis are not plentiful. But as a result of the Lenin-Chayanov debate in Russia on economic differentiation among the peasantry versus demographic differentiation, there has been a great deal of analysis for turn-of-the-century Russian data, as well as repeat studies for Bangladesh, and these will be reanalyzed in Chapter 3 as a way to substantiate the point of the overall interaction between accumulation and reproduction.

1.1 A Just-So Story

I will begin Model One with a "just-so" story, a simplified example of the pattern of interaction that I believe is behind the quantifiable historical materials. This is the basic story of how the relations of production can be reproduced over a long period of time, with considerable stability, even while the fortunes of individual families within the social structure wax and wane. I use the term "relations of production" as a shorthand for the unequal relations between providers of land and providers of labor, landlord-to-tenant or managerial farmer-to-agricultural laborer, in which a portion of production is surrendered by the laborer due to the socially-mandated rights accruing to landownership. For a densely-populated peasant society, the relations of production are almost synonymous with the landownership distribution, which we may visualize as a histogram, or even more simply, as a row of stick figures that are each just as tall as their tally of land deeds, and that stand each ranked against his neighbor in this measure, the tallest and mightiest on the right. In the rural economy we see the contours of the landownership distribution both in its peak of the wealthy and its tail of the deprived, because vast expanses of land cannot be utilized by the landlord unless there are also landless minions who can be compelled to till the land and surrender part of the product. How can such a system of inequality be maintained and reproduced?

Classes have often been envisioned as groups owning land or other necessary resources and transmitting it to their descendants for an extended reproduction of the inequalities of the social structure, such that, for example, a noble family remains in control of its wealth and dominions for at least a number of generations. Such could be said to be the case for feudal Europe, where primogeniture or ultimogeniture worked for preserving and bestowing whole manors. So if it were found in historical research in Europe that several noble families suffered a sharp fall in wealth or status within, say, fifty years, it might be thought to be a sign of historical transformation. In a similar line of thinking, the fact that Chinese families tended to disperse their wealth through partible inheritance has been used as an argument that no such rigid class structure existed (Ramon Myers 1970). But Model One shows that the class structure, as indicated by its most concrete basis of inequality, landownership, can be maintained even while no such stability of social position for families or individuals holds.

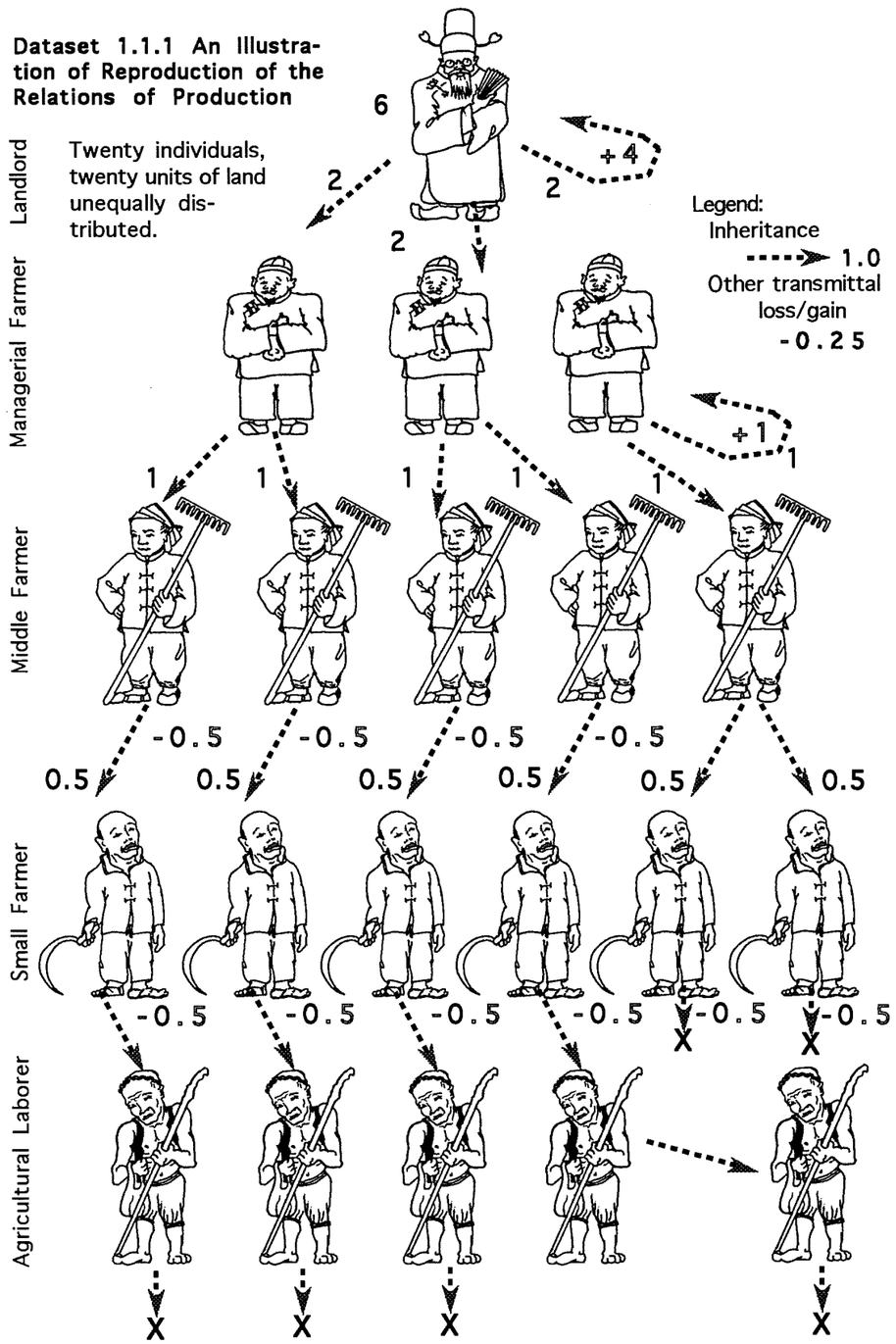
In my just-so story of Model One, all the major elements of the rural Chinese social structure are represented, from leisured landlord to agricultural laborer. However, adult males only are represented, since we are dealing with a patrilineal structure, and the central issue at hand is the transmission of ownership. (Daughters do not inherit except under extraordinary circumstances: if there is no direct male heir a daughter's son may be designated, if he takes the family name.) Also what is depicted here is just the reproduction of the structure of ownership, and so this just-so story will not yet be burdened with the complexities of relations of production, whether landlord/tenant or big farmer/agricultural laborer.

The adult males are depicted as if within one self-reproducing lineage, maintaining the same number of persons and the same area of cultivated land, in an equilibrium like a complicated perpetual motion machine. The cartoon figures in Dataset 1.1.1 A illustrate my conception of this system. They represent the range of social status: literati landlords, farmers of disparate fortune (it does not matter for the time being whether they are renters or not), and "bare stick" agricultural laborers. The example shows two ultimate ancestral points, as if progenitors, one in the top row and one in the second, which just happens to be the way the example worked out for easily divisible numbers of population. This structure could be seen as a genealogical chart; but it is both that and a description of a continuing cycle that is present in all of its phases at one point in time. For the diagram the individuals are all adults at the same time, though with differing stations in life. The passage of each generation reproduces each social role, both in biological reproduction and in reproduction of wealth status, as indicated by the dotted arrows.

This miniature social hierarchy is composed of one landlord, three managerial farmers (farmers operating mostly with hired labor), five middle owner-farmers, six small owner-farmers who may also be part-tenants, and five agricultural laborers. That is a total of twenty adult men. In total they own 20 units of land, but it is very unequally distributed, and the distribution defines their social roles. As is the convention throughout this thesis, one unit of land is equivalent to the average land per capita, and the product of that unit can supply at least subsistence for the average household; some households may starve, of course, due to unequal distribution. In the example the generations move in lock-step, and typical cases rather than the extreme range of variation are illustrated. Let us flesh out the story as follows.

Dataset 1.1.1 An Illustration of Reproduction of the Relations of Production

Twenty individuals, twenty units of land unequally distributed.



The Landlord owns six units of land, which he rents out to tenants. The rents are sufficient to provide his household a comfortable living in the nearby market town, where he is a local literati. Having married early upon the command of his parents, and having also taken a concubine later, the Landlord has three sons, and one of them, having early shown considerable promise as a scholar, has been primed for the imperial examinations. Each of his sons will inherit two units of land, which is not quite sufficient for landlord status; but the scholar, who will pass the examinations to become a degree holder, will take benefit from the prerogatives of bureaucratic office, and will buy another four units of land in his native village, such that he can reproduce his father's position at the point at which his father retires and divides his estate.

The three Managerial Farmers of the lineage each own two units of land. That provides modest luxury if their households remain in the village on its own farm, each household managing its own land and farming extensively using primarily hired labor. Every one of the Managerial Farmers has two sons, each of whom will inherit one unit of land. One unit is not enough to live on well, if labor is hired. However, one of the older cousins out of the total of six has a knack for money lending, and he has gained another one unit of land through defaulted mortgages, such that he can take up the life of a managerial farmer like his father. The others must farm with their own hands as adults.

There are five Middle Farmers, most of whom look back to an illustrious ancestry in the lineage. They farm their own land, one unit each, with just some temporary hired labor in the busy season; they are the stalwart middle peasantry, hard-working and fairly prosperous. Four have one son each, and only one has two. Ceremonial expenditures for marriages and funerals weigh heavily on these households, wishing as they do to maintain social prestige. Land put into hock is slowly lost. Only the family with two sons has been able to expand its production by renting in some land, and has staved off decline in the lifetime of the patriarch. But at his death the family land will be divided. So the six descendants of the five Middle Farmers will take up their adult lives as Small Farmers with just half a unit apiece, barely a sustainable subsistence.

The six Small Farmers owning half a unit of land apiece are close to the edge, and only those who are able to rent in land or find other income from crafts are able to marry before age thirty. Since the Landlord has six units of land to be tenanted, they will probably get by, albeit with heavy labor and rent payments. Four have single sons surviving to adulthood, but two have no heirs. All the remaining land of the Small Farmers, three units in the aggregate, is lost because they are vulnerable to individual

disasters such as illnesses, and to mass distress such as famines, when land is sold for a pittance just for immediate survival. The sons will become agricultural laborers on the land of the Managerial Farmers, will peddle and work as transport labor part of the year, or will even emigrate to Manchuria or Southeast Asia, where for many years their parents will not know whether they are alive or dead.

Of four Agricultural Laborers, only one or two manage to marry; most Agricultural Laborers are "bare sticks", living in the barns of their employers, or travelling with a small bundle of possessions to follow the harvest — marrying very late if at all. Only one Agricultural Laborer has a son who survives to grow up to be himself an Agricultural Laborer; but he dies in early manhood and without issue. Life is brutish and short for the poor. Most will die without fulfilling the sacred imperative of the ancestors to continue the family line.

Let us look now at this scenario in the aggregate. It is actually not important to the cyclic flow of this model whether the owner of two units of land is a Managerial Farmer or a small Landlord, or whether Small Farmers rent in land, but the description should provide some concrete vision on which to hang the mechanism. Dataset 1.1.1 B accompanying Dataset 1.1.1 A sums up the picture in numbers.

Dataset 1.1.1 B Quantification of the Reproduction of Social Relations

Class	Landowner-ership	Popu-lation	Total Land in Class	Loss/Gain before Transmission to Next Generation		Rate of Repro-duction
Landlord	6.0	1	6.0	4.0	67%	3.00
Mgr. Farmer	2.0	3	6.0	1.0	17%	2.00
Middle Farmer	1.0	5	5.0	-2.0	-40%	1.20
Small Farmer	0.5	6	3.0	-3.0	-100%	0.67
Agri. Laborer	0.0	5	0.0	0.0	0%	0.25
All	1.0	20	20.0			1.00

Those who own more land than the average reproduce much more prolifically than the average, and this creates considerable downward mobility for their descendants, but their higher income also allows some savings and accumulation of property on top of what they had inherited at the beginning of their careers. This accumulation of property does not entirely counter the downward mobility of their descendants due to partible inheritance, but it does allow them to reproduce some members of their own class at the same time they people the next lower class. For example, at the apex of the social

hierarchy, the Landlord hands on six units of land to his three sons, and one indirectly uses his bureaucratic status to gain another four units, for a gain of 67% over the original holding.

Those who own less land tend to lose it over time. Although they reproduce at less than replacement rate, and do not so often partition the property among heirs, this only slightly slows their fall. If we were to take this just-so story closer to measurable cases, we would find a large number of the population clinging to small parcels of garden land, but virtually landless and unable to provide for more than a small portion of their subsistence from it. 25% landless in this story is not an overstatement.

In all, there is considerable social mobility, but it is in the bulk downward mobility, not upward mobility. If we were to build some greater natural variation into this example, i.e. random distribution around the average, like a bell curve with a standard deviation, then we might discern a few small farmers in a hundred who hit upon a golden opportunity, or a few middle farmers who had so many sons that they constituted a formidable labor force and took over a vast amount of rented land, making it to landlordship within the life of the patriarch by dint of hard work. Such variation would complicate and somewhat conceal the overall trend. There could also be, mixed in, a large sector of middle and small farmers that just about evenly maintained its population numbers and land for generations. Those who are better off have the possibility of greater savings and maintaining if not advancing their position. But the logic of the model as a system is relentless downward mobility for the majority of descendents. The downward mobility cannot be matched by upward mobility, though some researchers have erroneously assumed that because there is a certain amount of downward mobility there must be equivalent upward mobility; this will be a topic of further discussion at the end of Part One, sections 3.9 and 3.10, when we consider rural mobility studies from pre-revolutionary Russia and Bangladesh.

In this just-so story, out of 20 units of land, in one generation 15 are transmitted by inheritance and only 5 by land sales from the poor to the rich. This is 25% in one generation, or perhaps 1% of land in one year. Allowing also for transfers of land among farmers that are not directly of the nature of expropriation of the poor by the rich, then if 1.5% of all land were to be transferred in sale annually, this slight annual volume could easily contain the massive aggregate levels of land transfer depicted in this scenario.

What is most significant about this just-so story is its illustration of opposing dynamic processes creating together a stable equilibrium of social structure. These processes are, in summary: first, the dispersal of landownership due to partible inheritance; and second, the concentration of ownership due to the purchasing advantage of the rich and their profit from the labor of the poor — what is here capped as "exploitation". The example is one that moves with clockwork precision, with constancy of both population and land, but the same overall dynamic could proceed even if those constraints were loosened. An increase in population and/or change in product per capita would change the annual grain harvest of the average unit of land, but relative landownership could still be calculated in terms of average units. The shape of the landownership distribution could wobble from generation to generation, yet still maintain more-or-less the same relations of production. It is possible that at some times the Landlord class would own 30% of all land, as in this example, or at other times would own 20% or 40%. But the processes of dispersal and accumulation could be in rough equilibrium through all of that. The normal intergeneration continuance involves huge flows of land, but their very normalcy allows them to be obscured beneath the placid surface of times of peace and prosperity, or the turmoil of times of warfare and political upheaval.

Aside from the general robustness of such a system, it should also be apparent, first of all, that the illustration shows certain interrelations and general constraints that are inherent to it. The accumulation of property by the rich cannot exceed the loss of property by the poor. And since the poor do not have much property to begin with, there are stringent limits on how much they can be expropriated. You cannot squeeze blood from a turnip. Note that in this example, which is fairly close to empirical landownership distributions which will be examined later, the Landlord and the Managerial Farmers own 12 of 20 units of land total, and the Middle and Small Farmers own 8 units. So the transfer of 5 units from poor to rich in one generation is 63% of the ownership of those with average or smaller holdings. Such a high level of expropriation can only be maintained due to the continual downward mobility of the descendents of the exploiters; they in turn serve as the expropriated, even while their pride in ancestral origins sustains their loyalty to the social order.

A second point is that the shape of the landownership distribution and thence the social structure and its relations of production is strongly shaped by the pattern of reproduction. The size of the leisured class determines how much land will be let to tenants or farmed with hired labor, affording livelihood, however meager, to the

dispossessed. The rate of reproduction of the propertied classes is of particular centrality, and it must interact with their rate of accumulation of wealth in creating the apex of the social hierarchy for the next generation. Although the rate of reproduction of the rich is much above average, it is still not high enough to immediately bring their next generation down to average landownership. In the illustration, the Landlord owns six units of land, i.e. six times the average land per capita, and reproduces at 3.0.

A third point in the social equilibrium is that the higher the rate of reproduction of the wealthy, then the lower we expect the rate of reproduction of the impoverished to be, if catastrophic Malthusian checks are to be avoided. The close relationship of landownership to reproduction is central to this system, and the under-reproduction of the poor is the reciprocal to the over-reproduction of the rich. The alternative scenario is starvation on a vast scale that might shake the social order. Some steady or recurrent rate of deaths of the poor due to deprivation or famine might be habitually absorbed; so the precise rate of reproduction at the bottom of the society might not be crucial, as long as it is somewhat below replacement. But large numbers of the dispossessed coming to adulthood would likely portend social disruption, and would be better avoided by preventing their reproduction in the first place. How the mechanisms effecting class differentials of reproduction probably worked historically will be a topic in following sections of this thesis, and female infanticide will loom large.

If the central point of this story is understood now, that there is a certain logic of a dynamic equilibrium between reproduction and exploitation, then we can proceed to discuss further what might be the signs that such a system actually exists in Chinese rural society, and what are its ramifications.

The conditions of the agricultural economy differed considerably in time and place, which could not but affect these processes. The fertility of the land and the agricultural surplus constrained exploitation and expropriation. But these constraints could shift with advances in cropping technology, with increasing population, or with depopulation after war or natural disaster. Let us reassess the reciprocal effect of expropriation and downward mobility with consideration of such variability. If the whole system were to remain in balance, a higher level of exploitation and expropriation would need to be accompanied by a greater class differential of reproduction. Such a congruence would not be surprising, because possession of secure livelihood through landownership is a general precondition for marriage in rural society.

In sum, what has been proposed here is a model of a dynamic balance between class differentials of reproduction that disperse ownership, and continual accumulation by the propertied classes that concentrates ownership To initiate a comparison with empirical data that will allow us to evaluate this proposal, we need a more detailed examination of the social processes involved and a more sophisticated modelling of the dynamic balance.

The following is an outline of points where we might seek patterns indicating that the proposed social processes are at work:

A. Differential reproduction of classes

Paternal presence: mortality, morbidity, seasonal migration or long-term emigration.

Access to women: rate of marriage and age at marriage for men, wife's life expectancy, remarriage and concubinage.

Maternal fertility: age at marriage, level of fertility, reproductive span.

Child survival and inheritance: infant and child mortality, infanticide, selling of children, adoption in or adoption out, sending children out to work, customs substituting daughters or sons-in-law for sons in inheritance.

Non-reproducing pockets of marginal and cast-off population outside of family structures.

B. Concentration of ownership

Rate of accumulation of ownership related to size of ownership.

Signs of famine buyouts, chronic indebtedness, land mortgaging.

All of these are aspects of the social processes involved here that will be examined in good time, as possible from extant materials. But the central outcome of the proposed dynamic between reproduction and accumulation is the landownership distribution, and this is a point on which more sophisticated aggregate models and comparisons with empirical data will hang. Before presenting empirical data, I will first discuss theoretical findings from a computer simulation of the dynamic of reproduction and accumulation.

1.2 Specifying the Relationship Between Reproduction and the Landownership Distribution: A Computer Simulation

The just-so story above was set up to make a point, with the simplest numbers. The landownership distribution was a given in the story. But with a very large pile of poker chips and a pair of dice, or a computer with medium capacity and somebody to program it — either way it takes a few hundred hours — the question can be turned around, to "What kind of reproduction and accumulation produces what kind of landownership distribution?".

It has often been proposed for Chinese society, by scholars as far apart on the political spectrum as Fei Hsiao-tung and Ramon Myers, that rapid reproduction of the propertied classes with practice of partible inheritance breaks down concentration of wealth. With the computer simulation we can quantify that outcome. Or, looking at the obverse side of the question, it might be supposed that in a society without exploitation, and with all sectors of it reproducing equally, the landownership distribution would be flat. For either query, the computer simulation will allow us to play out the implications of our speculations with a large population and a large number of generations.

Aside from large numbers, one aspect missing from the just-so story that can be built into a computer simulation is the random nature of number of children, and the variation in the number that are are boys. That was the usual anxious problem for any Chinese woman, traditionally under pressure to produce sons as soon as possible. In the computer simulation, the random nature of the number of sons means that at a given level of reproduction, say 2.0 for a particular landowning level within the simulation, some fathers will have 5 sons, some 4, 3, 2, 1, or even zero, but the average number of sons for that class will be precisely 2. The upper limit for number of sons may be set as high as 10, though under the conditions of probability with a mean of 2.0 even five sons is a very rare occurrence. The logic for the spread of the distribution will be explained later. In sum, this feature of the simulation means that although levels of reproduction are socially determined for groups, for individuals there is a large element of chance that diffuses the correlation of class and reproduction, and in fact even affects the overall outcome of inequality.

At the first stage of the presentation of the computer simulation, let us show just the effect of this random reproduction.

Initial Conditions of the Simulation

Let there be at Generation Zero (G_0) 1000 fathers, each owning one unit of land, i.e. 1000 units of land in all. Each father has an equal probability of bearing a male heir, with mean probability 1.0. There is zero population growth.

Considering that there is considerable variation in number of children surviving per family, and about 50% probability that any one child will be male or female, a Poisson distribution is a reasonable model for the distribution of number of sons. A Poisson distribution is a very skewed distribution with a long tail at the upper end, often used for modelling random events.[5] For mean of 1.0, that is, each father producing on the average one son, the distribution of sons expected will be as follows:

Dataset 1.2.1 1000 Sons for 1000 Fathers, According to a Poisson Distribution with Mean 1.0.

Sons	Fathers	Total Sons
0	368	0
1	368	368
2	184	368
3	61	183
4	15	60
5	3	15
6	1	6
All	1000	1000

As can be seen at the bottom of this table, 1000 fathers produce 1000 sons under the convention of a Poisson distribution with mean of 1.0. The number of large sets of brothers is small, and drops off rapidly. There are only one-third as many fathers

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5 The Poisson distribution is not too onerous to calculate for any given mean, and for means over 4 it begins to resemble a normal bell-shaped distribution. The appropriateness of a Poisson distribution may be seen by carrying out a small exercise in randomly assigning sex to a random number of children. In practical application, any skewed distribution with a low mean would be similar and have about the same effect in the computer simulation.

However, I have also confirmed that an empirical distribution of surviving sons approximates a Poisson distribution through analysis of data from Taiwan in Wolf 1985, p. 178, Table 7.12.

having three sons, compared with those having two sons, and so on. The expected probability is readily calculated. However, the assignment of sons using a random number generator may produce a few more or a few less sons, which number must be cleaned up and shaved to exactly 1000 before the simulation continues.

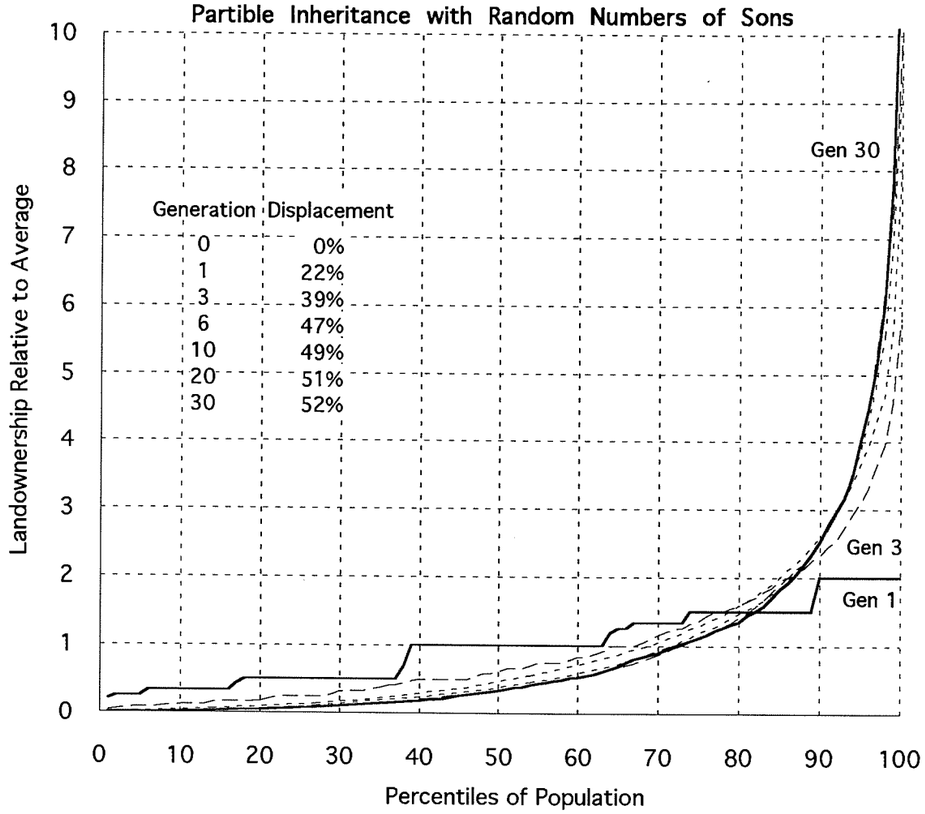
Stage One: Equal Reproduction Regardless of Landownership

After the passage of one generation, the sons have grown up, and the fathers have passed from the scene after dividing their property equally among their sons. 368 single sons have just the one unit of land originally tilled by their fathers. The 368 double sons of 184 fathers each have 0.5 units of land. The 183 triple sons of 61 fathers now hold 0.33 units of land each. And so on.

But there are 368 units of land on which the fathers died without male heirs. In the real social landscape that land might be taken over by a nephew, a son-in-law, or an adopted son. In the electronic medium the process is simulated by random assignment of the 368 units of land, each as a whole estate, among the members of the next generation without regard to their inherited ownership. It is a lottery that assigns beneficent awards to a few. So a few men (36.8% x 36.8% = 13.5%) will move into Generation One with 2 units of land; some (36.8% x 36.8% = 13.5%) with 1.5 units; some (36.8% x 18.3% = 6.7%) with 1.3 units; and so on. This award of property does not change the rate of reproduction of those who receive it, or prevent a second strike in the lottery in the next generation. As this process is repeated , a small peak of fairly large estates emerges, as shown in Dataset 1.2.2, which has been generated by one run of the computer simulation. Generation One is shown with the irregular heavy line. (Since this is one run of a random process, the numbers of sons at each level of ownership do not precisely match the theoretical numbers figured above).

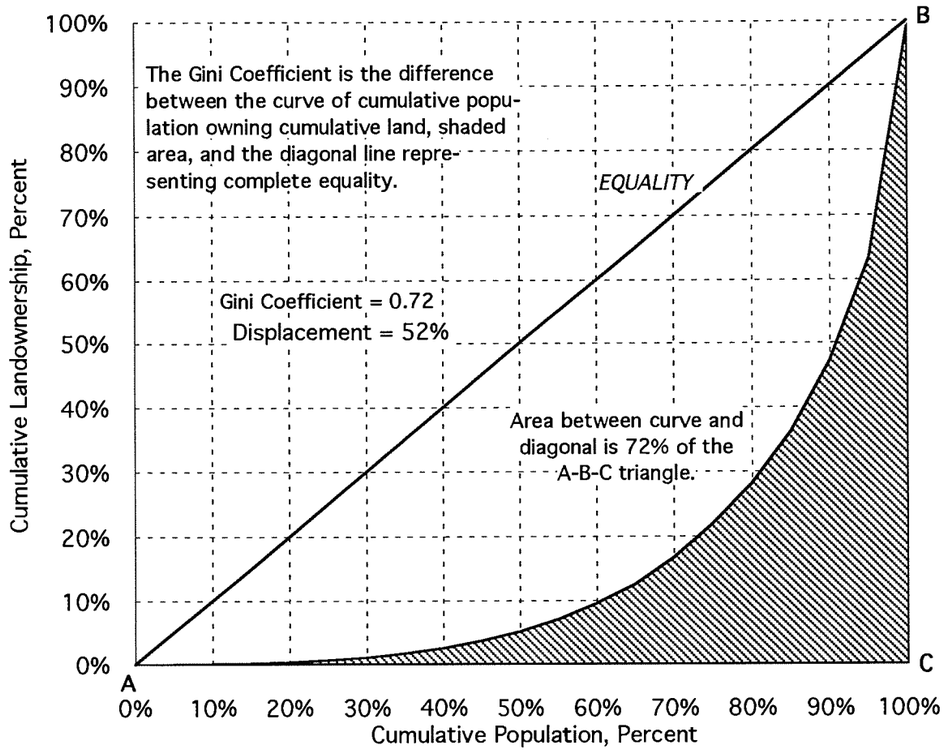
By Generation Three (lighter dashed line) this process has created a nearly smooth line with a peak higher than five units of landownership; just a few lineages have hit the jackpot more than once. Successive generations are represented by lighter dotted lines. The polarization slows by about Generation 10, and stabilizes between Generation 15 and 20. At the same time, the continuous division through partible inheritance renders nearly landless some lineages who have never been so fortunate as to reap the random extra inheritance. Inequality does not increase further, but the random nature of the

Dataset 1.2.2 Computer Simulation of Successive Generations of Partible Inheritance with Random Numbers of Sons

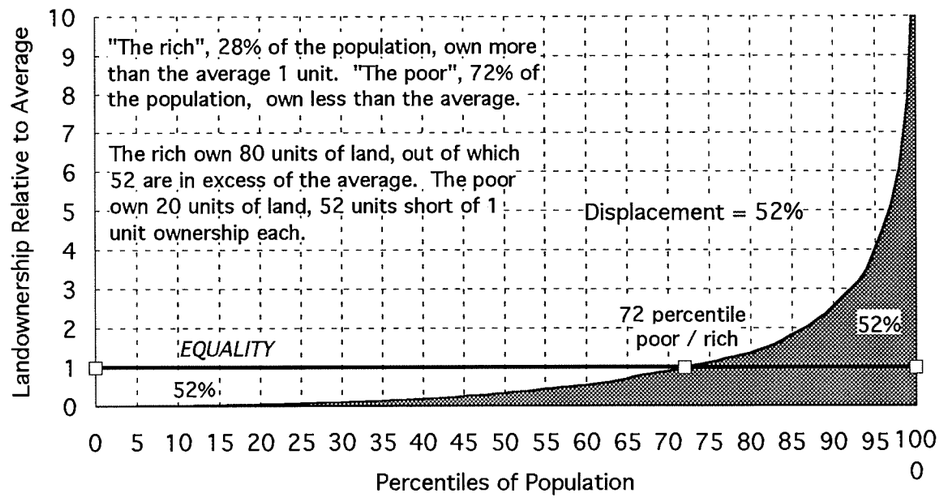


Dataset 1.2.3 Illustrations of Measures of Inequality

A. Illustration of a Common Measure of Inequality, the Gini Coefficient



B. Illustration of Displacement as a Measure of Landownership Inequality



process (in mathematical terminology, a Markov chain) still leads to fluctuations in the sizes of the largest estates.

This is a pedantic exercise, but the results are in fact very interesting. Random reproduction at an equal level of probability does not lead to equal ownership; in fact it is very unequal. Let us examine the outcome of the simulation, after it reaches equilibrium.

Generation 30 in Dataset 1.2.2 is just that curve. I would like the reader to look closely and understand the axes of this diagram, because the landownership distribution will be depicted in this form throughout this thesis. It is basically a histogram of landownership, with the population arrayed from poor (on the left) to rich (on the right), along the horizontal axis. The total population is 100, i.e. 100%. The vertical axis represents the amount of land owned. The scale of landownership is standardized to the average, which is "one unit" per head of population. (As mentioned earlier, we are dealing with the population in terms of its property owners, who in the social prototype are adult males.) I will generally use the term "unit" for the standardized measure of land, rather than "percent", to distinguish it more readily from percents of population. Following along this curve, we see that 60% of the population owns less than half a unit of land each, and the wealthiest 1% of population owns over 10 units. Average ownership for the top 5% is just a little over 7 units. In contrast, total equality, each owner having one unit, would be represented by a straight horizontal line at the 1 land unit level. Obviously the horizontal line is not any real case, but it provides a base line for a measurement of inequality, which will be the next item of discussion.

Measurements of Inequality

The measure of inequality I will use is called "displacement". It is the difference between the line of equality, and the curve of inequality: it is the total of the land by which those who own less than one unit are short, which is also the same as the total of the land that those who own more than one unit are in excess. That which has been "displaced" from the poor is piled up in the superfluity of the rich. This equivalence is set by the fact that the average of all ownership has been set as "one unit". It is a convenient equivalence, because it allows us to make a measurement on either the peak

or the tail of the curve of land ownership, which will be handy when we deal with the complexity of empirical data.

There are other ways that inequality can be measured. The most common is the Gini coefficient. The Gini coefficient is based on a curve (Dataset 1.2.3 A) which represents the summation of the amount of land owned by increasing portions of the population.[6] The case shown here is that which has just been generated and shown in Dataset 1.2.2.

The displacement measurement is much easier to calculate: Find out what portion of population owns more than the average, and how much of all land they own. The displacement is the difference between the two numbers. If 25% of the population owns more than the average, and what they own is 75% of all land, displacement is 50%. But the other advantage of the displacement measurement is that it is intuitively much closer to a concrete concept, the amount of property by which the poor are deprived in order to make the rich wealthy — if we imagined there was an original state of nature, a Garden of Eden, where man lived in blissful egalitarianism before the Fall brought selfishness and greed. "Displacement" can be readily gauged with the eye on the curve of landownership distribution as represented in Dataset 1.2.3 B. It is also much easier to see what is the relative level of ownership for the mass of smallholders in the displacement graph than in the Gini coefficient graph. The displacement measurement is not sensitive to differences in distribution of wealth at the peak, but that does not matter here, because

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6 To be more specific about the meaning of summation of the amount of land owned by increasing portions of the population: the poorest 10% of population owns 0.05% of land, the poorest 20% of population owns 0.3% of land, the poorest 30% of population owns 5.0% of land, ... the bottom 90% of population owns 48% of land, and of course 100% of the population owns 100% of the land. We know from this of course that the richest 10% of population owns over 50% of all land, in this case. Equality on the Gini coefficient graph is represented by a diagonal line, A-B. The coefficient is the percent of the triangle A-B-C that the curve of inequality leaves vacant. Zero is complete equality, 0.99 is monopoly of all ownership by 1% of the population. The Gini coefficient is sensitive to differences in the distribution of ownership at the upper end of the spectrum. It also can be estimated from rather rough data on increments of ownership, any information on percent of population owning what percent of land, but the calculations are quite complex.

The Gini coefficient calculation yields a figure somewhat higher than does displacement, when applied to the same distribution. There may be some occasion for comparing results of others' research, often cited in Gini coefficients, with the research here. So I have estimated the relationship between the Gini coefficient and the displacement measure for several landownership distributions: Displacement 32% = Gini 0.45; Displacement 42% = Gini 0.55; displacement 52% = Gini 0.72.

when we need that information we will deal directly with the curve of the landownership distribution.

With "displacement" as the measure of inequality, we can now say, in sum, that the outcome of the simulation of random reproduction, equal for all classes, is inequality with a displacement of 52%. 28% of the population owns more than the average, and what they own is 80% of all land. The rich own much more than their "fair share" of land — an excess that is equal to 52% of all land — and this is also the shortfall from equality for the rest of the population.

There were two elements of randomness that created this seemingly rather large degree of inequality: the random number of sons and the random bestowal of heirless estates. As we begin to try to think what this simulation means for the way we understand social reality, we may want to know which factor is the predominant one, or what are their relative weights. We can simulate an extreme possibility for transmission of the land which has no heirs: "leveling", in which all heirless land is divided with precise equality among the next generation. With a Poisson distribution of number of sons, but equal probability of reproduction for all fathers, approximately 36.8% of all land is left heirless each generation, and is divided up as 0.368 units of land for every son in the next generation. This is of course a powerful equalization, and when the process comes to equilibrium displacement is only 12%. But if we then subtract the 0.368 units of land that is constant for all, inequality for the remaining land is 25%. Since this is half of the inequality resulting for the previous simulation, we might say that random bestowal of whole estates accounts for half of inequality when fertility is constant for all.

If this is the case, adoption practices and other means of assigning heirs when there are no sons could have a significant impact on landownership distribution. No doubt the succession to fathers who lacked biological offspring was affected by adoption and other inheritance practices. Although there is very little hard data to go on (see, for example, Waltner 1990), two factors in adoption have been mentioned in ethnographies: first, bestowal of property tied the loyalty of the heir for the duties of old age care and for ancestor worship, and second, the bestower generally wished to adopt sons without the conflicting loyalties of birth parents nearby. But clans often tried to keep adoptions and assignment of heirs within the clan, to prevent dispersal of property. Inheritance through daughters, generally by means of attaching husbands to them uxorilocally, would have had about the same function as adoption of unrelated sons. The random assignment

of whole estates in the simulation is probably adequate to model a mixture of in-clan and out-of-clan adoption, in that the heirless land is assigned both to propertied and non-propertied members of the next generation, without preference for either one.

The number of estates randomly assigned is not an insignificant number, because with the expected distribution of numbers of sons, nearly 37% of fathers and their land are heirless. However, as polarization of the landownership distribution proceeds in the case of equal reproduction for all classes, only about one third of all fathers have as much as one unit of land to bestow.

But of course in reality (as will be demonstrated in Chapter 2) reproduction is not equal for all classes, so the next simulation examines what is the outcome with higher rates of reproduction for the wealthy. For one, fewer large estates go without heirs. Then less than 30% of land is distributed randomly in the computer simulation. This is part of why it is not worth further belaboring or complicating the matter of random assignment of heirless land in the simulation. Random assignment of whole estates will be the standard procedure.

Stage Two: Reproduction Proportional to Landownership

Wealth does not equal income, but it is generally a good indication of relative level of well-being, and of the stability and security of life over a longer period. We may further presume that a level of stable income attendant on wealth brings with it better health and better opportunities for family formation. Conversely, a lack of property leaves the individual and the family open to physically exhausting exploitation and to the vagaries of fortune and famine. So it may confidently be supposed that wealth is generally proportional to the capacity to reproduce. But we would not expect that the rate of reproduction is fully commensurate with wealth, for the following reasons.

Those who own no land still usually garner an income through renting in land, working as hired agricultural laborers, or doing handicrafts in the off-season; their reproduction rate is likely greater than zero. Conversely, those who can live on rents because they own a great deal of property still receive only a portion of the product of that land. So we would expect that, comparing rich and poor, the difference in their fertility is less than the difference in their ownership of land and property. As a simple model that is easily calculated, we can set the relationship of fertility to ownership as

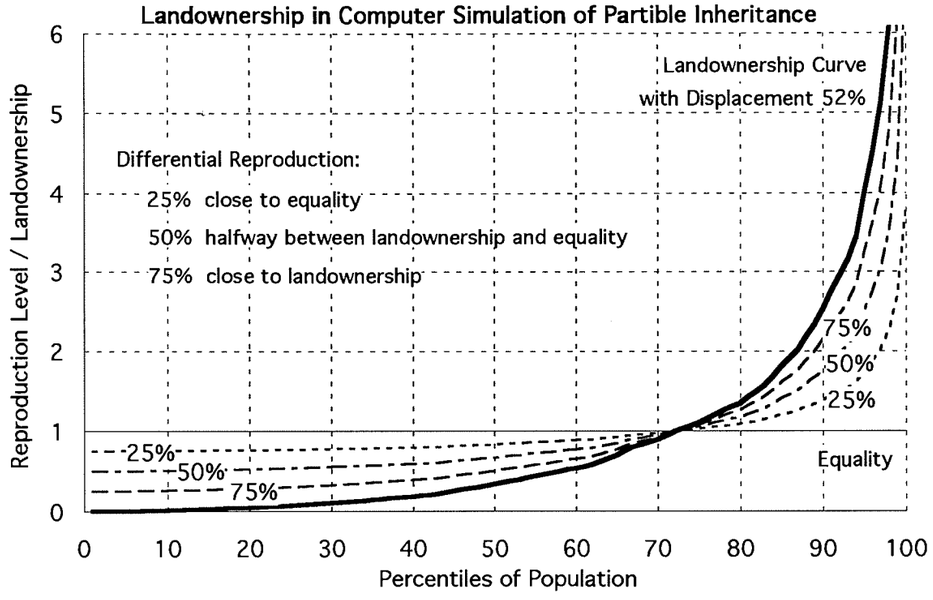
being halfway between the curve of landownership and the 1.0 line of complete equality. This level of fertility is, in effect, equal to the income for each male head of household if he farmed precisely one unit of land, and rented in or rented out the difference between that one unit and his number of units owned, at a 50% rate of rent.

The pattern of reproduction in relation to landowning has been set as if it reflected income due to landownership, and yet no rate of rent has been explicitly set. The rate of rent would be anticipated to operate as an important intermediary between landownership and income, setting reciprocal tendencies for rich and poor — the higher the rate of rent, the higher the income for the rich, and the lower for the poor. If fertility is indeed positively related to income, then the same reciprocal relationship would be found in the differentials of reproduction by class. High rents would both accelerate the accumulation of the rich, and brake the reproduction of the poor. But for now we will let all of this be subsumed within an assigned differential of reproduction. The differential of reproduction can also be varied in the simulation, from 25% (i.e. the rich reproduce only a little more than the poor) to 75% (i.e. the rich reproduce nearly proportional to their holdings, and only one in four of the landless has a son). The way this has been set in the simulation can be more easily understood from Dataset 1.2.4. . The differential of reproduction is a line set midway between the curve of landownership distribution and the 1.0 line of total equality. A 50% differential of reproduction is precisely halfway between the two.

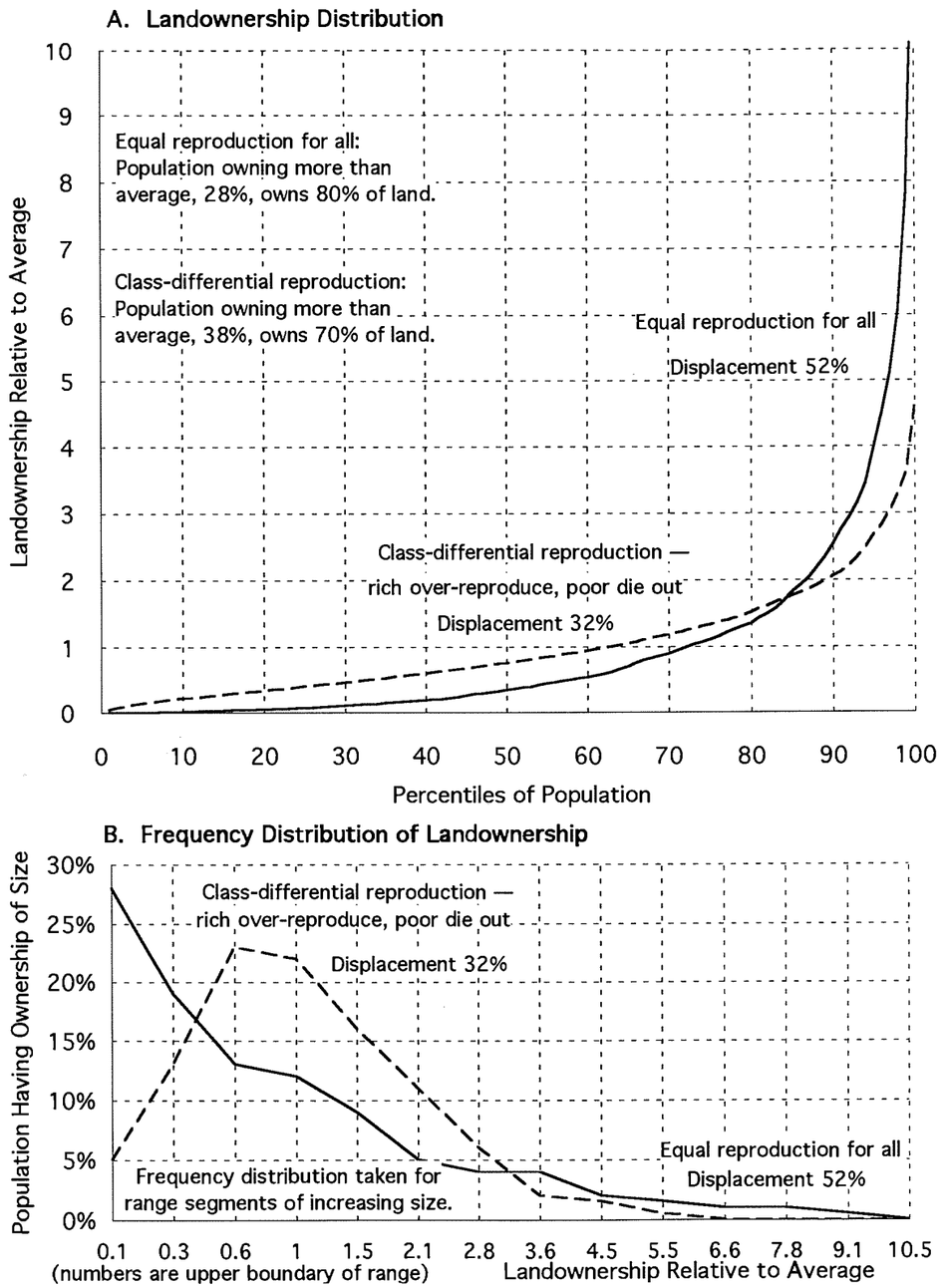
After adding this new condition of fertility proportional to landownership, we can again model the process of reproduction and division of land among heirs (at 50% differential of reproduction) until the landownership distribution comes to an equilibrium, as we did in the first stage of the simulation. The resulting degree of inequality is 32% displacement from equality. Dataset 1.2.5 A compares the two curves, equal reproduction for all classes versus class differentials of reproduction. Class differentials of reproduction provide a considerable but not complete levelling.

Another feature of the outcome is more apparent when we depict the two landownership distribution as frequency distributions, i.e. a graph of size of ownership versus number of the population holding that size. This is Dataset 1.2.5 B. The x-axis is percent of population that falls within the segment (labelled by its endpoint), i.e. for the dotted line representing the outcome of class differentials of reproduction, about 5% of the population is in the 0-0.1 landownership segment, 13% in the 0.1-0.3 segment, 23% in the 0.3-0.6 segment, and so on. The process of higher reproduction for the rich and

Dataset 1.2.4 Setting Differential Reproduction in Relation to Landownership in Computer Simulation of Partible Inheritance



Dataset 1.2.5 Computer Simulation of Landownership Distribution Resulting from Partible Inheritance: Class-Differential Reproduction versus Equal Reproduction



dying out for the poor creates a proliferation of medium-size holders, and relatively few smallholders. Thus the landownership distribution produced with a class differential of reproduction is a complex curve with a "hump", in this case in about the region of 0.6 to 1.5 units of land. This is a significant feature to look for in empirical data, and it could be an important factor in the stability of agricultural societies with partible inheritance.

The frequency distribution also makes it clear that there are several inflections in the curve of landownership distribution, though they are slight; this makes it very difficult to subject this curve to mathematical analysis. This is the reason why throughout this thesis the landownership distribution is dealt with in computer simulation, applying simple mathematical operations repetitively to discrete points (from 100 up to 2000) over the full range of the distribution, not with a mathematical description of the curve and then calculus operations on the formula for the curve. A fairly accurate mathematical description could no doubt be built up with a long Taylor approximation, but the number of terms needed would be very cumbersome, and it would not add to the research conceptually. Moreover, since results in Part Three of this thesis, the analysis of the determination of the rate of rent, are quite sensitive to the shape of the landownership distribution, I have found that a simpler and less accurate mathematical description does not function well in matching with empirical data.

Stage Three: The Rich Get Richer

With the curves from the first and second stages of the simulation, we have some benchmarks with which to ruminate on the meaning of empirical landownership distributions. But there is a third stage to the simulation, incorporating the process of accumulation displayed in the "just-so" story, that the rich get richer due to their superior capacity for savings and reinvestment.

The "just-so" story proposed that differential fertility just offset the accumulation due to exploitation, such that a stable social and economic structure could be maintained over the course of generations. Two questions emerge from this proposal: First, how much differential fertility just balances how much accumulation in each generation? Second, what is the landownership distribution(s) at the equilibrium?

For the third stage of the simulation, the rich — those owning more than one unit of land — are in each generation awarded an increment of land that is proportional to the amount each one owns in excess of one unit. (This award is made after their number of sons is assigned, and thus does not additionally influence the number of sons in that generation. The sequence thus mimics the life cycle: early reproduction, and then increasing income in middle years when family labor is mature and the dependency ratio is lower.) The award is set as a fixed percentage of ownership that exceeds the average, which is named the "accumulation rate" and set in the range between 10% and 40%. The model reflects the general economic principle that at higher incomes a higher rate of savings is possible. With the accumulation rate set at 25%, an owner of 5 units will receive an additional one unit (5 - 1 = 4, 4 x 0.25 = 1), and an owner of 1.2 units will receive only a sliver of an increment, 0.05 of a unit (1.2 - 1 = 0.2, 0.2 x 0.25 = 0.05). Since the award is calculated on land owned *beyond the average of one unit*, it is a "progressive" award, i.e. the rich get a higher percentage added in relation to their current ownership. So as landownership distribution becomes more unequal, the total accumulation of all the rich also increases. If inequality equals a displacement of 40%, then at accumulation rate of 25%, 10 units of land in total will be added to the holdings of the rich, and at the end of that cycle of the generation displacement will equal 50%.

The accumulation of the rich must of course also be matched by the expropriation of the poor. In the simulation, after the total accumulation of the rich is tallied, the tail of the landownership distribution is shaved, with slightly thicker increments taken from the poorest, until the total shavings equal the accumulation of the rich. Of course a considerable number of smallholders are totally dispossessed. This process is repeated in every generation, but at the same time the rapid proliferation of the very rich is creating new medium-size holders in the succeeding generation and the land of medium-small owners is being steadily whittled down. So the resulting frequency distribution is marked by an expanded number of medium-large holdings at about two units of land.

An example of this, with variable reproduction of 50% and accumulation for the rich of 35% repeated for 25 generations, is given in Dataset 1.2.6. The distributions for the two previous stages of the simulation, equal reproduction for all classes and class-differential reproduction, are given as well to allow comparison of all three. In this third case, the level of inequality is 42% displacement, halfway between the other two, and the resulting curve is also similar to an average of the two (compared in more detail in Dataset 9.6.2 A and B). In fact a curve with 42% displacement has been found to be

Dataset 1.2.6. Computer Simulation: Three Cases of Landownership Distributions Resulting from Partible Inheritance.

1. Equal Reproduction for All Classes,
2. Class Differentials of Reproduction, and
3. Class Differentials Plus Accumulation of Land by Rich.

A. Size of Landownership by 5% Segments of Population

POPULATION	LANDOWNERSHIP RELATIVE TO AVERAGE		
Population Segment	Equal Reproduction for All Classes	Class-Differential Reproduction, 50%	Class-Diff 50%, Accumulation by Rich 35%
5	0.001	0.092	0.000
10	0.007	0.180	0.000
15	0.020	0.241	0.003
20	0.039	0.304	0.063
25	0.058	0.367	0.132
30	0.087	0.431	0.187
35	0.123	0.494	0.241
40	0.164	0.568	0.355
45	0.217	0.640	0.482
50	0.300	0.723	0.609
55	0.392	0.807	0.730
60	0.494	0.900	0.875
65	0.618	1.004	1.036
70	0.825	1.132	1.177
75	1.024	1.269	1.365
80	1.252	1.433	1.583
85	1.597	1.663	1.837
90	2.192	1.922	2.204
95	3.252	2.363	2.749
100	7.136	3.467	4.374
Displacement	52%	32%	42%

B. Percent of Population in Increasing Segments of Landownership Range.

LANDOWNERSHIP		PERCENT POPULATION IN LANDOWNERSHIP RANGE		
Segment of Land Range	Endpoint of Land Range	Equal Reproduction for All Classes	Class-Differential Reproduction, 50%	Class-Diff 50%, Accumulation by Rich 35%
0.1	0.1	28	5	20
0.2	0.3	19	13	15
0.3	0.6	13	23	12
0.4	1.0	12	22	14
0.5	1.5	9	16	14
0.6	2.1	5	11	11
0.7	2.8	4	6	7
0.8	3.6	4	2	4
0.9	4.5	2	2	1
1.0	5.5	2	1	1
1.1	6.6	1	0	1
1.2	7.8	1	0	0
1.3	9.1	1	0	0
1.4	10.5	0	0	0

the one that best serves as a model to generate land tenure patterns, as will be seen in Part Two, Chapter 5. The curve halfway between the 32% and 52% simulations is the standardly-applied landownership distribution in following chapters.

When both differential reproduction and accumulation are in operation, the simulation comes near the equilibrium balance very quickly, within six generations. Since all families move in simple lockstep in the computer simulation, there are two phases in one generation, one in which fathers accumulate additional land, and one in which they reproduce and hand the land on to their heirs. In the division phase, landownership inequality drops down to 35-36% displacement. In the accumulation phase, the rich appropriate on the average 12.5 units of land from the poor, and then inequality is 48-49%. But since in real life both processes are in operation at the same time, for the final result of the simulation I average the two distributions, for an outcome of 42% inequality. It is possible that timing of household division, for example, could affect the weight that one or the other phase should be given in order to best match empirical data, but for now I have no guideline on that.

The example of variable reproduction 50% and accumulation 35% is one that can survive and cycle indefinitely, but computer simulations are not all immortal. Let us consider the progression of a simulation more closely. After the simulation starts out from complete equality, inequality gradually increases in each generation and thus total accumulation increases as well. This process generally reaches either a steady state or a breakdown before Generation 12. If the total accumulation slated for the rich (those owning more than 1.0 units of land) ever gets higher than all the land owned by the poor in any generation, then the simulation breaks down. This is fairly likely to happen: At landownership displacement of 55%, which would be, say, the rich 25% of the population owning 80 units of land, then a 40% accumulation rate would mean 22 units of land must be transfered — but the remainder of the population only owns 20 units. Then the program bombs. A whimsical vision of this is that the electronic peons have nothing more to lose, and have revolted against the program. On the other hand, if the simulation reaches a stable degree of inequality and does not break down through to Generation 25, then the original inputs for rates of fertility differentials and rates of accumulation are judged to have successfully balanced each other, creating a society that has both exploitation and stability.

Dataset 1.2.7 shows the viable combinations of rates of differential reproduction and accumulation, and the characteristics of their equilibrium states. Many combinations

allow stability of the two processes, seemingly permanent. Less stringent conditions could still provide a considerable time horizon for stability. The proposition seems to hold up: a higher differential of reproduction is required to counter a higher rate of accumulation, to produce a stable equilibrium state.

In Dataset 1.2.7 the bold type represents the runs of the simulation that have bombed due to unsupportable rates of accumulation. (Unfortunately each run takes over two hours to run and evaluate, and the program was not designed to exceed 40% accumulation, so the results here are limited.) The point of breakdown is in fact the most interesting thing about this computer simulation, because it implies the maximum of possible rates of accumulation under particular demographic regimes.

In fact, without differential reproduction, accumulation may be tolerable. At 25% class differential fertility (close to equality of reproduction for all, but still a sizeable increment at the peak of ownership), the highest viable rate of accumulation is 20%, and that results in 9 units of land out of the total of 100 being transferred from poor to rich in one generation. If accumulation is raised higher, the simulation revolts. At 50% class differential fertility (halfway between 1.0 and landownership, as if reproduction equalled income and rent were 50%), a 35% rate of accumulation is still viable, and 12.1 units of land can be seized by the rich in each generation without mishap.

What could not have been predicted in advance was that the degree of displacement in the landownership distribution is also slightly higher when both differential reproduction and accumulation are higher, but in viable balance. In the null case of no differential fertility and no accumulation, the steady state of the landownership distribution falls at 52% displacement from equality. When differential fertility is 25%, the highest viable accumulation leads to 49.5% displacement. When differential fertility is 50%, the highest viable accumulation is at 41.6% displacement. The same seems to be in store for differential fertility at 75%; more computers runs might find displacement of about 39% a notch before the breakdown rate. This is indeed a surprising result: that the landownership distribution could be more unequal at lower rates of accumulation.[7]

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[7] I will add the implications of this to a discussion in Chapter 10, the conclusion, following presentation of an "evolutionary scenario" of long-term population growth. Here I can be freer in conjuring up a logic for the characteristics of feudalism, in contrast to the high-population density Chinese case.

Dataset 1.2.7 Viable Rates of Accumulation and Class-Differential Reproduction in Computer Simulation of Partible Inheritance

SET CONDITIONS		RESULTS OF COMPUTER SIMULATION				
Class-Differential Fertility	Accumulation Rate for Rich	Stable through Generation	Displacement before Accumulation	Transferred in One Generation	Displacement after Accumulation	Average Displacement
0%	0%	25+				52.0
25%	10%	25+	40.5	4.1	44.6	42.5
25%	20%	25+	45.0	9.0	54.0	49.5
25%	25%	✂ 7	**48.1**	**12.0**	**60.2**	**54.2**
50%	0%	25+				32.0
50%	10%	25+	31.8	3.2	35.0	33.4
50%	20%	25+	33.6	6.5	40.1	36.8
50%	30%	25+	35.0	9.4	44.4	39.7
50%	35%	25+	35.6	12.1	47.7	41.6
50%	40%	✂ 8	**46.2**	**18.5**	**64.6**	**55.4**
75%	20%	25+	28.6	5.8	34.4	31.5
75%	30%	25+	28.9	8.6	37.5	33.2
75%	40%	25+	30.2	12.1	42.3	36.2

NOTES: Degree of class-differential fertility can be varied in model between 0% (all segments of population reproduce at probability of 1.0) and 100% (reproduction = land owned), as shown in Dataset 1.2.4. 25% is close to equality. 50% is halfway between equality and landownership. 75% is close to landownership, i.e. a high differential.

The accumulation of land in one generation only applies to those who own more than average ownership. Accumulation is: (Land Owned - 1) x (Rate of Accumulation), for each rich owner. Sum of all accumulation is subtracted from those who own less than average ownership by chopping off the tail of the landownership distribution. Simulation is terminated if those owning less than average do not own land enough to satisfy transfer demanded for accumulation by the rich.

Process generally comes to equilibrium or bombs by about Generation 12; simulation is continued to Generation 25 to confirm stability.

On the other hand, the theoretical breakdown of the system if it exceeds certain rates of accumulation gives reason for the landownership distribution to remain within a fairly narrow range of outcomes. Although it is not possible to directly verify what the class differentials of reproduction might be in empirical data, it seems that they could hardly approach the 75% mark, since that would mean an average of only 0.55 sons for the 70% of population owning less than one unit of land. Class differentials of fertility of about 50% (0.70 sons for that bottom 70% of population) seem plausible, however, in the light of sex ratios to be seen in Chapter 2, and of estimates of income for sectors of

the farm population, in Chapter 6. At the 50% rate landownership equality would probably stay around 40% displacement.

This computer simulation could seem like a numbers game, a flight of imagination. But step by step we will build up empirical observations to compare with it. However, even after ingesting a mass of empirical data, we must come back to think through the large issues of the reproduction of the social structure in terms like those of the model.

I would like to anthropomorphize the interplay between accumulation and fertility somewhat. It is logical to think that a high rate of extraction, i.e. profits on rented land and on land farmed with hired labor, could be behind a high rate of accumulation for the owners of large estates. The high income might finance early marriage for their sons, and concubines as well. That same extraction could squeeze the livelihood of the renters and laborers, and depress their reproduction. There are the sort of intervening variables that will be examined in empirical data in this thesis. Not the least of them is female infanticide. So it is probably not merely serendipitous that differential reproduction should tend towards equilibrium with accumulation; the two social processes are intertwined. But for the model we can only deal with an abstract quantification of the relationships.

The Implications of the Computer Simulation

Let us review three main findings from the computer simulation of partible inheritance: First, equal reproduction for all sectors of the society leads to considerable inequality, merely due to the randomness of demographic processes. Second, a similar degree of inequality can also be produced by concurrent processes of accumulation by the rich, and differential reproduction of classes, i.e. fertility varying positively with wealth. Third, relatively stable systems can be constructed at higher levels of accumulation with higher class differentials of reproduction.

These results leave us with some ambiguity of interpretation of empirical data, if we have only the evidence of a particular landownership distribution, which could be produced under several conditions. But if there is other evidence of the process of differential reproduction of classes — for example, high sex ratios —, the computer simulation may provide some basis to impute that the process of accumulation is also in operation.

The computer simulation offers parameters for approaching the question of how much inequality may have been intolerable to continued social adhesion in traditional China, that is, where was the breaking point for revolution. Jin and Liu, among others, have proposed in their 1992 book The Cycle of Growth and Decline — On the Ultrastable Structure of Chinese Society that there was a long dynastic cycle in which landownership gradually concentrated, as the nobility of the dynasty became entrenched; peasant uprisings levelled ownership when inequality reached an intolerable degree. The model of class differentials of reproduction does not presume that equilibrium was a constant state, that there was no historical development; but it does provide an explanation for why relative stability could be maintained over a long period.

There is a second point of historical relevance. Class differentials of reproduction imply that elite families are not likely to maintain dominance generation after generation, because their estates are periodically dissipated. Rather a circulation of elites is to be expected. This is consistent with a state system using an imperial bureaucracy, but inconsistent with a landed nobility. On the other hand, if the rate of accumulation were very low, as no doubt in some early historical periods when population was sparse, low class differentials of reproduction would allow the continuance of several generations of landed nobility.

It may be said that I have constructed a *deus ex machina*. Be that as it may, I would hazard a speculation that the 52% displacement from equality produced by random reproduction for all, the equilibrium endpoint of the first computer simulation, is the maximum degree of inequality that can be absorbed within a peasant society with partible inheritance. The thought behind this is that if 52% displacement can be produced merely by demographic roulette, human society might well have adjusted to such inequality over a long evolutionary development with a given level of surplus habitually produced; but further concentration beyond that point, due to expropriation in the absence of equalizing demographic mechanisms like class differentials of reproduction, would demand more than the available surplus. This is admittedly merely abstract speculation. But after we have proceeded to measurement of the surplus in Part Two of this thesis, and to analysis of the rate of rent on agricultural land in Part Three, the reader may find more to hang this thought on.

If empirical landownership distributions in areas with partible inheritance were much outside of the range of the results of the computer simulation (displacement of 32% to

52% for adult males, but numbers acceptably higher when the effect of more prevalent joint households among the propertied is included), then these ruminations would be irrelevant. In the following section, Section 1.3, I will present one empirical landownership distribution before proceeding in Section 1.4 to consider the kinds of concrete evidence we may find for differential reproduction of classes.

1.3 An Example of Landownership Distribution, Bangladesh 1978

Evaluation of empirical data on landownership distribution is quite involved. A major problem is that most agrarian surveys are compiled on the basis of farm size, including rented land, and not on the basis of ownership. Related to this, the total ownership of landlords is generally not seen in surveys because land rented-out is dispersed among tenants. Likewise, agricultural laborers are usually underrepresented or completely omitted from farm surveys. So it is rare to find reliable information on the full range of landownership distribution. For the Chinese farm surveys I will analyze, some complex figuring is necessary to estimate landownership distribution from size-of-farm data.

However, there is one large contemporary survey which specifically sought to investigate inequality of landownership: the 1978 Land Occupancy Survey of Bangladesh. Over 35,000 questionnaires were completed and coded. This survey carried out an exhaustive ennumeration of all inhabitants of villages that were selected in a scientifically-designed stratified random sample. This means that landless laborers, peddlers, and landlords who did not themselves operate farms were all caught within the net of the survey. It is not surprising then that nearly 29% of the population was found to own no land. Although the survey design fell short of providing specific answers on land/labor relations, i.e. how much land owners rented out and whether they used hired labor, it seems as reliable as can be expected of a government-sponsored, internationally-supervised, large-scale farm survey.

I would like to review a few brief points for why contemporary Bangladesh bears comparison with 1930's China: Only five percent of the population lives in cities in Bangladesh, though, as in China, villages and towns may be sizeable clusters of population. The population is very densely settled on low-lying land, and rice is the predominant crop, most of it transplanted, though in the flood season rice is also sown broadcast in waters up to twelve feet deep. Modern irrigation and use of machinery in farming are still minimal; even the Green Revolution varieties of grain have not been widely adopted, since they require irrigation and chemical fertilizers for superior yields. Levels of production per capita in foodstuffs (under 250 kg. grain) are about the same, or even somewhat lower, than 1930's China. Detailed village studies show bare subsistence agriculture, and a strong relationship between landownership and standard

of living (Jensen 1986, Chowdhury 1982, Alamgir 1980). After reading numerous dreary ethnographies of South Asian village life and its slight margin for survival, I cannot but be reminded of Brandt and Myers' proposals that commercialization would have been the panacea for 1930's China. Bangladesh and India have not escaped free markets, and they have not escaped poverty.

The national-level landownership distribution data for Bangladesh in 1978 are presented as a chart in Dataset 1.3.1 A, in the standard format used in this thesis, a histogram of landownership standardized to the average of one unit. This distribution has been calculated both in terms of ownership per capita (dotted line), and ownership per household (solid line). I have calculated inequality as 47% displacement from equality for ownership per capita (31.3% of the population owns more than the average, and they own 78.3% of the land), and nearly 56% displacement for ownership per household (29.1% of households own more than the average for households, and they own 84.9% of the land)[8]; as elsewhere, large landowners generally have larger families, including many households with multiple married couples. We do not know how many adult males of one generation are within the households, so it is not possible to make this empirical data totally comparable to the computer simulation. However, it is a safe call that if we could adjust the curve to ownership by adult males of one generation, the curve would lie in between the two shown in Dataset 1.2.5, which is a fairly narrow range.

The curve of ownership per capita seems to show a slight "hump" between the eighty and ninety percentiles of population, similar to that generated by frequent partition of estates among the wealthy in computer simulation. We must look at the landownership distribution from another more statistically-sensitive angle in order to clarify this. The frequency distribution of ownership sizes, given in Dataset 1.3.1 B, is of some interest since the swelling of population in the 0.6 - 1.5 size range may be the sign of class differentials of reproduction. This may be compared with the theoretical

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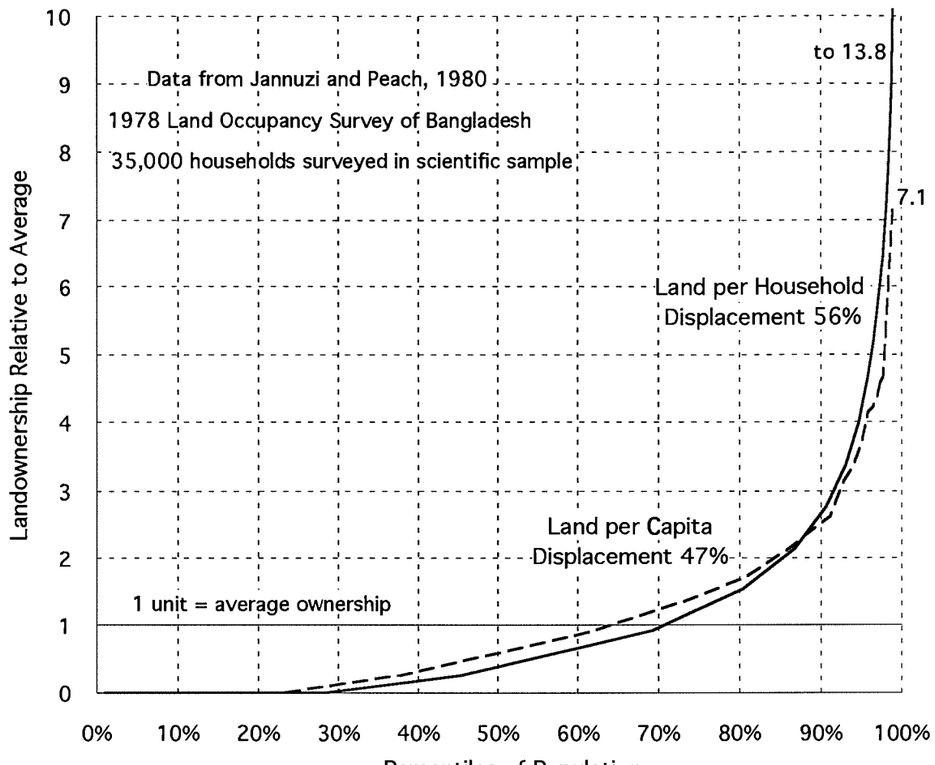
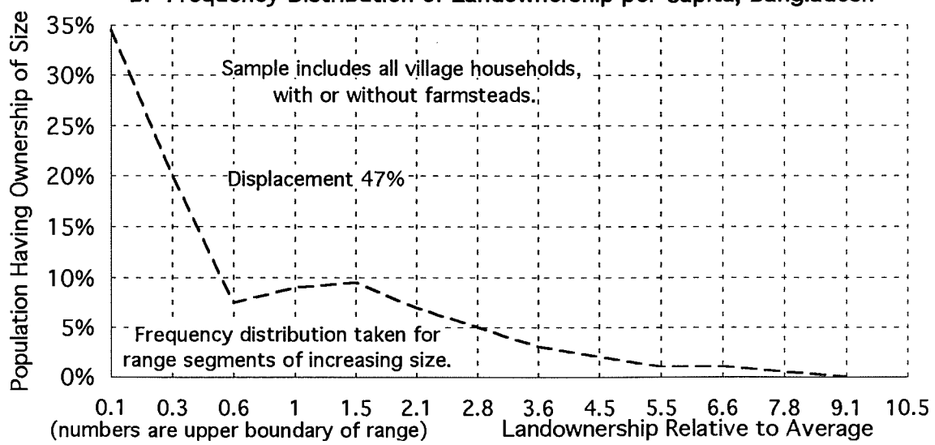
8 There is some apparent gap between the 18% of land that was reported as rented in among cultivators, and ownership by village-based landlords; the survey could not pin down how much was rented out. Urban owners of land were not included in this survey. I have examined the original raw data from the survey data tapes fairly closely to try to figure out how much of the rented land is contained in the ownership of villagers included in the survey; the survey includes villages of such large size that they might well be considered towns. There is no way to peg the figure very closely, but my guess is that about two-thirds of rented land is owned by those reporting within the survey. If the rest were owned by urban landlords, we might expect the adjusted measure of displacement for land per capita to be a few percent higher.

Dataset 1.3.1 A Landownership Distribution of Cultivated Land, Bangladesh



B. Frequency Distribution of Landownership per Capita, Bangladesh



landownership frequency distributions in the previous Dataset 1.2.5 B, and with an analysis of landownership distribution for North China in the 1930's., in Chapter 9, Dataset 9.6.3 A and B. The North China estimate, starting from a sample survey of farm households (just 100 in each locality), cannot encompass the landless population as exhaustively as did the Bangladesh survey, which had government records by which to count every village household. The Bangladesh survey shows many more landless and near-landless households.

While this comparison of frequency distributions is a suble point that need not concern us now, it also shows that there may be many ways to further examine in empirical data and specify the relationships among class-differential rates of reproduction, forms of inheritance, rates of dispossession of smallholders, and landownership distribution.

1.4 Mechanisms that Maintain Differential Reproduction of Classes: Why Female Infanticide?

The third stage of computer simulation was designed to "blow up" if the rich tried to take more land in one generation than the poor possessed. That is a pale imitation of the bloodletting of peasant revolutions in China, which often levelled landholdings with a violence that took millions of lives, and set up new dynasties. In the simulation, class differentials of reproduction kept that threat in check. It is to be expected, of course, that the poor lived short, brutish lives, and their children died with such frequency that they were thought in folklore to be the same mischieveous spirit coming back again and again. But a more efficient social deterrent, one involving less absolute deprivation, would have been the prevention of marriage. It cannot be known now how it came about, but male-heavy sex ratios seem to have been the historical pattern in East Asian, South Asian, and Middle Eastern cultures; and outright female infanticide is well known for traditional China and India, with often-fatal discriminatory treatment of females continuing to present. I believe female infanticide is not merely a reprehensible social practice perpetuated by cultural norms, but the linchpin of the system of reproduction of the social hierarchy.

Let me lay out an idealized picture of the function of female infanticide, before I go about filling in empirical descriptions. This picture spans both macro- and micro- level logic for the patterns. There is functionality of the whole system, and economic and cultural rationality for the individual as well.

Outright female infanticide, and mortality that is about twice that for boys due to poorer nutrition and care, lead to sex ratios of 115 to 135 males per hundred females in the ages approaching marriage age. Well-to-do families kill off infant girls at a higher rate than do poor families, to avoid excessive dowry burdens; they only need a few girls for household labor and to create strategic alliances.

This pattern, long recognized for India, was until recently denied for China. But recent research by James Lee of California Institute of Technology and co-investigators now demonstrates it for China.

> While the exact proportion of infanticide is hard to estimate from most sources due to incomplete registration of children, especially girls, in a community study of Liaoning peasants Cameron Campbell and I estimated that approximately one-quarter of all daughters were victims of sex-selective infanticide. As we might expect, the rate of infanticide varied by occupation, by household rank, and by economic conditions reflected through grain prices. The general rule was the higher the position, the more children and the larger the proportion of boys; the lower the position, the fewer the children, but the larger the proportion of girls. (James Lee, 1993 ms, p. 7, referring to Lee, Campbell, and Tan, 1992)

In studies of the Qing nobility, for which accurate birth and death records are available over a long period of time, Lee, Feng and Campbell found evidence that these families controlled timing of births and sex composition of their sibsets.

> ...(W)e can deduce that as many as one-tenth of all daughters born into the imperial lineage during the century and a half under consideration (1700-1840) were victims of infanticide. Moreover, as imperial emoluments and subsidies were gradually reduced during the late eighteenth century, the differential (between the sexes) in neonatal mortality widened over time. By the 1780's, female infanticide took as many as one-fifth of all daughters. Clearly in late imperial China, infanticide was not restricted, as is so often claimed, to the poor and desperate. (Lee, Wang Feng, and Campbell, 1994 ms., p. 2)

My picture of this process of sex selection is that poor families raise the girls, who may well be economically productive in weaving and handicrafts, but sell them off as servants or concubines when hard pressed, and at any rate they will at the point of marriage receive more in brideprice than they give away in endowments. For the rich, the value of women as labor is not as significant, and the marriage of daughters is costly in dowry. After girls are raised, the system of dowry and brideprice reallocates fertile women and their labor among households, with some degree of hypergamy. Logically enough, young women and their families wish them to marry into prosperous circumstances, not starvation.

Economic circumstances fall differently on men. Age at marriage for men is directly related to property ownership; the wealthier the family the younger its sons marry. But the imbalanced sex ratios insure that some men marry very late, and some not at all. The excess of unmarried men supplies the dregs of exploitable labor, those who are paid merely their cost of subsistence, if even that, excluding the cost of their reproduction. They are the "bare stick" agricultural laborers, craft workers, and transport coolies who are thrown by the side of the road when they die far away from home. Here again rates of accumulation may be related to differential reproduction.

Unbalanced sex ratios and uneven allocation of women are the major determinants of differential reproduction of classes. This has been overlooked in the standard demography that examines fertility per female rather than fertility per male. But a corollary of this proposition can be examined through standard crude birth rates: the fewer the number of women, the more children each one bears (Arrigo 1984, unpublished ms.). This is in fact another manifestation of the class differentials of reproduction, because the more limited the number of women, the greater the proportion of the total number held by prosperous families; and in general the more they reproduce, individually and in aggregate.

It should be kept in mind here also that the relative size of classes may vary, depending on total level of productivity and rates of surplus extraction, which will be topics of analysis in later parts of this thesis. I also maintain that higher rates of accumulation are based on concrete conditions that allow production and concentration of a greater surplus within a given area, not on an arbitrary or cultural determination of rates of extraction; but that proposition will not be substantiated until much later.

Overall, the picture proposed is that higher rates of accumulation for the rich must entail higher rates of female infanticide, in order to create higher class differentials of reproduction.

This is the basic picture, but it will be elaborated further when empirical data is examined. As we come to the level of micro-economics, we find that the capacity for reproduction seems to be further tempered by strategies for consolidation of wealth or production of labor.

Chapter 2 Population Processes in Pre-1949 China

2.0 Introduction

The concept of the interaction of population and landownership that has been modelled in the previous section is in itself fairly straightforward. Now, however, we must look to the mechanisms that would sustain such a system, and to the evidence of their manifestation that can be found in historical sources. This is of course much more complex on the ground. The processes of this multi-faceted system can be seen from many angles, demographic, economic, and even geographic, and no one source provides the whole picture. We must process, evaluate and integrate multifarious source data, which is rarely in a form that lends itself to easy comparisons.

In this section I will seek to demonstrate the operation of class differentials of reproduction. A wide range of demographic phenomena fall under that rubric, and they are closely related to the economic processes of the rural society, as they vary by social class and by agricultural regime. Therefore, while the over-arching concept of dispersion of landownership due to class differentials of reproduction holds as a generalization, when we look to the empirical data the story is more convoluted, but also more interesting, and it is intertwined with observations we can gather through ethnographies and cultural artifacts, which may take on new meaning through a materialist framework. The theoretical formulation offers a unified explanation of the source of much diversity.

This unified explanation involves drawing connections between many phenomena that may not be obviously related, and keeping in mental picture a plethora of these connections. In particular, it must not be forgotten that the foundation of the demographic processes is in the conditions of the agricultural economy. In evaluating the variation in these demographic processes, we must often "control" for those conditions, that is, consider how much they may offset the variables we wish to isolate.

Let me be more specific. There are major regional differences in the agricultural economy; the rationale for these differences is the subject of Part Two of this thesis. For now, a few of these major differences must be kept in mind. The northern wheat-growing regions ("the North" north of the Hwai River) have a shorter growing season,

less precipitation and water transport, generally lower agricultural productivity, and more dispersed population. Along with this goes less urbanization, less commercialization, less division of labor, and, for large landowners, more utilization of hired labor extensively on large farms rather than division of the land among tenants. In remote low-productivity areas like the Northwest social relations of production may be inward-turning and autarchic, with agricultural labor in abject dependence on local patrons. In contrast, the Yangtze river basins (Szechwan, middle Yangtze, and eastern lower Yangtze) and most of the far South and Southeast coast (collectively "the South") have a long growing season accompanied by monsoon precipitation that allows intensive multiple cropping of rice. The resultant dense population allows much more urbanization and division of labor, notably in the lower Yangtze region that is crisscrossed with waterways. Large landowners tend to rent out their land to tenants and collect their rents in cash and kind through agents. Cash cropping of fruit, cotton, oilseeds, etc. and local craft specializations abound.

These features of the agricultural economy have coincident demographic effects. For example, surveys find a wider range of farm sizes in the North, and along with this a wider range of family sizes. There are also more long-term hired laborers to be found attached to farm households. Moving south from the Hwai river, generally considered the North/South divide and the boundary of rice farming, there is more rented land and a smaller range of farm and family sizes. With higher productivity, a higher proportion of farm production is marketed, as is also necessitated for rent payments. I believe there is also much more migration out of the farm sector to town and city craft and transport work, but this is not fully demonstrable through the farm surveys.

Let me make up a concrete example that illustrates the pattern commonly seen in empirical data. Say we have a survey in which the data has been compiled by farm size for two samples, NW and SE, and it has been averaged in five farm-size groups, 20% of the farms in each group, for each sample. In NW the top group has farm size 4 times that of the bottom; in SE, 2 times. In NW the top group has 50% more fertile-age women than the bottom; in SE, 30% more. Then although the absolute difference between top and bottom groups is larger for NW, SE has a slightly greater gradient in the relationship between farm size and women, i.e. a greater difference in the number of women even with the same gap in relative size of farm. That is, at double the farm size the number of women increases by 1.3 times in SE, but only by 1.25 times in NW. Patterns similar to this example will echo in the comparison between North and South

China, because in almost all demographic dimensions South China shows greater differentiation over the economic strata, even while farm size is less polarized.

A second issue in looking at the empirical data is that the theoretical formulation conceptualizes reproduction of classes, which is not merely births per woman, the standard of conventional demography, or sons per family. A higher birth rate per mother or even per father is not necessarily a higher rate of reproduction for the class, over time. It is possible that in Class A one hundred Generation One fathers have 1.2 heirs each and beget 120 Generation Two families; while in Class B one hundred Generation One fathers bear 1.3 sons each, but 0.4 sons emigrate or fail to marry, with the result that Generation Two has only 90 new families. Although there is virtually no survey data that allow us to make such massive comparisons over time, the pre-marriage age excess of males, which is substantial for China, India and elsewhere, provides clues as to the magnitude of the process. So we must be concerned with a complex of demographic processes: rates and age of marriage, transfer of women in marriage, effects of dowry and brideprice on different social strata, fertility of women, infanticide and child sale and infant mortality, formation of joint families, emigration, and premature mortality of adults. Among these, a key proposition of this research is that there is a significant transfer of women among classes, that is, hypergamy, such that the wealthier groups take in more women in marriage than they give out and thus capture more reproductive power than they produce. This, I believe, is the main source of the differential reproduction of classes.

In the following chapter I will discuss the main indicators of reproduction that are available in survey data[9], and relate them to economic indicators:

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9 There are not many surveys for the Republican period that cover both economic and demographic information, and which provide as well crosstabulation or other means of relating the two realms. I have tried to make the most of what is available. This is not straightforward because the sources are not uniform in definitions, data collection purpose, or form of compilation. We must examine each one in turn to see confirmation of the phenomena found in other sources, or to take advantage of special features in a survey. Specifying how I have arrived at particular figures, or what they mean in the context of the particular survey, is often a lengthy explanation. I hope the reader will bear with this tedious process of evidence accumulation. However, the structure of titled sections and subsections within each chapter should make it easier for the reader to first read sections that provide summation, and thus to circumvent the detail until it is wanted.

- Sex ratios in pre-marriage ages, and their reversals around marriage age, implying constriction of marriage opportunities, and loss of male population.
- Age of marriage, especially as it varies by landownership for men.
- Number of women of fertile age (15-45) and older, per family.
- Number of children born or surviving, especially sons, per mother and per father.
- Rates of male and female infant mortality, and apparent infanticide or sale.
- Age and sex structure of the population.

These items are revealing not as disembodied variables varying in a single dimension, but as they are seen in concert with each other and with economic indicators.

2.1 Sources of Data for Analysis of Chinese Population Dynamics

A number of surveys were done in China early in the Republican period. These were often inspired by the ideological ferment of the day, the issue of the backwardness of China and its feudal rural society (Douw 1991), and whether revolutionary change was necessary for advancement. While rural inequality was the main object of study, some foreign observers of this period of dynastic decline and civil war, in a theme still echoing today, fixed on overpopulation as an explanation for poverty.

> One cannot see a Chinese village and its inevitable pullulating horde of children without realizing the vital problem of the East, a problem so immediate and tremendous that it dominates the mind like an evil dream. ... The picture is the same from one end of the country to the other; cities and villages innumerable taking their toll of the land, hamlets huddling even closer in valleys, where every field already supports more lives than would be possible in any other country except India; a third of humanity struggling hopelessly and unceasingly to procreate and maintain its swarm of predestined hungry ones. And for these there is no outlet; the untilled lands beyond the seas will have none of them; here they must live somehow or die ... and so the inexorable law works out its own pitiless solution, and they go down, these superfluous lives, by millions, to fatten the tired earth which could not fatten them. The whole sorry tragedy goes on before our eyes; infanticide, rebellions and diseases, swift slaying of famine or slow starvation. (Bland 1909, p. 81. Cited in Chiao 1934, p. 51.)

Although the Chinese bureaucracy had long kept count of numbers of households for taxation and conscription, the field of population in the Republican period seems to have been more a concern of foreign researchers in China, and they focussed on making comparisons on major indicators of economy and demography between China and other more developed countries, rather than looking for the dynamics of internal social stratification. Chinese researchers with a social conscience, such as Fei Xiao-tong, noted population phenomena but did not consider them to take precedence over economic inequality, which was their central object of their investigation.

> Since there is no open and easy source of income other than in agriculture, most of the small landowners must eventually become landless laborers. Some of them will remain single all their lives and then die out completely. Occasionally rural families may, through hazardous ventures in the outside world, suddenly rise to wealth; but such families are soon leveled down by the merciless pressure of population. One or two generations is quite enough to reduce the holdings of a rich family to petty units. The movement upward on the economic ladder is slow, but the movement downward is rapid. The supply of landless laborers is maintained by a constant increase in the population and a constant decrease in the size of landholdings. The traditional structure of the village is thus dependent

> upon the existence of two groups of people: the petty owners, who form a leisure class; and the landless laborers. This is the type of rural economy that we shall analyze in the following pages. (Fei and Chang 1945, p. 20. Field study 1939.)

The reader can see that the present thesis is an heir to Fei Hsiao-Tung. All the same, the relevant demographic survey data seem to have been mostly generated by foreigners or foreign-sponsored projects, the medical and agricultural extension missionaries like Herbert Lamson and John Lossing Buck (Stross 1986), and secondarily by Japanese researchers of the South Manchurian Railway in the service of Japanese expansionism (Young 1966).

Among the missionaries who went to China with the dream of uplifting rural China through scientific cropping and farming methods was John Lossing Buck, who worked in cooperation with the Department of Agricultural Economics of the University of Nanking. In 1921-25 he carried out a survey of 2866 farms in seventeen localities that was published as Chinese Farm Economy in 1930; this was a very ambitious study, covering cropping, farm economy, land tenure, standard of living, nutrition, and population. On the basis of this achievement, Buck was retained to head a much larger project on the agricultural economy, published as Land Utilization in China in 1937 (Stross 1986).

Among those from the University of Nanking working with Buck was C.M. Chiao (Chiao Chi-ming), who carried out some of the pilot studies for the population survey. Chiao used the data collected from 22 localities for his 1933 master's thesis at Cornell University, which contains much more of the original data tabulations than his published reports.[10] Chiao Chi-Ming's A Study of the Chinese Population, 1934, contains a foreword by Edgar Sydenstricker that describes the institutional setting of the research.

> An opportunity was afforded of collecting certain new population data upon a larger scale than hitherto had been possible in connection with the land utilization study by Professor J. Lossing Buck of the University of Nanking for the China Council of the Institute of Pacific Relations. These data included the sex and age and marital status of sample rural populations and the number of births and deaths occuring in these samples during the year preceding the date of inquiry. Altogether, a population of between 250,000 and 300,000 has been enumerated by Professor Buck's staff in China and the work of tabulation and analysis is being done by the research staff of the Milbank Memorial Fund. The study present in the following pages is a preliminary report based on nearly

[10] Cornell University, with its many departments specializing in agricultural science and rural sociology, was the academic base for most of Buck's American collaborators; their memoirs are preserved in oral history archives there.

> 68,000 persons in 12,456 families studied in 22 localities in 11 provinces in China. In many ways, this report is unique in that it gives for the first time an insight into the composition of the Chinese rural family, the sex, age, and marital distribution of the Chinese rural population, and some tentative information as regards birth and death rates. (Chiao Chi-Ming 1934. Quote is from Forward by Edgar Sydenstricker.)

Later Chiao directed a pilot project for the registration of vital statistics at a location chosen in Kiangsu, and wrote up the results in a short book in English: C.M. Chiao, Warren S. Thompson, and D.T. Chen, An Experiment in the Registration of Vital Statistics in China. Among all of these related surveys, this work carries through the most thorough analysis, and it also tabulates some of the demographic statistics by economic condition of the family. These results will be discussed at length in this section on empirical studies of class reproduction.[11]

The massive Land Utilization Survey project was not a single survey, but a number of overlapping surveys, each with a different focus, and sometimes different methods of data collection. The Population Survey covered 38,256 families in 101 localities; data from 18 localities was rejected as showing implausibly low birth or death rates. "The data on population, like those for other aspects of this Land Utilization Study, were collected by the investigation of a large number of communities, ... each selected because it was believed to be typical of its type. Most of the information is from the Population Survey and Vital Statistics Schedules, but a small amount was also obtained in the Hsien Survey, Village Survey, and Farm Survey Schedules..." (Buck 1937 p. 358). Unfortunately, most of the Population Survey was apparently not applied to the same sample as the detailed Farm Survey, although both were carried out in many of the same counties and localities in the years 1929-1933.[12]

[11] Chiao's book in Chinese (Chiao Chi-Ming. Zhong Kuo Nong Cun She Hui Jing Ji Xue, published in Chungking April 1945, Shanghai May 1946 by Commercial Press. 458 pp.) has no more information than that published earlier in English.

[12] The Population Survey, with data collection under the supervision of C.M. Chiao, did collect information on size of farm and form of tenure. However, with the death of Edgar Sydenstricker, who was have to prepared the population analysis together with C.M. Chiao, the task of writeup of the Population chapter for Land Utilization in China passed to Frank W. Notestein at the Milbank Memorial Fund in New York (Buck 1937 p. xv). As a result, the Population chapter presented a rather perfunctory analysis, and the detailed elaboration promised in a footnote (Buck 1937 p. 358) never appeared. The tabulation sheets of the Population Survey were kept in Notestein's files at the population research institute's library at Princeton University for many years, where they were subject to further analysis by

Buck, Chiao and Notestein are the major sources of data for the present thesis. Where population information was not compiled by size of farm or other economic indicator, I have sought what economic relationships can be found in the population surveys by ranking the locality samples by their average on economic measures. In the case of the Chinese Farm Economy data this has proved quite fruitful, and the analysis will be presented at length. The available economic measures for locality samples in Chiao's thesis and in Notestein's archives are very limited, and the ranking of the localities has been uncertain, but in light of the Chinese Farm Economy results it can be asserted that the same socio-economic patterns are present.

Many other sources have been used in this study of population dynamics. Nineteenth century Western travellers provided indignant accounts of female infanticide and child sale and marriage. Chinese researchers such as Fei Hsiao-Tung and Chen Han-Seng did detailed village studies in the early Republican period, as did activists like Mao Zedong (Report from Xunwu, translated 1990). Sidney Gamble's 1926-1933 study Ting Hsien: A North China Rural Community, which was produced in coordination with "Jimmy" Y.C. Yen's Mass Education Movement, described northern Chinese society with small surveys on aspects of land and population. Detailed studies carried out in Yunnan in 1939-42 were reported by Ta Chen in Population in Modern China, 1946.[13]

There are limits to the level of analytic sophistication we can reach with Chinese data for the prerevolutionary period. Fortunately, there has been much research on population and rural society in South Asia, under conditions which are still predominantly subsistence agriculture even to present. And there have been studies specifically on the Chayanovian theses of demographic differentiation and social mobility for Bangladesh and turn-of-the-century Russia. These will provide useful comparison, and a movement of this thesis towards general theory.

Ansley Coale et al., Irene Taeuber, and Arthur Wolf; recently most have passed to public archives at Princeton's Mudd Library. The data on non-resident population, which was overlooked in earlier analysis, provides another dimension on the dynamics of Chinese population. However, most of the detail and potential of the original interview schedules were already lost in the process of tabulation for a general presentation.

I wish to express great thanks to Ben Primer, university archivist, who went to considerable effort to locate and make these available to me in 1993. Much more data is awaiting analysis. Unfortunately, the sheets that were the basis for Notestein's calculation of children born by size of farm are missing from the file.

13 Later conditions of civil war and cessation of relations with the United States seem to have cut off the development of survey research in China, and restricted access to such materials in the United States. Only in recent years have Western researchers gained access to new materials, as seen in James Lee's analysis of the genealogical records of the Manchu nobility. Occasionally one finds small pieces of tantalizing compilations, but insufficient accounting of the correlates to make much of them in terms of the broader dynamics of Chinese society. One may still dream that, as rumored, there is a sealed door at the University of Nanking behind which lies thousands of original survey forms from the Buck surveys (personal communication from Sherman Cochran, Cornell, 1993; attributed to Randy Stross after visit to Nanking).

2.2 Social Reproduction is not Biological Reproduction: Early Ethnographic Accounts of Female Infanticide and Child Sale

Respected demographers have applied modern statistical techniques to the Chinese survey data of the 1920's and 30's with the goal of understanding the biological reproduction of the population. Their concern has generally been directed to measuring precisely how many births women have undergone on the average, and why the number approximates or falls short of "natural" fertility, the number of births that are physiologically possible. For example, to estimate the level of Chinese fertility, Barclay, Coale, Stoto and Trussell in their authoritative 1976 article took the numbers of male births given in the tabulation sheets of Buck's Population Survey, and used this to estimate female births (106 males per 100 females being an accepted figure for the biological sex ratio at birth). They believed the female figures reported in the survey fell considerably short of actual births because of hidden female infanticide. This was undoubtedly a correct assessment.

But a study of reproduction in its wider social significance should not be so focussed on biological measures. In this case, for example, the emphasis on biological fecundity disregards, among others, the effects the extreme disparity of the surviving sex ratio has on subsequent reproduction. Human reproduction is a social as well as a biological process. We know that not only were female infants often killed outright at birth or allowed to die through neglect or in foundling homes, but that many other social mechanisms redistributed children and adolescents of both sexes among families and among social classes. These included sale of children to serve as servants or concubines, adoption out of girls as little daughters-in-law, child marriage, transfer of rights of inheritance when an heir was lacking, and uxorilocal marriage. These transactions were socially and economically patterned. Moreover, the various roles incurred different mortality; adopted daughters-in-law, for example, died with much greater frequency than did daughters (Wolf 1975, p. 95). Footbinding and food restrictions also increased mortality for females.

It was such practices that the Western missionaries arriving in China around the turn of the century usually found barbaric and generally commented on in their travel accounts. Some, like Arthur Smith, also tried for sociological objectivity; others who were teachers and doctors tried to measure the incidence as it occurred in their surroundings.

In subsequent years Chinese reformers themselves decried practices such as female infanticide and child sale. The most systematic account of child sale I have seen is found in Mao Zedong's 1930 investigations in Kiangsi (Mao 1990). Before proceeding to a lengthy presentation and analysis of statistics that may call for some fortitude on the part of the reader, I wish to present some quotes from this period that help to put flesh and skin on the numerical skeleton.

Let us start with Arthur Smith, an acerbic but thorough observer.

> ...(T)he Chinese are almost the only people boasting an ancient and developed civilization who despise their own daughters who are married into the families of others, and are by that process lost to their own because according to ancient custom they can offer no sacrifices for their parents when the latter are dead. It is for this reason that the popular saying declares that the most ideally excellent daughter ... is not equal to a splay-footed son. ...
>
> The Chinese girl when she makes her first appearance in the world is very likely to be unwelcome, though this is by no means invariably the case. The ratio in which fortune-tellers allot happiness is generally about five sons to two daughters. ... (It) is not to be wondered at that the great pressure of poverty leads to the crime of infanticide upon an enormous scale. For aught that appear, this has always been the case. It is not that the Chinese conscience does not recognize the murder of girl babies as wrong, but that the temptation to such murder, especially the temptation to the disappointed and often abused mother, is too strong ...
>
> ...(Destroying female infants) seems to be most common in the maritime provinces of the southern part of China, in some districts of which it is by the Chinese themselves regarded as a terrible and a threatening evil. ...
>
> Next to the destruction of the lives of female infants, the Chinese practice most revolting to our Western ideas is the sale of their daughters, at all periods from infancy up to a marriageable age. The usages of different parts of the empire vary widely, but the sale of girls, like infanticide, seems to flourish most in the maritime provinces of the south, where it is conducted as openly as any other traffic. That the parents are generally impelled to this extreme step simply by the pressure of poverty we are quite ready to believe. ... Of the miseries which girls who have been thus sold are likely to endure, it is unnecessary to speak in detail, but enough is known on the subject to lead us to regard the practice with horror. If the parents do not feel able to keep their daughter until she is old enough to be married, and yet do not wish to sell her, Chinese custom has invented another expedient, which is a compromise between the two. This is the well-known "rearing-marriage," by which the girl is made over to the family into which she is to be married, and is by that family brought up, and married whenever their convenience dictates. ... In some instances the relations with the family of the girl are wholly broken off, when she is taken for a "rearing marriage", and in all cases it is regarded as a confession of poverty and weakness, which places the girl's family at much more than their usual disadvantage, at best sufficiently great. ...

> The practice of binding the feet of Chinese girls is familiar to all who have the smallest knowledge of China, and requires but the barest mention. It is almost universal throughout China, yet with some conspicuous exceptions, as among the Hakkas of the south, an exception for which it is not easy to account. The custom forcibly illustrates some of the innate traits of Chinese character, especially the readiness to endure great and prolonged suffering in attaining to a standard, merely for the sake of appearances.
>
> (Arthur H. Smith 1900, Chapter XXIII, Chinese Country Girls and Women, pp. 258-261.)

The nineteenth century fancy for defining nationality and racial characteristics is shown in these accounts, as well as the eugenics notions of the period. Still, the observations are useful.

> A heathen social economist, looking at things from a purely physical point of view, might defend polygamy as tending to keep up the bodily vigor of the race, for the concubines of a wealthy man are almost always taken from the stronger working class of women, while the chief wife is a small-footed woman of delicate build, from the same class as the husband himself. The offspring of the former would probably prove more vigorous and healthy. (R.H. Graves 1895, p. 107)

Women missionaries and travellers seemed to have had especial sympathy for Chinese women, and probably also greater access to them.

> And through it all, and up and down its flights of stairs, painfully hobbles the Chinese girl-child, the most ungraceful figure of all girl-children — poor little mutilated one, with her long stick and dreadful dark lines under her sad young eyes! Whatever the men may be, certainly the little girls of China are brought up as Spartans even never were, and those who survive show it by their powers of endurance. (Little 1899, pp. 96-97)
>
> The Chinese saying is, "For each pair of bound feet there has been a whole *kang*, or big bath, full of tears"; and they say that one girl out of ten dies of footbinding or its after-effects. When I quoted this to the Italian Mother Superior at Hankow, who has for years been head of the great Girls' School and Foundling Establishment there, she said, with tears in her eyes, "Oh no, no! that may be true of the coast towns." ... "But more here — more — more." (Little 1899, p. 140)

Women missionaries involved in medical work in particular were exposed to the harshness of Chinese life.

> Here (at the foundling hospital) the death-rate is of course enormous, and about a coolie-load per diem of dead babies is carried out of the hospital to receive uncoffined and unrecognised burial. Never was there a more practical illustration of the survival of the fittest! Such babies as survive ten months of this treatment acquire a definite value, like puppies which have had distemper, and they are purchased by childless couples who want to rear a servant to tend

> their old age, or else by provident parents who thus cheaply provide secondary wives for their sons — at least such are the ostensible reasons assigned to make the purchase legitimate. Even supernumerary sons are occasionally consigned to this hospital, whence they are probably removed by sonless couples who want to adopt an heir to offer sacrifice after their death. ...
>
> There is little fear that the girls who are thus purchased as future daughter-in-law will turn out unsatisfactory, as they are too much in dread of the alternative, namely, being reduced to the rank of servants, who are virtually slaves. But child-wives are sometimes provided just as cheaply by direct purchase from the parents, or by exchange. The other day, a lady was visiting a tiny Christian school in a village near here; she was particularly attracted by a bright little fellow, about eight years of age ...
>
> The little chap carried in his arms a wee baby girl, and the lady naturally asked if it was his sister, whereupon he looked shy, and did not answer, but his brother volunteered the information, "She is his wife!" On further inquiry as to why so young a baby had been taken from its own mother, the boy's mother explained that had she purchased an older child, she would have required to pay a higher price, whereas, having a girl of her own of the same age, she had exchanged with a neighbour, who also had a son to marry, but as this baby was larger and fatter than her own, she had thrown in a dollar and some cakes to equalise the exchange!
>
> I am told that the proportion of female infanticide varies greatly in different provinces. Throughout the province of Fokien it is unusually high; in fact, there are some districts in the neighbourhood of Amoy where thirty per cent of all the girls born are put to death — strangled, or else drowned like so many puppies. Here in Foo-Chow, it is quite a common thing for a mother to mention that she has made away with three or four girls! But I am told that throughout the empire the numerical disparity of female children is always a painfully suggestive characteristic. (Gordon Cumming 1886,.pp. 194-195)
>
> Very severe cases of enormously elongated tumour of the ear commonly occur among women, in consequence of unskillful boring of the ears for ear-rings in childhood. Strange to say, these occur in men also, and point to a most extraordinary superstition — an attempt to deceive malignant spirits by disguising a peculiarly precious baby-boy as a poor unwelcomed little girl. He is called by a girl's name, and is dressed as such, in the hope that all evil spirits will believe him to be "only a girl," and as such, not worth molesting! (Gordon Cumming 1886,.p. 296)

In his 1930 investigation into peasant life in Kiangsi (Jiangxi in pinyin romanization), recently translated into English, Mao Zedong devoted a section to the topic of selling children.

> There is a saying in Xunwu County: "You must repay your loan even if you marry off your daughter or sell your son". Lenders usually shout this out when pressing "terribly stubborn borrowers" for repayment. Their anger builds up because the borrower is unable to repay the loan.
>
> Reader, I am not exaggerating in order to expose the evil of the exploiting class in Xunwu. All my survey reports are made carefully without any overstatement. I

always doubted that the description of "selling his wife or son" appearing in articles was true. So I carefully questioned peasants in Xunwu to see whether this really happens. The result was careful interview of three peasants who participated in an investigation meeting. . .

Liu Liangfan ... said that his village consists of 37 households ... Five households had sold sons. Liu Changyu sold three of his four sons, Liu Changlun sold one of his three sons, Liu Changchun sold one of his two sons, Lin Fangting sold two of his three sons, and Liu Liangyou sold half of his one son. All five households had become bankrupt with nothing left; consequently, they had to sell their sons to repay their debts and buy food.

The buyer was either a nearby member of the gentry of the same surname as the seller or a rich peasant. There are more gentry buyers than rich-peasant buyers. The price of a boy ranges from a minimum of 100 yuan to a maximum of 200 yuan. When making this transaction neither the buyer nor the seller call this business "selling"; rather they call it an "adoption". But the world in general calls it "selling a child"....

The ages of the boys sold range from three or four *sui* to seven and eight *sui* to thirteen or fourteen *sui*. After the deal is made, the matchmakers carry the boy on their backs to the buyer's house. At this moment the biological parents of the boy always weep and cry. ...

When one boy was sold to someone in the Bachi area in Pingyuan County, Guangdong, Li Dashun came across the father, carrying his baby on his back, going in the direction of Bachi. The father had tears on his face and was ashamed when he realized an acquaintance could see he was selling his son. Why did he sell his son to someone in the Bachi area in Guangdong? Because the price was higher. A boy could be sold for 200 or 300 yuan there. A child of four or five *sui* brings the highest price because such a child can easily "develop a close relationship". In contrast, the price of an older child, eight or nine *sui* or over ten *sui* is lower, because it is difficult to develop such a relationship and the boy can easily escape from his adoptive parents. ...

Based on (the three informants') knowledge of the places they are familiar with, they estimate that 10 percent of the households in the county have sold their sons. Liu Liangfan told us that he had seen of, or heard about, more than a hundred boys being sold in the vicinity of his village.

(Mao Zedong, Report from Xunwu, translated by Roger R. Thompson. 1990, pp. 177-182. *Sui* means age, usually one year more than the Western count.)

These descriptions capture the human element of some of the demographic processes we are discussing, even as they are subsumed under economic expediency. Mostly they seem tragic, shaped as they are by the coercive aspects of unequal gender and class relations. A sense of tragedy and protest against the traditional Chinese family was purveyed even more eloquently, and then much more influentially, by writers of the Republican period such as Pa Chin, with his novel The Family, and Lu Xun with short stories about forced marriage, "renting out" of wives to bear children, and "bare stick" (impoverished and

unmarried) laborers. Not only did the poor suffer; men and women in rich families enjoyed their material wealth only under conditions of subservience to the patriarch. Yet the corporate family also had an extraordinary ethic of solidarity and care — with control — of its members. There has been much protest against the traditional family, and now as it fades away with the new affluence and independence of the young in industrialized Taiwan, there is nostalgia. But that is not the present story.

2.3 Landownership and Age at Marriage in North China — Gamble

Given the unbalanced sex ratios and rigid family structures of Chinese society, the major constraint on male reproduction is marriage. We will consider first the relationship between landownership and marriage.

Gamble's 1920's studies of villages in North China, Ting Hsien (County), Hopeh, provide a great deal of detail. Gamble provides standard demographic statistics for 5,255 families (pp. 41-44, 55-59). For ages 5-14, the sex ratio was 111 males to 100 females. 99% of women were married by age 21; nearly 60% married between the ages of 16 and 18. The ideal for men was marriage at age14 to a woman four years older; this was common, but age at marriage for men varied greatly, with about 10% of men in their early 40's still unmarried. Gamble further examined the relationship between landownership and age at marriage for 766 couples in 515 farm families. The larger the landholdings, the lower the age of the groom, and the higher the relative age of the bride, i.e. old enough to be fertile. Gamble also gives some data on widowers and their remarriage, as well as concubinage (p. 38). 17.4% of once-married men had lost at least one wife by death, and of these over half, 10.7%, had remarried; 15.8% of once-married women had lost a husband by death, and of these only a fifth, 2%, had remarried. The ideal of widow chastity further constricted the supply of wives.

Dataset 2.3.1. Size of Farm and Opportunity for Marriage — Gamble

Ting Hsien, North China, 1926-1933: 766 Couples in 515 Families

Family Landholding	N of Couples	Age of Groom	Age of Bride	Unmarried Males 22+	Widowers	Men with Concubines
100 *mu* +	57	13.2 yrs	16.8 yrs	1.8%	0.8%	5.5%
50-99 *mu*	219	15.6 yrs	17 yrs	5.2%	3.2%	not given
Under 50 *mu*	490	18.4 yrs	18 yrs	20.3%	5.1%	0.5%

Source: Compiled from Gamble 1954, pp. 38-55, 59.

It can be seen in this table that the portion of men marrying late or remaining widowers is much higher among smallholders, in fact about ten times higher than for the top group. For another sample of 400 farm families, Gamble reported that families owning 1-10 *mu* had an average of only 0.6 children, and those owning over 100 *mu*, 3.2 children (p. 66). It should not be overlooked that we have no comparison here for landless families.

The relationship between landownership and marriage is straightforward for Ting Hsien because, as in most of North China, there was very little rented land to provide an alternative livelihood for the landless or land-short. Where rented land was prevalent, as in central and south China, the relationship is more complicated.

2.4 Indications of Allocation of Women's Reproductive Power — Buck and Notestein, 1937

Let us now examine the small table in John Lossing Buck's Land Utilization in China that set off this whole research project.

For the population analysis that was written up by Frank W. Notestein, the 101 locations chosen paralleled much of the farm survey, but encompassed a much larger sample, 38,556 families in all after exclusion of locality data that was considered dubious. Of that number, 2,088 were non-farm families and for 110 the crop area was unknown, leaving 34,358 families for analysis by size of farm (F.W. Notestein Machine Table 22, unpublished archives, Princeton University, Mudd Library).

The data in each locality was divided into five groups of equal numbers (i.e. 20% of the farms in each), sorted by size of farm. However, the average size of farm in each group of the Population Survey was not reported in the chapter on population in Land Utilization in China that was authored by Notestein. In the Farm Survey analysis designed by Buck himself, households were assigned to groups according to their objective size of farm relative to the others, so the "very large" category generally had only a few households in it, and the "medium" and "medium small" many. To amend this gap of information, I cut the distribution of farm sizes in the Farm Survey into five equal groups, to provide an estimation of what could have been the average size of farm for each quintile group in the Population Survey. For the following table I have done this separately for North and South China.

Dataset 2.4.1 A presents numbers of wives per farm, both those under 45 years of age, and those over 45, and the births per woman for each group. The source information, p. 385 of Buck 1937, gives only these two age groups. The number of children per woman was standardized to a common profile of age, according to the text. The last line of each section of the table, "Ratio of Range", which is the Very Large group measure divided by the Very Small, provides an easy index of the relative spread in range. We can readily see that there are more wives of all ages on larger farms of both North and South; the difference is much stronger for the North, where there are 2.40 times more fertile women on very large than on small farms.

Dataset 2.4.1 A Number of Women and Births per Woman by Size of Farm — Buck 1937

NORTH CHINA

Farm Size Quintile	Number of Farms	Size of Family	Wives < 45 Per Farm	Wives 45+ Per Farm	Ratio, Wives < 45 / 45+
Very Large	3117	7.92	1.63	0.41	3.96
Large	3116	6.07	1.21	0.32	3.79
Medium	3116	5.13	0.93	0.25	3.72
Small	3116	4.57	0.83	0.23	3.69
Very Small	3117	3.98	0.68	0.20	3.48
All	15582	5.53	1.06	0.29	3.64
Ratio of Range		1.99	2.40	2.11	1.14

Farm Size Quintile	Est. Farm Size, Ha.	Births per Wife < 45	Births per Wife 45+	Completed Births/Farm
Very Large	6.17	2.55	5.19	8.47
Large	2.74	2.62	5.06	6.14
Medium	1.75	2.64	5.13	4.78
Small	1.18	2.62	5.00	4.16
Very Small	0.73	2.54	4.94	3.36
All	2.28	2.59	5.06	5.36
Ratio of Range	8.51	1.00	1.05	2.52

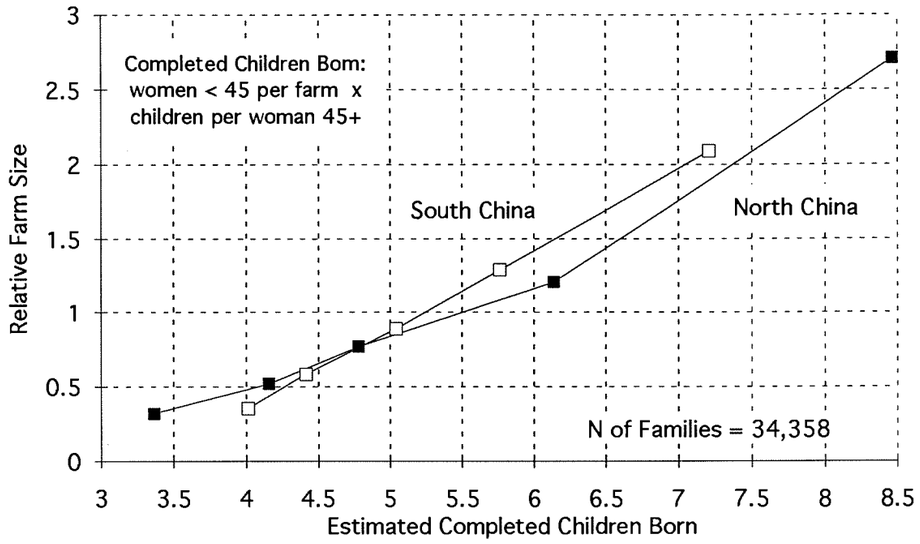
SOUTH CHINA

Farm Size Quintile	Number of Farms	Size of Family	Wives < 45 Per Farm	Wives 45+ Per Farm	Ratio, Wives < 45 / 45+
Very Large	3759	6.80	1.23	0.37	3.30
Large	3756	5.49	1.01	0.29	3.52
Medium	3746	4.93	0.93	0.24	3.84
Small	3756	4.48	0.86	0.23	3.80
Very Small	3759	3.94	0.79	0.21	3.79
All	18776	5.13	0.96	0.26	3.68
Ratio of Range		1.73	1.56	1.79	0.87

Farm Size Quintile	Est. Farm Size, Ha.	Births per Wife < 45	Births per Wife 45+	Completed Births/Farm
Very Large	2.61	2.86	5.87	7.21
Large	1.61	2.90	5.68	5.76
Medium	1.11	2.83	5.44	5.04
Small	0.73	2.82	5.13	4.41
Very Small	0.44	2.68	5.11	4.01
All	1.25	2.82	5.50	5.30
Ratio of Range	5.93	1.07	1.15	1.80

Source: Wives and children per farm has been calculated from Buck 1937, pp. 370, 385. Number of farms in each group was ascertained from Notestein Machine Table 22, unpublished archives in Princeton University Mudd Library. Number of farms excluded non-farm families and farms with unknown crop area.

Dataset 2.4.1 B Estimated Children Born by Size of Farm - Buck 1937



Chiling and Baby, papercut design for embroidery, Hawley 1949, p. 300.

The number of children per wife by size of farm varies only a little, but the variation is slightly stronger for the South, especially for women 45 and older. It is notable that the effect of allocation of women as wives is much greater than that of their individual fertility, and so it is in this function of allocation that we should seek the crux of differential reproduction of classes.

I have made a rough estimate of the total number of children per family expected over the life cycle by multiplying the number of wives under 45 by the number of children born for women 45 and over. This is probably a slight overestimate of total fertility for women, because early mortality for some women may cut their childbearing short prematurely; this would increase the difference in reproduction by class if poor women tend to die earlier. But the lack of information on maternal mortality should not deter comparison of the farm-size groups and investigation of differences between North and South. The higher number of births per wife in the South is offset by a slightly greater number of wives in the North, so both result in just about 5.3 births per farm.

From this first cut, it appears that class differentials of reproduction are lower in the South, where productivity is higher. But when we take into account the relative size of ownership that is reflected in the farm size groups of the population data, that impression changes. There is a much more even distribution of farm sizes in the South, and so it is not surprising that the fertility figures also do not range to such extremes.[14] Farm size is an important measure because large tenants also have high fertility. And there does not appear to be much difference between the groups in percentage of total farm area that is rented land (data taken from Buck 1964 p. 194) — from 13% for small farms to 11% for very large farms in the North, and from 42% to 36% in the South, so subtracting rented land would not change the pattern. But this apparent

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[14] This matching of land and reproduction is not totally satisfactory because the land and population surveys are overlapping but not the same samples. The original Notestein compilation was done by farm size, not by ownership, and the quintiles were merged across villages, so actually farms of very different size and productivity are averaged into each size group. This may be seen in that farms as small as 0.10 hectare and as large as 127.5 hectares were placed into the same "very large" group. The range but not the average is given in available sheets for North and South. It seems likely the average was never calculated on this data, and finding some of the original sheets that are missing will not solve this matter. Unfortunately, the sheets on births per woman by size of farm for the individual regions are also missing from Notestein's files, else a more detailed regional analysis could be made.

evenness also actually indicates a rather indiscriminate mixing of owners and tenants, large and small farm, in the averaging across villages.

Dataset 2.4.1 B charts estimated total children born against farm size estimated according to the distribution of farm sizes seen in the Farm Survey; farm size is expressed relative to the average for North and South separately, so it does not matter for this comparison that farming is more extensive in the North due to natural conditions like growing season and precipitation, that is, farms must cover a much broader area for the same production. The curve representing North China shows that the five farm groups are stretched over a wider range of sizes. But the curve representing South China has a slightly steeper slope, which is consistent with higher class differentials of reproduction. This is useful data, because it is a large sample, and because it is so rare to find demographic information linked with economic information in large samples.

Rented land is implicated in another complication that warrants more discussion. Due to the prevalence of rented land in the South, life cycle effects may well be compounded with land ownership in the size of farm grouping. If a tenant couple is able to bear several sons early in life, by their middle years they may be able to command enough labor, as their sons come to maturity, to rent and till a considerable expanse of land. That is, there may be a tendency for women who bear more sons to end their years on larger farms, probably also accompanied by more daughters-in-law. But for owners, high reproduction speeds fragmentation over the long run. At the top right of Dataset 2.4.1 A, I have calculated the ratio of wives under 45 years of age to wives over 45, both for North and South China, to try to get some sense of how the age structure might vary by farm size. The variation is small, but it is startling that North and South vary in different directions — the higher ratio is on very large farms in the North, but on medium to very small farms in the South. The North pattern allows the easy explanation that birth rates were higher and longevity was most extended on the biggest farms, which were often farmed with the help of hired labor. The U-shaped pattern of this ratio, not easy to interpret, will be seen again in other South data; the explanation will gradually emerge .

A second complication is that the size of family also increases with size of farm, although not proportionately, and this leads to the question as to whether larger numbers of wives are related to joint households, i.e. the nuclear families of two or more brothers subsumed within one economic unit, but still retaining separate interests of inheritance

— unlike stem families of parents and married son. Gamble found that "there was a tendency for the average size of the family to increase some 35 per cent with a 100 per cent increase in the size of farm" (Gamble p. 66). The figure here would appear to be 25-30 per cent, but the pattern is still clear. Wealth tends to accrete larger families, because of increased nuptiality and fertility, as described above, because common interest in property holds family members together, and because increased longevity retains family members and delays death of the patriarch. Finally, most data sources do not distinguish families from households, and for very large households the number may include distant relatives, permanent farm laborers and domestic servants. This all leads to some ambiguity as to whether the number of wives per farm should be adjusted for size of family.

My conclusion is that we should not discount number of wives, children, etc., to some standard of family or household size unless we know more about the family composition. But if we do carry out the mathematical operation of controlling the number of wives simply by the size of family, then the positive relationship between landowning and wives under age 45 is much weaker for North China, and levelled or even slightly reversed for South China.[15]

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15 An Indian demographer of rural populations, N. Krishnaji (Krishnaji 1992, Ch. 9), has shown that standardizing for size of family in ranking income or proportion of children in the family leads to distorted results. Some of the complications of such adjustment, for example, can arise from the tendency for female-headed families to be impoverished, leading to an increase of femaleness for smallholders (Krishnaji Ch. 10), and, in joint families, for lower nuptiality and fertility for collateral lines than for the head of household. Perhaps the standardization for size of family could thus create an appearance of more women in poor families.

2.5 Rented Land and Reproductive Strategies — Notestein

The differences between North and South in reproductive strategies and capacities are further elucidated in analysis of some of the unpublished Notestein data, summarized in Dataset 2.5.1. Looking first to the differences in agrarian structure between North and South, with the dividing line as given in the Buck survey at about the River Hwai, so that Shantung and most of Honan are to the north and the Lower Yangtze Delta is to the south, the survey shows that there is more rented land in South China, as is well known from other sources. According to the Population Survey, 55% of rural families in the South were part-owners or tenants, in contrast to just 14% in the North. Two-thirds of the families in the North were owner-cultivators, compared with a little over a third in the South. It is not a contradiction that more landlords appeared in the rural population in the North (nearly 5%) than in the South (2.5%), because the greater density of population and towns in the South allowed more absentee landlordism. The greater number of non-farm households and those of unknown tenure in the North were likewise due, I believe, to the greater availability of work for agricultural laborers, as well as to less specialized and commercialized division of labor, such that craft production remained in the rural sector rather than concentrating in towns.

The data from the Farm Survey gives some indication of probable differences in farm sizes by land tenure (from Buck, p. 197). Though not all the same sample, both surveys are so large as to be likely to reflect the population with fair verisimilitude. The average size of farm does not vary a great deal by land tenure, but the pattern is parallel to that of size of family. Part-owners have both the largest families and the largest farms, in the South.

The right side of Dataset 2.5.1 gives information on reproduction by tenure of farm from the Population Survey. Notestein compiled tables of number of living children, living sons, and living daughters by age of mother (Machine Tables 7A,B,C in Notestein's unpublished archives). On the bottom of the table of number of living children by age of mother, he tacked on a breakdown by land tenure status of the family — landlord, owner, part-owner, tenant — but only for wives age 45 and over, whose childbearing was complete. Using figures for the number of families by land tenure given in Buck 1937 p. 368, it is possible to calculate wives 45 and over per family, by land tenure. (Page

368 also gives a combined figure for number of families of unknown farm tenure and non-farm families, and the number of wives 45 and over on farms of unknown tenure allows some estimate of the portion of that figure that is non-farm.) Of course because many of the wives over the age of 45 have already passed away, their numbers are significant only as comparison among groups, not as absolute figures for the numbers of women who lived their fertile years in the family. So in the last column on the right I have calculated the index of Children Ever Born per Wife, times number of Wives, to represent the relative reproduction per farm.

Dataset 2.5.1 Land Tenure and Children Ever Born per Wife 45 & Over — Notestein Archives

Land Tenure	N of Farms	% of Farms	Size of Family	Size of Farm* (ha.)	Wives Over 45 /Farm	Children Ever Born /Wife	Children /Farm, Index
NORTH CHINA							
Landlord	859	4.9%	5.27		0.292	5.62	95
Owner	11737	66.8%	5.55	2.25	0.355	5.00	103
Part-owner	2100	11.9%	5.83	2.25	0.306	5.38	95
Tenant	840	4.8%	4.97	2.05	0.250	5.26	76
All known	15536		5.54		0.339	5.10	100
Unknown tenure	750	4.3%→	4.67			4.64	
Non-farm	1295	7.4%↗					
ALL	17581	100%		2.28			
SOUTH CHINA							
Landlord	524	2.5%	4.92		0.248	5.01	87
Owner	7623	36.9%	5.12	1.29	0.261	5.45	100
Part-owner	4695	22.7%	5.61	1.33	0.295	5.76	119
Tenant	6600	31.9%	4.74	1.11	0.235	5.32	88
All known	19442		5.10		0.260	5.47	100
Unknown tenure	750	3.9%→	3.56			5.60	
Non-farm	483	2.1%↗					
ALL	20675	100%		1.25			

Data sources: F. W. Notestein, unpublished archives, Princeton University, Mudd Library, Machine Table 7A; Buck 1937 p. 368.

* Data from Farm Survey, Buck 1937, p. 197. N = 16,786 farms

There is unpredictability in the mix of ownership represented in the tenure groups, and also in the survival and presence of wives 45 and older. But there are a few observations that may be made from it, given that wives 45 and older are overall more numerous on large farms, as are those under 45, as we saw in Dataset 2.5.1. For both North and South, tenants have notably fewer wives per family than the rest of the population. Landlords, surprisingly, have only a few more than tenants and fewer than owners.[16]

Owners in the North have more wives than do part-owners; the reverse is true in the South. The numbers of children per wife age 45 and over are somewhat irregular, highest for landlords in the North and for part-owners in the South. The low number for owners in the North again suggests some intentional limiting of fertility, especially given the large number of wives. If we look only at those who are producing labor for cultivation, i.e. exclude the landlords, then for the North we see a positive correlation between landownership and reproduction. But for the South the bulge of reproduction for part-owners shows, I believe, how the availability of rented land spurs reproduction of labor, especially for those who already have some economic base from which to launch the effort. This is not yet very persuasive data, but it will be corroborated by other sources.

I have suggested that the prevalence of rented land sets off a race among families for the early production of labor power to capture it in rental. There is other evidence in the Notestein data to support this proposal. Let us examine the pattern of production of sons and daughters over the reproductive years. It is convenient that the source data is in terms of surviving children rather than number of births, because what is useful here is social reproduction, not biological fertility. For Dataset 2.5.2 I have been able to separate the data not only by North and South, but also to take the small survey sample for the low-population density, low-sex ratio Southwest (Yunnan and Kweichow) out of the South (leaving densely-populated Kwangtung, Fukien, Szechwan, and the Yangtze River valley). The reason for the difference in patterns between South and Southwest

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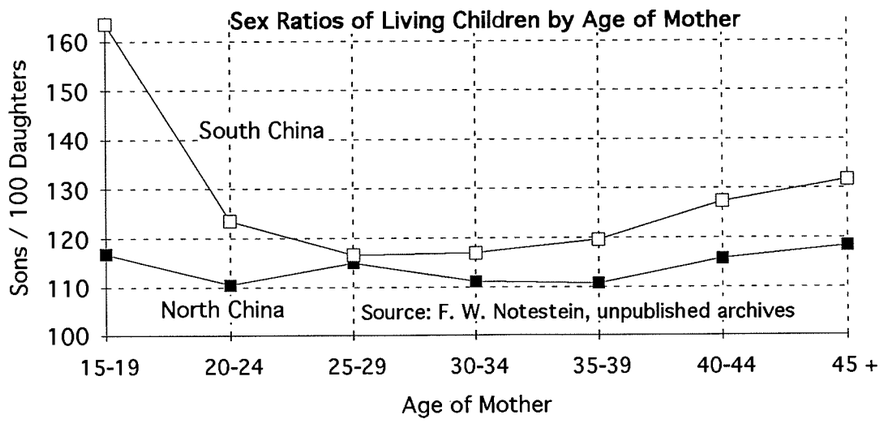
16 This pattern is not an anomaly; it appears in Indian data as well. In fact, there is a detailed debate in the South Asian literature about the effect of large-scale landownership in decreasing fertility: For landlords and managerial farmers, children are consumers, not labor-power. This issue will be discussed in Section 6.8 and related to the changing balance of the relations of production as flow of surplus from the countryside to the cities increases.

Dataset 2.5.2 Sex Ratios of Children by Age of Mother — Notestein

	NUMBER OF LIVING SONS			
Age of Wife	CHINA	NORTH	SOUTH	SOUTHWEST
15-19	0.121	0.107	0.146	0.085
20-24	0.444	0.418	0.474	0.421
25-29	0.842	0.819	0.879	0.764
30-34	1.183	1.147	1.237	1.032
35-39	1.436	1.399	1.505	1.244
40-44	1.647	1.614	1.719	1.418
45 +	1.725	1.725	1.755	1.560
All Wives	1.110	1.094	1.147	0.966
	LIVING SONS / 100 LIVING DAUGHTERS			
Age of Wife	CHINA	NORTH	SOUTH	SOUTHWEST
15-19	129.9	116.7	163.5	67.4
20-24	117.1	110.5	123.4	120.5
25-29	115.4	114.9	116.5	111.0
30-34	114.2	111.1	116.9	113.5
35-39	114.8	110.7	119.5	111.0
40-44	120.7	115.8	127.3	113.3
45 +	123.3	118.4	131.7	114.8
All Wives	118.8	114.9	124.1	113.0
N of Wives	46805	22485	20777	3543

Source: Notestein Machine Table 7B,7C

NOTE: Regions are combined from data for Areas as defined and numbered by Notestein: North = 6 Northern Plain + 7 Northern Highlands. South = 1 South + 2 Southeastern Hills + 4 Red Basin + 5 Lower Yangtze. Southwest = 3 Southwestern Plateau + 9 Other.



will be clearer after the geographical analysis of Part Two. Here the significant contrast is between North and South, both densely populated relative to land productivity.

As can be seen in the number of sons by age of mother, childbearing got off to a faster start in the South. The rapid birth of sons was paramount to early expansion of family labor capacity. Numbers of sons were 36% higher in the South for wives age 15-19, and 13% for wives age 20-24. The gap decreased to 7-8% after that, and nearly closed by the end of childbearing. Higher mortality of daughters due to outright infanticide and to neglectful care is implied by the high sex ratios, though it is also likely that older women forgot some of the daughters who left the household in sale or marriage. From the sex ratios we can surmise that women in the South were more adverse to wasting their time rearing daughters, especially in the earliest years of reproduction; the sex ratio for children of mothers age 15-19 was over 163 sons to 100 daughters. In physiological explanation, the two aspects may be related, because disposal of daughters (no breastfeeding after birth) could have engendered faster next pregnancy. Only in the middle years of childbearing did girls seem to be slightly more welcome, no doubt to care for brothers and expanding housework; the lowest sex ratios are for births in the 25-29 age group for the South, while they dip for the 30-34 and 35-39 age groups in the North. The small figure attached to Dataset 2.5.2 makes this point sharper by presenting the data graphically as well.

2.6 Class Differentials of Reproduction and Mortality in an Area with Much Rented Land, Taiwan — Wolf 1985

One of the most precise sources of early twentieth century Chinese demographic data is Taiwan. During their occupation, 1895-1945, the Japanese established and meticulously maintained a continuous population registry through local police stations. Although births were not always promptly registered, these were remarkably complete records. Arthur P. Wolf has compiled marriage and fertility data for a population that numbered about five thousand adult women at any one time, living in a rural area of northern Taiwan that he has studied intensively. Although he does not have direct information on landowning, Wolf was able to sum the annual land taxes paid by each household on each piece of land owned to arrive at an indicator of total landholding. Wolf's conclusion on the relationship between fertility and landownership is as follows:

> On the average the wives of landholders paying tax of ten yen or more bore 13.3 percent more children than the wives of landless laborers and tenant farmers. This is important because it suggests that in China, even small differences in wealth affected marital fertility. The families living in the communities covered by this study included only a few petty landlords. The great landlords who controlled nearly half the area's productive land were not local people. Thus the difference we find between the landless and the landed is the difference between tenant farmers and small holders whose property just managed to support a family. (Wolf 1985, discussion for Table 7.15)

Dataset 2.6.1 is adapted from Table 7.15 of Wolf's 1985 article "Fertility in Prerevolutionary Rural China".

The figure for fertility, "total marital fertility", is a standard used by demographers: the sum of children a woman would have if she were married and reproduced at the average rate for each age group over a fertile lifespan of age 15 to age 44. Of course marriage age and mortality may also differ, but a separate measure would be required to judge their effect.

This is large-scale, reliable data. It also has the advantage that the measure to test against fertility is landownership, not farm size as in most of the other sources. Fertility is quite high for all groups, but there is still a marked elevation for the women in major and uxorilocal marriages in the largest landowning group: about 12-16%

more births than the landless rural women. I have added a calculation of fertility relative to the average to make the pattern clearer.

Dataset 2.6.1. Total Marital Fertility Rates* for Hai-shan, Taiwan, by Form of Marriage and Amount of Land Tax, 1906-1945 — Wolf 1985

Land Tax $Y	Fertility by Form of Marriage: Major	Uxorilocal	Minor
	Completed Fertility		
10 or more	8.39	8.12	6.06
5 to 10	7.66	8.00	6.01
Less than 5	7.54	7.02	6.04
No land	7.25	7.22	5.91
Average*	7.44	7.40	5.98
	Fertility Relative to Average		
10 or more	1.13	1.10	1.01
5 to 10	1.03	1.08	1.01
Less than 5	1.01	0.95	1.01
No land	0.97	0.98	0.99
Average*	1.00	1.00	1.00

Based on Wolf 1985, Table 7.15.

* Data given here is simple average of total marital fertility rates by form of marriage, by five-year groups, 1906-1945, from Table 7.8, p. 170.

Wolf also divides the women by type of marriage, since the effect of this on fertility is the major thrust of his research: "major" marriage is the Chinese cultural norm, a woman marrying after puberty into her husband's family; "minor" marriage is a custom particularly prevalent in northern Taiwan in this period, in which a family raises an adopted girl from an early age for the purpose of early marriage with a son; and "uxorilocal" marriage involves an adult son-in-law being taken in by the bride's family. Both major and uxorilocal marriages show significant increases in fertility with increasing landownership, by implication "because coital frequency rises with a little more leisure and a little better diet" (p. 185); but the effect on minor marriages is trivial, confirming Wolf's thesis about aversion to marriage with virtual sisters.

2.7 Class Differentials of Reproduction and Mortality in an Area with Much Rented Land, Lower Yangtze Delta — Chiao, Thompson and Chen

As mentioned before, there are few sources for prerevolutionary China that provide demographic data related to socio-economic indicators. Where these do occur, the sample is often small, or not adequate in scientific method and/or thoroughness of analysis and reporting. There is, fortunately, one fair-sized survey carried out by Nanking University, Department of Agriculture, in which a great effort was made to collect complete vital statistics (births, deaths, migration), and these were for the most part also related to a rough scale of economic status. The source is An Experiment in the Registration of Vital Statistics in China by C. M. Chiao, Warren S. Thompson, and D. T. Chen, which was prepared from monthly reports on 4,579 families, continuing over a period of four years, 1932-35. This was a full population accounting of an area in Kiangsu Province north of Wusih, involving over 200 village reporters. This was in fact a pilot study related to the population survey projects of John Lossing Buck, on which Chiao Chi-min also worked, but it seems that other surveys were neither so painstakingly carried out nor so thoroughly analyzed and reported.

According to the Chiao, Thompson and Chen report, Hsiao Chi in Kiangyin County was a rural area of 13.9 square miles and about 20,000 population, including a market town and nearly 200 surrounding villages, which the researchers believed to be "fairly typical of the lower Yangtze delta in most important respects." This was a very fertile and fairly flat area, growing rice and mulberry for silkworms. The authors depict the area as already densely populated nearly past the point of carrying capacity. They found a net out-migration, with travel in and out increasing greatly in 1933 after the construction of a highway link and bus service. The area was within close migration distance of urban employment and industry in Wusih and Shanghai. Of 6,810 non-dependent males whose occupation was known, 80.7% were engaged in agriculture, 9.8% in "mechanical industries", 7.2% in commerce, and 2.1% in professional service.

As for agriculture, those owning some land and renting more, i.e. part-owners, had the largest farms, and controlled 72% of arable land. Tenants tilled another 21%. So the portion of all land that was rented land, as best as can be estimated from land tenure data with the assumption that part-owners owned 40% of their farm area, was probably

about 50%. This is significant for the problem of estimating economic inequality among the population, because with so much rented land available, neither farm size nor farm tenure are certain indicators of economic status.

The research, focusing on population, did not fix precise land ownership, but did ascertain general "economic status". The research supervisor checked with several informants before assigning a family to one of three categories, "rich", "well-to-do", or poor. However, from the following description "rich" is only fairly modest comfort.

> It was understood that those families which had sufficient food to eat and sufficient clothes to wear were classed as rich families; those families which had a doubtful sufficiency of food and clothes were classed as well-to-do families; and those families which had very insufficient food and clothes were classified as poor families. On this basis the rich families in Hsiao Chi region would receive an annual income of about four hundred dollars (Chinese) or more; the well-to-do families one hundred to four hundred; and the poor families one hundred or less. (Chiao, Thompson and Chen 1938, p. 13)

By this accounting 6.2% of the population was rich, 32.3% was well-to-do, and 59.1% was poor. A remaining 2.4% of population, nearly all attached to the households of rich families and described as agricultural laborers and shop clerks and servants, could probably also be counted as poor. Unfortunately the demographic statistics were reported in crude rates per thousand persons in households (so including maids and hired labor), not family, even where the statistics were related to economic status, and this must affect the figures for the rich families.

Although the research area was believed to be typical of the region and was experiencing population expansion, during the vital statistics registration period there was considerable demographic fluctuation attributed to three epidemics and two droughts. In addition, the effects of world depression were also felt in 1933 with a drastic drop in the prices received by farmers. The researchers observed erratic patterns of mortality and an increase in wandering and emigrant population. But with all that, the demographic pattern in general outline seems to be quite comparable with that found in other sources, and it is that general form that we seek to analyze.

For further description of this population and the relationship of economic status and landowning, more information is provided in Dataset 2.7.1 A and B. As can be seen in the beginning of the following series of tables, calculated on the basis of tables in Chiao, Thompson and Chen, there is some relationship between economic status and land tenure status as "owner", "part-owner" or "tenant", but owners in particular were widely

split between rich and poor, partly due, the authors say, to some frequency of retiring an aging father in his own household with a small plot of land. As a group, part-owners farmed much more land (0.84 ha.) than either owners (0.49 ha.) or tenants (0.28 ha.), and perhaps a need to produce more labor power drove them to the highest rate of natural increase among the three groups (possible life-cycle effects in the data complicate this conclusion). But their rate of infant mortality (248.8/1000) was close to that of tenants (247.8/1000), and far higher than that of owners (206.4/1000), perhaps reflecting the strain of hard labor on so much land and the higher mortality common in larger sibsets.

The three economic status groups differed even more in amount of land farmed: rich, 1.98 ha; well-to-do, 0.89 ha.; poor, 0.32 ha. Since economic status as judged by the researchers also seems to be a much more distinguishing indicator of well-being than form of land tenure, as seen in the population statistics, the rest of this discussion will deal with economic status and demographic indicators.

Let us examine first crude birth and death rates by economic status. In Dataset 2.7.1 C, we can see that both births and deaths per 1000 population were lowest for the rich. But if we consider that 18.9% of rich household members were not family members, and that these were probably mostly male laborers and servants who were hardly reproducing, then births per 1000 family members may have been high as 45. The death rate for family members was not likely to be higher than that for the whole household, indeed probably lower. So the rate of natural increase for the rich is still almost certainly higher than that of the next group down, the well-to-do. In comparison, the poor, suffering a high rate of mortality, barely increase in numbers.

In Dataset 2.7.1 D it is found that wives in rich families did not reproduce as much as the well-to-do. We might propose that the rich wives' reproduction rate reflected some concern for partition of inheritance, or the effect of lesser reproduction in collateral branches of extended families, or perhaps even a greater propensity for unreported female infanticide, all of which can be surmised from other data sources as well. But there is such a gap between numbers of married women per household that it is to be expected that rich families still had the highest number of births yearly, fully 70% more than poor families. Overall, one might surmise that the poor are limited by "positive checks", that is, poor nutrition, clothing and sanitation; or, as the authors also suggest, by the separation of husband and wife due to migration for labor in distant fields and factories.

Dataset 2.7.1. Economic Status and Reproduction in Kiangyin, Kiangsu, 1932-1935.

Data source: C. M. Chiao (Chi-min), Warren S. Thompson, and D. T. Chen,
An Experiment in the Registration of Vital Statistics in China,
Scripps Foundation for Research in Population Problems, Oxford, Ohio, 1938.
Survey Location: Hsiao Chi, Kiangyin County, Kiangsu

A. Economic Status and Farm Tenure

Economic Status	Number of Farm Households			All Farm Households	Non-Farm Households
	Owner	Part-owner	Tenant		
Rich	47	117	1	165	33
Well-to-do	104	937	105	1146	96
Poor	155	755	1481	2391	748
Total	306	1809	1587	3702	877

Economic Status	Percent of Farm Households			Crop Area (hectares)	Non-Farm Households
	Owner	Part-owner	Tenant		
Rich	15%	6%	0%	1.98	4%
Well-to-do	34%	52%	7%	0.89	11%
Poor	51%	42%	93%	0.32	85%
Total	100%	100%	100%	0.57	100%

Data source: Table 8, p. 19

B. Economic Status and Size of Family and Household

Economic Status	Number of Families	Persons in Household	% not Family Members	Persons per Family	Persons per Household
Rich	198	1660	18.9%	6.80	8.38
Well-to-do	1242	7198	1.8%	5.69	5.80
Poor	3139	13006	0.6%	4.12	4.14
Total	4579	21864	2.4%	4.66	4.77

Data source: Table 2, p. 13

C. Crude Birth and Death Rates by Economic Status

Economic Status	Births per 1000 persons	Deaths per 1000 persons	Natural Increase
Rich Household	36.5	28.5	8.0
Rich Family	45.0?	28?	17?
Well-to-do	48.7	35.7	13.0
Poor	44.2	41.8	2.4
All	45.1	38.7	6.4

Dataset 2.7.1, continued.

Economic Status & Reproduction in Kiangyin, Kiangsu, 1932-1935.

D. Women and Married Women 15-44 Years of Age, and Births, 1932-1935

Economic Status	Women 15-44	Births/1000 Women	Married Women	Births/1000 Married Women	Percent Married
Rich	291	267.0	231	212.4	79%
Well-to-do	1475	290.7	1208	238.1	82%
Poor	2648	250.6	2196	207.9	83%
Total	4414	265.1	3635	218.2	82%

Women Age 15-44 and Yearly Births per Household

Economic Status	Women/ Household	Married Women per Household	Married Women (Index)	Births/ Household	Births (Index)
Rich	1.47	1.17	147	0.248	143
Well-to-do	1.19	0.97	123	0.232	134
Poor	0.84	0.70	88	0.145	84
All	0.96	0.79	100	0.173	100

Data source: Table 34, p.48.
(Number of women and births averaged over four years of vital statistics registration.)

E. Frequency Distribution of Age at First Marriage, for Marriages 1931-1935

Age	MALE		FEMALE	
	Number	Percent	Number	Percent
14-16	7	1%	95	15%
17-19	159	25%	306	48%
20-22	280	43%	215	34%
23-25	104	16%	20	3%
26-28	50	8%	1	0%
29-31	16	2%	2	0%
32-34	14	2%	0	0%
35+	15	2%	0	0%
Total	645	100%	639	100%

Data source: Table 25, p. 37.

It is unfortunate that the report does not provide sex and age by economic status or other detailed information so these possibilities could be investigated. However, the overall sex and age distribution indicates that the sex ratio was over 120 males per 100 females in groups 0-4 years, 5-9, 10-14, and 15-19, with an average of 126.6 males per 100 females for all 0-19 (from Chiao et al. 1938, Table 17, p. 28). Moreover, 17.6%

of women 15 and over were widows, double the figure for men (Table 20, p. 31), likely due to prejudices against remarriage for women. Both the sex ratio imbalance and widow chastity must have created a serious squeeze on marriage opportunities for men in Hsiao Chi. This is confirmed in the frequency distribution of age at first marriage as recorded during the four years of the population registration, summarized in Dataset 2.7.1 E. The modal age at marriage was 20.5 for men and 18.6 for women. Of those married in this period, women mostly married within a short span of age, 18-21, and 97% were married by age 22; but only 86% of men married at age 25 or younger. Keep in mind that Dataset 2.7.1 E does not tell us what portion of men overall never marry; we only know, from other tables, that of all 6,551 men in the survey age 15 and over whose marital status was known, 22.6% were single.

2.8 Childhood Mortality by Economic Class and Education of Parents — Lamson and Griffing

The 1932-35 study of a rural area in Kiangsu by Chiao, Thompson and Chen showed no significant difference in infant mortality by economic status. Rich, well-to-do, and poor all had rates of 240-243 infant deaths per 1000 births. In fact the rich rated 243, the poor 240. Chiao attributed these results to the poor sending sickly infants, especially girls, to foundlings' homes in nearby Kiangyin, as well as selling them to cities such as Shanghai and Wusih (p. 58). He also said that infanticide was generally reported as a stillbirth in the vital statistics account; and it is likely female infanticide would also be disguised as infant mortality due to illness. The infant mortality rate for females overall was 263.6 per 1000, while that for males was 220.7 per thousand (p. 57). Ironically, if the rich more often practiced intentional female infanticide, as I suspect, they could appear to have higher infant mortality, and such intentional mortality would be mistaken for inadvertant disease.

However, Chiao believed that the poor suffered overall higher child mortality: "In the Kiangyin registration area it is only reasonable to believe that a larger proportion of all children born in families with higher economic status do survive and remain at home. This is because of the higher child mortality in poor families, and the larger emigration of children from these families into other districts" (p. 14). Chiao's belief is substantiated by other studies in the same period by H. D. Lamson (1930) and J. B. Griffing (1928), which he cites.[17] The data below is taken from a later article (1935) by Lamson and also from information cited in Chiao, Thompson and Chen pp. 13-14.

In his 1935 article Lamson summarized data on children born from a number of sources, matching it roughly in groups either by age of father or age of mother. Although the data is rough, and the meaning of upper or lower class not clearly defined,

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[17] These are: H. D. Lamson, "A Study of the Relation of Education to Family Size". The China Critic (August 21, 1930), pp. 799-882, and J. B. Griffing, "The Size of Family in China", Sociology and Social Research, Vol. 13, No. 1 (Sept. - Oct. 1928).] Much of the discussion of differential fertility according to social classes in the early twentieth century (see also W.H.Y. Chen, 1931.) was couched in terms of eugenics, particularly the concern in the West for the rapid reproduction of the lower classes.

Dataset 2.8.1. The Relationship of Economic Status and Education to Number of Children Living and Dead — Lamson and Griffing

A. Living and Dead Children of Upper and Lower Economic Groups in China

Economic Class	N of Families	Average Number of Children per Family: Living	Dead	All	Children Dead, %
Upper Class	1885	4.57	1.48	6.06	24.5%
Lower Class	4325	2.29	1.81	4.10	44.2%
Ratio, Upper to Lower		2.00	0.82	1.48	0.55

Data source: Herbert D. Lamson 1935, Table 3. Data summarized from several small surveys cross-tabulated by age of parents. Sample includes married persons with children only

B. Education of Parents and Number of Children, Families of Middle School Students

Education of Father	N of Fathers	Average Number of Children per Family: Living	Dead	All	Children Dead, %
Some Modern Education	858	5.13	1.59	6.72	23.7%
Some Private Education	535	4.98	1.74	6.72	25.9%
No Education	69	4.65	1.82	6.47	28.1%
Among 858 Fathers with Modern Education:					
Study Abroad	264	5.47	1.42	6.89	20.6%
College	232	4.74	1.31	6.05	21.7%
Middle School	279	5.20	1.76	6.96	25.3%
Primary School	83	4.95	2.35	7.30	32.2%

Data source: Herbert D. Lamson 1935, Table 6.

C. Literacy of Parents and Number of Children Living and Dead

Literacy of Parents	N of Fathers	Average Number of Children per Family: Living	Dead	All	Children Dead, %
Father literate, wife literate	74	4.38	1.91	6.29	30.4%
Father literate, wife illiterate	197	3.94	1.73	5.67	30.5%
Both illiterate	39	3.38	1.77	5.15	34.4%

Source: J. B. Griffing 1928. Cited in Chiao, Thompson and Chen 1938, pp. 13-14.

it is in total a large sample and worth capturing in brief with a simple average across the age groups, as given in Dataset 2.8.1 A. It is clear that the upper class has more children born, and even more surviving, largely due to a much higher child mortality for the lower class.

In a similar analysis of the families of middle school students, Lamson found that fathers with higher educational attainment had more children and slightly better survival of those children (Dataset 2.8.1 B). Especially in this period in China when modern education was advancing and provided the entry to new technical occupations, but was still mostly the privilege of the well-to-do, it may be expected that education, and particularly modern rather than the Confucian education traditionally provided in private schools, was strongly correlated with economic status. Along the same lines, in a small sample Griffing found a considerable gap in numbers of children and child mortality between literate and illiterate fathers, as shown in Dataset 2.8.1 C.

Sections 2.3 through 2.8 have been intended to establish the basic facts of the differences in the demographic experience of rich versus poor.

2.9 Poor Women are Wives for the Rich, Poor Men are Labor — Chinese Farm Economy, Buck 1930

Introduction

John Lossing Buck's earlier work, Chinese Farm Economy, published in 1930, was a fraction of the scale of the later Land Utilization in China, and generally receives less attention now. However, unlike the results of Land Utilization in China, for Chinese Farm Economy the enumeration of population was carried through on the same sample as the farm economy survey, and both were compiled by locality. It thus provides a sounder base for analysis of the age and sex structure than the later work, though it does not include vital statistics such as births and deaths. A further feature of the Chinese Farm Economy study that is valuable for demographic analysis is that it seems to have asked specifically about absent members of the economic family, and it provides tables on this portion of the population separately. This allows investigation of the age, sex, and family position characteristics of short-term migrants; this is particularly significant because this thesis proposes a scale of migration greater than generally recognized. Finally, a rather unusual set of questions was included in the survey, inquiring about the amount of land the farmer received in inheritance, and by what means farm size has expanded or diminished since then. This is another rare piece to the puzzle of land expropriation and land transfer over the life cycle.

The Chinese Farm Economy survey covered 2866 farms in 17 localities. These were situated in the North Plain (specifically in the provinces of Chihli, Shansi, Honan and northern Anhwei) and lower Yangtze (Kiangsu, southern Anhwei, and Chekiang) regions of China, with the exception of one locality in Fukien. The locality samples are named by the county and province in which they were taken; in three counties two samples were taken in different villages, and the samples are distinguished by year of survey or other marker. One locality, Wutai in Shansi, has no population data, and so our population for examination is generally 2640 farms in 16 localities, except for a further lack of information on absent members of the economy and on farm size history in some of the lower Yangtze survey samples.

There are several caveats and complaints to be encountered in approaching a past work while holding an agenda different from that of its original author. Detailed data on the

economy of farms is provided in Chinese Farm Economy, even data by size of farm, but its usefulness is limited by the book's focus on dollar profits of farm enterprise and capital invested, as if it were a capitalist enterprise in which the labor — family labor — could be dismissed. For example, family labor is totalled up with the costs of hired labor, in juxtaposition to the "profits of operator", and the receipts for tenants combined with receipts for landlords. In fact, it might be said that the results of the survey were over-processed, and then the simple tabulations omitted from the published work. So it is rather necessary for the purposes of this research to deconstruct the data as much as possible before reworking it to describe subsistence farming. This meets with some ambiguities of definitions and inclusiveness. Sometimes it is not possible to deconstruct the data; for example, family size has been translated into "adult male units" of consumption almost throughout of the book, and it is not possible to find out simple family size by size of farm, although due to the book's concern for exploring the best size of farm business there are a great number of tabulations by size of farm. It was a very complicated procedure to estimate the number of hired year laborers in each locality. (The later Land Utilization in China avoided some of this over-processing, and partly substituted a very useful measure, grain production or equivalent value, for dollar amounts.) All the same, my reshaping of the Chinese Farm Economy data has yielded results useful for a different agenda.

It is possible to rank the locality samples according to various economic indicators, and likewise organize the locality population information in relation to this ranking. This ranking is facilitated by detailed data on income and on capital invested in the farms. In setting the ranking, first income and then value of land owned was considered; the two generally did not diverge much. Then the ranking was divided into groups of high (HI), medium (MED) and low (LO) economic status; with so few locality samples, each group only contains two to four locality samples, hardly enough to average out geographical and other variations. The grouping of the localities also has some element of arbitrariness, but it is adequate to highlight the patterns of relationships among variables. For the three counties which each had two samples, it was fortunate that the dual samples could be appropriately split among economic groups, so that geographical effects might be evened out somewhat. A caution is in order, that variation across localities of slightly different average economic status might not be the same as variation within localities. For example, while use of hired year labor fairly indisputably increases with size and wealth of farm within one area, it is often the most impoverished regions where year labor is most prevalent; and the reason for this will be clear by the end of this thesis.

But the general concordance of the two forms of variation has also been confirmed in this research by testing both where possible.

In Appendix A, the ranking of the locality samples and the economic group assignments are given along with a number of economic indicators: family earnings (which includes mainly net cash receipts from the farm, the value of farm produce consumed, and non-farm income, including remittances from absent members of the economic family), value of land owned and value of farm capital (mostly buildings, trees and tools), crop area of the farm in hectares, and percent of farm area that is rented. There are also labor and demographic indicators such as family size, man-equivalent (translating all labor on the farm, including hired labor, into the equivalent number of men working year-round), and the percent of farm work performed by hired labor (calculated according to dollar values for labor).

This information and more is summarized by economic status groups (HI, MED, LO) in Dataset 2.9.1. An outline description, some of which could be anticipated in the general nature of peasant differentiation, can be drawn from this information. Although this is data which is the average of locality samples, and each group includes hundreds of farms, the range of these averages is fairly wide, which is not surprising given the likely wide skew of socio-economic inequality overall. For North China, the crop area of the HI group is 2.3 times that of the LO group; for East Central, 1.3 times.[18]

When we look to product of the farm (the cash equivalent in Chinese dollars) used by the family, we find evidence of constraint on consumption, because the LO groups consume an even lower portion of earnings than the HI groups, whereas normally low income groups would be expected to consume a larger portion of their income in basic subsistence — implying they must necessarily reserve a large part of their income for rents. For example, in the North nearly two-thirds of income is consumed by HI groups, but just half is consumed by LO groups. This apparent deprivation is confirmed when the product of the farm used by family is converted into grain-equivalent by means of a weighted

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18 The reader may remember from Dataset 2.4.1 above (Buck's 1937 compilation of births by farm size groups) that the range of farm sizes there was also larger for the North than for the South (8.5 and 5.9 times respectively), as was the range for family earnings. Since we are dealing here with farms averaged within each locality, not within size-sorted groups, the range of the averages is not so wide, but it still reflects the greater range of sizes in the North. In statistical explanation, the means of samples on a very skewed distribution are also quite variable.

Dataset 2.9.1 Economic Indicators for Localities Grouped by Economic Status — Data from Buck, Chinese Farm Economy, 1930

Economic Status	N of Localities	N of Families	Family Earnings, Cash Ch$ & Kind	Product $ Value Used by Family	Product in Grain Used per Capita	Crop Area (ha.)	% Farm Land Rented (by Ch$)	Land Owned, Value in Ch$	Owned Bldgs, Trees, Tools
NORTH CHINA									
HI	3	579	$328	$211	457	3.56	24%	$1327	$409
MED	2	257	$165	$106	433	3.44	3%	$966	$328
LO	3	553	$139	$69	237	1.56	4%	$511	$287
Total	8	1389	$224	$132	368	2.78	11%	$931	$350
EAST CENTRAL CHINA									
HI	4	567	$444	$190	568	2.19	36%	$1224	$588
MED	2	400	$304	$173	567	1.84	28%	$636	$605
LO	2	284	$236	$77	227	1.74	67%	$425	$451
Total	8	1251	$357	$157	483	1.99	42%	$877	$558

Economic Status	Family Size (members present)	Labor: Man Equivalent	Consumption: in Adult Male U	Family Size/ Man Equiv.	Family Size/ Consumption	Man-Work Units/ Ha.	Hired Year Laborers /Farm	Hired Labor/ All Farm Labor	Index of Double Cropping
NORTH CHINA									
HI	7.08	2.59	5.43	2.73	1.32	70	0.29	20%	171
MED	5.18	2.03	3.95	2.55	1.31	70	0.30	18%	152
LO	4.72	1.38	3.63	3.42	1.31	78	0.14	16%	128
Total	5.79	2.00	4.39	2.90	1.32	73	0.22	18%	150
EAST CENTRAL CHINA									
HI	5.48	2.80	4.23	1.96	1.30	163	0.33	18%	153
MED	5.09	2.12	4.10	2.40	1.29	138	0.23	23%	159
LO	6.24	2.48	4.30	2.52	1.37	190	0.18	21%	136
Total	5.53	2.55	4.21	2.17	1.31	164	0.25	20%	150

NOTES:Source of data is Buck 1930, Appendix I, also pp. 86-87, p. 234, p. 338.
Family Earnings is net cash receipts from farm, plus value of produce consumed,plus non-farm income (remittances, labor, profession, trading, rents, etc).Family Size in this table does not include absent members of the economic family.Man-Equivalent and Man-Work measure work on the farm, and include hired labor. N of hired year laborers has been estimated by labor cost. Adult Male Units: female 16+, 0.8; male 15-16, 0.9; child 6-9, 0.5; etc.Buck p.17.

average of the prices of all the major grains and legumes sold in the locality. The LO groups (and this is the average of both rich and poor households in the locality) barely exceed 220 kilograms of grain-equivalent per capita, which I have judged to be bare

subsistence.[19] In contrast, 450 kg. grain-equivalent is a comfortable standard for peasant livelihood. Despite a much higher level of production and earnings in the East Central localities, they consume a smaller portion of their product ($157/$357 = 44%) than does the North ($132/$224 = 59%). It appears they are squeezed by the necessity of paying rents on a large portion of their farm land; percent of land rented may be seen in the top section, right, of Dataset 2.9.1.

The lower section of Dataset 2.9.1 gives group averages for labor and family composition variables which are still part of Buck's farm economy analysis. Let us first look to the right four columns, which address agricultural intensification and use of hired labor. Predictably, the LO group applies more labor to each hectare of its more limited crop area. This is measured in Man-Work Units per hectare, one unit being the amount of work the average farmer accomplishes in a ten-hour day, and including hired labor. This is not reflected in the index of double cropping for the locality groups, although there is evidence from analysis of the farm size data that smaller farms practice slightly more intense multiple cropping in the East Central localities. It is likely that the index of double cropping reflects land quality, e.g. availability of water year-round, and we may note that for both North and East Central land values are higher for the HI group localities. Concerning hired labor, the HI group uses more hired labor, as expected, in the North (by the measure of all hired labor cost, both short and long term, to total labor "cost", where family labor was assigned equivalent cash value). But not so in East Central; perhaps greater intensity of farming by tenants necessitates more short-term hired labor to meet some phases of the crop cycle. However, when the number of hired year laborers is calculated per farm per locality — the total number 663 is known from population data, and then their distribution can be surmised from cost breakdowns — then the familiar pattern of more hired labor on richer farms re-emerges, as shown in the column headed Hired Year Laborers per Farm.

Buck measured the labor power of the household (including hired labor) in Man-Equivalent (all labor in terms of the equivalent number of men working year-round),

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19 The standard of subsistence has been set at 220 kg. grain-equivalent per capita for a self-reproducing population on the basis of Clark and Haswell 1964 and also in consideration that grain-equivalent must be set to include not just food staples but also all other miscellaneous foods and living costs. The estimate of incomes in Chapter 6, Datasets 6.3.8 A, B, C show the plausibility of this standard: for all areas except the Southwest Rice Area, which is higher, the lowest 20% of farms have average income of about 190 kg. grain-equivalent, a figure that may exclude much of the cost of reproduction.

and the food consumption needs of the family in Adult-Male Units (children under 2 valued at 0.3, and increasing with age to 1.0 for males and 0.8 for females of age 17 and older). From the first we can calculate a dependency ratio, Family Size/Man-Equivalent. This dependency ratio is lower for East Central localities than for the North, due to the much higher participation of women in agricultural labor in rice-growing regions (see p. 235, Table 4 in Buck 1930). But overall there is higher dependency for the LO localities, a pattern similar to that noted by Krishnaji for Indian populations (Krishnaji 1992, p. 158 Table 1, p. 177 Table 177). This could imply some level of life cycle effects, e.g. after splitting the household the new heads of family are likely to be men on small farms with dependent children; but average age of head does not differ enough to confirm this. Family size (number of persons of all ages) divided by Adult Male Units (children redefined in terms of adult consumption), on the other hand, provides an unambiguous and simple indication of the presence of children in the family. The numbers vary only slightly from 1.30, but this is sufficient to show barely higher numbers of children for HI localities in the North, and much higher numbers for LO localities in East Central China. My interpretation is that in the North lack of land strictly constrains the reproduction of the poor, but that where rented land is prevalent this constraint is released, and the life cycle with its reproductive vagaries takes on a notable role in the fortunes of the peasant, as was proposed by A.V. Chayanov for Russian peasants at the turn of the century. This generalization will take on more substance as we move on to examine the population data in detail.

Five tables and a series of population pyramid diagrams follow in this presentation of the analysis of Chinese Farm Economy. All follow the same scheme of assigning the localities to the same HI, MED or LO economic status groups. Where it is relevant, the same cross tabulation in each table is presented both for the whole "economic family", and for only those present, excluding "absent members of the economic family", to facilitate comparison with other surveys. Dataset 2.9.2 A utilizes information on the structure of the family, its composition of relationships to the head of household, to examine the differences of reproduction among economic status groups. The focus is on the matching of males with wives, and the reproduction of males from generation to generation. The listing of the full range of relationships in the family, including daughters, sisters and miscellaneous matrilateral relatives, and the average ages of those in each relationship, has been relegated to an appendix, Appendix B.

Dataset 2.9.2 B and C, both again based on the composition of relationships within the family, provide more detail than may be of interest to some readers. Dataset 2.9.2 B teases out some subtle patterns in age differences between head and wife, and between generations. Dataset 2.9.2 C contrasts the reproduction of the head of family with that of his brothers, to investigate whether joint families suppress or spur the reproduction of collateral lines.

Following this I will summarize the age and sex distributions of each of the economic status groups in a series of population pyramid charts (Dataset 2.9.3), and make some sweeping deductions on hypergamy and migration from these. Some of the age-sex features which may be seen even visually in the population pyramids are summarized in Dataset 2.9.4 A and B, giving sex ratios for childhood and young adulthood, as well as a rough ratio for the numerical balance between the generations (age 20-39/age 0-9). Dataset 2.9.5 carries this further to an estimation of the numbers of men lost through emigration and the proportions of women transferred among economic classes. The numbers behind the pyramids are also in Appendix C, for those readers who may wish to tinker with them further.

This will conclude the analysis of the population data in Buck's Chinese Farm Economy. Much later in this presentation of empirical data, in the discussion of concentration of landownership over time, the Chinese Farm Economy survey will appear again for an analysis of the change in landownership and farm size during the tenure of the farm operator.

Economic Status of Locality and Average Number of Sons

Dataset 2.9.2 is titled "Family Members' Relation to Head of Household, by Economic Status of Locality". But the purpose of Dataset 2.9.2 A is more specific, to indicate the reproduction of the male members of the family in relation to economic status. For this purpose it encompasses only heads of the household and their brothers (as one category), their wives, their sons, wives of the sons, and grandsons. Their numbers are standardized among localities as persons per 100 families in the locality sample; the total of all relationships is the average family size times 100, as may be seen in the full listing of family composition in Appendix B.

Dataset 2.9.2 Family Members' Relation to Head of Household by Economic Status of Locality — Buck, Chinese Farm Economy, 1930

A. Numbers of Wives and Children

NORTH CHINA — EIGHT LOCALITIES WITH INFORMATION ON ABSENT MEMBERS OF THE ECONOMIC FAMILY

Economic Status	N OF FAMILY MEMBERS PER 100 FAMILIES: Head & Brothers	Wife of H&Bro	Son of H&Bro	Son's Wife	GrSon of H&Bro	RATIOS OF FAMILY MEMBERS: Wife/ H&Bro	Son/ Wife	Son's W /Son	GrSon/ Son's W
ALL FAMILY MEMBERS									
HI	131	112	163	73	58	0.86	1.45	0.45	0.80
MED	122	88	133	44	32	0.73	1.51	0.33	0.72
LO	119	90	113	33	24	0.75	1.26	0.29	0.71
Total	124	99	138	52	40	0.79	1.39	0.38	0.76
LESS ABSENT MEMBERS OF THE ECONOMIC FAMILY									
HI	128	112	156	72	57	0.87	1.40	0.46	0.80
MED	109	86	110	42	30	0.80	1.27	0.38	0.71
LO	110	89	92	33	22	0.81	1.03	0.36	0.65
Total	117	98	122	51	38	0.84	1.24	0.42	0.75
PERCENT ABSENT									
HI	2.0%	0.6%	4.3%	2.1%	1.8%				
MED	10.9%	2.2%	17.3%	5.3%	6.2%				
LO	7.9%	0.4%	19.2%	0.5%	8.5%				
Total	5.8%	0.8%	11.5%	2.2%	4.0%				

Data Source: Buck, Chinese Farm Economy, 1930.
Table 2, p. 321; Table 3, p. 324. Number and Age of Members of Farm Families of Specified Relationship to Male Head (Living or Deceased).
Table 16, p. 350. Specified Relationship for Absent Members of the Economic Family

Dataset 2.9.2 A, continued

EAST CENTRAL CHINA — EIGHT LOCALITIES, ABSENT MEMBERS REPORTED FOR FAMILIES IN THREE

Economic Status	N OF FAMILY MEMBERS PER 100 FAMILIES: Head & Brothers	Wife of H&Bro	Son of H&Bro	Son's Wife	GrSon of H&Bro	RATIOS OF FAMILY MEMBERS: Wife/ H&Bro	Son/ Wife	Son's W /Son	GrSon/ Son's W
ALL FAMILY MEMBERS — MEMBERS PER 100 FAMILIES									
HI	122	103	143	51	33	0.84	1.39	0.36	0.65
MED	124	103	120	32	14	0.83	1.16	0.26	0.44
LO	114	100	143	31	18	0.87	1.44	0.22	0.57
Total	121	102	135	40	24	0.85	1.32	0.30	0.59
LESS ABSENT MEMBERS OF THE ECONOMIC FAMILY									
HI	119	103	130	51	32	0.87	1.27	0.39	0.64
MED	121	103	113	30	14	0.85	1.09	0.27	0.46
LO	113	99	142	31	18	0.88	1.43	0.22	0.57
Total	118	102	127	40	23	0.86	1.24	0.31	0.58
PERCENT ABSENT									
HI	2.6%		8.7%	0.3%	2.1%				
MED	2.2%		5.8%	4.0%					
LO	1.2%	0.4%	1.2%	1.1%	2.0%				
Total	2.2%	0.1%	6.1%	1.4%	1.7%				

EAST CENTRAL CHINA — THREE LOCALITIES REPORTING ABSENT MEMBERS OF THE ECONOMIC FAMILY

ALL FAMILY MEMBERS									
HI	112	102	148	66	43	0.91	1.45	0.44	0.65
MED	119	94	119	28	10	0.79	1.27	0.23	0.37
LO	119	102	134	38	22	0.86	1.31	0.29	0.57
Total	117	99	132	42	23	0.85	1.33	0.32	0.55
LESS ABSENT MEMBERS OF THE ECONOMIC FAMILY									
HI	103	102	113	65	41	0.99	1.11	0.57	0.63
MED	115	94	110	26	10	0.82	1.17	0.24	0.40
LO	117	102	131	38	21	0.87	1.29	0.29	0.56
Total	112	99	117	41	22	0.88	1.19	0.35	0.55
PERCENT ABSENT									
HI	7.9%		23.3%	0.8%	4.6%				
MED	3.1%		7.8%	6.0%					
LO	1.6%	0.5%	1.7%	1.2%	2.1%				
Total	3.9%	0.1%	10.9%	2.3%	3.0%				

Dataset 2.9.2, continued

B. Analysis of Age of Family Members Present in Household

Economic Status	AVERAGE AGE OF FAMILY MEMBER: Male Head	Wife of Head	Married Son	Son's Wife	MARITAL GAP: Head - Wife	Son - Wife	GENERATION GAP: Head - Son 1st-2nd	Son - Grandson 2nd-3rd	Diff-erence
NORTH CHINA									
HI	45.5	43.0	27.1	26.4	2.5	0.7	18.4	20.2	1.8
MED	43.4	40.8	26.3	26.2	2.5	0.1	17.1	20.1	3.0
LO	43.0	40.0	27.5	25.3	3.0	2.3	15.4	19.9	4.5
Total	44.2	41.5	27.0	26.1	2.7	0.9	17.2	20.0	2.8
EAST CENTRAL CHINA									
HI	40.2	37.6	26.0	25.1	2.6	0.9	14.2	21.0	6.8
MED	40.3	39.3	25.4	24.6	0.9	0.8	14.8	21.5	6.6
LO	42.6	39.1	24.3	22.5	3.5	1.8	18.2	18.7	0.5
Total	40.8	38.5	25.5	24.7	2.3	0.8	15.3	20.6	5.3

Data Source: Buck, Chinese Farm Economy, 1930.
Table 3, p. 324. Age of Members of Farm Families of Specified Relationship to Male Head (Living or Deceased).
NOTE: Age given in source only for members of the economic family who are present.

Dataset 2.9.2, continued

C. Comparison of Reproduction of Head of Household and Brother of Head, by Economic Status of Locality

Economic Status	HeadlBro /100 Families	Wives /Head lBro	Sons /Head lBro	Sons/ HeadlBro Wife	Sons' Wives/ Son	Age of HeadlBro Wife	Age of Sons Present	% of HeadlBro Absent	% of Sons Absent
NORTH CHINA — EIGHT LOCALITIES WITH INFORMATION ON ABSENT MEMBERS OF THE ECONOMIC FAMILY									
LINE OF HEAD OF FAMILY									
HI	100.0	0.89	1.63	1.84	0.42	43.0	17.9	0.3%	4%
MED	98.4	0.81	1.35	1.66	0.32	40.8	15.8	4.3%	17%
LO	98.4	0.80	1.15	1.43	0.29	40.0	16.1	0.7%	19%
Total	99.1	0.84	1.39	1.65	0.36	41.5	16.9	1.2%	12%
LINE OF BROTHER OF HEAD OF FAMILY									
HI	30.7	0.77	0.73	0.95	0.18	32.5	12.1	7.3%	2%
MED	23.3	0.35	0.47	1.33	0.14	32.7	12.9	38.3%	14%
LO	20.6	0.51	0.46	0.90	0.08	29.9	7.0	42.1%	19%
Total	25.3	0.61	0.60	0.97	0.15	31.8	11.1	23.9%	8%
EAST CENTRAL CHINA — EIGHT LOCALITIES, ABSENT MEMBERS REPORTED FOR FAMILIES IN THREE									
LINE OF HEAD OF FAMILY									
HI	99.8	0.90	1.43	1.60	0.35	37.6	15.8	2.3%	8.7%
MED	100.0	0.92	1.20	1.31	0.26	39.3	14.7	0.0%	5.8%
LO	98.9	0.88	1.45	1.65	0.20	39.1	13.0	0.4%	1.2%
Total	99.7	0.90	1.36	1.51	0.29	38.5	14.8	1.1%	6.1%
LINE OF BROTHER OF HEAD OF FAMILY									
HI	22.2	0.61	0.36	0.58	0.07	23.8	7.2	4.0%	0.0%
MED	23.8	0.49	0.38	0.77	0.00	24.8	9.9	11.6%	0.0%
LO	15.5	0.82	1.55	1.89	0.13	35.0	12.6	6.8%	2.9%
Total	21.2	0.60	0.56	0.93	0.08	30.7	10.3	7.2%	1.3%

Data Source: Buck, Chinese Farm Economy, 1930.
Table 2, p. 321; Table 3, p. 324; Table 16, p. 350.

NOTES: All members of the economic family are included in this table.
A few male heads of household are deceased & unreplaced, so number is not always 100.

We can see in Dataset 2.9.2 A, first page, that the HI localities in the North have far more heads of family and brothers than do the LO localities; these HI adult males also are matched with more wives, and have nearly 45% more sons. In terms of sons per wife, however, the HI group falls just a little behind the MED group. Again for the next generation, more HI sons are paired with wives, and their wives have more male offspring. High reproduction for the North HI group is loud and clear. No doubt LO brothers and sons tend to marry later, and, in the absence of property to give them a material stake in the joint family, leave the household more easily. And since it is mainly the brothers and sons (married or not) of the MED and LO groups who are temporarily absent in labor, if absent members of the economic family are left out, the relative dearth of male kin is even starker.

Not so clear for the East Central localities, shown on the next page of the table, first all eight localities, and then just the three for which absent members of the economic family were reported; however, those three localities contain half the population of the East Central study. The East Central LO group has the smallest number of heads and brothers, but they are matched with a few more wives, and these wives bear sons on a par with the HI group. The result is a U-shaped relationship of economic status and reproduction, with the MED group perhaps rationing the number of sons who must share a limited patrimony. The prolific reproduction of the LO group, mostly tenants, does not fully repeat in the following generation as it does for the North HI group, though: the sons are not matched with wives nearly as much as the East Central HI group, and the wives also fall a little short of the number of grandsons produced by the HI group. Since those temporarily absent are more commonly heads and their sons of the HI group, who are known for Kiangning, Kiangsu, to be engaged in trade, their exclusion accentuates the appearance of relatively higher reproduction for the LO group.

I wish to mention here the possible role of matrilateral relatives, less conventional means for aggregating family labor. The source table in Chinese Farm Economy for members of the family in relation to the head provides minute detail on relatives not generally considered to be part of the patrilineal family, such as sister's husband and wife's mother. In some surveys they would be called non-family household members, although uxorilocal marriage is not uncommon and is within the customary tradition, according to Wolf's study on Taiwan. For simplicity I have added together all such maternally or uxorilocally related family members, merely distinguishing them by male or female. The numbers are in the last column of Appendix B. There are barely one

of two such members per 100 families, according to the survey, but they may be significant in highlighting some features of the Chinese family. There are nearly twice as many matrilateral relatives in the East Central localities as in the North. Male matrilateral relatives such as daughter's husband are most numerous for the MED groups, where farm sizes suffice to employ more family labor, and almost absent from the HI groups, where another claimant to property might be resented. Female matrilateral relatives, some of whom seem to be older dependents, cluster in the LO groups.

Dataset 2.9.2 B seeks to find some further clues to the life cycle pattern by analyzing the ages of the family members. Although the average of the age blankets many divergences, it still gives us a fuller picture by which to imagine the family. It is of course also advisable to see whether there is any difference in age of head of household that would indicate that the life cycle was shifted in phase between different economic status groups. The age of the head averages 44.2 years in the North, and 40.8 years in the East Central localities; this sizeable difference of 3.4 years may reflect the effect of sons being tied to the inheritance of land for livelihood, retarding division of the household. This factor is no doubt also significant in differences in age of head within the North, where the HI group is over two years older than the other two groups. In contrast, the LO group in East Central is two years older relative to MED and HI. In general, there are greater numbers of sons for the older heads, though it is likely that the LO East Central group does not enjoy the head start in marriage age that the HI North group does.

This is the next item to examine. As seen in Gamble's data on marriage age in Ting Hsien, Hopei, if the husband's age is close to the wife's, early marriage is implied: rich landowners marry their sons in early puberty to 18-year old girls, hoping for grandsons (thus narrowing the average age gap for the group); while hired laborers cannot marry until perhaps mid-thirties, if then. In the table we see that LO groups both North and East Central have the highest age gap for head of household and his wife, and this pattern is repeated for the next generation as well, son and his wife.

Looking to the age gap between generations, we can see that the gap runs parallel to the numbers of sons, i.e. more sons means a longer reproductive span has already passed by, and thus the average age of sons is lower relative to the age of the father. (We do not know the age of just the first son, or age at marriage, to figure the minimum for the generation. Moreover, since the data for age of male head includes those whose sons have not yet married, the gap is probably not as long as a generation.) But it would seem that

an earlier age of marriage for the head might counter this lengthening. In addition, the sons shown in this table are only the married sons; married sons are listed separately from unmarried sons in the published data only for sons of the family head. So the larger age gap might also mean that more younger sons have already married, i.e. lower age of marriage. Both the first-to-second and second-to-third generation gaps are longest for the HI group in the North; for East Central, the LO group is longest for the first-to-second generation but shortest for the second-to-third generation. This provides some confirmation that the pattern of reproduction seen in Dataset 2.9.2 A is not a fluke caused by random effects.

Let me draw one further comparison between the North and the East Central localities. The second-to-third generation gap is about the same for both regions, twenty years, but the first-to-second gap is 17.2 years for the North and 15.3 years for East Central. So the difference between the length of the two "generations" is 2.8 years for the North and 5.3 for East Central. The patterning of this gap by economic status within each region is the obverse of reproduction of sons, i.e. the gap is lower where reproduction is higher. The gap is abruptly narrowest, only 0.5 year, for the East Central LO group, largely tenants. Speculating on this intuitively, I would say that it might reflect tenants tending to marry slightly later, probably only if they can get a rental tenure, but then reproducing labor power as much and as long as possible; while groups that own significant land restrain later reproduction slightly. On the other hand, the situation in the North, with a lower overall standard of living and nutrition, reflects most directly the difficulty of many smallholders in reproducing.

This does not mean that property owners in the North have no concern for the viability of their heirs' estates. Let us examine Dataset 2.9.2 C, which differentiates between the line of the head of family and the line of his brothers in examining marriage, reproduction, and absence from the economic family. The number of the first generation fathers, whether heads of family or their brothers, is given in the first column of the table in terms of number per 100 families. There are not quite 100 male heads of household, because according to the procedure of the survey a very few were recorded as deceased heads, evidently not yet formally replaced; the survey did not allow for female heads. The number of brothers in the household vary somewhat. There are clearly more for the HI group in the North, and fewer for the LO group in East Central. But although these are both high-reproducing groups, the roles of brothers in the two cases seem to be quite different, as we shall see. The overall picture is of slightly restrained

reproduction for brothers, relative to their sibling heads of family, for the HI North, but a rampant rush to multiply for the LO East Central.

Take first the matching of heads and their brothers with wives. HI group heads in both regions are generally accompanied by wives; the LO group heads fare a little worse. In the North, three-fourths of HI group brothers are married, much better than the MED or LO groups. Of course the fact that brothers are almost certainly younger than the head of the family shapes this, that is, many may not yet have reached marriage age (married and unmarried brothers are combined in the source data; the age of brothers can be seen in the Appendix, averaging 29.1 years in the North and 27.7 years in East Central, about 15 years younger than heads); but the great difference in number of wives per brother rather suggests that only those in the HI group in the North can marry in a timely fashion. In contrast, 82% of East Central LO group brothers are married, close to the 88% for heads; this is a much higher portion than for MED and HI groups.

When we look to numbers of sons, either per brother or per brother's wife, the picture is even more startling. Brothers' wives of the East Central LO group each have over three times as many sons (1.89/.58 = 3.26) as those of the HI group, and in fact even a little more than their sisters-in-law who are wives of heads. They may well be preparing to make their own grab for expansion of rented land holdings when the joint family breaks up. There is some indication that the LO younger brothers may marry even earlier than the heads: LO brothers' wives are only four years younger (39.1 - 35.0 = 4.1) than LO heads' wives, compared with 14 years younger for the MED and HI East Central groups.

The brothers of head of family fare very differently in the North localities. Both heads and their brothers in the HI group have many more sons than those in the LO group. But whereas the HI wives of head have also borne the most male children (1.84 each), HI brothers' wives have borne only half that, 0.95 each, and that falls 30% short of even brothers' wives in the MED group, who happen to be the same age. It would appear that the prevalence of joint families for the HI group is accompanied by a damping of reproduction — though not marriage — for the subsidiary line of descent. We might also note in passing that one of the HI localities, Su in Anhwei province, has a considerable number of families collecting rents, and these are 34% of non-farm income for the whole sample. Property holds the joint family together, but for rentiers more family members mean more consumption rather than more labor power.

The last two columns to examine in Dataset 2.9.2 C cover percent of heads, brothers, and their sons who are absent from the family. Percent absent for each category of family member is to be found in Appendix B. For the North it is of course mostly the LO group that sends its members out to earn money, since the farm often provides neither enough work nor income. Only a few heads of family are absent, but 40% of brothers in the MED and LO groups are absent. Similar numbers of sons of heads and brothers are absent, both 19% for the LO group, but since brothers' sons are several years younger, the percent is still a higher portion for brothers' sons of working age. We might suspect that peripheral persons in the family structure, e.g. brothers and their sons, tend to get spun off. But the figures are still surprisingly high for married sons of the head; in the LO group over half are absent.

For the East Central localities also more brothers are absent than heads, especially for the LO group, but there is a notable divergence in pattern by economic status due to the fact that one of the three localities for which absent members of the economic family are reported, the Kiangning (S) sample in Kiangsu province, has considerable remittances from absent members who are traders.[20] This sample is ranked in the HI group; from the detailed figures in Appendix 2, it appears that some of the absent men are accompanied by their wives, no doubt a high-income phenomenon. Another sample in the same county, Kiangning (T), is ranked LO and has no traders and few absent members reported. However, I will contend below in discussion of the age-sex distribution that many more men are ejected from the agricultural sector, and especially its poorer realms, that are reported continuing as absent members of the family.

Population Pyramids: Migration of Males and Transfer of Women Among Economic Classes

The family composition data provides a human face for the dismal science of economics. However, the standard for demographic analysis is the composition of the population by age and sex, which even in the absence of vital statistics of births and deaths gives some

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20 "It is well-known that many members of the villages studied in Kiangning (S) are absent and are engaged in trading in the big cities along the Yangtze from Shanghai to Hankow. Eighty-three per cent of other income is from these absent members and it (non-farm income) averages $138 per family for the 43.8 per cent of families having such income." (Buck 1930, p. 100.).

indication of the processes and history of the population. In Chinese Farm Economy the population is broken down by five-year age groups and sex for each locality, and the same is also given for absent members of the economic family. So it is possible to combine the locality data into HI, MED, and LO groups, as was done for the family composition data.

To set the data for each locality sample to a common standard despite the variation in sample size, I have calculated each age-sex group in terms of persons per thousand population. This is per thousand population both male and female, so the original proportions between the sexes are maintained; the standardized total may show then, for example, 541 males and 459 females. The numbers are given in Appendix C. Since the original N of persons for the total population is also given, it is possible to recover the original data without looking up the source. But it is more useful to be able to compare the size of age groups in the standardized form; the table also gives absent members of the economic family and percent of each age group absent in this form (for males only, since the number of absent females in negligible).

But it is difficult to intuitively grasp the meaning of so many numbers printed on a page, and so I have rendered all of this data as population pyramid charts, which I hope the reader will grasp at a glance. The age groups are 0-4, 5-9, . . . 70+; the researchers subtracted one year from the Chinese reckoning of age collected in the survey, to render age in Western calendar years, so clustering occurs on 9, 19, 29, etc., rather than 10, 20, 30, and this contributes slightly to unevenness of the pyramids. All of the population pyramid charts here are on the same scale, to facilitate visual comparison. Since each age-sex distribution was standardized to persons per thousand, the total area of all the bars is the same for each; and since we do not know the proportions of those of different economic station in the whole population of China at that time, there is no point in doing this otherwise. If one portion of one cohort of the population is missing, the remaining cohorts will appear proportionately larger as a percent of the population present. It is important to remember then in comparisons between pyramids that the overall shape, not the length of any one bar, is what is significant.

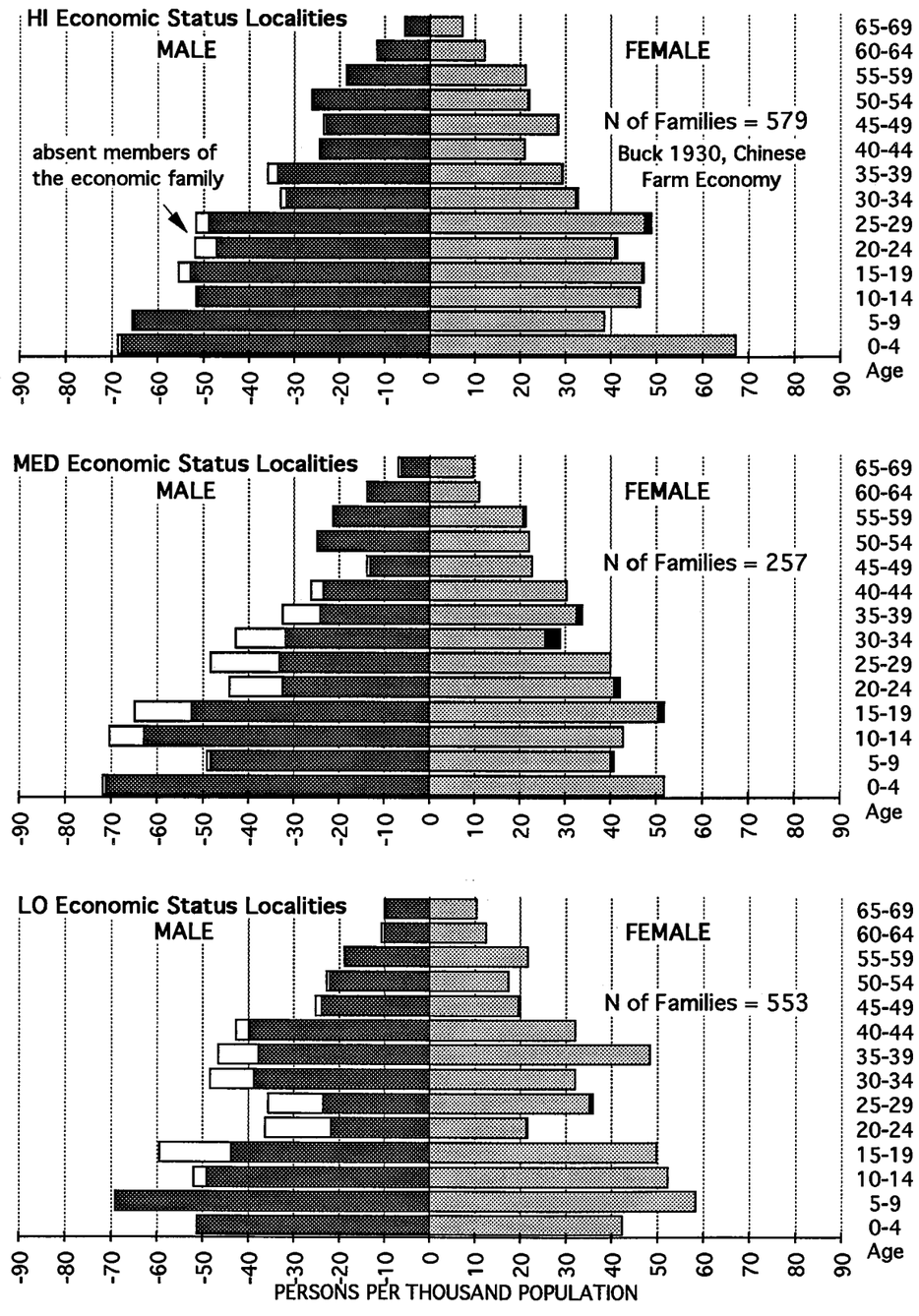
According to the usual conventions of population pyramids, the youngest group is the bottom slab of a structure like a wedding cake, and, for a population that delivers the same number of babies every year, the size of the older groups in the layers above implies the rate of dying off. However, rapid population growth, i.e. more babies being born every year, will also produce a pyramid with a wider base, as is commonly seen in

the contemporary developing nations. Aside from these basic factors of natality and mortality, a population pyramid may reflect continuous processes of migration due to employment and marriage, as well as cataclysmic events. As a convention in these charts, light bars representing females extend to the right, and dark bars representing males to the left; the contrasting black for females and white for males at the ends of the bars represent absent members of the economic family. For the purposes of computerized charting, the male scale had to be labelled with negative numbers, but plainly it does not represent negative numbers.

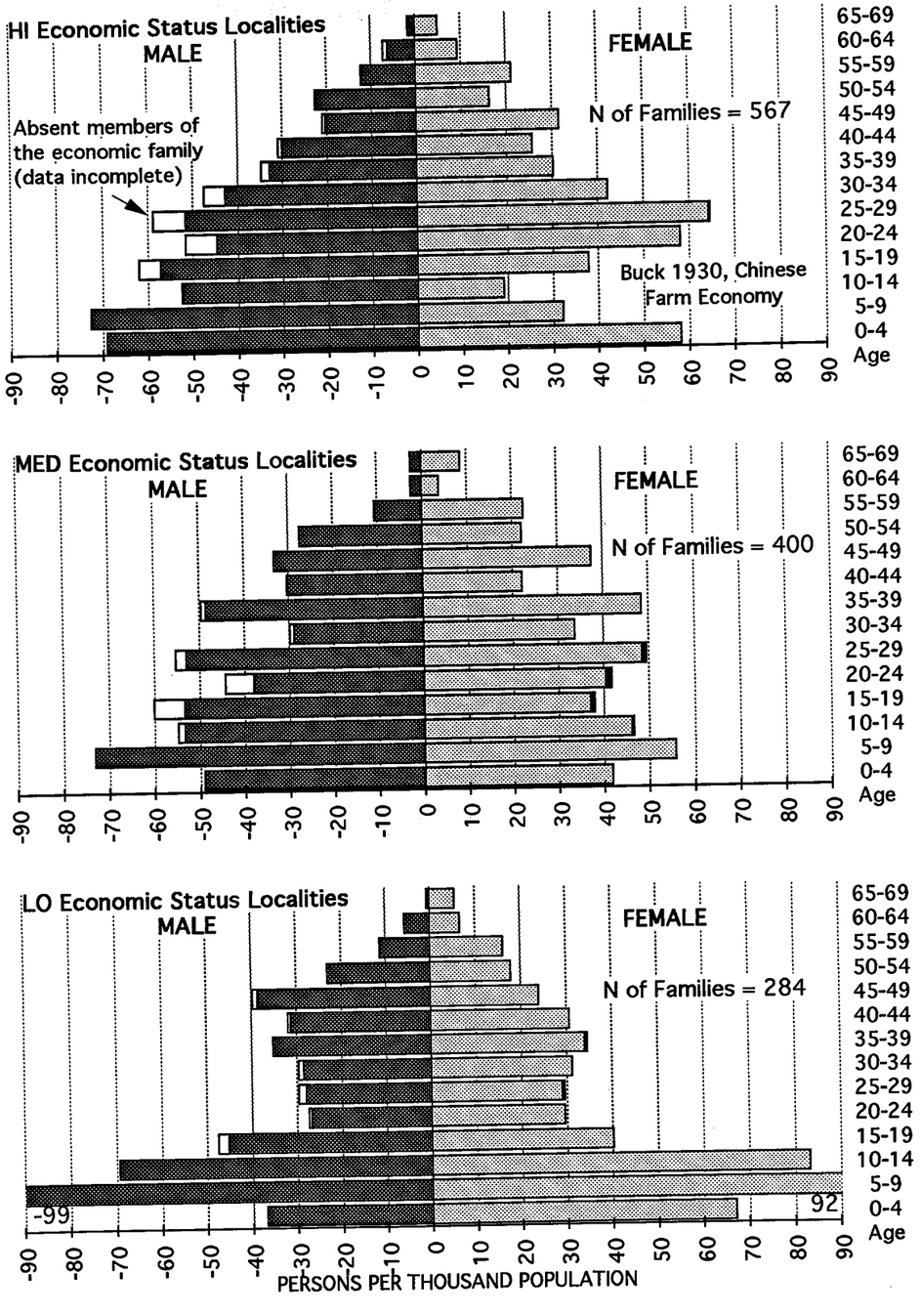
In the following charts, the HI, MED and LO groups summarized from eight North China localities are aligned on one page, and the same for eight East Central China localities on the next (Dataset 2.9.3 A and B). Since absent members of the economic family were incompletely surveyed for the East Central localities, a separate third page (Dataset 2.9.3 C) presents just the two samples for Kiangning hsien, Kiangsu province, where absent members of the economic family were recorded and where it just happens the two samples were quite disparate in economic standing. This locality appears to be a relatively rich, commercialized county on the Lower Yangtze, and here the contrast between rich and poor samples, as seen both in economic data and in the age-sex distributions, seems to be most extreme. The last population pyramid, Dataset 2.9.3 D, represents the age distribution for the hired laborers caught in the household survey (North and East Central together, not separated in the source data). It is only a fragment of a pyramid, in that it is not a self-reproducing population, but it bears comparison with the absent members of the economic family that are marked on the other population pyramids. The scale for the hired laborers has been rendered in proportion to that in the previous charts, i.e. the total number of male laborers and servants enumerated was 663, and that is equivalent to 42.6 laborers per thousand family members.

Let us examine the North China chart first. We will ignore the irregular 0-4 age group for the time being in this discussion. The HI group in the North is a fairly standard pyramid with a broad base, perhaps a sign of growing population and/or a regular rate of mortality, except that there is a slight shortage of women in the ages 5-9 through 20-24. It is in fact rather puzzling that the number of women increases after that to age 25-29. The MED group is similar but thinner on the female side; a great many men age 15-19 through 35-39, peak working age, are absent from the family, and a noticeable number of women also. For the LO group, the pyramid starts narrower, and then both men and women disappear for the peak reproductive years, 20-29; 37% of men in this

Dataset 2.9.3 A Population Pyramids for Localities Grouped by Economic Status: North China

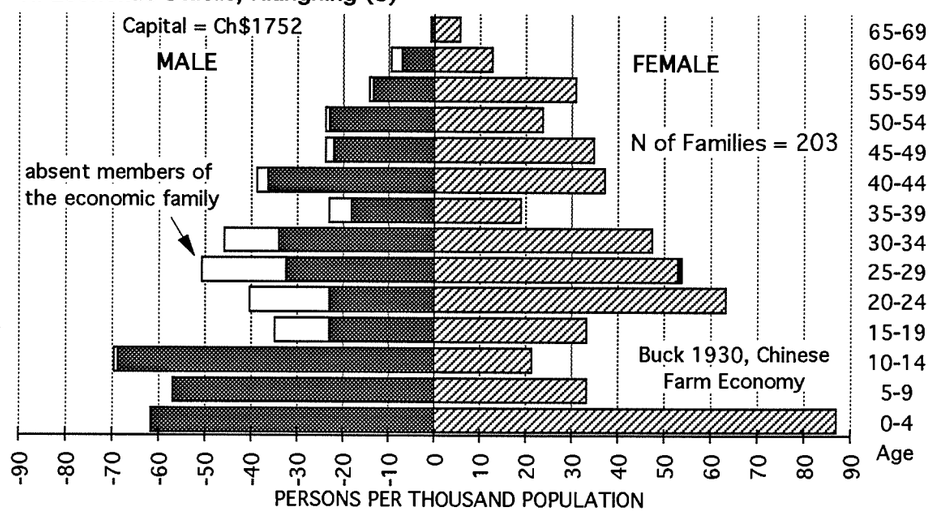


Dataset 2.9.3 B Population Pyramids for Localities Grouped by Economic Status: East Central China

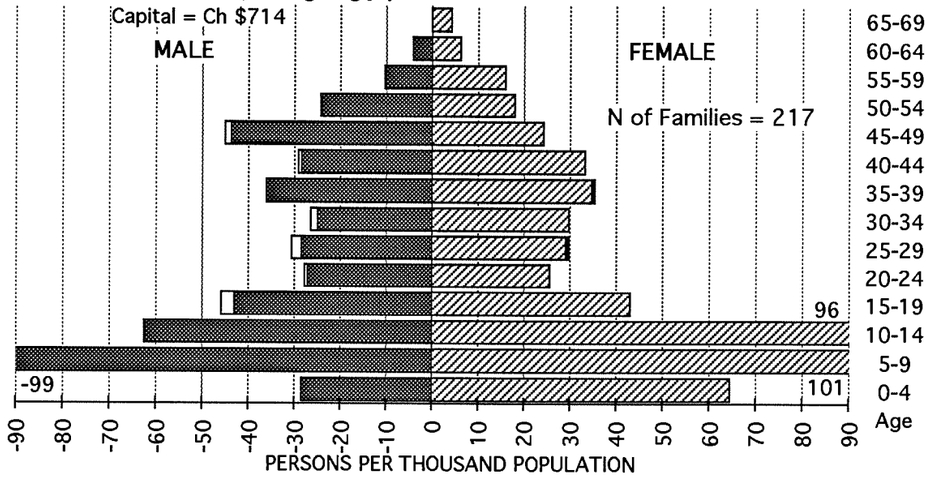


Dataset 2.9.3 C Population Pyramids for Samples in Kiangning, Kiangsu, East Central China, with Data on Absent Family Members

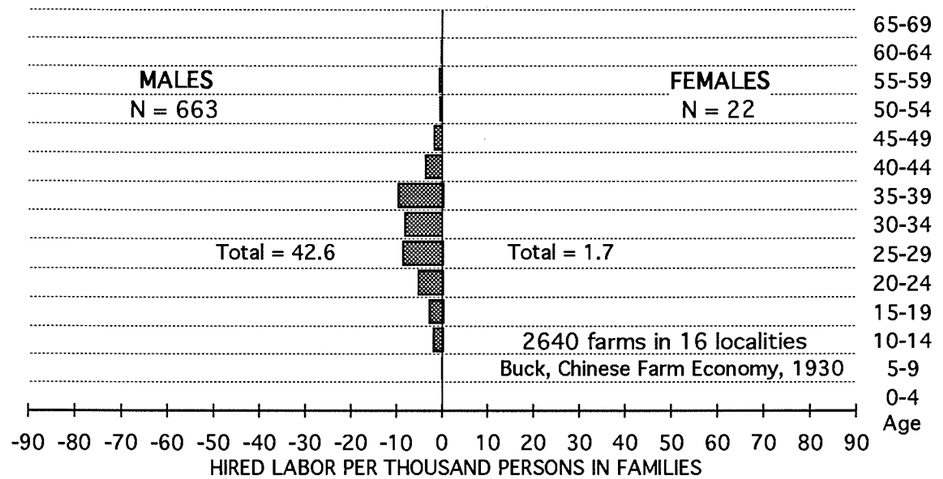
HI Economic Status, Kiangning (S)



LO Economic Status, Kiangning(T)



Dataset 2.9.3 D Age-Sex Distribution for Hired Laborers and Servants in 2640 Households, North and East Central China



cohort are reported as absent members of the family, but from the shape of the pyramid it would appear that at least that many more have not been reported. At older ages the number of men again increases, and it appears as if the weary migrants are finally coming home to rest. The older dependents are a large portion of the LO population.

A similar progression is apparent in the East Central chart, with much more drastic markings. The HI group pyramid starts with a broader base than HI North, at least for males. Little girls disappear steadily until at age 10-14 they are outnumbered by boys nearly three to one. From that nadir they rebound until they even outnumber young males. There is no major disturbance for the HI male population, though some are absent. The MED group pyramid is narrower and somewhat irregular, probably largely due to clustering in years that end with 9. The LO group pyramid starts with an extremely wide base, both males and females, but then both disappear at age 15-19 and 20-24, with only a little recovery at age 35-39. About the same contrast but more accentuated is found when Kiangning (S) from the HI group and Kiangning (T) from the LO group are singled out for comparison. Kiangning (S), the HI locality, has only 21 girls age 10-14 per thousand population, but 63 women age 20-24. Kiangning (T) is conspicuous for a number of girls in the age bracket 5-14 that falls off the chart, but then largely vanishes at marriage age. Since both of these samples are from within the same county, there is no reason to suspect this difference is due to some geographical variation or bizarre local custom. Rather, they may be two parts of an interlocking puzzle, two sides of a symbiotic relationship between economic strata. However, I wish to tantalize the reader here rather than rushing to conclusions; after a more thorough perusal of the pieces, following, I will assemble the whole puzzle in section 2.10, "The Whole Picture, On the Ground".

Before leaving these charts I would like to point out a feature that is consistent but that I cannot fully explain. That is the variation in the 0-4 age group. Almost all population surveyors of the time say in their texts that infants and small children are underreported; and some mention superstitions about avoiding the spirits' jealousy over the birth of a boy, so the misfortune of the birth of a girl is feigned. None of that explains the variation by economic status which is seen consistently for North China, East Central, and also the two contrasting samples in Kiangning, Kiangsu. The HI groups report much larger numbers of little boys than do the LO groups. The effect is particularly noticeable for East Central groups: for the 0-4 age group, HI has 69 boys per thousand population, MED has 49, and LO has 37. (Meanwhile, LO has the most

girls, as anticipated.) We might think that this correctly reflects lower birthrates for the poorer groups, but we have already seen the large number of sons for this LO group, and the 5-9 age group has 99 boys. We might suppose that the LO groups vastly underreport small boys, but why this should be so is not evident. A pattern of sale of boys cannot be ruled out.

Some features of the age-sex distribution, sex ratios and the relative proportions of age cohorts, are summarized in Dataset 2.9.4 A and B. The left five columns give sex ratios for the ages 0-4, 5-9, 10-14, 5-14 (a combined age category for pre-marriage age, to smooth out random irregularity that is magnified in ratios), and 20-39 (young adulthood, the period of maximum reproduction). The next two columns carry the analysis of sex ratios to the relative numbers of family members, unmarried sons per unmarried daughters, and grandsons per granddaughters. All sex ratios are stated in males per 100 females. The last two columns are, for males and females respectively, the numbers in the cohort age 20-39 divided by age 0-9. This provides a summary for the proportions of the population pyramid, a rough measure of how many remain (or are newly present) from childhood to adulthood.[21] For these small locality samples this generation ratio seems to reflect movements of population segments, i.e. marriage for women and travel to labor for men, more than natality and mortality alone.

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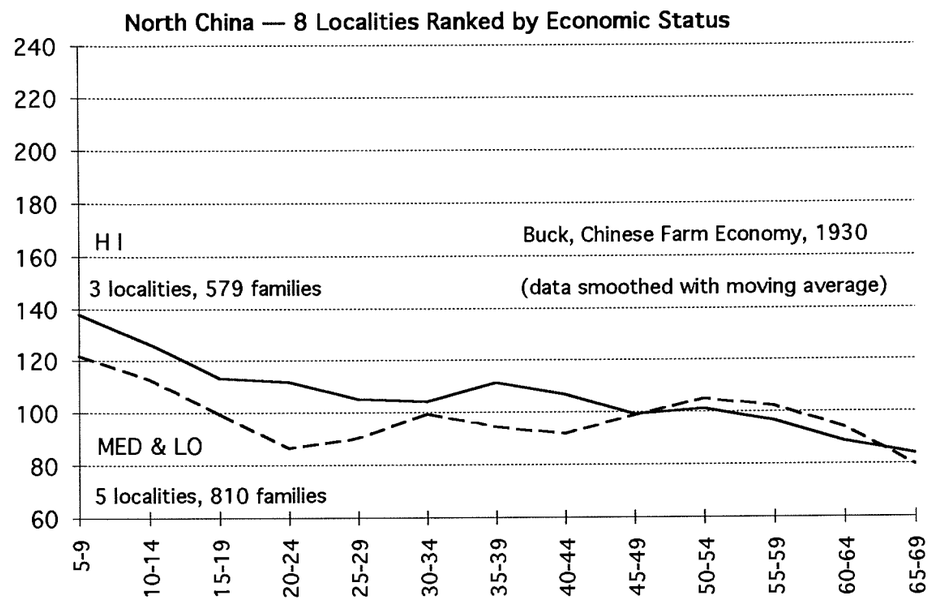
21 The average of this measure for males for the whole survey is about 1.3; to be precise, 17.0% of the male population falls in the age range 20-39, and 13.1% are age 0-9. Age 0-9 does not seem to be a wide enough cohort for the younger group, and it would be better to use 5-14, but the age 0-9 is calculated here to facilitate comparison with other surveys for which we have age-sex distribution by decades only. Soon past age 14 the transition to adult roles begins for much of the population, and if these ages were included the results would be difficult to interpret.

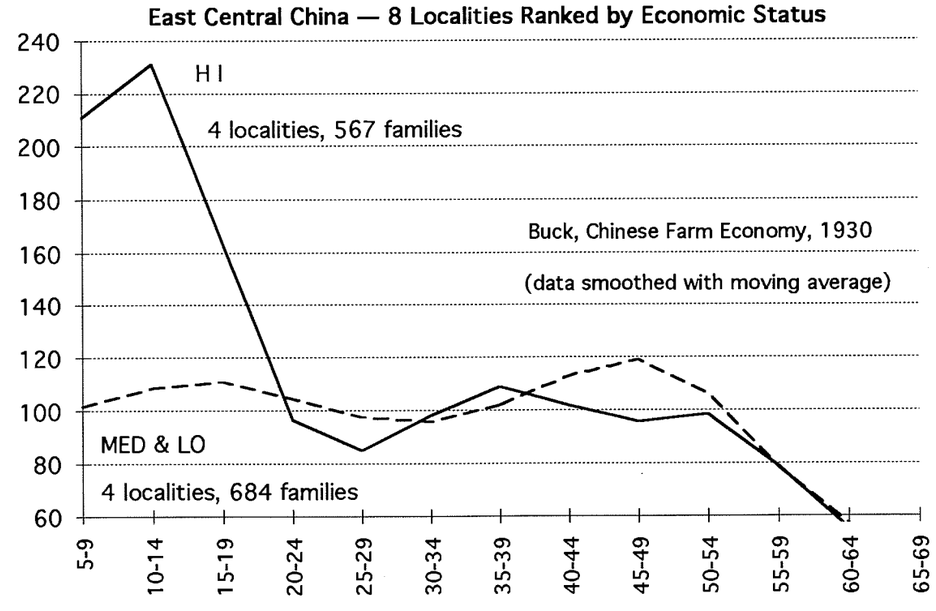
Dataset 2.9.4 A Sex Ratios and Generation Ratios, by Economic Status of Locality — Buck, Chinese Farm Economy, 1930

Economic Status	SEX RATIOS BY AGE MALES/100 FEMALES Age 0-4	Age 5-9	Age 10-14	Age 5-14	Age 20-39	SEX RATIOS OF FAMILY MEMBERS Unmarried Sons/Das	Grandsons /Granddas	GENERATION RATIO Age 20-39 / Age 0-9 Male	Female
NORTH CHINA — EIGHT LOCALITIES WITH INFORMATION ON ABSENT MEMBERS OF THE ECONOMIC FAMILY									
ALL MEMBERS OF THE ECONOMIC FAMILY									
HI	102	170	111	138	113	126	156	1.29	1.44
MED	139	120	165	143	116	115	165	1.39	1.57
LO	121	118	99	109	121	117	153	1.39	1.37
Total	113	140	115	127	116	121	156	1.33	1.44
LESS ABSENT MEMBERS OF THE ECONOMIC FAMILY									
HI	101	170	111	138	108	126	154	1.21	1.42
MED	137	121	147	134	88	115	158	1.02	1.51
LO	121	118	94	107	89	117	140	1.01	1.36
Total	112	140	110	125	98	121	151	1.12	1.41
EAST CENTRAL CHINA — EIGHT LOCALITIES, ABSENT MEMBERS REPORTED FOR FAMILIES IN THREE									
ALL MEMBERS OF THE ECONOMIC FAMILY									
HI	119	225	275	244	99	158	238	1.36	2.16
MED	117	131	118	125	103	118	200	1.46	1.78
LO	55	107	83	96	97	87	98	0.90	0.79
Total	99	146	132	140	100	120	186	1.27	1.56
LESS ABSENT MEMBERS OF THE ECONOMIC FAMILY									
HI	119	225	274	243	88	158	233	1.21	2.16
MED	117	131	116	124	98	119	200	1.38	1.75
LO	55	107	83	96	95	87	96	0.88	0.78
Total	99	146	131	139	93	120	182	1.17	1.55

Data Source: Buck, Chinese Farm Economy, 1930, Table 10, pp. 337-9 and Table 14, p. 347. Also Table 16, p. 350.
NOTES: Married, unmarried children of head of family are listed separately in source. Sex Ratio is for unmarried only: average age10.1 years for sons, 9.1 for daughters. Grandsons/Granddaughters includes the third generation of both heads of families and their brothers. It is not known whether the grandchildren are married or not, but average age is close for males and females (for heads, 6.2 and 5.2 years).

Dataset 2.9.4 B Sex Ratios by Age for Members of the Economic Family Present in Household, by Economic Status of Locality





It is easy to see from the table that sex ratios were very high in the pre-marriage ages, and higher for East Central than for North China — 127 and 140 males per 100 females respectively for the age group 5-14. However, this is a small gap compared to that within each region by economic status of locality: for the North the HI group is 138, the LO 109; for East Central the HI group is 244, the LO 96. The extremely high sex ratios for the HI groups are also confirmed and given more texture in the analysis of sons/daughters, figured from the relationship of family members to head tables. To repeat, there is overall an excess of males in each region for the pre-marriage ages, and aside from this there is an uneven distribution of girls among localities of different economic status.[22] And both phenomena are more severe for East Central China than for the North. I emphasize the pre-marriage age sex ratio, because this is the best quantified indicator we have of the brake on reproduction for men, especially as it varies by class. The sharp reversals in sex ratio over the life cycle must also lead to

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[22] Rozman's thorough study of sex ratios in Ch'ing Hsien, south of Tientsin in Chihli around 1850 likewise found that childhood sex ratios varied much more over localities than did adult sex ratios. Much of his analysis and results are parallel to that presented here, though without a unifying theoretical framework. The areas in which sex ratios dropped most from childhood to adult years (which could be due to an influx of women) tended to be in the more densely populated and commercialized areas around the Grand Canal (Rozman 1982, pp. 51-57, including Map 3.2). A further point from Rozman somewhat relevant to the following discussion in section 2.10 is that he found overall sex ratios correlated with population density among prefectural units within Szechwan around 1820.

We need not think that such variation in child sex ratios was due only to female infanticide or neglect, or that they necessarily indicate a rigid pattern in which the well-to-do always practiced the most female infanticide. James Lee's work has shown a complex socio-economic patterning — even in relation to fluctuation in grain prices — that influences whether girls are allowed to survive (Lee and co-authors, 1992, 1993), while in general richer peasants raise more boys in absolute numbers and proportionally by sex (see quote in section 1.4).

In this regard a small piece of information from the Notestein archive's Machine Table No. 8 on infant mortality is suggestive. Infant mortality was estimated from number of infants found in the survey census, and the number reported born in the last year. Of course infants may have disappeared for reasons other than death. Out of the fifteen localities surveyed in Szechwan, the sample in Chungking county (high product per capita, rented land prevalent with high rents), around the major city, was the only one where boy infants disappeared in inordinate numbers. Fifty-five males and 33 females were reported born in the year of the survey (167 M/100 F, obviously not a natural sex ratio). Twenty-two infant boys and 21 infant girls were found present at survey. So 60% of boys and 36% of girls were missing. For the other fourteen localities 12.7% of infant boys and 10.1% of infant girls disappeared out of 339 and 270 infants, respectively (126 M/ 100 F), a modest rate for infant mortality. This leads to the suspicion that the Chungking sample farm households practiced both much female infanticide and much sale of male children.

suspicions that portions of the population disappear and reappear. In Dataset 2.9.4 B the sex ratios for North and East Central are charted, both on the same scale, for ages 5-9 through 65-69; for the chart they have been smoothed considerably according to the weighting 1/4 for the previous age group, 1/2 for the labelled age group, and 1/4 for the following age group. I have used members of the economic family present in the household for these charts, because most surveys do not pick up those absent. The original numbers can be seen in Appendix C, Age and Sex Distributions by Economic Status of Localities. The sex ratios for the HI groups are contrasted with those for the MED and LO groups together. Perusing these charts carefully, one can see several differences between HI and MED & LO that are common to North and East Central, such as a mid-life elevation of sex ratios at about age 50 for MED & LO, whereas the HI group peaks at 35-39. Perhaps this is the age at which wanderers return home. But the pre-marriage age sex ratios are the main concern in this discussion. The HI group in the North has a somewhat higher young sex ratio than MED & LO, but this is only a fraction of the divergence seen for the East Central groups. There is a vast excess of males at age 10-14 for the East Central HI group, but these cohorts are suddenly matched with women when they arrive at marriage age. We will work through more data to resolve this apparent contradiction.

The "generation ratio" for each economic status group, actually the ratio between cohorts, is a more oblique measure than sex ratios, and only relevant in comparison with the total population's experience of births and deaths, but it is still a useful summary indicator. On the side of women, in the North all groups have more women for the twenty-year 20-39 age cohort than for the ten-year 0-9 age cohort, but the LO group has a slightly lower ratio than the average, i.e. the HI and MED groups have gained relatively more women in marriage than they have given out. For the East Central survey, the difference between economic groups is extreme: the HI group has a female generation ratio two-fifths over the average (2.16 / 1.56 = 138%), while the LO group's is only half the average (0.79 / 1.56 = 51%). The HI group gains many more women in marriage than they raise, while the LO group loses girls precipitously. This pattern is in fact the most constant feature I have seen in all the demographic data for this period.

For men the generation ratio does not vary to such extremes, and is subject to influence by other factors, since men do not usually take up new residence for marriage. For one, the ratio is lowered by a high rate of male births, but it is increased by a high rate of

men staying in the parental home or joint family (and in some other surveys by the presence of hired labor in the household); both effects are features of a better economic base, and could cancel each other out. For the North, the ratio is slightly lower for the HI group, which syncs with the considerably higher number of sons there (review Dataset 2.9.2 A). But when the absent members of the economic family — often adult sons and younger brothers — are removed from the figures, the ratio reverses, showing that the HI groups retain a greater proportion of their males from childhood to young adulthood. For the East Central survey, both HI and LO groups have the same high numbers of sons (both higher than the MED group), but the LO group has a generation ratio one third lower than that of the HI group, implying that a much larger proportion of boys born are lost over time, even though they are not reported as absent members of the economic family.

I will take this analysis one step further with a speculative exercise on the age-sex distributions that estimates how many men or women must have been lost or transferred during the course of life events in order to produce the observed age-sex distributions. Several obstacles must be navigated. One problem with the above generation ratio is that we do not know birth and death rates, i.e. what would be the attrition in the cohort sizes with age even in the absence of emigration; so it does not seem possible to measure what portion of the cohorts are inexplicably lost over time (projecting a progression over years that is reflected in the age-sex distribution), even though visually the gaps in the population pyramids are glaring. With a few simplifying assumptions, it is however feasible to make such an estimate. First of all, we have seen in the data on absent members of the economic family and on hired labor that women very rarely participate in either; I will assume that women always remain in the household, although they are transferred in marriage. Second, and related, I will assume that we can treat the sum of women in all localities of the rural survey as a closed population, although the men are not a closed population. Third, I will assume that the attrition of women from cohort to cohort is tantamount to cumulative mortality over a period of time, and that this is not so different from the mortality of men that it cannot serve as a baseline for the attrition of men's cohorts.[23]

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[23] Barclay, Coale, Stoto and Trussell, 1976, estimated mortality from the unpublished Notestein compilation of Buck's 1937 population survey, based on both deaths reported in the survey year and on the age-sex distribution. They construed from the age-sex distribution that underreporting of deaths was more serious for males than for females, despite the general disregard for females in Chinese society, and were puzzled that "the probabilities of dying between ages 5 and 10, 10 and 15, and 15 and 20 seem high relative to infant and adult mortality" (p. 621). Their estimates ignored the heavily-male non-resident population in the survey, and did not consider the possibility of emigration of males.

Dataset 2.9.5 makes some calculations on the basis of two cohorts of the age-sex distribution, pre-marriage age 5-14 (excluding the erratic 0-4 age group), and young adulthood age 20-39. Absent members of the economic family, who are obviously undercounted in the survey and not inclusive of all missing population, are excluded from the cohorts. The ratio of the two serves as a generation ratio the same as in Dataset 2.9.4 A. The ratio for females for the whole population of each region serves as the standard for what rate of attrition would be expected from the 5-14 cohort (ten years inclusive) to the 20-39 group (twenty years, so of course this broad cohort may still be larger), if the same rate of mortality affected males. Of course with the same rate of attrition the same sex ratio as at age 5-14 would be maintained. To apply a ratio that represents the whole population as reliably as possible, I have calculated it from the age-sex distribution for the much larger 1937 Buck survey (unpublished data in F.W. Notestein archives). The resulting standard ratio is 1.51 for the North Plain Area and 1.56 for the Lower Yangtze and Rice-Tea Areas combined, the latter number fairly lower than the East Central 1.74 ratio in Dataset 2.9.5 — which seems to mean that rich areas that receive women are overrepresented in the Chinese Farm Economy survey here. This does not, however, impede the comparison between localities of different economic status, which is in fact similar in outcome no matter which standard is used. The regional comparison also stands.

The calculation to estimate the gain or loss of household members in the critical transition to adulthood proceeds as follows. Given that the LO group in the North has 118 males per 1000 population in the 5-14 cohort, with normal rates of mortality there should be 178 males within the ages 20-39 (118 x 1.51 — 1.51 is the standard of mortality, the ratio of females in the twenty-year cohort age 20-39 to the ten-year cohort age 5-14, that has been calculated for North China in the middle of Dataset 2.9.5), but there are only 122, 32% less. The same calculation has been carried through for the rest of the table. The result is the two columns on the right side of Dataset 2.9.5, for males and females respectively, showing gain (positive numbers) or loss (negative numbers) more than expected due to normal mortality, in the transition to adulthood.

Dataset 2.9.5 Estimate of Emigration and/or Excess Death Loss from Age 5-14 Cohort to Age 20-39 Cohort, after Attrition set Equal to Female Regional Average — Buck, Chinese Farm Economy, 1930

Economic Status	AGE-SEX COHORTS Age 5-14 Male	Age 5-14 Female	Age 20-39 Male	Age 20-39 Female	Age 20-39 / Age 5-14 Male	Age 20-39 / Age 5-14 Female	EST. GAIN OR LOSS from 5-14 Cohort Male	EST. GAIN OR LOSS from 5-14 Cohort Female
NORTH CHINA								
	ECONOMIC FAMILY MEMBERS PRESENT — PERSONS PER 1000 POPULATION							
HI	117	85	161	150	1.38	1.77	-9%	17%
MED	111	83	121	139	1.09	1.68	-28%	11%
LO	118	111	122	137	1.03	1.24	-32%	-18%
Total	116	93	141	144	1.22	1.54	-20%	2%
NORTH PLAIN	BUCK 1937 — N OF FEMALES 9798	8357	13441	12637	1.37	**1.51**	-9%	0%
EAST CENTRAL CHINA								
	ECONOMIC FAMILY MEMBERS PRESENT — PERSONS PER 1000 POPULATION							
HI	125	51	172	195	1.38	3.80	-11%	145%
MED	126	102	168	171	1.33	1.68	-14%	8%
LO	168	176	119	124	0.71	0.71	-55%	-55%
Total	136	98	157	170	1.16	1.74	-26%	12%
LOWER YANGTZE	BUCK 1937 — N OF FEMALES 7802	5809	9615	8852	1.23	1.52		
RICE-TEA	1521	657	2485	1208	1.63	1.84		
BOTH	9323	6466	12100	10060	1.30	**1.56**	-17%	0%

Data sources: Buck 1930, Chinese Farm Economy, pp. 337-8, and
F.W. Notestein archives Machine Table No. 2, compilation for Buck 1937.

This result is strongly patterned by economic status of locality; for both North and East Central, LO localities lose women and HI localities gain women, and, as before, the pattern is much stronger for East Central. Quite startling, East Central HI localities gain almost one-and-a-half times (145%) more women over those that they raised. East Central LO localities lose over half (55%) of the women that they raised. (It is no inconsistency that these numbers are not complementary, e.g. a HI doubling and a LO halving, because there may be any proportion of LO and HI localities and households in the total population that is exchanging women.) As expected from previous information on absent members of the economic family, it is the LO localities that lose the most men, much more in East Central — 55% — than in the North — 32%. While it is not possible to confirm the surprisingly high estimates of 20% and 26% loss of males, for the two regions respectively, over the whole survey, the relative effect by economic status cannot be doubted.

One might muse whether these large numbers could indicate some regular fluctuation over the life cycle that is strongly patterned by economic status, but the source data is localities ranked by economic status, not families ranked by economic status, and household division would not affect the age-sex distribution of the locality.

We cannot know whether the shortfall is excess mortality or emigration. My view is that increased mortality is coincident with migration, whether temporary or long-term. The itinerants die in greater numbers due to hard labor and the insecurity of their shifting environment. Looking to the age-sex distribution for later years, it is possible that a quarter or so of those lost within the years 20-39 return later. So there remains a huge gap between the number of males raised within the rural sector, and the number who pass their maturity within families there. Of course some portion of adult males is still within the rural economy, but largely undercounted and unseen in their itinerant work in trade, transport and/or agricultural labor. And whether we look to the 1930 or the 1937 survey reports, this proportion is greater for the densely populated and urbanized Lower Yangtze region than for the North China Plain. Overall, I believe that emigration is a larger factor in this gap than is mortality, and that the size of the gap reflects a symbiosis between labor markets and reproduction of labor power in marginalized farm households. I will cite some figures and sources on Chinese labor migration for this period in the sub-section "Male-Heavy Marginal Populations" within the following section 2.10. In Part Two I will analyze the relationship of land tenure patterns to how much adult male labor remains in the countryside.

If these estimates in Dataset 2.9.5 do indeed sketch the dimensions of emigration and hypergamy, it is puzzling that demographers have for so long neglected the effects of socio-economic patterning. However, with more recent access to Chinese villages, American researchers have observed that the age-old patterns of transfer of women are still in operation, including even market logic for brideprice and dowry, albeit with some modifications reflecting changes in property rights under the People's Republic. William Lavely carried out a systematic survey of 527 women in Szechwan in 1979. His results reveal the magnitude of movement of women in marriage.

> The movement of women in marriage is now the single most important avenue of mobility, physical and social, in a society which has little of either. ... (T)he commune gained 30 percent more women in marriage than it lost. The explanation for this lies simply in the more favored economic status of Shifang County relative to other areas. There is a well-known propensity for women to marry into higher statuses, a phenomenon known as hypergamy. ... As economic inequality has been reduced within local units, disparities between higher level units have become more pronounced. The result has been an increasing tendency for marriage out of poor areas and into wealthier areas, a kind of geographic hypergamy.
>
> Evidence of geographical hypergamy can be clearly seen in a breakdown of migration by provenance and destination as recorded in the commune migration registers. Of out-marrying women, only 5 percent left the county and only 1 percent went to a county beyond a 60-kilometer radius of Shifang. By contrast, more than a quarter of in-marrying women came from outside the county, and 18.6 percent of in-marriers came from beyond a 60-kilometer radius, including many from poor areas outside the Wenjiang District (the county of the survey).
>
> (Lavely 1983, pp. 6-7)

This magnitude of movement is not necessarily specific to the post-1949 period. Consider the Notestein data on non-resident population. The term "non-resident" apparently refers those who were resident in the farm families during the year of enumeration, but not resident in the area at the time of the survey. The survey found 8734 women aged 15-19 (16-20 in Chinese years, prime marriage age) resident in farm households, and 653 non-resident, i.e. the non-residents were 7% of all. Of 601 non-resident women whose martial status was known, 94% had been married within the previous year. There were smaller numbers of non-resident women in the 10-14 and 20-24 cohorts, but these were likewise newly-married. After analyzing the relationship of women migrants to head of family in this survey, Irene Taeuber commented, "The migrations of women were family processes rather than processes of economic adjustment" (Taeuber 1970, p. 80). Although we know nothing from this

survey about the distance to which women migrated in marriage, the fact that women's migration is voluminous in the marriage years and overwhelmingly for the purpose of marriage must lend credence to the interpretation that the flux of women in the Chinese Farm Economy data is indeed due to geographical hypergamy.

2.10 The Whole Picture, On the Ground

Introduction

We have amassed enough data to substantiate an interpretation. These population pyramid charts and summary numbers tell a story of some complexity that I will repeat several times over from different angles. The pattern we see in these charts is part of the society-wide process of the reproduction of the social relations of production, including its labor power. That process of reproduction is itself an inherently exploitative process. In explaining the process, we should explain the proximate reasons for what families and individuals do in their particular positions, while recognizing the larger scale of social relations as the ultimate engine. This discourse begins from the big picture. Those who are relatively alienated from property produce a disproportionate part of the reproductive power (females) and exploited labor power for the next generation. Overall, a significant hypergamy operates due to the structural shortage of women and the allocation role of brideprice and dowry. Thus women tend to flow from poorer areas to richer areas and from poorer households to better-off households in the transaction of marriage, and secondarily as concubines and servants. In the closer view, propertied families avoid raising daughters in order to minimize dowry expenditure, a condition of the power relationships and market forces; while poorer families, without the social obligations of rank, can raise daughters as if they were little pigs, holding them to get a good price. That is not to say that these cruel conditions of infanticide and child sale were not ameliorated by human affections and interdependence, wherever possible. This is the stuff of many social protest novels and movies of the Republican period.

The allocation of women through mechanisms of dowry and brideprice also impedes the reproduction of unpropertied males; in general, lower class males must pay a substantial brideprice that is only partially offset by the dowry goods that accompany the bride, whereas upper class males receive equivalent or even greater dowry (McCroery 1976; Miller 1981, pp. 136-154; Arthur Wolf, class presentation 1974).

A sizeable portion of unpropertied males do not have the means to marry early, and they leave their households of birth under economic duress to seek employment as agricultural labor, porters, craftsmen, peddlers, etc. If the family has some property

or a homestead to keep its core intact, errant sons are more likely to return frequently. If the family has little property, subordinate family members are more likely to choose to strike out on their own rather than to accept the hierarchy of the family and surrender of the product of their labor. So the emigrants or temporarily absent members of the family for those of low economic status are particularly understated. Many of them never reproduce, and the conditions of livelihood reported for laborers (Fei and Chang 1949, pp. 58-60) are such that it might be supposed they are paid the cost of their subsistence, usually, but not the cost of their reproduction.

This is a rather stark account because it depicts the extremes of the rural social formation. But given that the population pyramids here are based on locality averages, not individual families ranked by economic means, they are probably if anything an understatement of the magnitude of these processes.

If the reader has accepted that the population pyramids imply the movement of women in marriage and men for labor, then I will move to another important point. The magnitude of the fluctuation is much greater for the East Central localities than for the North. More women move up the social scale in marriage, given that the rich discard their daughters in great numbers by infanticide or maltreatment. For the lower Yangtze and southeast coast, we might also suspect that as many as 10% of little girls were given away as "little daughters-in-law", as is implied in some migration data. The transfer of women transfers their reproductive power; a more massive transfer means a greater class differential of reproduction. It is true that tenants reproduce feverishly as a one-generation strategy; but, it is my contention, so many more of their class do not obtain a farm tenure and lack the money to marry, and thus drift away, that the class of tenants as a whole may not reproduce itself (labor opportunities outside the rural sector are provided by the more commercialized economy of the lower Yangtze) . But I will have more to say about that shortly.

I propose that the greater class differential of reproduction as described counterbalances faster concentration of landownership in the fertile lower Yangtze region. A quick glance back to the top of Dataset 2.9.1 will show the difference in earnings and consumption, both in cash and in kind. The peasants in the East Central localities produce much more, but their consumption is just a little more than those in the North; they seem to be squeezed by the payment of rents. In sum, greater exploitation is balanced by greater class differentials of reproduction. This point brings us back to the model presented in Chapter 1. This is a simple equilibrium model of an agrarian society. As a whole, the

relations of land with labor are persistent ones; reproduction opportunity is closely tied to landownership.

Let me set the important proposition that greater accumulation is balanced by greater class differentials of reproduction into a broad context of empirical observation. This will entail musing on some of the relationships between sex ratios and the outlines of the agricultural economy — specifically population density, which strongly shapes land tenure forms, the amount of agricultural surplus that can be extracted, and the clustering of consumption of the surplus in towns and cities. These relationships have multiple dimensions of determination, and I will merely sketch them here.

Population Density and Sex Ratios: Supply of Labor to the Cities

Let me first present the empirical relationship of sex ratios and population density; then I will spin out the implications. In Dataset 2.10.1 A the age-specific sex ratios for all of China, taken from the 1937 Population Survey and divided into seven regions as in the Notestein data, are matched with population density information for each region. In looking at the balance of males and females, "non-resident" population has also been examined. "Non-residents" were those reported as living in the farm household within the year preceding the survey, but not present at the time of the survey. Most are family members, but they could also be hired labor. For the most part, non-resident females are daughters and sisters who have been married out within the year, and non-resident males, the bulk of this population, are young men looking for work. The unpublished Notestein tabulations include sheets on their relationship to the family head, their marital status, occupation, and their destination, but there are only aggregate tabulations of each of these for each region, rather than cross-tabulations. This information is most important for imparting a sense of the interrelationship between farm households and the non-farm sector. However, in some regions non-resident men are as many as 9% of all men in the stalwart years of 20-39. I have included an estimate of the number of non-residents who continue to work in the agricultural sector in calculating adult sex ratios for the farm population.

Pre-marriage age sex ratios (the cohort of age 5-14) follow population density over the gross area with amazing precision (correlation = 0.96); see Dataset 2.10.1 B, in which the data is rendered as a chart. That is, the denser the population, the higher the sex ratios; and the lack of women is a direct brake on the reproduction of the excess men.

Dataset 2.10.1 A Population Density and Sex Ratios — Buck 1937, Notestein Archives

	RESIDENT POPULATION				NON-RESIDENT* POPULATION			
	Age 5-14		Age 20-39		Age 5-14		Age 20-39	
Region	M	F	M	F	M	F	M	F
North Highlands	1311	1132	1725	1528	26	17	125	8
North Plain	9798	8357	13441	12637	53	38	693	102
Lower Yangtze	7802	5809	9615	8852	54	19	374	114
Southeast Hills	864	657	1277	1208	28	7	127	22
South	1417	1153	1656	1585	1	3	31	5
Red Basin	1571	1287	2299	2153	6	7	62	9
Southwest Plateau	1376	1205	2229	2204	2	3	16	10

* Present in farm household within past year but not at time of survey.

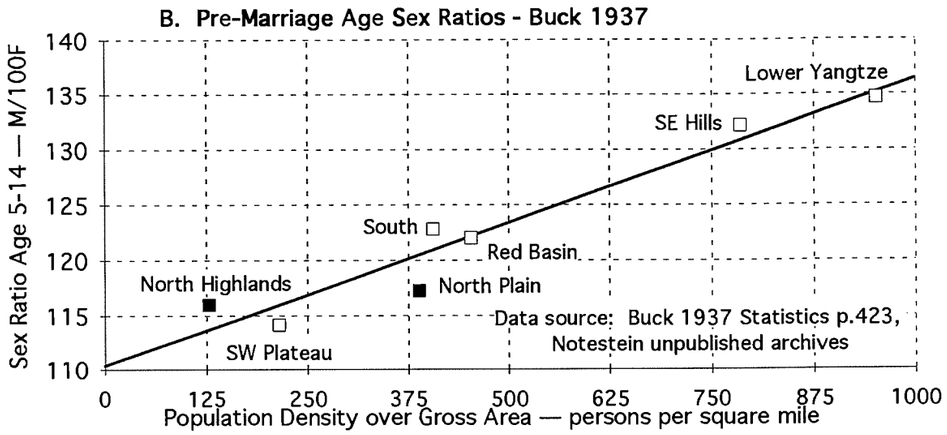
	SEX RATIOS			POPULATION DENSITY Persons/Square Mile	
	Age	Age 20-39			
Region	5-14	Resident	All Farm	Gross Area	Cult Area
North Highlands	116	113	115	128	958
North Plain	117	106	108	388	966
Lower Yangtze	135	109	110	951	1507
Southeast Hills	132	106	108	785	2072
South	123	104	105	406	2852
Red Basin	122	107	108	453	1425
Southwest Plateau	114	101	101	215	2273

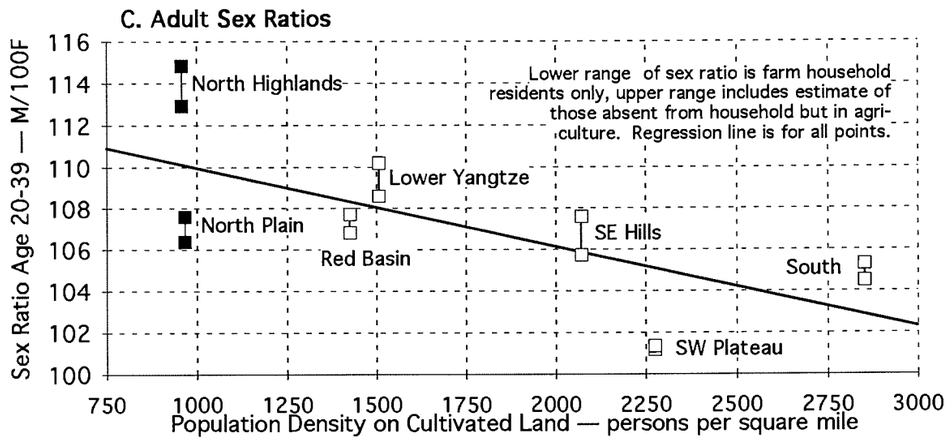
	Male Non-Residents /All Age	Migrants Working in Agri-	FARM POPULATION GENERATION RATIO Age 20-39/5-14		Estimated Loss of Males
Region	20-39	culture**	M	F	Age 20-39
North Highlands	6.8%	25%	1.33	1.35	2%
North Plain	4.9%	26%	1.39	1.51	9%
Lower Yangtze	3.7%	55%	1.25	1.53	20%
Southeast Hills	9.0%	22%	1.50	1.84	20%
South	1.8%	49%	1.18	1.38	15%
Red Basin	2.6%	38%	1.48	1.67	12%
Southwest Plateau	0.7%	70%	1.63	1.83	12%

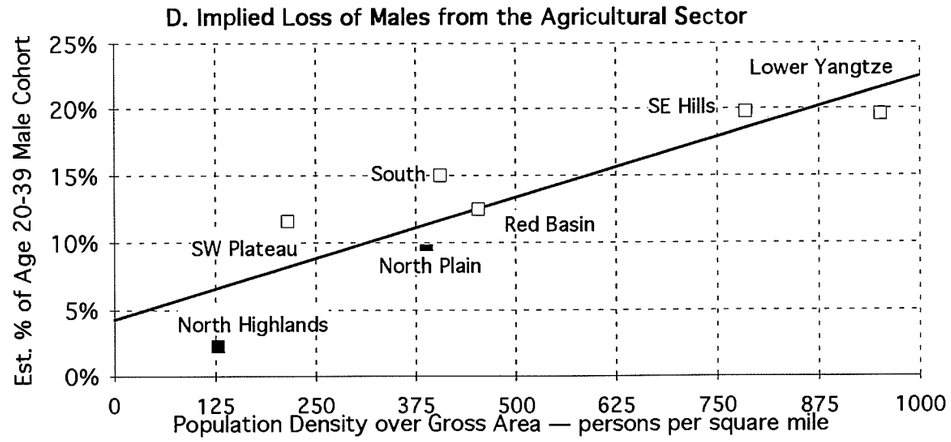
** Calculated from Notestein Machine Table 12A.

NOTE: The Population Survey applied regions similar but not identical to Buck's crop regions. Notestein numbered regions South to North in his "machine tables". Following are equivalences.
North Highlands [7] = Spring Wheat Area (4 localities) + Winter Wheat-Millet Area (3).
North Plain [6] = Winter Wheat-Millet Area (9) + Winter Wheat-Kaoliang Area (26).
Lower Yangtze [5] = Yangtze Rice-Wheat Area (21) + Rice-Tea Area (3).
SE Hills [2] = Rice-Tea (4). South [1] = Double-Cropping Rice (Kwangtung) (4) + Rice-Tea (1).
Red Basin [4] = Szechwan Rice (15). SW Plateau [3,9] = SW Rice Area (4) + Szechwan (1).
Data source: Buck 1937 Statistics Vol. p. 423. Notestein Machine Tables 4, 17, 12A.

Dataset 2.10.1 (Figures) Population Density and Sex Ratios — Buck 1937







I believe the sex ratios reflect demand for labor in the non-farm sector. Population density over the gross area is most significant for the rise of towns and commercial traffic. By contrast, it is possible to have intensely cultivated pockets of fertile land in mountain valleys, as in southwest China, with little urbanization. The measure of gross population density has been taken here by weighted average of the Buck region figures, according to how many localities in the Population Survey fell into each; this is a rough measure that reflects conditions for the region more than just the locality of survey, as is appropriate for this use. But high population density is generally also accompanied by intense cultivation, a larger surplus per land area, and high rents that funnel the surplus to the non-farm sector. So this aspect of population density also pulls labor for transport and specialized manufacture. (Population density and spatial variation in occupational structures will be examined in detail in Chapter 6.)

In contrast to pre-marriage age sex ratios, mature sex ratios have no correlation with population density over the gross area. They are, however, negatively correlated (correlation = - 0.70, just a tad short of significance at the 5% level) with population density on cultivated land, which is much more immediate to the environment that the mature members of the farm family live in; see Dataset 2.10.1 C. The rationale of this negative correlation is that where population is sparser more land is farmed extensively in large estates with hired labor, providing a meager foothold in the countryside for unmarried men; so there is a greater preponderance of adult men in the rural sector. With less concentration of trade in towns, there is also a larger role for itinerant peddlers and rural craftsmen in this autarchic economy.

And conversely, where cities and industry concentrate labor, labor migration often leaves behind a preponderance of females among adults, a phenomenon found particularly along the southeast coast of China, and also more generally. For India: "(T)hese variations in the sex ratio are influenced to some extent by the rural-to-urban migration, demonstrably more prominent among males seeking work. Such a sex-selective migration tilts the balance in favour of females in the rural areas..." (Krishnaji 1992, p. 206).

So it appears that pre-marriage age and post-marriage age sex ratios have virtually no certain relationship, and often even a negative one, since high population density can be associated simultaneously with high sex ratios in childhood and low sex ratios in adulthood. Clearly we are not dealing with a closed population. Here it may be useful to

cite Notestein's brief comments on migration, based on information collected in the Population Survey though not adequately analyzed.

> Apparently this growth of rural population went on in spite of a net outward migration. Of the total sample of 206,274 residents and non-residents ennumerated, 9,116 or 4.4 per cent were recorded as migrants of one sort or another. This may be taken as a minimum estimate of the movement. About 70 per cent of the migration represented attempts to make better economic adjustment. ...
>
> These data, as already stated, do not include the movements of entire families. A recent survey conducted by the National Agricultural Research Bureau, which studied the outward movement of families in 1,001 hsien of 22 provinces, indicates for a three-year period that five per cent of the families emigrated.
>
> Emigrants from small farms were more heavily represented than those from large farms. Of the emigrating farm families 42 per cent had less than 0.76 acres and 31 per cent between 0.76 and 1.52 acres. Eighty-six per cent had three acres or less. The median size of farms for the Farm Survey farms is 3.3 acres. Apparently one-half of the families with farms of less than median size contributed six-sevenths of the migrant families.
>
> Fifty-nine per cent of the emigrant families moved to cities, the majority to work, or as refugees. Most of the reasons given for emigration reflect directly or indirectly the pressure of population on resources and natural calamities. ...
>
> Tenant families were represented nearly four times as heavily among the migrants as in the general population.
>
> (Notestein, Population chapter in Buck 1937, pp. 395-397.)

If we measure the attrition of men from the 5-14 age cohort to the 20-39 age cohort in the same speculative manner as done previously for Dataset 2.9.5, taking the attrition of women as a standard, then we have a rough estimate of the portion of men lost from the farm sector in excess of normal mortality. This estimate is again highly correlated with the population density over the gross area, which would seem to buttress the argument that farm families in the aggregate produce excess male labor — labor that does not reproduce — in response to demand for non-farm labor as well as for farm labor.

I have shifted from talking about class differentials of reproduction, to reproduction as response to demand for labor. But these two perspectives are two aspects of the same class relations. It is a greater surplus squeezed from the peasants that supplies towns and cities; and that surplus is largely consumed in services and luxury items produced by labor from the countryside. Another part of the surplus is utilized in mortgaging, money-lending, and purchases that lead to concentration of landownership. At the same time, the better-off classes appropriate the female offspring of the less privileged,

which allows them to procreate more prolifically and recreate the same balance of land and labor for the next generation. This is an audacious scenario, but one that has been considerably substantiated by the demographic analysis, and will be further developed in analysis of the agricultural economy.

Male-Heavy Marginal Populations

The complement to an outflow of predominantly male labor from the rural household must be accumulation of male labor in other parts of the economy. We may look for this in town crafts, transport and migrant agricultural labor, and even, from the mid-nineteenth century on, exodus to near-slave indentured labor conditions in the Americas, Southeast Asia, and Manchuria. I will not try to write another thesis here to establish the magnitude of non-reproducing male labor outside of the rural sector, but I will cite a few items to suggest that the outflow of male labor that has been proposed above is plausible.

For example, Gamble's surveys included a study of a large walled village laid out on five streets, Chai Ch'eng, in 1930. "The population was 2,085 persons ... The masculinity rate (males per 100 females), 114, was considerably above the 106 rate of the (farm families). Judging from our studies of other groups of Ting Hsien families, it seems probable that the wealthier families of the village were living on Propriety Street. There the size of the average family was 7.3, the masculinity rate 97. The poorer families apparently lived on Benevolence, Wisdom, and Faith Streets, where the family averages were all less than 5.0 and the masculinity rates from 117 to 138." (Gamble 1954, p. 146-7).

Even more marked than the patterning of sex ratios by wealth of residential area, marginal populations were heavily male. For example, a 1928 census of the city of Wuhing, Chekiang, a city of about 690,000, found that 5% of the male population lived in boats, temples, and public places. The sex ratio for this part of the population was 471 males per 100 females, versus a sex ratio of 132 for the rest of the population. For those living in public places, males outnumbered females seven to one (The China Institute of Economic and Statistical Research, 1939).

Both Chinese and Indian population surveys that go beyond the range of farm households find heavily male marginal populations: migrant agricultural laborers, urban craft and

transport labor, boat dwellers, etc. In the unpublished Notestein tabulations, there are sheets on "Non-Resident Population" (Notestein archives Machine Table No. 17) that were never reported in the 1937 population analysis, and were also overlooked in later analyses of this data by Taeuber et. al. and by Coale. The numbers of this non-resident male population are as much as 5% of all adult males for some areas; and even over 15% of males age 15-19 in the Southeast Hills. This may not seem to be a large number as a percentage of the total population, but this number in the survey may still only represent a fraction of absent members of the economic family — those home at the moment — and as a sector of the impoverished population, the number could be sizeable. (I will analyze this data further in Chapter 6, Sections 6.4 and 6.5.)

The pattern of male migration for employment was especially notable in the late nineteenth and early twentieth century because it involved the movement of millions of Chinese from South China to Southeast Asia, and from Central and North China to Manchuria. A 1931 study by Franklin Ho reported that for the five-year period 1925-29, 4.1 million persons arrived in Manchuria and 1.6 million departed. Of 2.1 million Chinese immigrants who arrived at Dairen in that period, 84% were adult men (Ho 1931, p. 10-11). John Shepherd has recently undertaken a broad study of immigration to Taiwan from Fukien in the nineteenth century. He cites a 1717 local gazetteer: "In some villages with hundreds of men there is not one who has a wife" (Shepherd 1995, p. 11). He has also reviewed the records for migration to Southeast Asia, to compare the sex ratio and marital status of other Chinese migrant populations. By 1930-33 there were an estimated 5.4 million Chinese living abroad in Southeast Asia, the majority working-age men either unmarried or with wives left behind in China.

Reproductive Capacities and Strategies under Separation from the Means of Production

An important complication in the demographic dynamics needs to be elaborated in this sketch of the big picture. We have seen from the Chinese Farm Economy lower Yangtze data that the prevalence of rented land frees reproduction from direct dependence on landownership. This fact entails a major modification to the theory of the class relations of reproduction. We see a qualitative shift, a new pattern which overlays but does not replace the positive relationship of fertility and farm size for peasants. Tenants and part-owners operating large holdings need even more family labor power than do owners of the same size holding, because under the burden of rents they cannot slack off and

enjoy less intensive farming methods. The strategy for renters is to bear sons as early and as prolifically as possible, to create a labor pool that can bid for control of a large extent of rented land. At the same time, the recipients of rents have less need for labor, and reduce their reproduction somewhat, either intentionally or inadvertently. Those who obtain rented holdings generally have the wherewithall to obtain wives for reproduction; but the prospects of being able to rent land and to reproduce seem to be improved if some land is already owned.

The timing of reproduction may be seen in a large survey taken in the Kunming Lake region, Yunnan, 1942, during the time the Republican government withdrew to the interior to elude the Japanese incursion into China. Data from a census that covered over 57,000 couples is cited in Ta Chen, Population in Modern China, 1946. Sixty-three percent of these were in agriculture, and tenants and part-owners are three-fifths of them, so rented land must have been extensive. The compilation allows a calculation of surviving children per couple, by occupation of husband and by age of wife. See Dataset 2.10.2, following. I have also calculated a standardized average for number of surviving children for each occupation by weighting each age group according to the age distribution of the entire population of wives. The calculated average for average age of wife for each occupation also gives some indication as to whether they are younger or older on the average than the whole population of wives (Dataset 2.10.2 A). Since this census covered all sectors of the population of an urbanized region, not just farm population, it is very interesting to see the proportions of occupations represented, and their relative numbers of children. As before, the lower economic groups, both rural and urban, generally reproduce less; this is so in terms of children per women of standardized age, and might be more marked if we knew the reproduction rate of men. But our immediate concern here is the farm sector, and we find that part-owners have the highest number of children there, just as they usually have largest size of family in other surveys of regions where rented land is prevalent. Overall, the rural sector has higher female fertility than the urban sector.

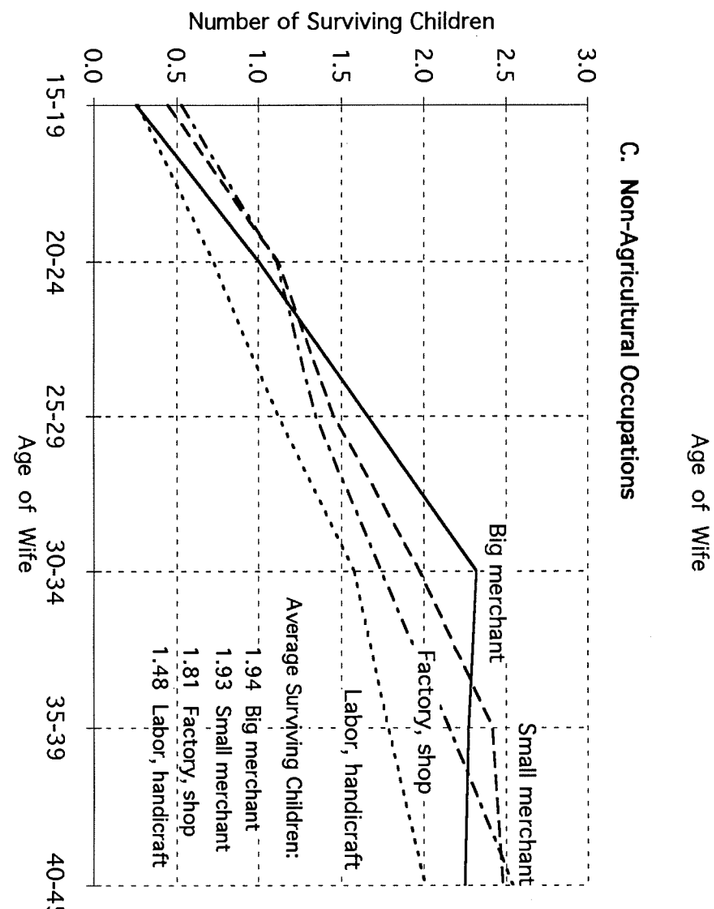
In 2.10.2 B the data for landlords, owners, part-owners and tenants are charted by age of wife. The landlord group has the most young wives, implying that landlords' sons marry young; and they start out at the fastest pace of reproduction, but soon slack off.

Dataset 2.10.2 A Occupation and Number of Surviving Children — Kunming Lake Region, Yunnan, 1942

Occupation of Husband	% of Couples	N of Couples	N of Children	Average Wife's Age	Average Surviving Children*	SURVIVING CHILDREN PER COUPLE BY AGE OF WIFE Age 15-19	Age 20-24	Age 25-29	Age 30-34	Age 35-39	Age 40-45
Public service	1.6%	929	1,975	32.3	2.21	0.43	0.86	1.84	2.31	2.69	2.94
Liberal professions	0.9%	527	874	31.2	1.82	0.28	0.72	1.29	2.04	2.37	2.34
Education	0.5%	296	483	31.8	1.75	0.33	0.60	1.42	1.61	2.09	2.67
Landlord	0.7%	384	782	34.0	1.96	0.50	0.69	1.45	2.18	2.42	2.62
Owner & occupying farmer	24.7%	14,117	28,796	33.6	2.01	0.27	0.97	1.59	2.17	2.43	2.62
Part-owner & cultivator	27.0%	15,422	33,375	33.8	2.12	0.32	1.36	1.84	2.17	2.44	2.68
Tenant	11.4%	6,500	12,666	33.8	1.88	0.38	0.82	1.57	2.14	2.17	2.41
Big merchant & entrepreneur	1.1%	621	1,144	31.6	1.94	0.25	1.00	1.65	2.32	2.27	2.24
Small merchant & workshop proprietor	12.4%	7,090	13,830	33.5	1.93	0.44	1.12	1.45	1.97	2.41	2.48
Factory skilled worker	0.6%	340	505	28.7	2.02	0.60	0.73	1.33	1.80	2.12	3.63
Shop employee & peddler	5.3%	3,052	5,423	32.9	1.79	0.51	1.15	1.34	1.73	2.15	2.42
Common laborer	6.5%	3,708	5,553	33.0	1.50	0.25	0.78	1.16	1.58	1.81	1.99
Servant	0.3%	153	218	32.1	1.51	0.00	0.58	1.35	1.76	1.63	2.00
Handicraft master	7.0%	3,980	4,711	29.3	1.46	0.27	0.66	1.08	1.56	1.75	2.02
Pauper	0.0%	10	7	32.5	0.59	1.00	1.00	0.00	0.00	1.00	1.00
All	100%			33.2	1.93	0.32	1.02	1.54	2.04	2.30	2.53
Total Number of Couples		57,129	11,0342			2043	6499	11121	12280	12567	12619
% of Couples (*average children/couple standardized by this age distribution)						3.6%	11.4%	19.5%	21.5%	22.0%	22.1%

Data source: Ta Chen, Population in Modern China, 1946. Chicago: University of Chicago Press.
Table 19 in Appendix, p. 93. (originally compiled by Mr. Ru-chiang Su, Institute of Census Research)

Dataset 2.10.2 (Figures) Occupation and Number of Surviving Children — Kunming Lake Region, 1942



Dataset 2.10.3 Size of Family, Landownership per Capita, and Access to Rented Land in Areas with Much Rented Land — Buck 1937

SZECHWAN RICE AREA — 802 Farms, 33 Farm Size Groups, Eight Localities
57% of land area is rented land.

Rented/Cap *N of Farms*	HOUSEHOLD SIZE ——> 3-4.9	5-6.4	6.5-7.9	8-9.4	9.5+	All
LAND OWNED /CAPITA (ha.)						
0.00-0.05	0.014 *77*	0.072 *121*	0.122 *57*	0.211 *86*		0.102 *341*
0.05-0.10	0.047 *65*	0.039 *119*	0.049 *63*		0.064 *6*	0.044 *253*
0.10-0.15		0.022 *12*	0.085 *57*	0.038 *34*	0.18 *40*	0.095 *143*
0.15-0.20					0.207 *29*	0.207 *29*
0.20-0.33				0.137 *18*	0.343 *12*	0.219 *30*
0.722			none *6*			0 *6*
All	0.029 *142*	0.054 *252*	0.081 *183*	0.159 *138*	0.203 *87*	*802*

DOUBLE CROPPING RICE AREA — 710 Farms, 32 Farm Size Groups in
(KWANGTUNG) 7 Localities where at least 49% of land is rented.

Rented/Cap *N of Farms*	HOUSEHOLD SIZE ——> 2-3	4	5	6-8	9-11+	All
LAND OWNED /CAPITA (ha.)						
0.00-0.01	0.162 *21*	0.197 *45*	0.227 *106*	0.468 *28*		0.247 *200*
0.02-0.04	0.068 *31*	0.138 *45*	0.046 *58*	0.083 *44*		0.082 *178*
0.04-0.07		0.110 *64*	0.086 *64*	0.070 *91*	0.077 *7*	0.087 *222*
0.07-0.10			0.106 *52*	0.130 *7*		0.109 *59*
0.10-0.15				0.113 *33*	0.113 *6*	0.113 *39*
0.31-0.72				none *6*	0.053 *6*	0.027 *12*
All	0.106 *52*	0.147 *150*	0.135 *280*	0.133 *209*	0.081 *19*	0.133 *710*

Part-owners have by far the highest rate of births in the early childbearing ages 20-24 and 25-29, though the lead later narrows. Tenants fall behind. The part-owner pattern shows, I believe, the strategy for early childbearing and the capacity to carry it out. For the urban occupations, traditional labor such as unskilled laborer and handicrafts has delayed and relatively low fertility, but in contrast skilled factory workers reproduce early and prolifically. Their reproduction is in fact comparable to that of big merchants — except that it continues at a high rate late in wives' reproductive lives, while the big merchants' wives slack off earlier, as if avoiding the full amount of childbearing that their prosperity would allow. Small merchants fall between factory workers and big merchants. This information for urban occupations will be of some interest later when we investigate contemporary South Asian cases (Section 3.7.1).

The extreme imbalance of the sexes must make marriage problematic for many men. It is interesting to note that the adopted daughter-in-law practice is known to be most prevalent for the lower Yangtze and southeast coast regions, just the regions found previously to be most densely populated and to have the highest pre-marriage age sex ratios (Dataset 2.9.1 B). Northern Taiwan, where Arthur Wolf found an amazingly high incidence of the "minor marriage" form at the turn of the century, was also a very rich agricultural region with high rates of tenancy. Adopting and raising a future wife for sons of the family was one way of trying to beat the shortage of women and the cost of brideprice. This would be a likely strategy for those who pay rents.

Where rented land is plentiful a large labor pool facilitates a family's control of more rented land per capita, as if household labor operated with an economy of scale, even when ownership per capita is held constant. This is demonstrated in Dataset 2.10.3, which crosstabulates the farm size data (Buck 1937) from two areas with plentiful rented land. The crosstabulation is for land rented per capita, by household size and by land owned per capita. The average for land rented per capita in hectares is the main number in each cell; the number of farms is the small number below. Since the source data is by farm size groups for each locality of the Buck 1937 Farm Survey, not by individual farms, this pigeonholing cannot be very precise. Still several patterns are clear, especially where they are confirmed by appearing in both areas, the Szechwan Rice Area (Szechwan province and western portions of Hupeh) and the Double-Cropping Rice Area (Kwangtung, Kwangsi, and southern Fukien). For those who own no or almost no land (which is represented in the first line of each crosstabulation in Dataset 2.10.3), land rented *per capita*, not just land rented in total, increases with household

size. There are hints of such a tendency by household size for those who own somewhat more land, as well, but not for certain. The second main pattern is that for those who own some land, the more land they own per capita, the more they rent per capita as well. This can be read vertically in the center cells. Ownership no doubt provides a more secure base for the expansion strategy. This is not operative, however, for the largest owners (the last line), which is the third pattern common to both crosstabulations. They have large families, but are fully occupied or are content with the amount of land they have to farm, and rent in almost no land.

Conversely, where rented land is not plentiful, as in most of North China, no such reproductive strategy is possible. With landownership the only gateway to security in the rural sector, marriage opportunities must remain closely tied to the land. But there is still an additional angle to understanding the race for reproduction in the fertile and densely-populated South, and that has to do with the rate of surplus extraction on rented land — the rate of rent — and its geographical variation. In some parts of North China there is rented land, but the tenants were barely more than agricultural laborers who were self-exploited. On the other hand, in the South large tenants often attained a relatively comfortable standard, even while they farmed hard. Part Three on the determination of the rate of rent will provide a further analysis of productivity, surplus extraction, and the geographical variation of the rate of rent.

I have said above that high reproduction for tenants is a "new" pattern, but I meant so only with a very long time perspective: as described in Kang Chao's Man and Land in Chinese History and elsewhere, growing population density over several centuries in general spurred a shift from centrally managed estates to renting out to tenants through bursaries. Part Two of this thesis will present a theory for the relationship between population density and land tenure forms seen in the early twentieth century survey data, and this has implications for such a historical progression. Until then, let us merely note the historical and geographical trend.

Finally, if we look ahead with a continuing long perspective, the heightened reproduction of peasants who have been divorced from ownership of the means of production and who compete for contractual access to means of production, as seen here, can be conceptualized in continuity with the prolific reproduction of laborers' families under early industrialization. We could say that there is a transition from one mode of reproduction to another, but it is a very long transition, and the social processes are basically continuous across the "transition", though their preponderance shifts. After

we have reviewed a great many demographic and village studies from contemporary South Asia, I will have more to say about that, in section 3.7.

2.11 Relating Regional Demographic Differences to Agricultural Productivity — the Notestein Archives

The previous section on "the big picture" has already laid out the main features of the demographic dynamics of the Chinese peasant. The most salient data has been presented. All the same, it is incumbent upon the researcher to verify these patterns in as many data sources as possible.

The results found in the population pyramids extracted from Chinese Farm Economy can be somewhat confirmed in their generality through analysis of the Notestein population survey. Although it seems that the Farm, Food, Agricultural, and Population Surveys that were all part of the Buck project were not necessarily carried out on the same households, they do seem to provide some indication of general conditions in each county where they were carried out, and it is likely that the same villages were involved in many of the surveys. The surveys list the localities by the name of county, not by specific village. Of course a great deal of heterogeneity is no doubt hidden in the aggregation of data for a locality, and villages within a county may be a patchwork of rich and poor. All the same, I have matched up the Farm, Food, and Population Surveys as much as possible, to try to look at variation in the age-sex distribution of the population in relation to economic and nutritional well-being. The results mostly echo those of the previous population pyramids.

There were 101 locality samples in the Population Survey, a few of which were two or more samples within the same county. The total population covered was over 150,000 persons. About 70 of these locality samples can be matched with data of the Farm and/or Food Surveys in the same county. The number of localities in the match[23] is further

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23 The match between Farm and Population Surveys is complicated a little by the fact that Frank Notestein's "machine tables" only list areas by numbers, and also due to variations in romanization of the county names, which is not surprising given the bewildering variety of dialects in China. All the same, it can be reliably accomplished through several sources: the locality listing in Irene Taeuber's 1970 article; the Key to Map 3 (pp. 3-4) in the Atlas volume of Buck 1938 which checks off where all the different surveys were carried out; and pp. 416-9 of the Statistics Volume, the first table of the Population chapter, which lists all the counties of China. Fortunately the Atlas and Statistics volumes also give the Chinese characters, so the standard pronounciation of the name can be ascertained.

reduced a little by merging either the Farm or the Population Survey data, depending on which has samples doubled in one county. Many of the 101 localities that have no corresponding Farm Survey data are in Szechwan, and overall the Population Survey has more sample localities in the Yangtze River region and North, so south of the Yangtze is underrepresented.

The outcome of the match is 66 sets with data both for population age-sex distribution, and for economic indicators. Appendix D of this thesis lists all of the localities. I experimented with data on agricultural product, nutrition, animal units per farm (animals both for labor and food production), percent of households in the county that are farm households, and percent of households having savings loaned out. Of the 66 matched sets, 65 have Farm Survey data from which I have calculated product per capita in kilograms of grain-equivalent — without adjusting for variation in labor intensity, as I have done elsewhere in this thesis when the distribution of landownership is examined —, and then subtracted off 40% of the production of land that is rented land, as if excluding production allocated to rent payments, to come up with a rough estimate of average income. Fifty-six localities can be matched with data on daily calorie intake per standardized adult-male unit. Production per capita and food calories seem to be the two most reliable measures of well-being. The correlation between the two overall is 0.62. However, most of that regularity is within the North, where the correlation is 0.80; for the South the correlation is only 0.29. I have made use of both measures, where possible, in ranking the well-being of the localities. The procedure of analysis of this data is detailed as follows.

First I divided up the 66 counties into four geographical regions, based on Buck's crop regions but also merging those with economic and demographic similarities. The concern was that there should be enough counties within each of the four to average out considerable roughness, but that the level of agricultural productivity and population density within each region should not vary too vastly. The point of dividing the data into as many regions as possible was to get at intra-regional rather than inter-regional variation in population patterns, i.e. narrowing the variation in the agricultural base, and hopefully highlighting differences between localities that are rich or poor due to differences in ownership of land and control of production. The first region, the sparsely populated and mostly impoverished Northwest, includes the Spring Wheat and Winter-Wheat Millet crop regions in Buck's scheme; the second, North Plains, is the Winter Wheat-Kaoliang crop region, which is further divided into North and South

segments elsewhere in this research; the third, the Lower Yangtze, is Buck's Yangtze Rice-Wheat crop region, also South in the North/South division of China; the fourth encompasses all the rice-cropping South, i.e. the Rice-Tea area (only two localities in the match), the Double-Cropping Rice, Szechwan Rice, and Southwestern Rice crop regions (the last represented only by one locality). Then within each of the four regions the localities are ranked by the averages of their ranks for product per capita and for daily calories. After this ranking, the localities were divided approximately equally between two groupings of high and low economic well-being. It would be desirable to cut the ranking into three or four segments, especially since we have seen there are some non-linear relationships, but there is not enough reliable data — the fact that the economic indicators come from other surveys is most of the problem — to permit this.

The top half of Dataset 2.11.1 shows first the relevant economic indicators by which the ranking was done, averaged for each grouping by region: product per capita less 40% of the estimated product on rented land, and daily calories from all food. Appendix D provides the details for each locality from which Dataset 2.11.1 has been summarized. Other indicators are useful for verifying whether the ranking was a meaningful one. Daily calories from animal products (which should be a very sensitive measure of wealth, since meat is valued but so little is consumed), is considerably higher for HI groups in all regions. Animal units per farm (including both labor and productive animals, pegged at oxen, horse or mule = 1.0, water buffalo = 0.66, donkey = 0.5, chicken = 0.01, etc.) are much higher for the HI groups in the two southern regions, but not in the two northern regions; there seems to be a pattern in this, but I cannot explain the reason.

The last items for locality comparison that can be gleaned from the Statistics volume are percent of farms that have savings (survey information available for only about half the localities), population density (persons per square kilometer of crop area, from the Farm Survey), and percent of households in each county that are farm households (this information was obtained by Buck from a government Agricultural Survey, not his own surveys). The most significant form of savings, according to Buck's Table 16, pp. 406-7, is in the form of money loans to others, and this is what I have input to the locality comparison. This is somewhat higher for all HI groups except in the Lower Yangtze region, where the LO group has much higher savings — we might speculate that this could be due to rent deposits, but it is more likely that there are more problems with the match between the various surveys in this region.

Dataset 2.11.1 Summary Comparison of Farm Economy, Food Intake, and Age-Sex Distribution of Population, with Matched Locality Samples Sorted by Cropping Region and Economic Status — Notestein Archives

A. FARM AND FOOD SURVEYS —

Geographical Region (Crop Regions)		N of Local ities	Product*/ Capita less 40% Rent	Daily Calories All Food	Daily Calories Animal	Animal Units on Farm	Farms w/ Savings in Loans Out
Northwest (WWM, SW)	HI	7	657	3612	29	1.12	7%
	LO	8	233	2593	16	2.05	3%
North Plain (WWK)	HI	11	630	4396	62	1.29	20%
	LO	10	232	2539	24	1.24	12%
Lower Yangtze (YRW)	HI	8	594	3794	122	1.25	21%
	LO	7	260	2931	44	0.64	37%
South (DCR, RT, SR, SWR)	HI	8	550	3807	179	1.12	18%
	LO	7	280	2944	135	0.91	15%
All China simple average	HI	34	608	3902	98	1.19	17%
	LO	32	251	2752	55	1.21	17%

*annual kilograms of grain equivalent

B. POPULATION SURVEY —

Geographical Region (Crop Regions)		Popu-lation Size	Sex Ratios: M/100 F Age 0-4	Age 5-9	Age 20-39	Males 20-39 /0-9	Females 20-39 /0-9
Northwest (WWM, SW)	HI	12,193	114.2	133.6	115.1	1.45	1.55
	LO	15,454	103.6	110.3	108.6	1.17	1.15
North Plain (WWK)	HI	22,481	112.2	122.8	105.3	1.19	1.32
	LO	25,643	116.6	115.5	107.3	1.10	1.19
Lower Yangtze (YRW)	HI	24,340	107.7	113.9	108.7	1.23	1.25
	LO	14,188	104.0	116.4	108.2	1.12	1.14
South (DCR, RT, SR, SWR)	HI	14,932	116.5	126.7	108.5	1.15	1.28
	LO	19,508	104.7	110.7	109.2	1.25	1.23
All China simple average	HI	73,946	112.6	124.2	109.4	1.25	1.35
	LO	74,793	107.2	113.3	108.3	1.16	1.18

NOTE: Locality samples were ranked by product per capita in kg. grain-equivalent and by food intake to evaluate economic status. Locality samples in the Farm and Food Surveys were matched with those of the Population Survey according to the county (hsien) in which they fell.
Sources: Farm and Food Surveys, Buck 1937 Statistics volume; pp. 73-74 for daily calories; p. 131 for animal units on farm; p. 406 for savings; Notestein archives, Machine Table 2.

There is a fairly strong and regular relationship between product per capita less rent, and population density, within each geographical region. The higher the population density in a locality, the lower the product per capita (correlation of -0.30 for all the localities together, low but significant). These two aspects commonly vary inversely, of course, when the comparison is within one cropping area with about the same growing conditions. It is clear from a few quick calculations that in each region the farmers in the LO localities have somewhat smaller holdings on average, and their land is much less productive per land area than that of the farmers in HI localities. Both of these elements go into creating the gap in net product per capita between HI and LO. So it does appear that we are dealing with a geographical patchwork of rich and poor areas.

It may be noted in passing in this table that there is a larger gap between rich and poor localities within the North than within the South, parallel to what we saw before in Dataset 2.4.1 (Buck 1937, number of wives and children by size of farm) where the original data had actually been collated according to the relative farm size within each locality sample. This is a hopeful sign that we may indeed be capturing some social stratification variation in this analysis, not just regional variation. To summarize this pattern:

Region	Product per Capita (kg. grain) less 40% Rent		Ratio
	HI GROUP	LO GROUP	HI / LO
Northwest	657	233	2.8
North Plain	630	232	2.7
Lower Yangtze	594	260	2.3
South	555	280	2.0

The more sparsely-populated areas have a wider gap between HI and LO, as seen in the last column. The underlying reason for this pattern will be a matter for analysis in Chapter 4 and 5, but for now it is just relevant as a brief note for evaluating the population survey comparison.

Let us move on to the comparison with the age-sex distribution and other information from the Population Survey. Although there does not seem to have been any systematic coordination between the Farm and the Population Surveys — the investigators were just trying to reach a description of general conditions in China — , the survey schedules seem to have been carefully planned. Chiao Chi-ming, who directed the population

survey, used the information from 22 localities in his master's thesis at Cornell University in 1933. According to Chiao,

> The data used in this study are a portion of the data collected in connection with the China Land Utilization Population study now being conducted by the Department of Agricultural Economics, College of Agriculture and Forestry, University of Nanking, and which is financed by the China Council of the Institute of Pacific Relations...
>
> The survey method used in this study is a shorter and quicker method than the registration method. The information from one family for the previous year could be obtained in half an hour's time. Usually, the Chinese farmers remember quite clearly the details of the events which occurred in the family during the previous year. The number of births, deaths, marriages, and migrations were the big events of the year and the adults in the family could report this information very accurately. ... The main difficulty in this study was the psychological reaction of the farmers. In certain localities the farmers did not wish to report their male babies for fear of some misfortune happening to the child. In some localities, false ages were reported for girls of marriageable age because the parents were reluctant to report their ages to other persons.
>
> (Chiao 1933, pp. 24)

However, the later analysis of the material was rather perfunctory, and, finally, many sheets of the original Notestein compilation are missing.[24] It may be noted that while investigators within China, such as Chiao Chi-ming himself in his earlier registration of vital statistics in Kiangyin, usually took information on farm tenure and landholdings and/or general economic status, and used this in their analysis, very few of the American-sponsored studies did, nor did Chiao's 1933 thesis at Cornell.

The lower half of Dataset 2.11.1 shows population data for the same locality groupings for each region, by high and low economic well-being. This should to some degree reflect the population pattern for rich and poor, though no doubt much more weakly than if we could break down each locality into rich and poor segments.

To recapitulate, my general prediction of what we may detect in the age-sex population pyramids is that the rich raise fewer girls to avoid dowry payments, while the poor

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[24] The source data by locality, Notestein's Machine Table 2, is for the resident population only. It excludes the "non-resident" population, a small percentage, which is apparently composed mostly of women being transferred in marriage and migrant worker men. Their inclusion might change the picture a little, but this cannot be remedied because the breakdown of non-resident population by area is not extant.

raise a few more to sell them as servants and concubines. For both groups, aside from outright female infanticide, discrimination against girls results in increasing sex ratios through childhood years. At maturity or before, nearly all daughters leave their natal home, in marriage or virtual sale. Rich families replace daughters with daughters-in-law promptly and in greater numbers; the poor, often with a delay, if at all. Meanwhile, poor families generally lose more sons through labor out-migration. The upshot is a greater lack of women for the poor in the ages most men are married.

These patterns may be examined in the five calculations I have done on the merged population data for each grouping, results shown in the lower half of Dataset 2.11.1. I added up the population for all the localities in each grouping, rather than averaging the individual sex ratios for each locality, to avoid the wider swings in the smaller numbers. Sex ratios for the ages 0-4 are often puzzling both in Chinese and Indian data, but in this data there are always more males than females, and the HI groups do usually have higher sex ratios at age 0-4, i.e. more boys, than the LO. At age 5-9, sex ratios are much higher overall, and for all except the Lower Yangtze region are higher for the rich than for poor. (The exception in the Lower Yangtze region will be examined further in Section 6.6; the sex ratios there are probably the result of very early transfer of girls for future marriage, as "little daughters-in-law".)

It is unfortunate the rest of the breakdown in this data source is ten-year cohorts, and we cannot take the sex ratio for precisely age 5-14. As for sex ratios at maturity (age 20-39), after daughters have left and sons have married, it would be expected that rich families would have a greater number of fertile women relative to men, but where farming large estates with agricultural year laborers is common, as in the North, their presence elevates sex ratios. However, it can still be seen for all regions except the Lower Yangtze that the drop in sex ratios from age 5-9 to age 20-39 is much more precipitous for the HI groups than for the LO groups. For All China (simple average of the four regions) the drop is: 122.8 - 108.8 = 14.0 for the HI group, and 113.3 - 108.3 = 5.0 for the LO group. This means in sum that the richer localities enjoy a greater inflow of women of fertile age than they themselves produce.

We can look at the implied change in the male and female population over the life cycle from a different angle, in terms of the relative sizes of the cohorts.

The ratio of males age 20-39 to those age 0-9 is meant to measure the relative loss of males. If there were no mortality or migration, the 20-year cohort would be double the

size of the younger 10-year cohort; that is obviously not the case, but we can use the ratio as some indication of the loss of population. In all regions except the South, which is the most densely populated on the crop land, the LO groups lose more than the HI groups. The relative loss for the poor (the difference between HI and LO) is most marked in the impoverished far north, the Northwest region, where rich and poor localities are starkly differentiated, and then the gap narrows for the North Plain and the Lower Yangtze, which have higher agricultural productivity overall. We cannot distinguish whether this loss of males is due to out-migration or mortality; it is probably both. There is a reversal in the South, with the HI group losing slightly more than the LO, which could be due to complications of rented land in determining whether a locality belongs in the HI or LO group, or perhaps it really does reflect high out-migration for the well-to-do.

The ratio of females age 20-39 to those age 0-9 is meant to measure the relative gain of females. In every region the HI groups gain more than the LO. In parallel with the decreasing HI/LO gap in product per capita noted above, the HI/LO gap in this ratio decreases from North to South:

Region	Female Generation Ratio Age 20-39 / Age 0-9		Ratio
	HI GROUP	LO GROUP	HI/LO
Northwest	1.55	1.15	1.35
North Plain	1.32	1.19	1.11
Lower Yangtze	1.25	1.14	1.10
South	1.28	1.23	1.04

The ratio for males age 20-39 decreases similarly but less regularly. This is only one of many regularities in the data, but it also lends some credence to the validity of this exercise of matching up the different surveys.

The rationale for the regional variation cannot be approached until we have examined the regional variation in agricultural economy in Part Two. That will resolve a major portion, though not all, of the variation that can be seen in the age-sex distribution.

2.12 The Process of Accumulation of Land over the Life Cycle — Chinese Farm Economy, Buck 1930

So far I have dealt with only one side of the model of the class relations of reproduction, differential reproduction of classes that disperses landownership. The other side of the dynamic equilibrium is the concentration of landownership. This is the ongoing process in which those who receive the surplus of the society in rents, interest, profits, or taxes are able to accumulate disproportionate ownership of that important and limited capital asset, land. There does not seem to be any simple source that can give us a measure of this total process, and it might also be argued that it could not operate at a constant amplitude across the vast area of China. However, Victor Lippit has made a sweeping estimate that the national surplus of China before the 1949 revolution was 19% of GNP in the 1930's (Lippit 1974). This is a useful measure of order of magnitude for the surplus. We would also need to know how much is consumed and how much reinvested. Lacking this macro-economic information, we must turn again to village studies and surveys.

Sources of information on changes in landownership over time are hard to come by. One such source is a table in Chinese Farm Economy (Table 4, pp. 35-36) which analyzes changes in size of farm over the tenure of the farm operator, from the time he began farming to the time of the survey. Since the heads of household average 40-45 years of age, we might suppose the period of tenure to range about 15-25 years. The table gives information on farm size change for eight localities in North China, but for only five out of eight surveyed in East Central China. It is possible to reconfigure this table to highlight change in ownership rather than change in farm size, though there is some ambiguity as to whether it accounts for all land which is owned and rented out and therefore not a part of land that the operator originally farmed. The capital letters just under the headings at the top of the table columns label and help explain the process of calculation.

This result of this reconfiguration is presented here in a two-page table, Dataset 2.12.1, which has three sections. Each section gives the same information, separately, for North China and East Central China. The first section (Dataset 2.12.1 A), filling the first page of the table, specifies the landownership at time of inheritance and at the present time for each of the localities, which are also averaged by HI, MED and LO

economic status, the same as in other tables here analyzing the Chinese Farm Economy data. The HI, MED, LO and Total averages have been figured by simple average from calculations on the locality data, even though the full listing of localities is not given for the subsequent sections of the table; so the averages will not multiply out precisely as shown in the column labels.

Aside from the original land figures in hectares, I have estimated the production on the land in each locality sample, and converted hectares into annual kilograms of grain-equivalent produced on the land, in order to be able to make a more useful comparison between localities of different economic status. This is significant because of the considerable variation in productivity, particularly between the North and East Central China, the latter producing nearly three times as much per hectare, just as seen in this data. So farms in the North are much larger, but produce somewhat less on the average than in East Central China. As a concrete measure, kilograms of grain produced by an area of land has direct significance for human subsistence, as will be analyzed in detail later in this thesis, and has much greater durability across time and space than Chinese dollar amounts, the common measure in Chinese Farm Economy.

The measure "product per hectare of cropland in kilograms of grain-equivalent" was prepared also for the purpose of facilitating comparison between Chinese Farm Economy and Buck's later larger survey Land Utilization in China. The first data column of Dataset 2.12.1 A lists this for each locality. It was calculated by adding up, for each major crop (which are nearly all grains and legumes), the extent of land devoted to each crop in each growing season, times the yield. This was further adjusted for the residual land devoted to minor crops, and by the index for the yield of the current year in comparison with the average year. A few significant high-value, low volume cash crops like cotton and sesame, and low-value, high-volume crops like sweet potatoes, were converted to the weight of a comparable cash value of wheat or rice. Other than that, the measure is the total weight produced per hectare of cropland for both grains commonly marketed (wheat, rice and soybeans) and those commonly consumed on the farm (barley, millet, kaoliang, corn, green beans). This measure does not seem to agree with the indices given in Chinese Farm Economy for comparison of crop yields in different localities, but it is close to the figures for average production in grain-equivalent per hectare that are derived from Land Utilization in China, with a similar range of variability, more nearly constant at around 1200 for the North Plain, and much higher but more variable for the South.

Dataset 2.12.1 Analysis of Change in Landownership and Farm Size during the Tenure of the Farm Operator, for Localities grouped by Economic Status — Buck, Chinese Farm Economy, 1930

A. Land Inheritance and Subsequent Transactions

County, Province	N of Farms	Economic Status	Product / crop ha. in kg. grain-equivalent	FARM AREA IN HECTARES: Inherited portion of first farm A	Present farm land, own & mort B=A+E+F-G-H	Rented to others (less taken back) C	Land owned, mortgaged in, and rented out. D=B+C
NORTH CHINA							
Kaifeng,Honan		HI	1380	2.48	2.87	0.00	2.87
Sincheng,Honan		HI	1570	2.15	2.45	0.00	2.45
Su, Anhwei		HI	1050	3.65	4.12	1.11	5.23
Yenshan 1923,Chihli		MED	1330	3.88	3.68	-0.02	3.66
Hwaiyuan, Anhwei		MED	1360	3.17	3.56	0.07	3.63
Wusiang,Shansi		LO	1120	1.63	1.76	0.09	1.85
Yenshan 1922,Chihli		LO	1320	2.35	2.29	0.00	2.29
Pingsiang, Chihli		LO	1580	1.11	1.12	0.02	1.14
HI	579			2.76	3.15	0.37	3.52
MED	257			3.53	3.62	0.03	3.65
LO	553			1.70	1.72	0.04	1.76
Total	1389			2.76	2.96	0.18	3.14
HI	Land valued by		1330	3540	4040	390	4430
MED	estimated product		1340	4730	4870	30	4900
LO	per hectare in		1340	2230	2260	40	2300
Total	kg. grain-equiv.		1340	3350	3580	170	3750
EAST CENTRAL CHINA							
Kiangning S, Kiangsu		HI	4050	0.96	1.69	0.00	1.69
Lienkiang, Fukien		HI	5450	0.54	0.70	0.03	0.73
Laian 1922, Anhwei		MED	1520	3.65	3.75	2.09	5.84
Wuchin, Kiangsu		MED	5080	1.09	1.08	0.04	1.12
Kiangning T, Kiangsu		LO	3330	1.18	1.32	0.07	1.39
HI	364			0.75	1.20	0.02	1.21
MED	400			2.37	2.42	1.07	3.48
LO	217			1.18	1.32	0.07	1.39
Total	981			1.48	1.71	0.45	2.15
HI	Land valued by		4750	3410	5330	80	5410
MED	estimated product		3300	5550	5600	1690	7290
LO	per hectare in		3330	3930	4400	230	4630
Total	kg. grain-equiv.		3890	4370	5250	760	6010

Source: Buck, Chinese Farm Economy, 1930. Table 4, p. 35. Changes in Size of Farm Area
NOTE: HI, MED, LO, Total calculated by simple average from locality data.

Dataset 2.12.1, continued

B. Summary of Gain and Loss of Landownership

Economic Status	LAND (HA.) GAINED: Purchased E	Mortgaged in (less redeemed) F	LAND (HA.) LOST: Sold G	Mortgaged out (less redeemed) H	CHANGE IN OWN LAND SINCE INHERITANCE: % Gained E+F/A	% Lost G+H/A	VOLUME OF TRANSFERS Gain & Lose /All Land E+F+G+H/D
NORTH CHINA							
HI	0.41	0.04	0.09	-0.02	17%	3%	15%
MED	0.39	0.12	0.34	0.07	14%	11%	25%
LO	0.21	0.20	0.31	0.08	25%	23%	46%
Total	0.35	0.12	0.23	0.05	17%	10%	24%
HI	530	60	110	-20	Land valued by		
MED	520	150	450	90	estimated product		
LO	280	260	410	100	per hectare in		
Total	430	160	310	50	kg. grain-equiv.		
EAST CENTRAL CHINA							
HI	0.37	0.08	0.00		59%	0%	37%
MED	0.37	0.06	0.39		18%	16%	23%
LO	0.24	0.03	0.12	0.01	23%	11%	29%
Total	0.34	0.06	0.18	0.01	27%	13%	27%
HI	1610	300	0		Land valued by		
MED	630	90	680		estimated product		
LO	800	100	400	30	per hectare in		
Total	1060	180	350	10	kg. grain-equiv.		

C. Change in Land Rental and Farm Size

Economic Status	CHANGE IN RENTAL OF LAND: Rented in when began farming I=K-A	Rented in (less land released) J	Increase in land rented in J-I/I	Rented in % of present farm size K/L	CHANGE IN FARM SIZE: When began farming K	Present size of farm L	Change in farm Size L-K/K
NORTH CHINA							
HI	0.33	1.01	x 2.0	24%	3.09	3.74	23%
MED	0.05	0.15	x 2.3	3%	3.57	3.68	4%
LO	0.09	0.08	x -0.1	4%	1.78	1.66	-5%
Total	0.18	0.50	x 1.7	12%	2.94	3.20	9%
EAST CENTRAL CHINA							
HI	0.18	0.44	x 1.4	29%	0.93	1.61	67%
MED	0.47	0.58	x 0.2	28%	2.84	1.93	-20%
LO	0.83	1.18	x 0.4	44%	2.01	2.23	11%
Total	0.43	0.64	x 0.5	31%	1.91	1.86	21%

There is a slight inconsistency here in applying the measure, since it is for hectares of crop area (land on which crops are grown, exclusive of homestead, work areas, paths between fields, etc.), and the source table is for the more inclusive farm area; however, the difference is usually not more than 5%, relatively insignificant.

In Dataset 2.12.1 A, we can see that the HI (as judged by capital and income) localities do not necessarily have the largest farms in terms of area, and in fact may be smaller. When judged in terms of grain-equivalent produced, the HI localities in East Central China are in a much better position. The HI and MED localities have about the same amount of land owned and farmed at the time of the survey, while the LO localities have much less. However, the HI localities have gained much more land during the tenure of the operator than have the other two groups.

This is much clearer in the second section of the table, Dataset 2.12.1 B, where gains and losses to the farm area are recounted. The table has been simplified by counting land mortgaged in or out as net of the amount of land redeemed, given separately in the Buck source table. From this source table I have also calculated that overall only 10% of mortgaged land is redeemed. Although this may be an undercount, it is so low as to suggest that mortgaging land is tantamount to selling it, and it generally does not revert to the original owner. This is the justification for treating mortgaging of land as a transfer of ownership, as done in summing up "land owned, mortgaged in, and rented out" in the last column of Dataset 2.12.1 A.

There have been both gains and losses, sales and purchases, since the initial inheritance. It does not quite make sense to cancel one against the other, to calculate net gain, since very likely different farms in the samples are involved. But it can be seen that gains are much greater than losses for the HI localities in both North and East Central China. The differences for each between the gains and losses may be summarized as follows:

Change in Landownership over Tenure of Farm Operator: % Gained - % Lost

	North China	East Central China
HI Localities	14%	59%
MED Localities	3%	2%
LO Localities	2%	12%

This is one of the best pieces of evidence that the rich get richer. All groups show an average gain in ownership, and this is not surprising in that the time period is the middle of the life cycle of the farm operator, when maturing sons may be augmenting

labor power. Land may be sold when it is fragmented at the point of inheritance, and those who sell off and/or emigrate will also not appear in a sample of farmers.

The third section of the tables, Dataset 2.12.1 C, concerning change in land rental and farm size, shows that for almost all localities the amount of land rented in increases over the tenure of the farm operator, as would also be consonant with increase of labor power. Relative to the amount of land rented at the beginning, this increase is more marked for the HI localities, which also generally enjoy more sons and joint estates with brothers. In terms of acreage, the increase in the North is greater for HI localities, and greater in East Central China for LO localities; this pattern, incidentally, is consonant with the analysis of the rate of rent and consequent renting patterns, to be presented in the third major part of this thesis. There is of course a greater overall prevalence of rented land in the more fertile East Central localities, which is part of what allows a more marked increase in farm size during the tenure of the operator in East Central China than in the North.

It must be kept in mind in looking at all these figures that each locality encompasses a mix of farm sizes and fates, and what we are comparing is the average for each locality, with some samples being somewhat better off on the average than others. But there may be rich-getting-richer and poor-getting-poorer within each sample, as well as in the comparison between samples. Also, it is possible for some portion of the sample to be large rentiers, while the bulk of farmers are of modest means, as for the Laian 1922, rated MED in economic status. The Laian 1922 sample registers the highest volume of property transfers, with 0.70 hectare purchased, 0.72 hectare sold, and 2.09 hectares of land rented out — per farm, averaged over just 100 farms. This and the decrease in average size of farm (from 3.65 ha. at time of inheritance to 2.54 ha. present size) implies a massive transformation of small owners into tenants, and of large farmers into rentiers.

Again, this comparison of locality samples ranked by HI, MED or LO average economic status must be only a pale reflection of the magnitude of interactions between social classes that would be seen if we could travel back in time, join the Buck team and re-compile the original survey schedules by economic status of individual farms. The volume of land transfers gives us some indication of the possibilities for rapid restructuring. In the last column of Dataset 2.12.1 B, I have added gains and loss and divided this by all land that can be accounted for. We cannot know whether both those who have lost and those who have gained the same piece of land have been netted within

the survey, i.e. how much overlap there is. This calculation can only be expected to yield a rough order of magnitude, and perhaps it should be divided by 2. Losses and transfers are heavier for the poorer samples, of course, relative to their ownership. In any case, the volume of transfers is sizeable for a period of fifteen or twenty years, I believe sufficient to support the process of centralization of ownership through exploitative transfers, and dispersal of ownership in inheritance, that has been proposed in the model of reproduction of social relations.

2.13 The Stability of the Landownership Distribution over Time — Lavely and Wong

Many aspects of differential reproduction by class have been demonstrated in the previously-discussed historical materials. I have deduced the outlines of the process over time from examination of cross-sectional survey material. There are few sources that afford a time-lapse view on the process of differential reproduction and accumulation. However, given the emphasis in Chinese society on the continuity of family descent and the debt to ancestors for their bequest of land, Chinese peasants are thought to have remembered their genealogies and the amount of land inherited over several generations with considerable accuracy. In their thorough study of the North China plain during the 1930's, the South Manchurian Railway Company researchers also investigated transmission of land in three Hopeh villages, North China. I am indebted to William R. Lavely and R. Bin Wong for finding and analyzing this data specifically with the intent of investigating transgenerational change in landownership[25].

The data source is Jidong noson jittai chosa hokoku sho (Field study report of village conditions in north China), a 1937 survey carried out under auspices of the South Manchurian Railway Company and with ambitions for Japanese penetration of rural China. The survey covered three villages in Hopeh: Pinggu, a grain-growing village for which the data are most complete; Fengyan, cotton-growing; and Changli, specializing in pear orchards. The respondents were thoroughly interviewed as to the amount of land they owned and received in inheritance, for themselves and for their fathers and grandfathers as well. 319 households were surveyed, of whom 233 households had received land from their fathers. These 233 lines of descent are the main subjects of

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25 Edwin Moise published an article in 1977 systematically outlining the effect of partible inheritance in dispersing ownership. I began quantification of the population model with land accumulation balanced by differential reproduction in late 1975. My preliminary findings on the Buck data (leading to Parts One and Two of this thesis) were compiled in a large manuscript in 1983 and presented in summary at an August 1983 seminar with Lavely and others. Lavely and Wong produced their research report in late 1984 with alternative methodology and presentation. Also in the early 1980's two economists in Europe created computer models of intergenerational transmission of wealth (Crama and Pestieau 1981; Pestieau 1982).

Lavely and Wong's analysis; these included 561 bequeathals of estates over several generations.

This analysis provides several useful benchmarks. First, inheritance in practice was substantially equal partition of the estate among male heirs. For 37 cases in Pinggu village of land succession with more than one heir, 30 (81%) were divided equally or roughly equally, 4 (11%) were divided unequally, and 3 (8%) were not divided. The undivided three were small estates, under 20 mu, in which division could have resulted in an unviable holding; inheritance could perhaps have been divided with cash or other compensation among brothers. (Lavely and Wong 1984, p. 9-11).

Second, the average length of a male generation in this sample was found to be 29.8 years. The survey was only adequate for compiling a small sample for time of succession, but Lavely and Wong applied sophisticated life table methods to come to that figure. They also give a broader perspective on male generation length:

> Twenty-eight to 30 years is a typical length of a female generation in human populations, but it is relatively short for a male generation. The male generation is usually longer because the male reproductive span is longer. Male fertility rates are not commonly used by demographers and male fertility schedules are rare. Some are available for Chinese society, thanks to the labors of genealogical demographers. For fifteen clans in the Lower and Middle Yangtze regions studied by Liu Tsui-jung, mean ages of paternity schedules — an estimate of a male generation — ranged from 32.6 up to 36.6, with a mean of 34.4 years ... These longer generations are expectable in a society in which males marry later than females, where male remarriage is frequent, and where concubinage is practiced.
>
> However, a male generation length of under 30 years is expectable for rural north China, given the region's distinctive marriage customs. Male marriage age in north China was low relative to south China, and low relative to females. ... If men marry women older than themselves, and do not remarry, then their fertility is constrained by the reproductive span of their wives. (Lavely and Wong 1984, p. 26)

Lavely and Wong quote Gamble's 1931 data on age at marriage for men and women in rural North China. We have seen (Dataset 2.3.1) that this data also shows a strong relationship between landownership and male age at marriage, with the sons of the largest landholding group married at age fourteen to fertile-age daughter-in-laws. Although we do not have a calculation for male generation length by landownership, we might infer that this could have provided a significant effect in class differentials of reproduction, independent of numbers of sons born.

Third, the size distribution of sibsets of inheritors fairly closely fits a Poisson distribution, with most commonly only one heir, and very few large male sibsets.

Fourth, it is clear in the Mantetsu data that the largest landowners have the highest average number of surviving heirs.

Both points three and four can be seen in Dataset 2.13.1 A, which presents data for the last generation from the two villages where data was more complete, Pinggu and Changli. In the adaptation of Lavely and Wong's table I have merged the numbers for the two villages and calculated average number of sons for each landowning group. According to this table, the reproduction rate of those owning 60 or more mu (about four hectares, still only a moderate-sized farm for which much hired labor would probably not be necessary) is over 60% higher than that of those owning under 20 mu of land.

However, even the landless average more than one son, and the overall reproduction rate appears to be 1.85, apparently a considerable population growth. Although it was no doubt the case that there was population growth in the villages in this period, I believe the figures here overstate the reproduction rate, since the selection of the sample was for men whose ancestors had land. There were probably a great many landless tenants and farm laborers in previous generations who died without issue, and these are an invisible portion of the previous generations. If we can assume on the basis of some empirical evidence, including Dataset 2.13.1 A, that the numbers of sons more or less fall in a Poisson distribution, we can suppose a mean of reproduction that includes the sonless fathers. The overall net reproduction rate per generation may be in the range 1.15 to 1.4; but the precise number need not concern us. What is interesting in terms of the land/population model, however, is whether growth of the population affects the outcome. This will be followed up below.

The benchmarks provided by Lavely and Wong's analysis — pattern of partible inheritance, length of generation, surviving male heir sets, relation of male reproduction to landholding — are a welcome confirmation of the conditions established in the model and previous computer simulation of partible inheritance. However, what is most important in this analysis is the empirical observation of the pattern of landownership distribution over time. Let us examine this closely, in Dataset 2.13.1 B. Lavely and Wong calculated a measure of landownership distribution inequality that is standardized to the mean, and so is not influenced by population growth and resultant

Dataset 2.13.1 Landownership Stability over Time: Analysis of 1937 South Manchurian Railway Company Data for Three North China Villages — Lavely and Wong.

A. Male Sibsets Surviving to Household Division

Male Sibset	Land Bequeathed by Father: none	< 20 mu	20-60	> 60 mu	Total
1	2	39	16		57
2	4	17	15	8	44
3		7	5	5	17
4		2	2	3	7
5		1			1
6			1		1
All	6	66	39	16	127
Average N of Sons	1.67	1.62	1.92	2.69	1.85
N Relative to Average	0.90	0.88	1.04	1.45	1.00

B. Landownership Distributions (Measured in D, Percent Displacement from Equality) for Four Generations in Three Hopeh (Hebei) Villages.

Gener-ation	Pinggu (grain) N	Pinggu (grain) D	Fengyan (cotton) N	Fengyan (cotton) D	Changli (pear orchard) N	Changli (pear orchard) D	All Three Villages N	All Three Villages D
1	25	31.6%	41	53.8%	22	46.9%	88	45.8%
2	66	43.9%	63	52.0%	54	34.4%	183	43.9%
3	75	33.4%	54	48.5%	65	84.4%	194	54.7%
4	35	34.4%	29	48.5%	32	50.2%	96	43.9%
All	201	36.8%	187	50.8%	173	57.7%	561	47.9%
N of House-holds	98		120		101		319	
Inherited Land (mu)	84		62		87		233	

C. Computer Simulations of Landownership Distribution (Measured in D, Percent Displacement from Equality) Generated under Different Assumptions

Gener-ation	Class Reproduction N	Class Reproduction D	Random Reproduction N	Random Reproduction D	Both Class & Random N	Both Class & Random D
1	126	48.5%	126	48.5%	126	48.5%
2	194	34.4%	197	52.0%	207	39.9%
3	298	25.4%	295	60.2%	333	42.5%
4	457	19.1%	400	53.8%	400	39.9%
5	678	15.6%	768	67.8%	681	43.9%

NOTE: Lavely and Wong's original table is given in Transformed Coefficient of Variation, V*. Coefficient of variation (V) is standard deviation divided by the mean. V* = V/(V+1), So then V = 1 / [(1/V*)-1]. V has been transformed to D, Displacement, after analysis of curves in rent model, Displacement = 0.25025 V + 0.0936.

Source: William R. Lavely and R. Bin Wong, "Family Division, Reproductivity and Landholding in North China". Population Studies Center, University of Michigan. Research Report 84-65, November 1984. Tables 6, 9 and 10.

decrease in average farm size. In Dataset 2.13.1 B I have transformed this into my own measure, percent displacement from equality, which is likewise standardized to the mean.[26] This is a measure which is easy to conceptualize; it is merely the difference between complete equality and the observed distribution, i.e. how much land would have to be transferred to create that outcome.

The landownership distribution does not change greatly from generation to generation, but rather oscillates over a range (with the exception of a rather wide swing in generations 2 and 3 for Changli). The average displacement from equality is 48%. These small samples can be influenced by timing of household division; also, the landownership distribution is a very skewed distribution, for which small samples can come out very differently. However, there does not seem to be any overall movement towards either greater equality or greater concentration.

The figures for inequality of landownership, given here as transformed into "displacement", the measure used throughout this thesis, suggest stability over time, despite growing population. Of course the measure of inequality is calculated relative to the mean, and so it is not upset by a downward (or upward) trend in average farm size. There seems to be persistent difference, however, between villages, with Pinggu, the grain-growing village where the Mantetsu survey records are also the most complete, by far the most equal in land apportionment. We should remember that the apparent exclusion of most landless families from the sample may have shifted the measure towards equality. The three villages taken together range in inequality from a minimum of 44% to a maximum of 55% displacement over the four generations, with an average of 48%. That is quite close to the previously-presented 1978 Bangladesh survey, as well as to the results of the computer simulation.

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26 The measure of inequality in Lavely and Wong is called the transformed coefficient of variation, V*, which ranges between 0 (equal) and 1 (polarized). This measure is taken from Allison 1978. V* is based on the coefficient of variation, V, which is the standard deviation divided by the mean. V* = V/(V+1). V* was transformed back into the coefficient of variation by means of the reverse equation, V = 1 / [(1/V*) - 1]. Then I applied the different measures of inequality to several landownership distributions to find that V has a virtually linear positive relationship with displacement, D, at least in the range we are dealing with, 32% to 52% displacement: D = 0.25025 V + 0.0936.

Lavely and Wong use somewhat different terminology and measures than I do, but the conception is parallel, as can be seen in their discussion. By "intrageneration change" they mean changes in ownership during the life of the head of household, due to purchases and sales. "Intergeneration change" is the effect of division of estates in inheritance. After an analysis of the relative weights of intragenerational and intergenerational change, Lavely and Wong say:

> The image of a relatively mobile society of smallholders, gaining and losing ground under their own stewardship, is thus balanced by an equally familiar image of a landed elite maintaining their position with difficulty against the inevitable loss of land occasioned by partible succession. ... Each generation wins its battle to improve its lot, but the war to hold on to land is decisively lost in the transfer of land between generations. ...
>
> Large landholders experience losses due to partible succession that are not made up by corresponding intragenerational gains, while for the average small holder inhabiting a volatile environment of intragenerational losses and gains, the division process nearly cancels, on average, the net gains resulting from "hard work and luck". Not only is partible succession crucial in landholding change overall, it has very different significance for large and smallholders. ...
>
> (William R. Lavely and R. Bin Wong, "Family Division, Reproductivity and Landholding in North China". Population Studies Center, University of Michigan. Research Report 84-65, November 1984, pp. 20-21.)

Measuring changes "proportionately", that is, relative to previous ownership for each household, rather than in absolute amounts of land transferred, the intragenerational changes appear much more weighty, i.e. small households in particular are subject to large gains and drastic losses, relative to their usual petty parcels. But in absolute terms, downward mobility due to partible inheritance is dominant.

Lavely and Wong have also devised a computer simulation to model the effects of partible inheritance and random numbers of surviving male heirs. Although they do not carry it as far as in this thesis, their simulation is interesting because it directly applies the benchmarks found in the empirical data and it incorporates population growth. Their results, with the measure of inequality translated into "displacement", are reproduced here as Dataset 2.13.1 C.

The table reports on three simulations taken through five generations. Each starts with 126 households and landownership inequality of 48.5% displacement. The authors do not specify how heirless estates are apportioned; perhaps they have circumvented this

issue by assigning at least one son per estate, and so must deal with rapidly expanding population instead.

The first simulation applies class differentials of reproduction without pegging them to actual landownership level: in each generation the top 4% of landholders have a net reproduction rate (NRR) of 3, the next 46% have NRR of 2, and the bottom 50% have NRR of 1. Within each "class" all fathers have the same number of sons. This results in a progressive leveling.

The second simulation assumes a male NRR of 1.5 for the whole population, but a wide random variance of 1.33 in numbers of sons for each father. In the four generations of the simulation after the initial setting, the average inequality is 58.5% displacement, and although there is no direct progression towards inequality in succeeding generations, there may be a continuing tendency towards greater polarization.

The third simulation applies both class differentials of reproduction and random numbers of sons within each land class. In addition, reproduction is tied to absolute landownership, with the top land class reproducing at 2.25 NRR, and the bottom at 1.25 NRR. (So it seems the average NRR must fall, a fairly credible portrayal of Malthusian pressures, as population expands and land is fragmented.) Under these conditions, the simulation seems to stabilize at an average of 42% displacement.

Several conclusions from this simulation reinforce the logic of the computer simulation that have been presented earlier. Random numbers of heirs increase inequality in each generational transfer, and it can hardly be doubted that this operates irrespective of class differentials. Class differentials of reproduction level inequality. With both processes, displacement from equality seems to hold at about 42%. However, the simulation does not proceed far enough towards the logical conclusion of equilibrium, so we should take the numbers generated as indicative of the effect of the process, not the absolute outcome. Moreover, Lavely and Wong have not built the intragenerational change that they found in empirical analysis into their computer simulation. This is the process of concentration of ownership that, I believe, provides the foil for class differentials of reproduction, and raises the equilibrium of the society to a higher level of inequality, at least 48%. After the empirical landownership distribution has been investigated later in this thesis we can reevaluate this issue with greater precision.

Chapter 3 Comparison across Cultures and Histories: Population Processes in Turn-of-the-Century Russia and Contemporary South Asia

3.0 Introduction: The South Asian Demographic Literature

I have proposed that class differentials of reproduction are not merely a phenomenon specific to Chinese culture, but a more general phenomenon of societies that practice partible inheritance; and that the class differentials of reproduction provide an indispensable maintenance of equilibrium in the relations of production. If so, the demographic processes that create the class differentials of reproduction should be operative in many other settings, and particularly in environments where the press of population on land resources constrains the alternatives to starvation.

South Asia , then, is the obvious choice for comparison with pre-1949 China. Although communal village tenure of land only gave way to individual property rights since the advent of British colonialism, still the subcontinent has had a millennium or more of state domination of the peasantry, and a social order in which the fruits of the land have been distributed unequally. Several reports on landownership distribution for South Asia that I have analyzed, such as the one for Bangladesh presented in Section 1.3, show a contemporary level of inequality comparable to that of the pre-1949 Chinese peasantry. The caste system imparts a certain static appearance to that social order that would seem to inhibit the kind of mobility proposed for China, but it is also known for South Asia that castes may be transformed in occupation over time. Within a short time frame, the identification of castes with certain life styles and roles in fact makes the class analysis more transparent, as can be seen in some ethnographic studies (e.g. George et al. 1992). Finally, the alarm over population pressure in South Asia, where the specter of famine still looms in modern times, has led to a wealth of demographic studies that I can call upon for this analysis.

There is another reason to look to comparative cases. Many ambiguities cannot be resolved in dealing with Chinese data from such a distance of time, back before current means of surveying and computation. Starting with the 1982 census in the Peoples Republic of China, more contemporary data have been available, for example reliable data showing reported sex ratios at birth increasing in the 1980's (Zeng et al. 1993). Population studies have been renewed. But without clear private ownership of land —

private ownership was abolished in the 1950's formation of cooperatives and communes, and was in the 1980's only beginning to be reconstituted under various guises — it is very difficult to quantify the relations of production and how they might determine reproduction. Fortunately, South Asian researchers have done numerous village studies and taken the analysis to a much more refined stage, particularly with a concern for population dynamics, and often with a materialist philosophy underpinning the design of their studies. The more I have delved into this South Asian data, the more I have seen the subtle parallels with Chinese demographic patterns.

In making this comparison, I have not ignored consideration of what might be the difference in historical circumstances. Although subsistence farming is still the lot of the mass of South Asian peasants, and I believe they may validly be compared with pre-revolution Chinese peasants in most household functioning, the Green Revolution has in many places advanced capitalist agriculture, with large landowners dismissing tenants and agricultural laborers in favor of farming with tractors; and industrialization has displaced much peasant subsistence through craft exchange. This is a caveat, that while many of the traditional processes of the agricultural economy and class relations continue, there are also uneven changes across the region; this may be kept in mind during the following review of South Asian studies.

Surprisingly, the other main source of comparative material that I have found is from early twentieth century Russia. Although Russia had very different ecological conditions, basically many times more land per capita than Chinese or South Asian peasants, and communal tenure on the land with periodic distribution according to family mouths or labor power, still there just happens to be extant from that period large-scale surveys that indicate class differentials of reproduction and also increase in arable land held by big peasants over their life cycle. This large-scale survey data facilitates some intriguing deliberations on the theory proposed in Model One, specifically that higher rates of accumulation are balanced by greater class differentials of reproduction.

Demographic Indicators and the
Specifics of Female Infanticide by Economic Class

Let us review the demographic indicators that are relevant to the cross-cultural comparisons.

There are two main issues to examine in relation to socio-economic indicators in the South Asian data: 1) fertility and mortality, which can lead to conclusions about rates of net increase and 2) patterns of female infanticide and excess female child mortality, which create the conditions for restricted allocation of women. There are also subsidiary issues such as joint family formation and its influence on fertility that may be compared with the Chinese sources. For basic rates of reproduction we should examine births and deaths, especially child deaths, by landownership, farm size, or other economic indicator. It would be ideal to have number of sons surviving per adult male, but the South Asian studies, in the usual demographic tradition, generally report marriage age for women and children per married women, without mentioning rates of marriage and childbearing for men.

It would be easier to understand the implications of this data if we could cover each topic in a logical order. But each survey source to be introduced has its own setting and particularities of data presentation, so we must proceed by author and survey, and integrate the findings at the end. A number of South Asian studies are reviewed in Sections 3.1-3.5.

The outcomes of all of these processes are to be found combined in diachronic studies of peasant social mobility, which will be reviewed in sections 3.7 and 3.8. The sources of these studies are mainly Russia, but there have also been two small Bangladeshi studies modelled after the Russian ones. Here we are closest to confirmation of the "just-so" story presented at the beginning of Part One.

Let us think about why female infanticide might be patterned by class.

It is conceivable that class differentials of reproduction could operate with the endogamous reproduction of classes, i.e. the rich have many children and preserve girls as well (which they then exchange among themselves), while the poor suffer low fertility and high mortality of children of both sexes. But depriving the poor of the means of reproduction, women, through market mechanisms of dowry and brideprice,

brings unequal social relations to a higher level without direct application of coercion. This is consistent with the institutionalization of private ownership of productive resources, a long historical process that continues to present. It may also decrease the costs of reproduction for the rich, since their women do not have be raised at cost comparable to the privileges accorded to sons. Moreover, declining to raise daughters and thus taking wives of slightly lower social standing reinforces the servility of women within the family. These are some of the cultural implications.

I concluded for China that there was significant female infanticide that functioned to restrict the numbers of women and thus to constrain the reproduction of the poor. Female infanticide was in particular indicated by the high sex ratios (males per hundred females) among children of the rich, and seemed to be accompanied by massive transfers of women from poor areas to rich (Datasets 2.9.3 A, B, C in particular). This finding may be surprising to sinologists, some of whom have concluded from fieldwork that it is the poor who practice female infanticide (personal communication, Gene Anderson, 1985). It is not necessary to argue that the poor do not practice female infanticide, only that the weathy practice more.

Although female infanticide among the landed rich has not generally been recognized for China, with the notable exception of relatively recent work by James Lee of California Institute of Technology (Lee et. al, 1992, 1993), it has been well established in studies of India since the publication of Barbara Miller's 1981 book, The Endangered Sex: Neglect of Female Children in Rural North India. Female infanticide and hypergamy, women marrying up from lower social groups, has been found most pronounced among landowners in northwest India; female infanticide was noticeable even to early British colonial officers because of localization in certain castes that were reported to do away with all female infants. Since the 1980's, there has been increasing detail in research, especially research seemingly influenced by feminist outrage against female infanticide, detail that allows us to examine these issues in some depth for small studies. Demographers, however, have been slow to integrate issues of socio-economic differentiation or female child discrimination into their research designs.

It has also been noted for India that bourgeoisification has led to increasing rather than decreasing pressure on women, with high demands for dowry, originally a mark of upper

class status, becoming prevalent in middle and even lower classes.[27] In a recent studies (Wadley 1993), it was found that the poor in India have been practicing increased female infanticide and/or discrimination, apparently due to changes in dowry practices and employment opportunities.

Reasoning about Transitions in Demographic Patterns

There is another way in which the South Asian literature can help us understand the function of reproduction in peasant household economy. From the 1970's a few demographic researchers using anthropological methods, such as Mamdani (1972) and Mead Cain (1977), studying children's contribution to farm labor in Bangladesh, challenged the 1960's modernization theory presumption that the demographic transition would advance in developing countries with rising standards of living because the rich reproduced less. Higher fertility with larger area farmed and/or owned was observed in several parts of the world, though the pattern was found to be mixed, and this relationship has been the subject of some investigation and neo-classical theorizing (Stokes and Schutjer 1984; Cain 1985; Sharif and Saha 1993). It provides us a way to understand that slightly lower reproduction for landlords and for the largest farmers in some of the Chinese data (see Datasets 2.4.1 A and 2.5.1 in the previous chapter) is not anomalous; and it may be logically related to the consumption role of a rentier in the relations of production.

Related to this, a process of transition from high fertility for the rich, especially landed rich, to low fertility for the rich and high fertility for a proletarianized poor, has been described in detailed South Asian and Middle Eastern studies. Although most of this transition is beyond my analysis of data for China (we have observed only heightened fertility for tenants in South China and lowered fertility for landlords), it fills out a more dynamic picture of the demographic processes, and it also has bearing on the comparisons we can make with contemporary South Asia. Speculations on the shift in

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[27] This has been not just as an academic issue, but an issue for feminist mobilization against bride burnings — "accidental" burnings in the kitchen of brides whose families did not deliver sufficient dowry to the groom's family. A contemporary Indian feminist magazine, Manushi, often covers such incidents.

relations of production and relations of reproduction that produce such a transition will be developed in Section 6.8 after analysis of urban-rural differentiation.

Here in Chapter 3 I will present only a small part of this literature, discussing the value of women's and children's labor, in Section 3.5. This review of literature for South Asia will begin with some of the basic comparisons, and proceed to the more complex.

3.1 Fertility, Child Mortality, and Joint Family Formation — Edwin Driver, India

A rare early examination of the issue of social class and reproduction in India is to be found in Edwin D. Driver, Differential Fertility in Central India, 1963. This book reports on a 1958 study of Nagpur District in central India, which had then 247,000 households, distributed 34% urban, 10% town, and 56% village. Although this seems a high rate of urbanization, the district was said to be conservative and representative of "old India". The study was a 1% scientific sample of couples in city, town and village, covering 2589 households total.

Driver also reviewed the available studies of socio-economic status and fertility, several of which showed a positive relationship:

> When previous studies of economic status and fertility are juxtaposed, one obtains an unclear picture of the relation between these two variables. The United Nations-Government of India Survey of Mysore, using type of dwelling as an index of the economic status of the family, found a positive association between completed fertility (that of women 45 years of age or over) and upper status. Rural women living in huts had 4.4 live births, whereas those living in "mudhouses with thatched roof" had 4.5 live births, and those living in still better houses had 5.0 live births. Similarly, the wives of agricultural laborers had 4.0 live births, while those of small cultivators had 4.7 live births and those of large cultivators had 5.1 live births. (Driver p. 9, citing unpublished ms. by C. Chandrasekharan, 1957).
>
> The relation of land ownership to fertility is treated in the report of the National Sample Survey, Government of India. Among women married at least twelve years, the wives of the largest landowners have the highest fertility. But the differences between the groups are small, and the relationship of land ownership to fertility is not linear. (p. 10)

Driver's own survey found an uneven relationship between income and births over the whole population, both urban and rural. This is not surprising in that those male heads of household occupied in agriculture, only 26% of the survey (Driver 1963, p. 26), had by far the greatest number of children. He did however find a clear relationship among those owning land. (No differentiation of city, town, or village residence was made, so I have excluded the majority owning no land from the table). Higher child mortality for small owners increased the gap in numbers of living children.

Dataset 3.1.1 Fertility and Child Mortality Among Couples Classified by Land Ownership, for Nagpur District, Central India, 1958

Land Ownership (acres)	Number of Couples	Mean Number of Children Living	Dead	Ever Born	Percent Child Mortality
20+	306	3.4	1.4	4.8	29.2%
10-19	297	3.0	1.6	4.6	34.8%
1-9	403	2.5	1.8	4.3	41.9%

Source: Driver 1963. Table 100, p. 110

Driver also examined the socio-economic pattern of joint families, which he defined broadly as including either parents or siblings in addition to the nuclear family. 42% of families in Driver's sample had joint families. This adds some ethnographic color to our understanding of traditional families.

> The joint-family is thought to have considerable bearing on the fertility performance of its members. According to one school of thought, it operates to keep fertility below the level that it would reach if a couple lived separately from its kinsmen, i.e. in a nuclear family. By virtue of the number of people living together, couples are permitted little privacy and hence infrequent opportunities for sexual intercourse. In addition, further restrictions may be imposed by the internal organization of the house and the deliberate controls exercised by other members, especially the elders. The only evidence indicating the operation of these factors is a case illustration provided by Taya Zinkin (T. Zinkin, India Changes, New York: Oxford University Press, 1958, pp. 63-64):
>
> "In the South Punjab, a typical household resembles that of Ram Singh, a Delhi student who invited me to visit his father's prosperous home. The inner courtyard, in which most of the family activities go on, is lined with rooms — the kitchen, a number of storerooms, a cattle room, one room for the women, and one for the men, and, in a corner there is a little room, scarcely the size of a big double-bed. Ram Singh explained that this was the nuptial room. The members of the family have to take turns reserving it. To reserve it too often is frowned upon. Ram Singh said that he could ask for it five times a month, at the most, and this only because he is newly married. 'We have no freedom to talk to our wives' he said bitterly." (p. 38-39).

Wadley's study of a rural area in north India also found that separate sleeping rooms for men and women were nearly the universal case in 1968, and "the mother-in-law had nightly allotted beds and private rooms", but that by 1984 private rooms were common. Fertility had also increased in the 1970's (Wadley 1993). As in the Chinese case, the interference of mother-in-laws often had an adverse effect on marital relations. However, Driver's 1963 sample showed 4.9 children for couples in joint families, and 4.4 for those in nuclear families (pp. 82-83), which I take to be largely a socio-economic effect. The study, not controlling for residence or socio-economic level, did

not find any significant difference in fertility between couples in nuclear and joint families for wives of the same age.

Dataset 3.1.2 Number of Couples in Joint Families by Land Ownership, for Nagpur District, Central India, 1958

Land Ownership (acres)	Number of Couples	Having Joint Kin*	In Joint Family	As % of Those w/Joint Kin
20+	306	77.8%	36.6%	47.1%
10-19	297	76.4%	40.1%	52.4%
1-9	403	66.5%	27.0%	40.7%

*living parents or brothers with whom a joint family could be formed.

Source: Driver 1963. Table 33, p. 52

Still, the data on joint family occurrence provides us some confirmation of the usual pattern of more joint families for those with more land ownership. Not only are there more kin living for richer families, but property seems to give greater impetus to joint residence. The exception for the largest landowning group could be due, I suspect, to a larger proportion of this group having urban residence and non-agricultural occupation.

3.2 Fertility and Child and Adult Mortality by Economic Indicators — The Matlab Project, Bangladesh

After a long period in the 1970's in which socio-economic differences seem to have been largely ignored in demographic research, or flattened as an income effect among many other interacting biological effects, there has been some renewal of attention to socio-economic differences since the early 1980's. This first appeared in the form of value-of-children studies, explaining why more children rather than fewer were wanted by households in underdeveloped countries (Cain 1977, White 1973, 1982), and why contraceptive technology offered by the developed countries was often not welcome. Since then some large scale surveys have admitted statistically-significant measures of demographic processes in relation to occupation, land holding and/or land ownership, though the analysis has usually still been framed in terms of biological intermediaries such as coital frequency and duration of lactation.

One thorough long-term demographic study that has provided much of this literature is in Matlab Thana area of Comilla District, where there has been a demographic field station since 1963. Several researchers have written on this continuing project: Abbas Bhuiya, Lincoln C. Chen, A.K.M. Alauddin Chowdhury, Emdadul Huq, Stan D'Souza, and John Stoeckel, among others.

> ...A demographic surveillance system has been maintained among 233 villages containing a population in 1974 of 276,679. The surveillance system consists of regular cross-sectional censuses and longitudinal registration of vital events (births, deaths, migrations, and marriages). Socio-economic status data were collected in the 1974 census. ... In October 1978, the study area was reduced to 159 villages containing an estimated 1974 population of 160,000. (Stan D'Souza and Abbas Bhuiya, 1982, p. 753)

A positive relationship between landholdings and fertility was noted in Stoeckel and Chowdhury, 1980. On the basis of age-specific fertility rates for the years 1968-70 they constructed the standardized demographic measure "total fertility ratio", which is an estimate of completed fertility over an average woman's reproductive lifetime, age 15 to 49. This was found to relate to husband's landholdings as follows:

Dataset 3.2.1 Total Marital Fertility for Rural Bangladeshi Women by Husband's Landholding, 1968-70, Matlab, Comilla District.

Landholding (acres)	N of Women	Total Fertility Ratio	Childbearing before Age 25
3 or more	1,184	7.69	36.4%
2 to 2.9	1,671	7.39	34.3%
1 to 1.9	3,895	7.34	34.9%
less than 1	8,655	7.08	36.1%
none	3,654	6.84	37.8%

Source: John Stoeckel and A.K.M. Alauddin Chowdhury, 1980. "Fertility and Socio-Economic Status in Rural Bangladesh: Differentials and Linkages", Population Studies 34(3):519-524. Table 2, p. 521.

I have added the last column, calculating what percent the fertility rates for ages 15-19 and 20-24 are of the total for rates over all ages 15 through 49, to highlight some subtle differences in the timing of reproduction. The landless in particular start childbearing at age 15-19 at the highest rate for all groups, but fall behind at later ages. The point of early reproduction for the poor is to produce workers for household support during the life of the parents; later reproduction would rather increase the consumer burden. This resembles the Chinese data we saw in Datasets 2.5.2 and 2.10.2. The highest landownership group also bears children early, but then it continues for the highest completed fertility.

In this standardized calculation women on landholdings of three or more acres have only 12.4% more children than those with no land. But we must consider that the total fertility ratio is what completed fertility would be for women in each group if they were married and alive through to age 49. And it is likely that both husbands and wives of the poorer groups experience higher mortality; and their children experience higher mortality as well. So the actual difference in numbers of surviving children per household must be much greater than 12.4%.

D'Souza and Bhuiya have reported on mortality patterns for Matlab with reference to socio-economic indicators. Their description of the area is that there is skewed landownership, with 18% of households owning 47% of land (p. 754). Mortality is most strongly differentiated for their categories that consider landowning as well as other occupations, as follows:

> At the lowest socio-economic level (I) are agricultural laborers, and at the highest level (III) are landowners — persons who work or live off their own land. In between, at level II, are owner/workers — persons who, while owning some land, do in fact work for others. This group includes self-employed persons such as fishermen, fish vendors, boatmen, and businessmen. Also included are salaried employees of industrial concerns, for example, mill workers. (D'Souza and Bhuiya, p. 760)

The relative sizes of these category populations are shown in their 1974 numbers for ages 15-44: (I) 19,962; (II) 77,807; (III) 4,390.

There was general famine in Bangladesh in 1974/75, resulting in much higher than normal death rates in the survey years 1975 and 1976, especially for families of agricultural laborers, and also for the young and the old of all groups. The effects of this crop failure, in destitute wanderers, deaths, and distress sales by small landowners, are described and quantified in great detail in Alamgir 1980, Famine in South Asia. For Matlab, in Comilla District which was not the center of the famine, 1975 mortality for landowner family members aged 15-44 was elevated one-fifth over what it was in 1974; for agricultural laborer families mortality was double the 1974 rate. Dataset 3.2.2, following, compares the economic groups in average annual death rates for the four years 1974-77.

Dataset 3.2.2 Mortality Rates for Rural Bangladeshis by Occupation and Age Group, 1974-77, Matlab, Comilla

Occupation of Head of Household	Deaths per 1000 Persons in Age Group, Average 1974-77			
	Age 1-4	Age 5-14	Age 15-44	Age 45+
Landowner	15.9	2.0	2.2	28.7
Owner/worker	27.5	2.6	2.4	23.3
Agri. laborer	42.9	4.0	3.6	34.0
All	29.6	2.8	2.7	25.6

Source: D'Souza and Bhuiya, 1982, Table 6, p. 761.

As common in societies with minimal medical services, deaths of children under age five accounted for over half of all deaths. For children age 1-4, diarrheal diseases, which can be related to malnutrition, caused 43.9% of deaths, and measles 13% (Chen, Huq and D'Souza 1981). The researchers took note of a persistently higher mortality for female children, and did a careful study of parental discrimination in feeding and medical care.

> Conclusive evidence was provided in an earlier study by the authors (D'Souza and Chen 1980) of higher female than male mortality from shortly after birth through the childbearing ages in a rural area of Bangladesh. Male mortality exceeded female mortality in the neonatal period (first month of life), but this differential was reversed in the postneonatal period. Higher female than male mortality continued through childhood into adolescence and extended through the

> reproductive ages. The most marked differences were observed in the 1-4-year age group, where female mortality exceeded male mortality by as much as 50 percent. ... Son preference in parental care, intrafamily food distribution, feeding practices, and utilization of health services are some of the behavioral mechanisms by which sex-biased attitudes may have led to the observed mortality pattern. (Chen, Huq and D'Souza 1981, p. 55.)

Slightly higher male neonatal and infant mortality is the norm for societies not known to practice gender discrimination among children, such as modern industrial societies. Here higher infant mortality for girls was found to be general to all classes, and the effect was most marked in time of famine, 1975. Let us look to the data to draw further conclusions. To differentiate the rates for male and female children, and also distinguish economic status, it is necessary to read the numbers off Figure 2, p. 763, in D'Souza and Bhuiya. The indicator for economic status is number of cows owned by the household; there is no information on child deaths by sex and landholding. The relative sizes of the category populations can be seen in the numbers for ages 15-44: no cows, 57,820; one or two, 28,995; three or more cows, 25,040.

Dataset 3.2.3 Mortality Rates for Rural Bangladeshi Children Aged 1-4 Years, by Number of Cows Owned by Household, Matlab, 1974-77.

Cows/ Household	Deaths per 1000 Children Aged 1-4 Years, by Sex									
	1974		1975		1976		1977		All	
	M	F	M	F	M	F	M	F	M	F
3+	12.0	18.0	17.5	33.0	21.5	28.5	13.0	17.5	16.0	24.3
1-2	13.0	27.5	23.0	43.0	28.0	34.5	18.0	28.0	20.5	33.3
0	21.0	36.0	41.0	52.5	32.0	40.5	17.5	34.0	27.9	40.8

Cows/ Household	1974 N of Children Age 1-4	Ratio of Female to Male Death Rates in Years		
		'74,77 Normal	'75,76 Famine	'74-77 All
3+	6,114	1.42	1.58	1.52
1-2	7,290	1.79	1.52	1.62
0	15,425	1.81	1.27	1.46

Cows/ Household	Deaths per 1000 Persons in Age Group, Average 1974-77			
	Age 1-4	Age 5-14	Age 15-44	Age 45+
3+	19.9	2.0	1.9	21.4
1-2	27.2	2.3	2.3	26.5
0	34.4	3.2	3.0	33.7
All	29.4	2.7	2.6	28.7

Data source: D'Souza and Bhuiya, 1982, Figure 2 and Table 8, p. 763.

Mortality increases markedly for all girls in 1975, and is not yet back down to normal in 1976, no doubt the lingering aftermath of malnourishment. Mortality increases moderately and later for boys among the well-to-do — but deaths surge for boys among poor almost as suddenly as for the girls, suggesting the poor do not have reserve the rich have with which to discriminate between the sexes. This may explain somewhat why the poor have more equal mortality for girls and boys.

I have appended to this table of mortality by cows owned per household the figures for deaths in other age groups, for comparison with the previous table on mortality by landownership; the range of death rates is slightly narrower. This might lead us to expect that the range of death rates for children by landownership would be wider than what is shown here.

3.3 A View on Reproduction, Mortality and Sex Ratios — Krishnaji, India

The evidence on reproduction and landholding has not shown an unequivocal positive correlation in the South Asian literature, but that is the predominant relationship in the judgment of an experienced Indian demographer. N. Krishnaji's 1992 book, Pauperising Agriculture: Studies in Agrarian Change and Demographic Structure, exhibits a high level of conceptual and methodological sophistication. Allow me to introduce this book with an extended quotation that also recapitulates several of the arguments in this thesis.

> Let me consider first the differentials between the poor and the rich. It is commonly believed that the poor are more prolific and that, as the Victorian epigram has it, while the rich get richer the poor get children. Despite its strong moorings within the western intellectual tradition — carried over to the educated middle and upper classes in the third world — the belief is based more on plain prejudice than on hard facts. Careful studies show that, under conditions of uncontrolled fertility ..., fertility levels tend to be somewhat lower among the poorer classes. This is generally true for the countries in the third world but is modified to the extent that the practice of birth control is slowly spreading. Reviews suggest that both an inferior nutritional status and a longer duration of breast-feeding (among other factors) contribute to such a differentially lower fertility among the poor. ...
>
> For example, in India, agricultural labour families are small on average, ranging below five in size, while for the rural population as a whole the average ranges above 5.5. Not only a somewhat lower fertility — by how much it is difficult to say — but also a higher mortality is responsible for this type of difference in the family size.
>
> One of the important reasons why agricultural labour and small peasant household tend to be smaller on average is that they are always — in all regions of India — among the poorest. And, because poverty and under-nutrition are associated with higher levels of morbidity and mortality, the proportion of children who survive beyond the age of five years in poor families tends to be smaller than in other groups of the rural population.
>
> The implications of such demographic variation are obvious. As a consequence of narrow fertility differentials in the absence of deliberate control, and of higher death rates among the rural poor, agricultural labour and poor peasant populations are expected to grow at a somewhat lower rate than the rest of the population. However, they are not closed populations. Their numbers are affected by migration to some extent, but more importantly by the additions to the ranks of the poor through the pauperisation process. (N. Krishnaji 1992, pp. 224-6)

In a detailed examination of family size, Krishnaji finds that in 1961-62 data for all of India, the proportion of children in the household increases with size of landholding, except for the very largest category, only a few percent of all holdings, for which it drops sharply (p. 179).

As an overview on sex ratios (please remember that Indian reports usually quote sex ratios as female-to-male, not male-to-female as quoted above for Chinese data), Krishnaji says

> The Indian population has an excess of males over females and the gap has tended to widen during this century. In a pioneering study, Visaria [1961] has shown that higher female mortalities in both the child and reproductive age groups are mainly responsible for the deficit of females in India. (p. 199)
>
> How are the mortality differentials and the imbalance between the sexes related to poverty? ... The regional distribution of the sex ratio within India, which has remained fairly stable over time, as Visaria has shown, with very pronounced deficits of females occurring in the northwest and distinctly balanced sex ratios in the south, has led to the speculation that the ratio is governed by and hence related to women's role in agricultural work, more prominent in the poorer regions and mediated to some extent through the cropping patterns. While neat correlations across regions between agricultural prosperity and crop-mix on the one hand and the sex ratio on the other are lacking, it is nevertheless true that the agriculturally rich wheat-based states of Punjab and Haryana have very low female ratios [i.e. more males] and low rates of participation of women in work whereas the poorest states in India, viz, Orissa, Bihar and Madhya Pradesh are more balanced with respect to numbers of females and males, and the paddy-based south has the highest sex ratio [i.e. most females per males]. The deficit of females in the northwest has been repeatedly noted in the early British-Indian censuses, and indeed so were Rajput [high-status caste] villages without female children or with only a few. The census authorities discuss female infanticide in this context and attribute practices linked to what is now mildly described as discrimination mainly to landowning families of certain castes and their strong preference for male progeny ascribed to both economic and cultural factors. (p. 200)

This regional description provides an example of ways of thinking about the reasons for female infanticide and/or fatal discrimination, and relates it to women's work, while it locates the practices in the landowning castes.

I have an alternative explanation which coincides with both Chinese and Indian observations, and I will review it here in case the reader does not immediately see the implications from the brief discussion in section 1.4, "Mechanisms that Maintain Differential Reproduction of Classes: Why Female Infanticide?"

Cropping patterns between China and India are parallel (China: North wheat, South rice. India: Northwest wheat, South rice), while patterns of productivity per capita and per land area are different (China: South is higher in most regions. India: North is higher.) Women work in the fields in South China, which practices intense rice cultivation, but not in the wheat-growing North, similar to the pattern for India. But in contradiction to the women's work thesis, the juvenile sex ratios are much higher for South China, apparently due to more female infanticide and mistreatment as decried in early missionary reports.

My explanation for female infanticide is that it is a major means for maintaining differentials of reproduction, and its prevalence should be proportional to the expropriation of surplus by the owners of the means of production. In Part Two of this thesis I will propose that the agricultural surplus produced per land area, not per capita, sets the boundary of possible expropriation of surplus. Although I do not have enough agricultural data for India to test the proposition about female infanticide there, it seems that there is more female infanticide in the high-productivity North for India and in the high-productivity South for China. That does not necessarily mean that women's productive activities do not also play an important role in determining their social status.

3.4 Locating Female Infanticide and Neglect in Relation to Landownership — Intensive Village Studies in India by George et al. and Wadley

We have looked at class differentials of mortality and of births per woman in various South Asian sources, but there are two aspects in which the paradigm presented for the class differentials of reproduction in China is not complete for South Asia. The first is differential access to women, i.e. delayed or unattained marriage for men, and the second is locating the site and magnitude of female infanticide. For the first, none of the large demographic studies for South Asia has provided numbers of fertile age women by socio-economic indicators that would allow me to calculate differentials of access to women. This is a byproduct of the demographers' fixation on births per woman. However, it is clear that sex ratios in South Asia (given in this literature in terms of females per 1000 males there, so numbers under 1000) are very unequal, and considerable numbers of men must remain unmarried. This imbalance is described in a recent detailed study of a north Indian village, which may well be representative of long-term change in India.

> While the Karimpur sex ratio has favored men for all of this century, it has become more so over the last 50 years, moving from 866 females/1000 males (116 M/100F) in 1925 to 816 females/1000 males (123 M/100F) in 1984. The juvenile sex ratios have become markedly male favorable, going from 913 females/1000 males (110 M/100F) in 1925 to 802 females/1000 males (125 M/100F) in 1984. ... Moreover, the greatest loss of female life is found precisely in those groups where jajmani (traditional patron-client) employment has been curtailed, where women's labor has been replaced in agriculture, and where men's non-agricultural employment is increasing, all of which contribute to a decline in women's employment. (Wadley 1993, p. 1372).

On the second issue, some small-scale studies have been useful. A recent report by George, Abel and Miller, 1992, affords considerable insight.

Fieldwork was carried out April 1987-September 1989 by Sabu George; the area of study was twelve villages in Tamil Nadu state, South India — not recognized as an area of common female infanticide. Culturally it is Dravidian, with consanguineous marriages, "relatively equal treatment of sons and daughters in terms of food and medical care, and relatively high status of adult women" (p. 1153). Each home was visited by a village health worker every 10-12 days, and every house in which an infant was born was

visited within two days of birth. Intent of infanticide if the child were a girl was sometimes known in advance by the health worker.

> In the study population of 13,000 there were a total of 773 birth outcomes recorded, involving 759 live births of which 378 were male and 381 female. Among the cohort of live born infants, 56 died in the period of two and a half years, and of these there were 23 males and 33 females. ...Of the 23 male deaths, there was no infanticide. Among the 33 female deaths, there were 19 infanticides. ...(I)n the six villages in which the infanticides occurred, infanticides constitute 72 per cent of female deaths ... (or) 9.7 per cent of all female births. (George, Abel and Miller p. 1154)

Seventeen of the 19 female infanticides occurred within seven days of birth, and the latest by the sixteenth day. Only one was a first-born daughter. "This pattern corresponds to the well known parity-specific practice of female child neglect in north-west India which seems to protect and preserve first-born daughters but discriminate against higher parity daughters." (p. 1155). Three other reported stillbirths were suspected to be female infanticide as well.

The six villages practicing female infanticide were not believed to be anomalous in the area. Rather, they reflected a particular class and caste background.

> (For a nearby population, the Kallars of Madurai district, according to government hospital sources) about 70 per cent (450 out of 570 infants) of infant girls are infanticide cases. Such a high percentage merits careful local investigations for confirmation, but is not out of the realm of possibility given historic data on similarly high rates in north-west India during the 19th century, and the pattern reported for a region of contemporary Rajasthan in which very few girls are kept alive. (p. 1154)

> The caste composition of the villages with the female infanticide cases differs from the other villages in that they are predominantly Gounder, with lower proportions of the other caste groups. ... Although the Gounders involved in female infanticide live in remote villages, they are the upper social stratum of their villages. In fact, Gounders own a significant proportion of the land in North and South Arcot districts. To assert that, relatively speaking, the Gounders are well-off does not mean that they do not feel economic pressures when it comes to raising daughters. As in northwest India, it is precisely the costs of raising daughters according to upper-class rules that create severe constraints on household finances. (p. 1155)

George's account must lead us to see female infanticide as a deliberate family strategy. And since deliberate female infanticide is carried out soon after birth, we would expect that any study less thorough than this one would discover no report of a birth, or at most a stillbirth. The female infanticide is largely invisible, and what remains to be detected is later differential mortality due to sex discrimination. In this light it is not

surprising that some of the Chinese surveys showed high sex ratios at birth but then even lower female than male infant mortality (Notestein archives, Arrigo analysis unpublished). And if the reported birth rate is not broken down by sex so the implied female infanticide can be seen in the sex ratio, the wealthiest groups might well give the impression of considerably lower fertility than they actually have.

The dynamics of female infanticide and sex discrimination are further elucidated in another recent article, Wadley 1993, quoted above concerning increasing sex ratios in her area of study, Karimpur, a village 150 miles southeast of New Delhi in Mainpuri, Uttar Pradesh state. The village had 327 families in 1984; interviews covered 96% of all ever married women in the village, 480 out of 501.

The high-caste Brahmans own 60% of arable land; they now have high education and relatively low fertility. Strict purdah (seclusion) is still observed for upper class women. Lower class women only work outside the home, say as agricultural labor on the family's or others' land, if in company of kinsmen. There has been considerable impact of government modernization programs in this area since the 1950's. "By the late 1970's, the poor had shifted from agricultural employment to outside labor jobs." (p. 1370), so there is now less employment for women accompanying their male kin. There has also been a breakdown of traditional client-patron relationships in which lower-class women served as sweepers, water carriers and washerwomen in the homes of upper class women; much of this work, for example carrying water, has become unnecessary due to the installation of modern facilities.

The effect of sex discrimination in the village is directly observable. Aside from ritual celebration of boys' births but not of girls',

> Daughters are breast fed for shorter periods, as the mother shortens the interval between pregnancies to get the desired son ... In 1984, several 3 and 4 year old girls were so malnourished that they were unable to walk. In the one case of male and female twins that survived infancy, at age one the boy was fat and glowing with health, while his sister was scrawny, with yellowed hair. (Wadley 1993 p. 1373)

According to Wadley, discrimination against female children has increased among the poor as women's job opportunities have decreased, and heavy dowry demands have also replaced earlier brideprice and egalitarian marriage customs for the poor, making it onerous to marry off daughters. Boys continued to be valued because of non-agricultural work opportunities for lower-class men, and fertility has risen with the greater

availability of health services; but girls are wanted less than in previous decades. On the other hand, "The landowning rich are coming to terms with the fact that large families are a detriment, whether sons of daughters. Too many daughters consume family resources in dowries and too many sons cause land to be split into shares too small to maintain prosperity" (p. 1367). This transformation may be seen in child mortality rates in the following table. In the earliest period the rich have the highest ratio of female to male child deaths; in the last period the poor have the highest ratio.

Dataset 3.4.1 Child Mortality per 1000 Births over Time, by Sex and by Economic Status in 1984, for Karimpur, Rural North India.

Economic Group	1931-1951 M	F	F/M	1952-1971 M	F	F/M	1972-1984 M	F	F/M
A. Above Subsistence	446	619	1.39	303	362*	1.19	246	270	1.10
B. About at Subsistence	623	735	1.18	360	473	1.31	229	305*	1.33
C. Below Subsistence	(numbers too small)			534	542	1.01	217	337*	1.55

* Underreporting of female births suspected.

Source: Wadley and Derr, 1986, Table 16, p. 25. Appendix A explains economic categories. See same table in Wadley 1993, Table 6, p. 1374.

3.5 The Value of Women's and Children's Labor in Relation to Landownership — Cain, Bangladesh

With this discussion we are focussing in on the internal dynamics of the peasant family in increasing detail. Two sources have described the value of women in terms of their labor. The value of children has been likewise investigated by demographers as a means to explaining class differentials of fertility. That is, while the "supply" of children may be constricted by conditions that vary by economic class, e.g. opportunities for marriage, married men's absence from the family due to migrant work, poor maternal nutrition, and child mortality, the "demand" for children also varies by economic class according to the short-term returns from children's labor, and the long-term strategies for parental and family welfare. The most detailed study of children's labor that is available in the demographic literature on South Asia was carried out by Mead Cain in Bangladesh in 1976. This study also gives us concrete figures for adult labor.

Cain carried out his fieldwork in a poor and densely-populated village (6.6 persons per hectare), Char Gopalpur, in north central Bangladesh (Cain 1977). The village had 343 households, and among them he took periodic time budgets for 40 each (each with at least one male child) landless families, smaller owners (under 0.65 ha.), and larger owners (over 0.65 ha.), with the three groups matched for age of parents (see Cain's Note 3). Cain judged 0.65 ha. to be the minimum amount of land needed to supply rice for the average-sized household. Average land per household was 0.81 ha., not much more than subsistence, but landownership was highly skewed, with 33 percent of all village households owning no arable land, and another 30 percent less than 0.65 ha. By calculation on a more detailed listing of landownership distribution in Cain and Mozumder (1980, Table 1, p. 20), I estimated landownership inequality at 54.5% displacement for the 343 households of Char Gopalpur. Operational holdings showed the same degree of displacement from equality. Evidently about half of the largest owners rented out land, though only about 20% of total land was rented land.

Cain found a codified sexual division of labor for adults, with women's activities especially limited because of purdah. Moreover, opportunity for use of children's labor was structured according to control of productive assets, basically land and animals. A condensation of Cain's data on time expenditure is as follows in Dataset 3.5.1.

Dataset 3.5.1 Average Number of Hours Worked per Day, by Sex and Age and Landownership, 166 Rural Families, Char Gopalpur, Bangladesh, 1976

MALE FAMILY MEMBERS

Land Owned	Work Activity	Number of Hours Worked per Day at Age 4-6	7-9	10-12	13-15	16-21	22-59
Landless	Crops & Animals	0.5	0.8	2.1	0.7	1.3	0.9
	Wage,Trade,Fish	0.0	1.4	6.0	9.4	9.4	8.7
	Housework	1.5	1.5	1.2	0.3	0.7	1.2
	Total	2.0	3.7	9.3	10.4	11.4	10.8
Smaller Owner (under .65 ha)	Crops & Animals	0.9	3.3	2.8	3.7	3.4	3.2
	Wage,Trade,Fish	0.3	2.1	2.4	6.4	6.1	4.8
	Housework	0.8	1.2	0.6	0.9	0.6	1.0
	Total	2.0	6.6	5.8	11.0	10.1	9.0
Larger Owner (over .65 ha)	Crops & Animals	1.5	3.0	6.5	6.7	4.6	4.8
	Wage,Trade,Fish	0.1	1.0	0.9	0.0	1.2	2.2
	Housework	0.9	0.7	0.5	0.9	0.9	1.2
	Total	2.5	4.7	7.9	7.6	7.5*	8.2

FEMALE FAMILY MEMBERS

Land Owned	Work Activity	Number of Hours Worked per Day at Age 4-6	7-9	10-12	13-15	16-21	22-59
Landless	Crops & Animals	0.4	0.9	0.8	0.7	0.3	0.3
	Wage,Trade,Fish	0.0	1.2	0.4	3.9	1.9	2.5
	Housework	1.7	6.0	5.4	5.2	6.5	6.8
	Total	2.1	8.1	6.6	9.8	8.7	9.6
Smaller Owner (under .65 ha)	Crops & Animals	0.7	1.2	1.8	0.6	0.4	0.7
	Wage,Trade,Fish	0.0	0.0	0.8	0.8	0.8	0.7
	Housework	1.1	2.9	5.2	7.6	8.0	7.5
	Total	1.8	4.1	7.8	9.0	9.2	8.9
Larger Owner (over .65 ha)	Crops & Animals	0.9	1.1	1.6	0.3	0.6	0.9
	Wage,Trade,Fish	0.0	0.0	0.3	0.2	0.8	0.2
	Housework	0.8	3.1	6.8	7.6	8.7	8.6
	Total	1.7	4.2	8.7	8.1	10.1	9.7

Child Labor Study Sample Size:

Land Owned	N of Parents	Unmarried Children Age 4+ at Home Male	Female	M/100F
Landless	40	41	33	124
Smaller Owner	40	63	56	113
Larger Owner	40	62	41	151

Notes: First two categories of work are combined from more detailed categories in original table. The first is crop production and animal care on family's own farm, thus relating to asset ownership of the family. The second includes wage work, trading, fishing, and other, not involving asset ownership.

* Items do not add to total, apparently due to error in original table.

Source: Mead Cain, 1977. Table 5, p. 218. Sample size: Table 3, pp. 214-215.

The amount of work performed by small children is surprising. It is clear that by age 10-12 children are working hours comparable to those of adults, though they may be doing lighter tasks that free adults for more substantial work. As Cain explains, those without land cannot apply their children's labor as early to productive tasks as can landowners who have animals to tend and crops to carry, but by age 10-12 the sons of the landless are performing wage labor and putting in longer hours in total.

This table is also relevant to the previous discussion of women's labor. The daughters of those who have land largely withdraw from farm work after age 12, though young women still do fishing, and from then on and in their married life are engaged in long hours of housework. In contrast, among the landless the women work for wages and in trading for a fair portion of their time, and spend less time in housework.

> On average a son's production exceeds his consumption by about age 12 and compensates for his cumulative consumption by age 15. Although children of both sexes work long hours at young ages, the reproduction of sons in the course of household expansion has special significance because the prescribed sexual division of labor in Bangladesh severely limits female opportunities for productive employment. (Mead Cain 1978, p. 426).

We can guess from the sample sizes that the landless group had the smallest average number of children, and also that the larger landowners had the highest sex ratios among

Dataset 3.5.2 Women and Births per Woman by Landownership for 343 Rural Households, Char Gopalpur, Bangladesh, 1976

Land Owned	N of Households	Women/ Household	Births*/ Woman	Births*/ Household	Children Dead
Larger Owner	120	1.14	4.3	4.9	25%
Smaller Owner	96	1.29	5.2	6.7	25%
Landless	127	1.65	4.6	7.6	27%

Land Owned	Male Age at Marriage	Sons Away fr Parents**	Women Widowed by Age <Age 35	Age 35-44	Age 44+
Larger Owner	21.9	18%	3%	9%	41%
Smaller Owner	23.2	34%	3%	4%	41%
Landless	23.0	35%	6%	36%	58%

* Age-standardized mean number of live births for ever-married women.

Sons living away from parents' household based on small sample of households: landless 9, smaller owner 17, larger owner 11. For landless group, four boys living away as permanent servants not included in calculation.

Source: Mead Cain, 1978, Table 3 and 4, pp. 435-436.

their children. This was not due to age at marriage; girls married at age 13-14, with the average age a few months older for the larger landowners, which would imply that their sex ratios could be even higher if matched for age with the other groups.

Other indicators by economic status show that the larger landowners do not have the highest fertility, although mortality for adults and separation from the family for sons follows expected socio-economic patterns.

Since the number of births per woman has been standardized by age in the source data, the calculation I have done for number of births per household may not be precise; however, it may be taken as an indicator. Although households with more land have fewer births per woman, they probably have more children per households, and so over the long run more heirs who will share in the estate.

3.6 Russian Debates on the Nature of Peasant Differentiation: Lenin versus Chayanov

The cross-sectional demographic data in many ways supports the thesis of a process of differential reproduction that counters accumulation and centralization of property, but since this is a process that unfolds over time, time-lapse studies would be more convincing. It is very difficult to carry out a follow-up study on the same families after a lapse of twenty or thirty years, but some have been done.

The largest and most thorough of such studies grew out of debates in Russia on differentiation among the peasantry that began even before the turn of the century. Since the substance of this debate itself has relevance for this thesis, I will outline it briefly and provide the reader with directions for further reading before proceeding to the data. This debate was a political debate, tied up with explanations for why Russia lagged behind Europe in its development, and what was the source and solution for its backwardness, encumbered as it was with a vast, uneducated and underproductive peasantry. Both Marxist and Neo-Classical intellectuals took the penetration of capitalism into the countryside and the polarization of the peasantry into capitalist farmers and agricultural wage laborers as a necessary and desirable stage in an advance towards future development — though Marxists also vilified the immiseration of the peasantry and anticipated further revolution against capitalism. The perception of increasing peasant differentiation was challenged by the Neo-Populists, also known as the Organization and Production School of rural economists, who believed the egalitarian and democratic traditions of the peasantry, as seen in the redistributional commune or *mir*, were the best foundations for a future with social justice. (See Shanin 1972, pp. 45-47 .) Both Marxists and Neo-Populists carried out or cited rural investigations to prove their point.

V.I. Lenin himself in 1899 produced a large volume dense with statistics, The Development of Capitalism in Russia, to show that peasant differentiation was serious and was further advancing due to the penetration of capitalist market relations. He emphasized unequal ownership of productive resources and the development of profitable side industries by rich peasants, along with the proletarianization of poor peasantry.

A.V. Chayanov was the director of the major Russian institute of agricultural economics in the 1920's. Some of his concerns, such as the optimal farm size and capital inputs, paralleled those of his American contemporary John Lossing Buck in China; his research also prefigured Russian central state planning (Kerblay 1966). Chayanov argued that the main source of peasant differentiation in the Russian countryside was the life cycle of the household, from nuclear family with a high burden of dependants to the mature household with working sons and their wives living in a joint economy. The life cycle, combined with demographic chance — how many sons were born and how long the family workers remained alive and healthy — engendered considerable variation of economic status among households (Chayanov Ch. 1-2). Thus this inequality in the countryside did not indicate relations of substantial exploitation between rural classes[28]; hiring of labor was not dominant (Chayanov pp.255-6). So the communal solidarity of the peasantry would persist due to mechanisms maintaining low internal differentiation, and the peasantry could possibly form the base of a future egalitarian society.

In contemporary peasant studies, the debate has been christened after its two main protagonists, "Lenin versus Chayanov", and pursued by many scholars (notably Utsa Patnaik and Mark Harrison) especially since the publication of the English translation of Chayanov's Theory of Peasant Economy in 1966 — long after Chayanov's 1939 demise in Stalin's liquidation of the Neo-Populists. South Asians such as Patnaik and Rahman have argued for the Leninist position emphasizing differentiation internal to rural society. Their investigations of the Indian and Bangladeshi peasantries have found gross inequalities and exploitative relations between large landowners and tenants or agricultural laborers. Anthropologists such as Durrenberger (1984) have conducted micro-studies that confirm some aspects of Chayanov's observations on the life cycle, as far afield as among New Guinea swidden agriculturalists and French fishermen.

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[28] I have carried out a brief exercise randomly assigning zero to three sons and early or late household division for several generations of six families. Male adult labor, varying from teenage to old age, was assigned values between 0.5 and 1.0. The simulation yielded inequality in household labor power on the order of 23% "displacement" from equality, which is 70% of the peasant differentiation of 33% commonly found in the Russian surveys. This exercise and other calculations relevant to the Lenin-Chayanov debate are to be found in an unpublished manuscript, L.G. Arrigo November 1988, "Interpreting Differentiation with the Peasantry: Demographic Processes versus Labor Exploitation".

The concrete situation of the Russian peasant has been variously described in the Lenin-Chayanov debate, specifically whether or not private ownership of land and rental relations were advancing after the Stolypin reforms of 1906. But by 1915 still only 10% of peasant land was owned by individuals; communes and associations owned another 10% (Atkinson, p. 83). According to Shanin, "Capitalist farms (or even farms well integrated into the market economy) remained, on the whole, exceptional. The revolution and civil war of 1917 swept away the Stolypin reforms and re-established the essentials of nineteenth-century peasant customary law" (p. 32).

In reviewing the Russian statistics presented by Lenin, Chayanov and Shanin in some detail, I came to the conclusion that Lenin did not demonstrate that differentiation of the peasantry was rapidly advancing over what it may have been historically. There may well have been increasing emigration and involvement in commerce. But considerable differentiation and commodification could also be a normal condition of a pre-industrial peasant society, not evidence of capitalism. And there are other reasons to reconsider the applicability of Lenin's thesis. Buried in Lenin's presentation of budget data there is indication that land allotments were fairly equal in terms of area per family member (calculate land allotment from Lenin pp. 93-97 and pp. 148-166). Rich peasants expanded their sown area by renting land from others who lacked labor power or draft animals. The rent was a significant portion of net returns to farming, and also a significant cash income for poor peasants (see budgets pp. 148-166). So much of the relations of production presumed of a capitalist society, in which a proletariat alienated from the means of production is forced to tender its labor, or the relations of a class society based in private land ownership, such as China, where landless peasants paid high rents to absentee landlords, did not obtain. However, there was of course socio-economic inequality in other factors of production, most notably measured in surveys of horse ownership, and there was class domination of the peasantry through high taxes and land redemption payments continuing from the 1864 emancipation of serfs. But because of periodic redistribution of land in Russia the demographic and life cycle differentiation proposed by Chayanov could have had much greater sway.

So let us leave behind the polemic of the Lenin-Chayanov debate on peasant differentiation for now and examine what might be the quantitative effect of demographic processes on peasant inequality, a matter than can be much elucidated through the Russian surveys.

The Chayanov hypothesis that labor capacity over the life cycle was the main source of differentiation for the Russian peasantry was further elaborated by Shanin through comprehensive analysis of surveys done in the period 1886 to 1925, especially those with a time-lapse follow-up of the social mobility of the households. Here is where I have found the material that is of central significance to this thesis. Though the average Russian peasant, with much greater land resources, seems not nearly so pressed to the margin of survival as the average Chinese peasant[29], still the effect of over-reproduction of the rich and dying-out of the poor is very marked in this data.

Shanin sees all of the multifarious forms of social mobility as cancelling each other out, thereby confirming Chayanov's vision of the stability of peasant society with cyclic rises and falls for individuals. He has compiled data from the large time-lapse studies to demonstrate this, the major subject of his 1972 book The Awkward Class: Political Sociology of Peasantry in a Developing Society: Russia 1910-1925. We will examine this in detail below. It is clear in this data that rich families (measured by land sown and ownership of the major productive resources, horses and oxen) partitioned at a high rate, and poor families died out and emigrated at a high rate. Others that did not partition or disappear experienced both upward and downward mobility in fairly equal degree. The result was a highly stable distribution of land sown over time, as Shanin observes and as has been proposed in this thesis for pre-revolutionary China.

In contrast to Shanin's summation, my vision of the peasant economy is that fortuitous reproduction can provide some fleeting upward mobility when a number of sons reach working age in the household life cycle, say for the 26% or so of fathers who have two sons or more. And a very few garner windfalls through commercial dealings or bureaucratic service. But the fate for the vast majority must be downward mobility and eventually lineage extinction.

Perhaps Chayanov and Lenin can finally be reconciled, to some extent. Demographic determination cannot prima facie be separated from economic determination, especially when the extinction or partition of households is found to be so closely tied to their landholdings. My reinterpretation of Chayanov's theory and Shanin's material, in large,

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29 According to Atkinson 1983, p. 262, making an estimate based on Kerblay, the annual average food consumption for the rural Russian population in the years 1896-1915 was a plentiful 670 kilograms per capita — over twice that of modern South Asian populations.

is that demographic processes are not independent of socio-economic effects, but are rather themselves also shaped by the economic structure. In the case of the Russian peasantry we may have a dispute of the sort "Which comes first, the chicken or the egg?". According to accounts of the Russia mir, land was redistributed by number of adult males or family members, at least once a generation but no more than once every twelve years (Shanin 1972, p. 80). It is difficult to attribute priority to either land allotted or to labor power produced.

But the case is not so ambiguous where ownership of land in itself provides the basis for unequal relations of production. It is not surprising that South Asian agrarian researchers have roundly rebutted Chayanov and championed Lenin's position on peasant differentiation. Rahman's study of social mobility in two Bangladeshi villages provides a relevant comparison. Looking at eighteen families that did not divide over a period of thirty years, Rahman found that land owned and land operated did not much adjust to changes in household labor power or dependency needs (Rahman pp. 81-86).

3.7 Russian Surveys on Peasant Differentiation, Household Change, and Social Mobility, 1880-1925 — Shanin

There is a great wealth of Russian material on peasants, only a small portion of it available in English. One reason extensive studies were carried out even a century ago was because of the existence, since 1865, of the *zemstvos*, regional authorities which had gradually become involved in social problems of the peasantry (Shanin 1972, p. 49). Much appreciation is due to Teodor Shanin for bringing the results of early Russian agricultural surveys, rare in scale and scope, to an English-speaking audience. Shanin's introduction of this data and preliminary comments are as follows.

> Dynamic studies were first introduced by N. Chernenkov. He compared data on 17,090 peasant households, recorded in a local census of 1894, with the information collected about the same households in the national census of 1897. This work was followed by a study of Vyazma *uezd* in 1884 and 1900, the three more dynamic studies on the eve of the First World War. In all the pre-revolutionary studies, the basic data were not collected specially for the purpose of the study but were examined *ex post facto* after being collected for some other purpose.
>
> From 1920 onwards, the Ts.S.U. (*Tsentralnoe Statisticheskoe Upravlenie*, a national statistical board established in 1918) introduced annual dynamic censuses of all peasant households as a basis for the systematic study of peasant mobility. These censuses were based on large samples and steps were taken to ensure their representativeness, both nationally and regionally. The data were no longer approached ex post facto and their collection was geared to the needs of the dynamic studies. The analysis was very labour-consuming and the publication of results lagged. Not all the results of the post-revolutionary dynamic censuses and studies were ever fully published, but elements of them can be found in Ts.S.U. journals and handbooks and in the publications of some rural statisticians and economists. In 1927, a large-scale dynamic study for the period 1924-5 was published in the annual Ts.S.U. handbook. This first official publication by the Ts.S.U. of a full-scale dynamic study of a representative sample of more than half a million peasant households in various regions of the U.S.S.R. was followed, six months later, by a similar publication for 1925-6. This, however, was the last one to see the light of day.
>
> The evidence gathered by three decades of dynamic studies of the Russian peasantry revealed clear,and somewhat surprising, uniformity and continuity in the patterns of mobility of peasant households. The basic processes and interrelations proved qualitatively similar in dynamic studies of samples reflecting different periods, drawn from different areas, and using different categories of peasant wealth. ... (Shanin 1972, pp. 72-73)
>
> ... The first general conclusion which can be drawn from the dynamic studies, is, therefore, that the mobility of peasant households is multidirectional in

> character — i.e. it consists to a great extent of opposing movements of individual households which cancel themselves out when analysis is confined to the study of the mobility of the society as a whole. The net mobility of a peasant society can be seen as the tip of an iceberg — the summary results of socio-economic changes of much greater magnitude.
>
> A further conclusion which can be drawn from the dynamic studies would have to be the existence of a strong *centripetal* mobility of peasant households in relation to the median wealth in the society studied — i.e. the rises of the poorer households and the descents of the wealthier ones. Moreover, ... the higher the relative socio-economic position of the peasant household, the greater, on the whole, is the likelihood that it will begin to deteriorate, and vice versa, the lower its position the better its chance of showing an improvement. Given the existence of demonstrable centripetal forces, in a society in which socio-economic stratification does not disappear, it follows that centrifugal tendencies must be operating to countervail the centripetal forces ... (Shanin 1972, p. 74).

Shanin's conclusions[30] on equal multidirectional mobility reflect, I believe, a misemphasis stemming from the form in which the data was originally organized by the authors of the surveys. The surveys distinguished between "substantive change", reshaping or extinction of the household as a unit due to partition, merging with other households (generally due to lack of labor power), emigration, or dying out; and "non-substantive change", improvement or decline of economic standing in terms of land sown or productive resources while the household remains a single unit. Shanin looks in detail at the change in relative position for households that undergo "non-substantive change", change in holdings of land sown, but does not measure against that the experience of those undergoing "substantive change". But the households resulting from household partition must almost always be poorer in resources on average than the parent household, and thus partition may be an experience of downward mobility for most partitioners, although it also marks an increase in social standing for the new head of household. Even more so, disappearance of households cannot in general be a phenomena of prosperity, but a form of difficult downward mobility — though those who experience it do not persist to bear witness.

These substantive processes are closely related to the central concerns of this Part One, differential reproduction of classes: high rates of partition must overall reflect family

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30 By centripetal mobility Shanin means movement towards the mode, or equalization; by centrifugal mobility he means polarization. In other words, in this final sentence Shanin proposes, as I have, that there must be socio-economic forces that concentrate wealth in the same degree that demographic forces disperse it. However, he has not elaborated further what these forces might be.

reproduction at greater than average, and high rates of extinction must reflect a lesser than average rate of reproduction. Here I will call the outcome of these processes "household reproduction", i.e. with partition equivalent to the birth of a new household, and merger or emigration or extinction equivalent to death of a household, in contrast to family reproduction of sons. Reproduction of labor power must be, basically, the birth of sons, and secondarily other means of accreting labor such as attaching sons-in-law to the household. However, Chayanov and Shanin provide very little demographic information by which the relationship between partition and numbers of sons may be confirmed.

It is also conceivable that partition could occur between an adult son and his father, and then the father would live out his days on a small holding, so accentuating a pattern of partition on large and extinction on small holdings. This could be a normal process of the life cycle, rather than a mark of socio-economic differentiation. But the usual description of the Russian peasant family is a multi-generational one. The example given by Chayanov in his family cycle scheme (Chayanov pp. 58-59; cited in Shanin, p. 104) is of a joint family gradually improving its consumer/worker ratio as sons come of age, and applying those workers to expanded land sown. Shanin's review of law and practice on peasant inheritance and partitioning (pp. 222-224) sounds very much like Chinese peasant practice: portions split equally among male descendants and adoptees upon the death of the head, plus an additional allotment for the descendant who takes on care of the aged; land sown by households in which no male members remained reverted to the commune. Unless it were shown that fathers frequently split from all their sons, it should be substantially correct to treat household partition and disappearance as indications of the level of reproduction.

In Dataset 3.7.1 A and B, the top half of the page, I reproduce Shanin's Table 6.1, p. 98, for peasant mobility in Surazh Uezd, Chernigov Gubernya over the 29-year period from 1882 to 1911. This is a sample of 1477 households, relatively small but representative of the pattern and presentation of all the surveys. It is convenient that this span of 29 years is very close to what Lavely and Wong found to be the average number of years between partitions in their study of North China villagers, i.e. one generation. My estimate of the degree of peasant inequality shown in Surazh Uezd is 25% displacement, quite low, but this is not inconsistent with that of the very large

Dataset 3.7.1 Peasant Mobility and Land Transfers for 1477 Households in Surazh Uezd, Chernigov Gubernya, 1882-1911

A. The Dynamic Study

Sown Land in 1882 (desyatinas)	A-1. Households Undergoing Substantive Change 1882 - 1911 Total	Partitioned	Disappeared	*Land Group Midpoint*
< 3	58.1%	6.2%	51.9%	*1.5*
3 - 6	48.0%	15.4%	32.6%	*5*
6 - 9	50.2%	26.1%	24.1%	*7.5*
9 - 12	54.2%	35.1%	19.1%	*10.5*
> 12	66.4%	57.6%	8.8%	*15*
Est. Average Land Sown		*9.90*	*5.87*	

B. Peasant Differentiation

Percent of Households in Sown Land Group	1882	1911
	10.8%	13.2%
	34.5%	38.6%
	25.9%	25.0%
	13.5%	11.2%
	15.3%	11.0%
	7.54	*6.90*

Est. 9.3% pop. growth

Sown Land in 1882 (desyatinas)	Total	A-2. Households without Substantive Change: Sown Land in 1911 (desyatinas, 1 des. = 1.09 ha.) < 3	3 - 6	6 - 9	9 - 12	> 12
< 3	41.9%	11.8%	19.7%	8.4%	1.0%	1.0%
3 - 6	51.9%	11.4%	24.4%	10.6%	4.3%	1.2%
6 - 9	49.7%	8.1%	18.4%	13.3%	5.6%	4.3%
9 - 12	45.8%	4.3%	16.4%	10.7%	6.6%	7.8%
> 12	33.6%	1.2%	10.2%	9.6%	5.2%	7.4%

C. Analysis of Mobility for All Strata *(1882 households set to 1000 ; 1911 set to 1093)*

Land 1882 *(relative to average)*	Substantive Change during 1882 - 1911 Partitioned	Disappeared	Est. N of Partitioners in 1911
0.20	6.7	56.1	65.1
0.66	53.1	112.5	235.4
0.99	67.6	62.4	166.9
1.39	47.4	25.8	76.4
1.99	88.1	13.5	83.3
All Groups	262.9	270.2	627.1
	1.31	*0.78*	*0.97*

Mobility Experience of 1882 Households, per 1000	
Upward	124.2
No Change	151.6
Downward/Disappeared	-460.6
Partitioned	-262.9
In aggregate, these gained 76% more land; each divided among 2.38 heirs.	
Partitioners,@6.76 des.	627.1

Land 1882 *(relative to average)*	All Groups	Households without Substantive Change: Land Sown in 1911 *(relative to average)* *0.22*	*0.72*	*1.09*	*1.52*	*2.17*
0.20	45.3	12.7	21.3	9.1	1.1	1.1
0.66	179.1	39.3	84.2	36.6	14.8	4.1
0.99	128.7	21.0	47.7	34.4	14.5	11.1
1.39	61.8	5.8	22.1	14.4	8.9	10.5
1.99	51.4	1.8	15.6	14.7	8.0	11.3
All Groups	466.3	80.7	190.9	109.2	47.3	38.2

Sum of Mobility Matrix: Upward 124.2; No Change 151.6; Downward 190.4

Data source: T. Shanin 1972, Table 6.1, p. 98.

Russian samples we will examine shortly, 28-38%, because these surveys compile all samples strictly by size of farm regardless of productivity.[31]

In Shanin's tables the time-lapse data on social mobility are given under the rubric "the dynamic study", following on previous researchers' practice. Rates of partition and disappearance are first given for households that have undergone substantive change. Households on small farms disappear at a high rate, and those on the largest farms partition at a high rate. Then there follows a matrix of land sown in 1882 versus land sown in 1911 for households which have remained stable units, i.e. no substantive change. The percentages refer to households within one size group of land sown, so the total across both substantive and non-substantive change within one land group is 100%. The other important information in Shanin's Table 6.I is the percentages of households in each size group in 1882 and 1911, under the title "peasant differentiation". I have reproduced the original table here in Dataset 3.7.1 so that the reader can understand the form of the source data, but since Shanin's book is widely available I will not do so for other of his tables that I will cite below.

As Shanin has said, the mobility matrix for stable households shows that large numbers of very small farms become larger farms over time, and the overwhelming number of large farms fall to small size. Of course merely due to its format this matrix cannot reflect any further loss or gain within the end categories of the land size groups. More importantly, it tells less than half the story, because the substantive changes in households are excluded from it. We must assess both aspects of change together.

Dataset 3.7.1 C is my own analysis of Shanin's data. To carry the analysis further, if we are going to compile the overall result of upward and downward mobility for the entire range of land sown groups, we must factor in the relative numbers of each. This can be done by means of the distributions given for land sown in 1882 and 1911. I have recreated the table of substantive and non-substantive changes in terms of the experience of a population of 1000 households. When we sum the mobility experience of all land groups, we find that 27% disappeared, and 19% suffered a loss in land sown. On the side of upward mobility, 12.5% enjoyed an increase in land sown. For the 26% of

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31 Shanin also repeats the apt observation of earlier Russian agricultural researchers, that combining together farm size samples from rich and poor villages, or from extensively-farmed and intensively-farmed areas, often created an erroneous survey picture of a differentiated peasantry (pp. 135-6).

households which partitioned, we may surmise that the majority of their heirs fell to smaller land size groups, also a kind of downward mobility, although perhaps not drastic in terms of land per worker. But since these partitioners must form over half the population of 1911 (households stable as a unit for the whole period were only 47% in 1882), it is logical to query further about them.

From the mobility matrix we can sum the distribution of land sown for households that remained stable, and of course their numbers are still the same. From the decrease in the average land sown per household (see italic numbers under B. Peasant Differentiation) it may be deduced — assuming there was no change in total sown land — that the population of households present grew by 9.3%, equivalent to a very moderate 0.31% annual growth over 29 years. From these pieces of information it is possible also to estimate the number and land sown distribution in 1911 for the heirs ("the partitioners") of those households which were partitioned. With these givens, the 263 per 1000 households that partitioned between 1882 and 1911 would have been succeeded by 627 households, that is, on average they were divided among 2.38 heirs, a completely plausible number.[32]

The story becomes curious and curiouser when we examine the estimated 1911 land sown distribution for the partitioners. The 263 partitioned households had an average of 1.31 units of land in 1882 (1 unit = 1882 household average of 7.54 desyatinas, or 8.22 hectares), and their 627 partitioners had 0.97 units each in 1911. Either these relatively rich households expanded before they partitioned, and/or their heirs expanded as their households matured after partition — in the aggregate their land increased 76% from 1882 to 1911. Shanin says that households that could put aside savings and made other provisions for possible partitioning (p. 86 note 1). He quotes Khryashcheva (1916): "As far as the total number of newly-created households is concerned we may generally observe, now as well as in the past, an increase in land sown as well as in the means of production. It seems that the moment of partitioning coincides with the moment of greatest strain in the original household which strives to equip the new ones — i.e. to provide the necessary horses, equipment, and so on. The original household not only

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32 In fact, for a Poisson distribution with mean 1.0, 36.8% of fathers have no sons, 36.8% have one son, and the rest have two or more, so the number of partitioners would average 632/264 = 2.39, almost precisely this result.

divides existing equipment but at times buys horses and equipment or gives money to new households for this purpose" (p. 87).

In Dataset 3.7.1 D I have drawn up a balance sheet summary of the process of land transfer that I believe accompanied this example of Russian household reproduction. Changes in land sown by stable households are a relatively minor part of the total picture; only 72 units of land (per 1000 units total land) are gained by the upwardly-mobile here. That is why I say Shanin made an error of misplaced emphasis in hanging much of his analysis on the mobility of these stable households. But the successors of partitioning households, overwhelmingly the more prosperous peasants, gain 262 units, and this block is no doubt garnered from the 211 units of those peasants who have disappeared, and a little more from others downwardly mobile.

Dataset 3.7.1 D Balance Sheet of Household Reproduction and Land Transfers: Analysis of Data for 1477 Households, Surazh Uezd, Chernigov Gubernya, 1882-1911

N HOUSEHOLDS 1882	1911	DESCRIPTION OF HOUSEHOLD CHANGE	LAND SOWN Loss	Gain
466	466	NO SUBSTANTIVE CHANGE — STABLE HOUSEHOLD UNITS		
		Land sown by same household from 1882 to 1911	-321	321
		Changes in land sown for stable household units	-123	72
		SUBSTANTIVE CHANGE — PARTITION/DISAPPEARANCE		
271		1882 land of households which have disappeared	-211	
263		1882 land handed down by partitioned households	-345	
		(169 households sowing more than average, -278)		
		(94 households sowing less than average, -67)		
	627	Land received by partitioners (heirs to those partitioned)		345
		Additional land gained by partitioners by 1911		262
1000	1093	Total	Total -1000	1000

Land sown in original data (desyatinas) has been standardized to 1000 units of land;
1 unit = average land sown per household = 7.54 desyatinas (6.92 ha.)
Number of households has also been standardized to 1000.

Then we may look to the matter of continuity or rotation of the households in the largest land size group, those holding 12 desyatina or more, or about twice the average: 15.3% of households in 1882. For this same top land size group in 1911, 9% are the same households as in 1882, 22% have risen from lower land size groups, and the rest,

nearly 70%, are the successors of partitioned households. We cannot know precisely what land size groups these partitioned households came from, but of course the preponderance of partitioned households worked more than the average land. So the pattern seems to be that the ranks of the top land size group are substantially replenished by internal reproduction, even while there is downward mobility for their descendants, on the average.

This is a striking picture of the cycling of peasant classes following on differential reproduction.

I have gone to some length in spinning out this analysis because it is rare that data that so aptly makes the point is available. It illustrates the process of differential reproduction of households over the period of one full generation. These results for Surazh Uezd can provide some measure of comparison when extrapolating the data for shorter term studies. The larger, more carefully executed studies of social mobility for Russian peasants, carried out over a decade later, encompass only a short period.

The 1924-25 Ts.S.U survey covers very substantial numbers, and the land size range segments are smaller, allowing a fairly detailed look at land sown distribution and rates of household change by land size. I will make several other points of argument that are relevant to my Part One model in analysis of the survey, again calling upon Shanin's published data. But in only one table reporting on this survey does he provide the beginning and end land distributions so that I can carry out the analysis as done for Surazh Uezd.

That more complete table is Shanin's Table 6.III, p. 100, which reports on peasant mobility in sixteen guberniyas (provinces) of European Russia, in the single year 1924-25. The sample size is 265,436 households. The degree of inequality for land sown size per household is 32.5% displacement, again considerably lower than for our previously-discussed Chinese or Bangladeshi peasants, who did not enjoy periodic land redistribution. Displacement, the measure of inequality relative to the average, is virtually the same in 1924 and 1925.

Since this survey's view of social mobility spans only one year, we are dealing with very delicate figures for differences in rates of change, but they are still significant because

of the large sample.[33] My main concern in this data is with the indicators of differential reproduction, the substantive changes of disappearance and partition. Here we have more detailed categories of disappearance, with "merged", remaining members of the household joining with other households, separate from "extinguished (due to dying out) and emigrated". (The data does not allow us to separate extinction from emigration.) Merging was a relatively rare occurrence. We will examine these rates in a series of graphs.

Dataset 3.7.2 A charts household change rates against land sown. As usual, the land measure is relative to the average. The annual rate of extinction and emigration is 16% for the landless, but drops steeply to 3.5% for those who have a little land. The annual rate of partition climbs steadily with land sown, up to a plateau at 12% for those who hold over four times the average. Merging is under 2%, but slightly elevated for both small and large holdings. This chart may perhaps impart a distorted impression, that extinction was rare and partition common over the whole range of land sown; this should be corrected by seeing the same rates graphed against percentiles of households ranked by increasing land sown, Dataset 3.7.2 B. Since only about 10% of households held 2 times the average or more, high rates of partition applied to a relatively small number. However, there is also the small downturn in rates of reproduction for the top few percent of these peasants, seen in all three indicators, which should lead us to recall the analyses of South Asian data by Stokes and Schutjer 1984 and by Sharif and Saha 1993, that ownership of much capital seems to depress reproduction. For this whole population of Russian peasants, 2.8% of households were extinguished or emigrated, 0.5% merged, and 2.7% underwent partition in the year 1924-25.

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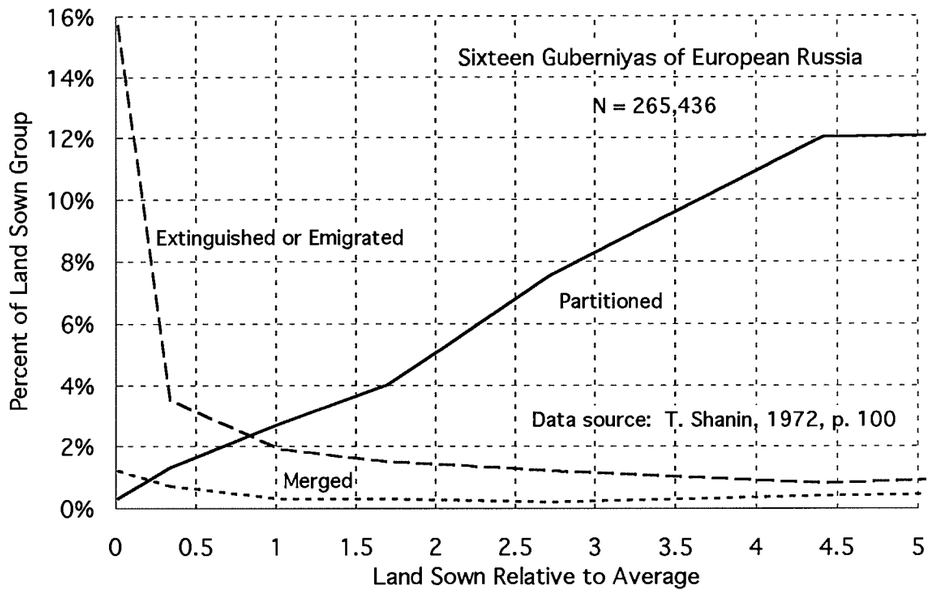
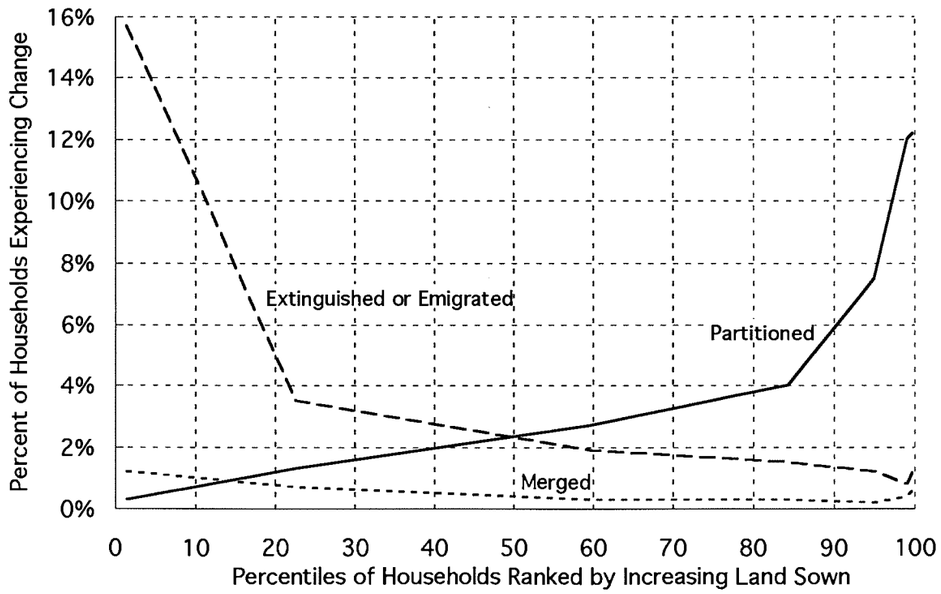
[33] I was surprised to find in my analysis of Shanin's Table 6.III that the average size of land sown seems to be 6.3% larger at the end of the year (from 2.95 to 3.13 desyatinas, i.e. from 3.22 to 3.41 hectares). There is also a comparable net gain in land sown shown in the mobility matrix for the stable households, which are 94% of the survey (58.9 land units / 939.9 households = 6.27%). This is difficult to interpret. With such a large sample, I do not believe it reflects any real decrease in population, or increase in average land. There may well be some small numbers of in-migration or return migration that are not incorporated in the survey. Then just the effect of following up on the same households, which are accreting land over the life cycle, would create a higher average. Perhaps the 6.3% rather indicates the average annual gain for households that do not disappear or partition; in a longer-term survey the gain would be submerged by the effects of partitioning. This apparent anomaly could be a provocative point in thinking about the household life cycle, especially since land sown fairly closely follows family labor power in this Russian case.

Dataset 3.7.2 Rates of Household Partition and Disappearance for 265,436 Peasant Households, European Russia, 1924-25

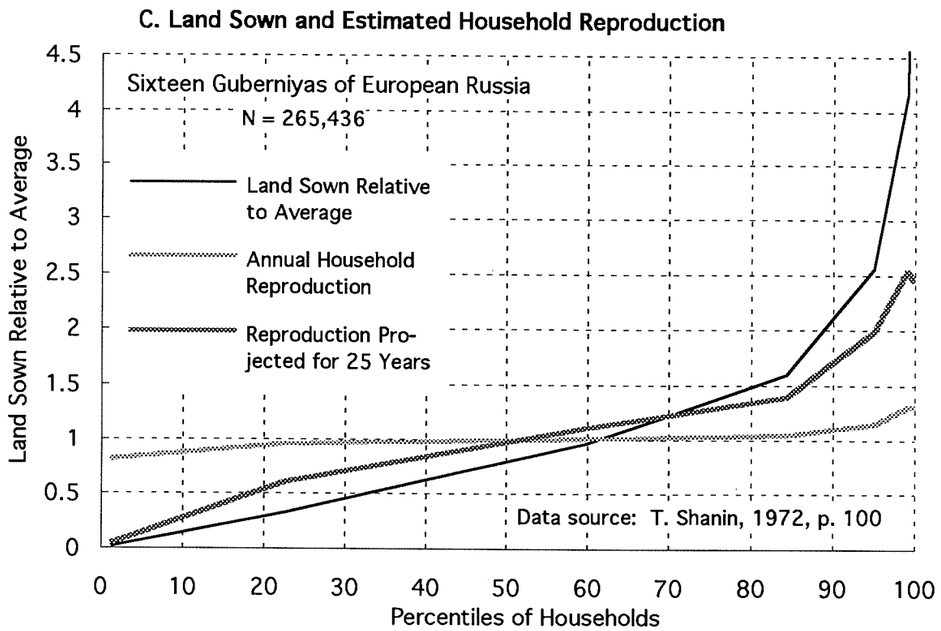
A. Rates of Household Change by Land Sown



B. Rates of Household Change by Percentiles of Households



Dataset 3.7.2 continued



These patterns are interesting, but they would be more meaningful if they could be put in the context of the total land sown distribution and total reproduction.

I have constructed overall rates of reproduction as follows. One year's household reproduction for each land sown group may be specified as

Annual household reproduction =
1 - (disappear % + merge %) + (partition % x number of partitioners).

For an unchanging population with a stable number of households (rather, population growth for one year is too small to bother with here), the number of partitioners (of whom there must be by definition at least two per partitioned household, but there may be more) must replenish the losses due to disappearance. So the extinction, emigration and merger of 3.3% of households must be balanced by at least 2.22 partitioners (1 + 3.3%/2.7%) for each partitioned household. In my estimation, the number of partitioners for each land size group is also adjusted slightly, higher where rates of partition are higher, since that is where larger sibsets are likely to be found in greater numbers. This procedure yields an estimated annual rate of reproduction for each land size group.

Then we also want to speculate what this annual rate of reproduction might mean for reproduction over a generation. Let us make a story out of this simulation. In 1870 we met Leo Tolstoy, and he was planning to write an epic novel about two generations of peasant families. (Not so bizarre a flight of fancy; A.V. Chayanov himself in 1920 wrote a novel about a peasant utopia, one that involved travel to the future for the protagonist (Kerblay pp. xliv-xlv).) Tolstoy wanted to know how many descendants would issue from two main clans on which he is modelling his novel, the Pauperovitchs and the Kulakskis, over the twenty-five years of his story, so that he could figure how many characters to write into his novel. We promised to try to give him some numbers to go by. Let us say that at the beginning each clan has a hundred mature male heads of household. The Pauperovitch families are not the poorest of the poor, but they are of very modest means, and subject to destitution if a family's single horse dies. The Kulakskis, the offshoots of a ruthless land grabber of the previous generation, work hard on their rolling acres, but can afford sumptuous feasts and subservient underlings to do their bidding. In living among the peasants for a year to collect observations for his novel, Tolstoy has found that among the Pauperovitchs six families have emigrated to the New World, eight have died out, and three have partitioned among two sons each, so there

is a net loss of 11 families. Among the Kulakskis, two families have died out and ten have partitioned into twenty-two new households, so there is a net gain of 10 families.

For us to give an answer to Tolstoy, it is not adequate to multiply the annual rate of reproduction for a land size group repeatedly, once for every year, as demographers might do for reproduction of the whole population (say, for half a percent annual growth, 1.005 raised to the 25th power). We cannot imagine that there will be 1083 Kulakski families (1.10 raised to the 25th power, times 100) spawned within 25 years. The number is not anywhere near that high, because the same rate of reproduction no longer applies to the heirs of partition. The offshoots are not likely to partition again soon, though a few might during this long period; also some might disappear. My simple but serviceable model for reproduction over a span of 25 years assumes that heirs will neither further partition nor disappear, or at least for them the two processes will balance each other out. There is no provision for upward mobility other than this. Both disappearance and partition remove the households from the pool of reproducers. This rough modelling has no guarantee of producing precise results that can be demonstrated to match live data, but it has some use in playing out the implications of annual reproduction rates, and it will be useful later in comparisons between data sets.

Now we can predict for Tolstoy that at the end of 25 years only one of the original Pauperovitch families will remain, and only five of the original Kulakskis. But the Kulakskis will have 175 offshoot families in various stations in life, so their numbers will have multiplied by a factor of 1.80, nearly double. The Pauperovitchs will have produced 35 offshoot families (for whom, in a more detailed simulation, there might also be a disappearance rate), and so the once hundred-strong clan has dwindled down to about a third of its former might. No doubt Tolstoy will have no problem juggling these numbers of characters in his novel.

Fast forward to the sixteen guberniyas of European Russia, 1924-1925. If we calculate annual rates of household reproduction and reproduction projected for 25 years for each of the land sown size groups, while smoothing out a little unevenness in rates for the top group where the sample size is rather small, then we can compare the curves of reproduction against the curve of land sown for percentiles of households. This comparison is presented in Dataset 3.7.2 C The 25-year projection of reproduction accentuates the slight inflections in the annual household reproduction rate. It also fairly faithfully follows the land sown curve, at least between the 20 and 95

percentiles, falling about midway between land sown and the 1.0 line of equality (as was applied for a rule of thumb in the computer simulation of differential reproduction at the beginning of Part One, Dataset 1.2.4). But reproduction drops off rapidly below the 20 percentile, perhaps falling even to zero. And above about the 95 percentile reproduction is not quite as high as would be expected from land sown.

One lesson to be discerned is that there is an overall consistency between reproduction and land controlled, although we can anticipate exaggerated demographic effects at the extremes of poverty and wealth. This conclusion seems quite matter-of-fact when the data are all laid out as in Dataset 3.7.2 C, but we should not forget that there are many other possible and defensible propositions for the relationship between land and reproduction, and in past decades demographers often the presumed that the high reproduction of the working classes in early industrial society indicated the poor would reproduce more in peasant society as well.

Although this curve of differential reproduction might fall within the range of some Chinese data we have examined, it is not quite a straightforward matter to apply the implications from this analysis of Russian peasants, who enjoyed periodic redistribution of land, to Chinese peasants, who were alienated from the land under well-established rules of private ownership. It is likely that Chinese peasants suffered even higher differentials of reproduction, due to greater inequality and more pernicious conditions of exploitation. The killing of female infants and the inter-class transfer of women, as has been described in previous sections, were a vivid manifestation of this, in that basic comforts of human life, a wife and children, were denied to a portion of men. On the other hand, redistribution of land in the Russian case could also cause land controlled to follow more closely the vagaries of reproduction because land would be allotted for sons produced. I will refrain from judging which case should have had greater differentials of reproduction.

There is another aspect in which the Russian data seems to bear on a proposition made in the model of differential reproduction: the greater the rate of accumulation of land for the propertied, the greater the differentials of reproduction. This proposition was advanced on the assumption of a tendency towards equilibrium between the two processes, i.e. the social balance would settle on a fairly stable distribution of land ownership. Moreover, we found in the computer simulation of differential reproduction that higher rates of both also produced a slightly more unequal state at equilibrium (Dataset 1.2.7). In the Russian case we are not dealing with land ownership per se, but

inequality in land sown is generally part and parcel of inequality in ownership of other productive resources, most importantly draft animals, but also buildings, implements, etc., as is abundantly shown in data cited in Shanin (pp. 64-69).

Table 7.I, pp. 124-5 in Shanin gives mobility data for four regions of Russia, 1924-25. The source data of this compilation of Ts.S.U. surveys must be overlapping with that presented above for European Russia. The four regions are.the "Grain-Deficient Zone" and the "Grain-Surplus Zone", the North and South, respectively, of European Russia; Belorussia, between the Ukraine and Europe, also northerly; and the North Caucasus, south of European Russia. (See Shanin pp. 122-124 for a more detailed description; the Ukraine, Siberia, and the Volga area are not included in these regions. Chayanov pp. 140-41 maps cropping patterns; See the bottom of Dataset 3.7.3 A.) I will present the data for these four regions in some detail, for the purpose of comparison among them.

The task of comparison entails considerable processing of the tables as provided in Shanin, because we must take comparable units of the population, and comparable units of land, to allow comparison between the regions. The original measure of land area for the survey was desyatinas, and the surveys were also compiled by land sown size groups. But average size of farm was quite different for the four regions, reflecting different productivity and population density; for example, the North Caucuses had both rich soil and low population, and so large grain surpluses. We will get an erroneous comparison of land sown distribution if the top size group in one region contains 15% of households, but in another region it contains only 5%. Of course the smaller the percent of population taken for the top group, the higher the average ownership that peak group will have. What we want for standardization is land sown relative to the average, for deciles of households. To get this I smoothed the irregular segments of the land sown distribution of the source table (irregular because they are step-functions with differing percents of population in them), smoothing the curve by hand while retaining the same area under the curve. Then I dissected the curve into ten segments with equal populations of households, and added up the land sown for each through a computerized version of the curve. This process was carried out for the indicators of household reproduction as well.

Dataset 3.7.3 A charts the pattern of land sown by decile of population for the four regions. Dataset 3.7.3 B summarizes the main points of the comparison of demographic data among the regions, in table form. Dataset 3.7.3 C gives full tabular data for ten deciles. The regions are listed in the order of increasing differentials of reproduction:

A. Belorussia / North (between the Ukraine and the Baltics),
B. Grain-Deficient Zone / North (European Russia),
C. Grain-Surplus Zone / South (European Russia), and
D. North Caucasus / South.

I do not have sufficient information to compare agricultural productivity in the four regions, but it is tantalizing that this pattern seems to follow what we saw in the Chinese data, greater differentials of reproduction in the South. In this Russian case, unlike China, the South regions also enjoy more land per household than the North, as can be seen in the top section of the table, and so we may assume from this (as well as from Shanin's description and the customary names "grain-deficit" and "grain-surplus") that the South regions have considerably greater productivity per capita. By my measure of inequality, there is also a general increase in displacement, from 28% for region A to 39% for region D; although displacements for regions B and C do not quite fall in line, the end points for land sown by the top 10% do, as can be seen in the bottom section of the table, and in Dataset 3.7.3 A. This figure does not exhibit as wide a range of land sown sizes as we have seen previously in Dataset 3.7.2 C for European Russia, because it has been constituted by deciles of population, and this averages out the great variation of land controlled among the last few percentiles.

As is already familiar for the Russian data already presented, Dataset 3.7.3 B shows that the rich households partition at a high rate, and the poor households disappear at a high rate. What is further important for our comparison, though, is that these phenomena are the more marked, the greater the inequality of control of land. This is shown even in the aggregate figures for all households, that an increasing portion of the population is involved in partition and disappearance. The two do not just increase in tandem, however; disappearance increases even faster than partition (see the ratio between the two in the last column of the middle section of Dataset 3.7.3 B), implying that for those households that do partition, there are more partitioners [34] — also a sign of greater differentials of reproduction. All of this seems to indicate that the differentials of reproduction may increase more than can be explained by a fixed relationship between

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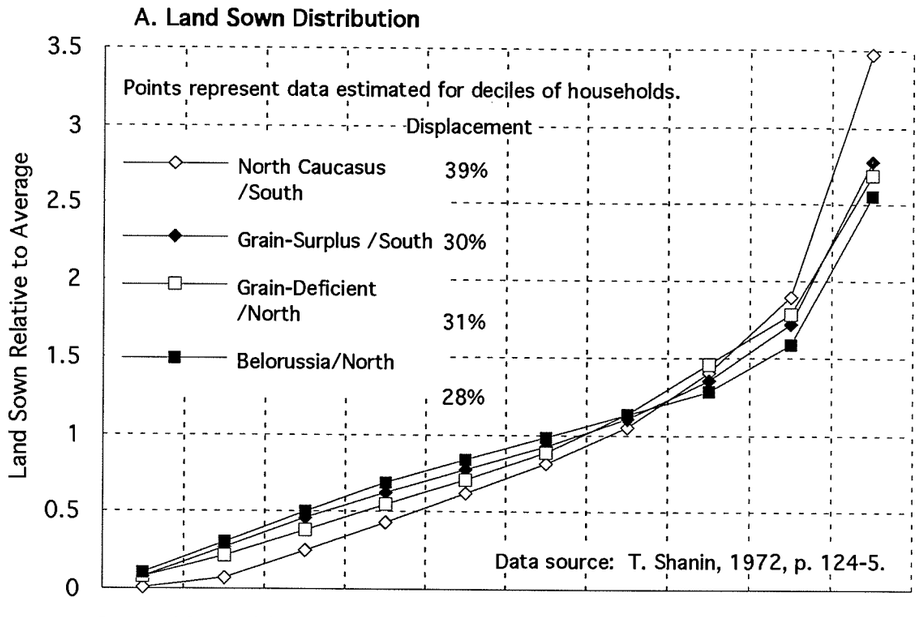
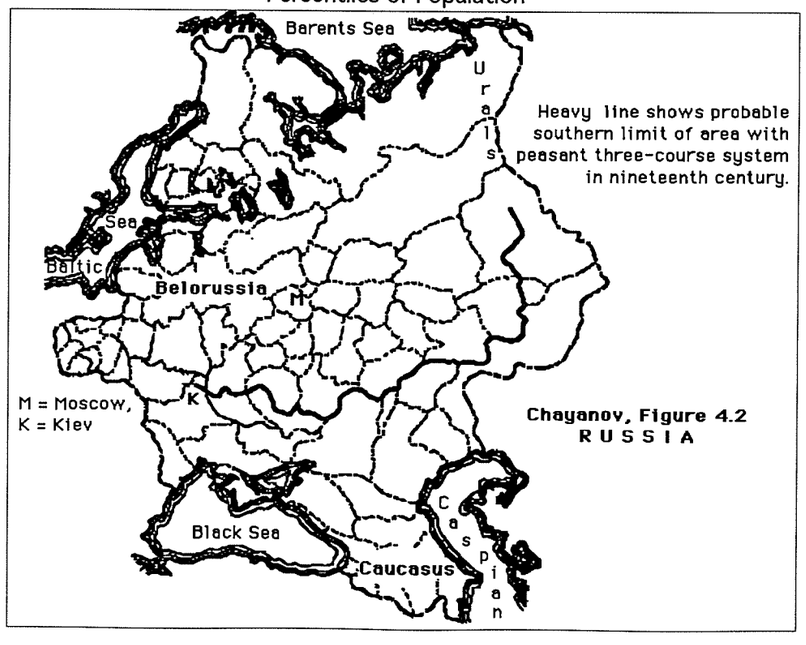
[34] Number of partitioners has been estimated beginning from the ratio between overall disappearance and partition rates, assuming that there is zero population growth overall (Partitioners = 1 + Disappeared/Partitioned). After the partition rate is adjusted slightly for each decile to follow the gradient of partition rates, as was mentioned above, it is also necessary to adjust downward for zero population growth, so average number of partitioners for region D, for example, is estimated at 2.52 rather than 2.87.

Dataset 3.7.3 Comparison of Peasant Differentiation and Household Change for Four Regions of Russia, 487,455 Households, 1924-25





Dataset 3.9.3 B Summary of Land Sown Distribution and Differential Reproduction of Households — Russia 1924-25

FOUR REGIONS	N of Households	Land Sown /Household (hectares)	Displace-ment from Equality
A. Belorussia / North	10,190	3.19	28.0%
B. Grain-Deficient Zone/ North	188,914	2.16	31.6%
C. Grain-Surplus Zone / South	235,609	4.16	30.0%
D. North Caucasus / South	52,742	5.44	38.7%

HOUSEHOLD REPRODUCTION 1924-25 — AVERAGE FOR ALL HOUSEHOLDS

	Percent of Households Partitioning	Est. N of Partitioners, Constant Pop.	Percent of Households Disappearing	Ratio Disappearing /Partitioning
A.	1.3%	2.17	1.6%	1.23
B.	2.5%	2.18	3.1%	1.26
C.	2.9%	2.21	3.9%	1.33
D.	3.0%	2.52	5.6%	1.87

	FOR TOP 10% OF HOUSEHOLDS			FOR BOTTOM 20% OF HOUSEHOLDS		
	Land Sown Relative to Average	Percent of Households Partitioning	Projected Reproduction in 25 Years	Land Sown Relative to Average	Percent of Households Disappearing	Projected Reproduction in 25 Years
A.	2.59	4.8%	1.78	0.201	2.7%	0.57
B.	2.69	5.9%	1.88	0.159	6.2%	0.34
C.	2.71	8.0%	2.02	0.170	8.5%	0.28
D.	3.47	9.1%	2.67	0.039	13.6%	0.23

Source: Dataset 3.7.3 calculated from T. Shanin, 1972, Table 7.I, pp. 124-5.

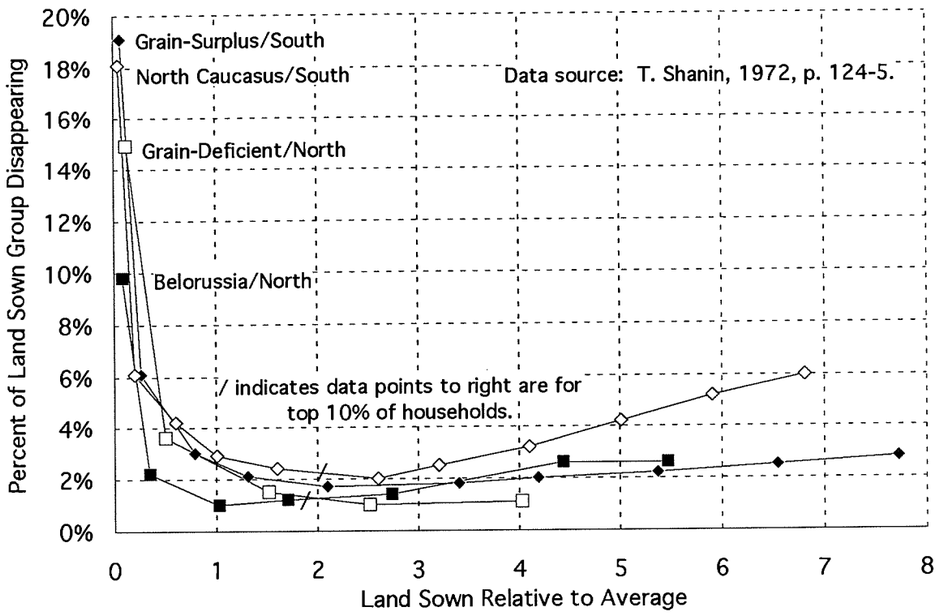
NOTES: Source data is given in dessyatinas (1 dessyatina = 1.09 hectare), and data is aggregated in land sown segments of increasing size:
0-0.1, 0.1-2.0, 2.1-4.0, 4.1-6.0, 6.1-10.0, 10.1-16.0, 16.1-25.0, over 25.
Data has been transformed by fitting curve for each variable over land sown segments,then cutting curve and aggregating into deciles of households.
Household Reproduction varies from 1.0 due to numbers of households experiencingpartition or disappearance. Projected Reproduction in 25 years is outcome expected if partitioned households do not further partition or disappear. This measure is a multi plicative factor, i.e. 0.50 = half gone, 1.50 = 50% increase. N of Partitioners is set for zero population growth overall, while higher for prolific rich and lower for poor.

Dataset 3.7.3 C Land Sown and Household Reproduction by Deciles of Households, Four Regions of Russia, 1924-25.

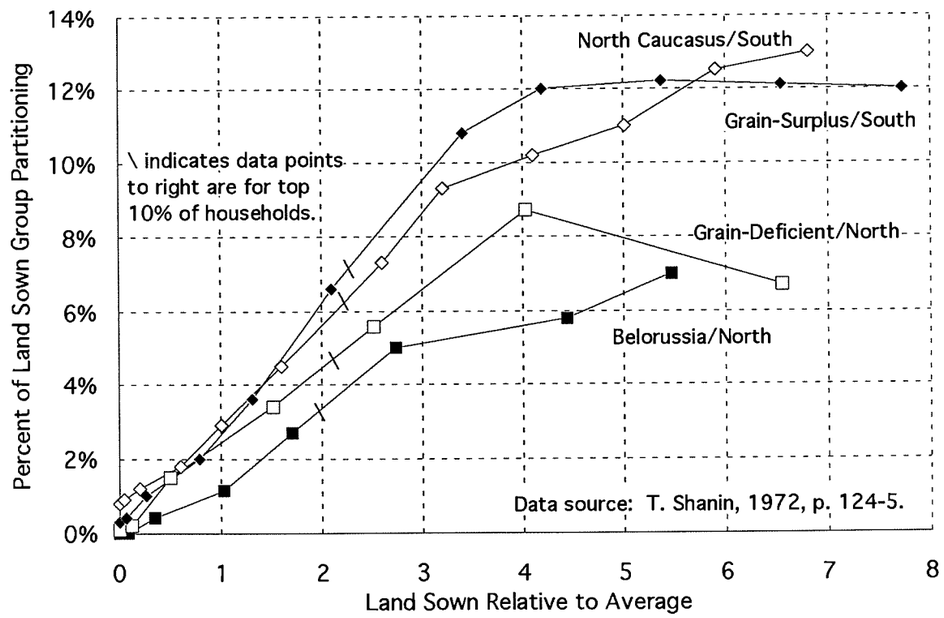
Household Decile	Land Sown Relative to Average	Percent of Households Partitioning	Estimated Number of Partitioners	Percent of Households Disappearing	Est. Net Annual Reproduction	Projected Reproduction in 25 Years
BELORUSSIA — NORTH						
1	0.10	0.1%	2.01	3.1%	0.97	0.49
2	0.30	0.3%	2.04	2.2%	0.98	0.66
3	0.50	0.6%	2.08	1.8%	0.99	0.79
4	0.69	0.8%	2.11	1.4%	0.99	0.91
5	0.84	1.0%	2.12	1.3%	1.00	0.95
6	0.99	1.1%	2.14	1.3%	1.00	0.99
7	1.14	1.2%	2.15	1.2%	1.00	1.03
8	1.28	1.3%	2.16	1.1%	1.00	1.07
9	1.58	2.3%	2.29	1.2%	1.02	1.28
10	2.59	4.8%	2.61	1.2%	1.06	1.78
All	1.00	1.3%	2.17	1.6%	1.00	1.00
GRAIN-DEFICIENT ZONE — NORTH						
1	0.08	0.4%	2.03	7.6%	0.93	0.22
2	0.24	0.8%	2.06	4.8%	0.96	0.47
3	0.41	1.2%	2.09	4.1%	0.97	0.61
4	0.57	1.6%	2.12	3.5%	0.98	0.76
5	0.74	2.0%	2.15	2.9%	0.99	0.93
6	0.90	2.5%	2.18	2.2%	1.01	1.10
7	1.14	2.9%	2.22	1.8%	1.02	1.25
8	1.46	3.4%	2.25	1.6%	1.03	1.38
9	1.78	3.9%	2.29	1.3%	1.04	1.51
10	2.69	5.9%	2.43	1.0%	1.07	1.88
All	1.00	2.5%	2.18	3.1%	1.00	1.01
GRAIN-SURPLUS ZONE — SOUTH						
1	0.08	0.6%	2.04	10.3%	0.90	0.17
2	0.26	1.0%	2.07	6.6%	0.95	0.39
3	0.45	1.5%	2.10	4.7%	0.97	0.61
4	0.62	1.8%	2.12	3.7%	0.98	0.77
5	0.77	2.0%	2.14	3.2%	0.99	0.87
6	0.93	2.2%	2.16	2.8%	1.00	0.97
7	1.11	2.8%	2.19	2.3%	1.01	1.13
8	1.35	4.0%	2.28	2.0%	1.03	1.40
9	1.72	5.7%	2.41	1.8%	1.06	1.71
10	2.71	8.0%	2.56	1.7%	1.11	2.02
All	1.00	2.9%	2.21	3.9%	1.00	1.00
NORTH CAUCASUS — SOUTH						
1	0.01	0.9%	2.15	19.8%	0.81	0.10
2	0.07	1.0%	2.18	7.3%	0.94	0.36
3	0.24	1.2%	2.21	6.0%	0.95	0.48
4	0.43	1.5%	2.25	5.2%	0.97	0.59
5	0.61	1.9%	2.32	4.3%	0.98	0.78
6	0.81	2.4%	2.40	3.3%	1.00	1.00
7	1.05	3.1%	2.53	2.9%	1.02	1.23
8	1.40	4.0%	2.69	2.5%	1.04	1.52
9	1.89	5.3%	2.90	2.2%	1.08	1.89
10	3.47	9.1%	3.55	2.6%	1.21	2.67
All	1.00	3.0%	2.52	5.6%	1.00	1.06

Dataset 3.7.3 continued (Figures) Four Regions of Russia, 1924-25

D. Percent of Households Disappearing, by Land Sown

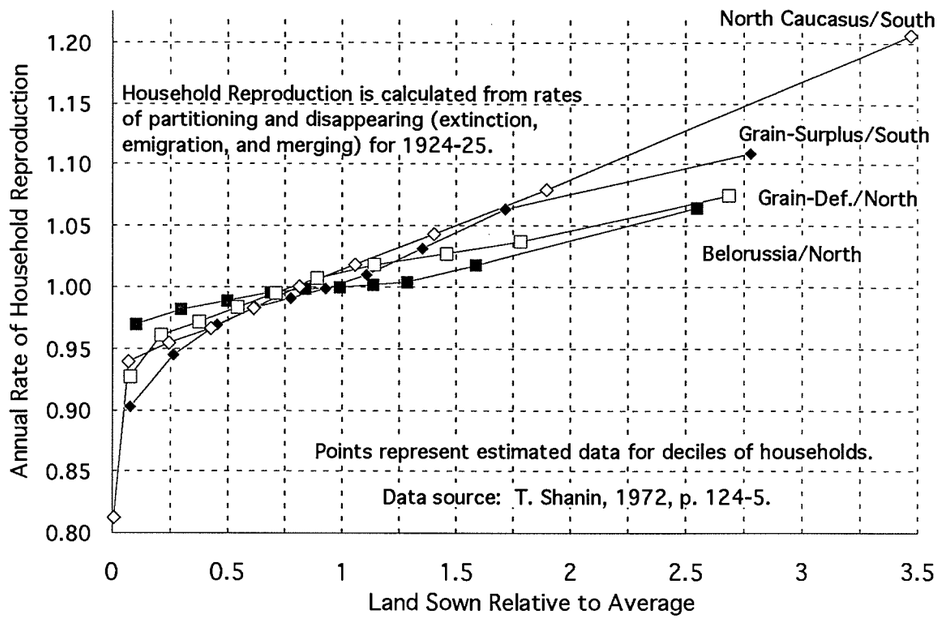


E. Percent of Households Partitioning, by Land Sown

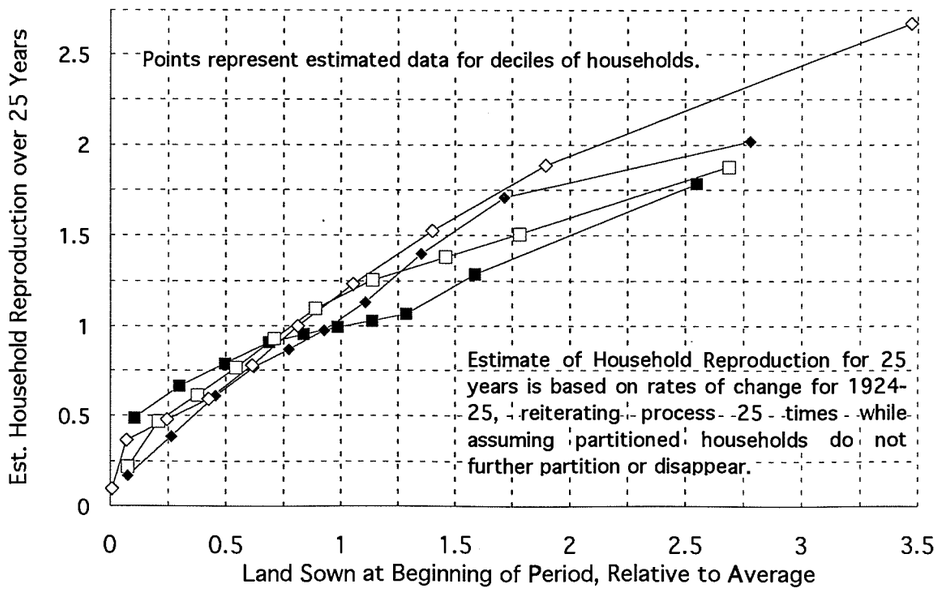


Dataset 3.7.3 continued (Figures) Four Regions of Russia, 1924-25

F. Annual Household Reproduction by Land Sown



G. Household Reproduction Projected for 25 Years



land and reproduction rate, and that there may even be some inherent effect of social hierarchy on reproduction, such as increased capacity for those at the peak to claim a disproportionate number of women.

Dataset 3.7.3 C gives the data that has been generated to make this comparison among the regions. However, it is much easier to understand the overall picture through the following series of charts. The first two charts show households disappearing and partitioning by land sown (Dataset 3.7.3 D and E). In these two figures I have not standardized the data to deciles of households, so the downward inflections in rate of partitioning for the top few percent of households can be seen. These two figures are followed by annual rates of household reproduction (Dataset 3.7.3 F) and estimated projected reproduction for 25 years by land sown (Dataset 3.7.3 G); and in these charts each data point represents a decile of population, so it is easy to visualize the portion of households to which the relationship applies. In the last figure it can be seen that the North Caucasus has not only a wider range of land sown, but a higher rate of reproduction all along that range past 1.0 units of land sown. This could be taken to reflect not so much higher differentials of reproduction, but higher fertility with the generally higher agricultural productivity of this region — except that the lowest decile of population here reproduces at an abysmal rate, showing the reciprocal part of the pattern of differentiation.

Here I rest my case on the differentials of reproduction in Russia. I look forward to some scholar of the Russian peasantry taking on the *zemstvos* data again.

3.8 Small Bangladeshi Surveys on Peasant Differentiation, Household Change, and Social Mobility, 1930-1980 — van Schendel and Cain

Shanin's revival and advancement of Chayanov's theory of demographic differentiation among the peasantry has had considerable influence. Two books on Bangladesh, Peasant Mobility: The Odds of Life in Rural Bangladesh by Willem van Schendel, 1981, and Peasants and Classes: A Study in Differentiation in Bangladesh by Atiur Rahman, 1986, have taken Shanin as their foil. Both use small village studies as the basis for their argument, and both find rapidly increasing population and dwindling land per capita, with increasing numbers of agricultural laborers, over a period of several decades. Rahman contends there has been widening polarization. In the main, both disagree with Shanin's proposition that demographic processes lead to a levelling of peasant differentiation, though they do find some similar processes and some multidirectional mobility. Of the two books, Rahman's is rather perfunctory in presenting the village studies, but van Schendel's is rich in detail and description of the lives of the peasant families, though the numbers are small. In particular he recounts specific cases of family partition, merger, and disappearance under conditions where the specter of starvation is sometimes not far removed. We might imagine we are reading about pre-revolutionary period peasants in China, though the year and place, 1977/78 Bengal, is distant.

Examining landownership in Dhoneshor, District Comilla, van Schendel says

> In *1960* the distribution showed that each household owned on average less than half as much land as their precursors, despite the fact that the village as a whole owned about 23 percent *more* land than in 1984.
>
> This was caused by a great expansion in the number of households, from 33 to 81. Dispersion was also less than in 1894, although it was still considerable. The largest holding was below 10 acres. Strikingly, the proportion of landless households was now smaller, and half of them owned a homestead plot. As we will see later, most of these households had been landowning before. The original landless households (or their successors) had disappeared from the village as a result of extinction or migration. (van Schendel p. 231)

Population had increased in the past in another village van Schendel studied, Goborgari, District Rangpur, due to in-migration. But these conditions were also changing due to population increase. In past decades migrants could easily establish themselves in new villages because their labor was needed, but no more; migration was increasingly the last resort for the poor, and they faced resentments of prior residents in their new locations. Non-agricultural opportunities continued to be meager.

Van Schendel divided his samples into four classes that relate directly to subsistence; he found monetary amounts were not relevant measures for these largely subsistence farmers. His economic categories are: A. unable to provide for 12 months a year, B. just able to provide for 12 months a year, C. able to create surplus of 1-3 months per year, and D. able to create surplus of over 3 months a year. A household's position was largely determined by landowning, but not entirely. Van Schendel's analysis of "non-substantive" changes in economic category for households over the long periods he has traced his sample, 45 to 85 years, shows more downward than upward mobility, but it is difficult to tell how much of this to ascribe to exploitation and appropriation of land, and how much to the increasingly severe crowding on the land. On this matter I will merely quote his figures for volume of land transfers.

> We have reliable, mostly written information on land transfer in Goborgari since about 1945. ... Since 1945 a total of 62 ha. (156 acres) was transferred, 53% by means of sale, 42% by inheritance, 4% by gift, 1% by reversal to the state, and less than 1% each by land exchange and land theft. ... Both land sales and land transfer in general have been amazingly stable processes since 1945. In the five years preceding 1960, for example, 18% of all land owned by Goborgari villagers was transferred, and in the five years preceding 1977 the figure was exactly the same, 18%. ... (van Schendel 1981, p. 325)

The villagers of Goborgari, 75 households, owned 49 hectares (122 acres) of cultivable land in 1977, so it can be seen that this volume of transfers could involve all land once or more in a generation.

Following on Shanin, van Schendel does not put much emphasis on "substantive change" of households, but he does provide some basic information. Dataset 3.8.1 combines data for all three of the villages studied. This is an accounting of the number of household change events occurring over the long periods investigated, not a rate of occurrence per 100 total households. However, since only a few households had no change, it must be representative of the relative frequency of the processes. The relative frequency should also not be affected by differences in the length of time covered. There are more events (227) than households (201 in 1977/78). As seen before in the Russian surveys, it is the rich households that partition the most, and poor households that emigrate and die out. Here it can also be seen that most immigrating households are poor as well. Merger was a more common occurrence among the propertied, says van Schendel, because property was necessary to induce the transformation.

Dataset 3.8.1 Substantive Household Change over Extended Time for Bangladeshi Peasants — van Schendel

Location of Study: Area, District, Time	Goborgari	Rangpur	1933-1977
	Ghorshal	Bogra	1922-1978
		Dhoneshor	Comilla1894-1978
Economic Categories of Study	Category A	unable to provide for 12 months a year	
	Category B	just able to provide for 12 months a year	
	Category C	able to create surplus of 1-3 months per year	
	Category D	able to create surplus of over 3 months per year	

CATEGORY OF HOUSEHOLD CHANGE

	Partition	In-Migration	Out-Migration	Merger	Extinction	Total
	NUMBER OF HOUSEHOLDS					
A.	15	21	16	1	15	68
B.	33	9	6	3	13	64
C.	24	3	4	1	4	36
D.	35	1	6	7	6	55
All	107	34	32	12	38	227

(Total includes 4 households that experienced no substantive change.)

	PERCENT OF HOUSEHOLDS BY ECONOMIC CATEGORY					
A.	22%	31%	24%	1%	22%	100%
B.	52%	14%	9%	5%	20%	100%
C.	67%	8%	11%	3%	11%	100%
D.	64%	2%	11%	13%	11%	100%
All	47%	15%	14%	5%	17%	100%

	GROWTH OF HOUSEHOLD NUMBERS			Est. Partitioners that Later Disappeared	
	N of Households		Net		
	Beginning	1977/8	Increase	Number	% of Part.
A.	59	55	-7%	8	25%
B.	49	67	37%	2	3%
C.	26	42	62%	2	3%
D.	25	37	48%	5	6%
All	159	201	26%	17	7%

Average N of Partitioners = 250/107 = 2.34

NOTE: All samples combined based on reconstructed N of original data.
Source: Willem van Schendel, 1981. Peasant Mobility: The Odds of Life in Rural Bangladesh. The Netherlands, Assen: Van Gorcum.
Tables 2.29 (p. 106), 3.35 (p. 189), 4.27 (p. 257).

Dataset 3.8.2 Number of Women and Children per Woman by Economic Category for Bangladeshi Peasants, 1977/78 — van Schendel

Economic Categories:
A. deficient, B. break-even, C. up to 25% surplus, D. over 25% surplus.

	Estimated Number of Women			N of Households	Wives per Household	
	Age 15-49	Age 49+	Total		Age 15-49	Age 49+
A.	51	20	71	65	0.78	0.31
B.	59	26	85	75	0.79	0.35
C.	37	21	58	45	0.82	0.47
D.	38	16	54	43	0.88	0.37
All	185	83	268	228	0.81	0.36

	N of Children Born for Women			N of Children Alive before Age 15		
	Age 15-49	Age 49+	Total	Age 15-49	Age 49+	Total
A.	4.02	5.75	4.52	3.17	3.44	3.24
B.	3.46	6.72	4.43	2.75	4.27	3.20
C.	3.99	6.22	4.85	3.12	4.23	3.53
D.	4.41	6.89	5.21	3.65	4.88	4.01
All	3.89	6.39	4.68	3.12	4.17	3.44

	Percent of Children Dead before Age 15 for Women			Average Household	Total Children Alive x Total Women/Household	
	Age 15-49	Age 49+	Total	Size	Number	Index
A.	21%	40%	28%	4.18	3.54	0.88
B.	21%	36%	28%	4.61	3.62	0.90
C.	22%	32%	27%	6.62	4.55	1.13
D.	17%	29%	23%	7.40	5.03	1.25
All	20%	35%	27%	5.41	4.04	1.00

NOTE: All samples combined based on reconstructed N of original data.
Source: van Schendel, 1981. Appendix A. Tables 2.24 (p. 304), 3.27 (p. 316), 4.21 (p. 322). See p. 209 Note 28 concerning data collection.
80% of children dying before age 15 died by age 5.

The net increase in household numbers for each economic category, as shown in the lower left of Dataset 3.8.1 was calculated by van Schendel, and the relatively greater increase of the C and D categories is clear. The slightly lower increase for the richest D category appears in two of the three samples, and may reflect some levelling of reproduction for rentiers. The overall growth of the population, 26%, does not appear high enough for the long periods of the study to produce serious overpopulation, but the total amount of land held by some villages has also receded considerably. From the growth percentages I figured that van Schendel had excluded the disappearances of successors to partitioned households from his tables on substantive changes; my estimate

of these is at the lower right of the table, and as expected the largest portion of these disappearances are in the poorest category. Adding these into the main table would increase extinction to 30% of household change events for category A. I was also able to calculate from his tables the average number of partitioners per partition event, and the result, 2.34, is within the range estimated for the Russian data.

Van Schendel collected a wide range of detailed and useful information on land use, agricultural labor, family structure, etc., that cannot be reviewed here, with the exception of the very pertinent demographic information on children per woman by economic category. He collected this information for 228 current households, which were the three villages in which he did his intensive study of mobility plus small samples from several other villages in Bogra District. I have broken down the numbers he gives for total number of women into those Age 15-49 and Age 49+ on the basis of the data on number of children born per woman for each group and for both together. This then allows adding all the samples together, and also calculating wives of each age group per household.

Dataset 3.8.2 shows, consistent with Chinese data, that the richest families had the most fertile-age women per household and that those women had the most children per woman. These families also enjoyed the lowest child mortality, though at 29% for women reporting in 1977, it was still distressingly high and only a little lower than the average 35%. The curve of fertility seems to show a tendency towards a U-shape with heightened fertility for the poorer groups, as we saw in South China data where rented land was plentiful. Category A for women age 15-49 and category B for women age 49+ have the second highest fertility following the rich category D, which may also reflect life cycle effects between them, that having many sons improves later life circumstances for poor parents. Van Schendel describes increasing tenancy for the Bangladeshi villages, but does not provide aggregate figures. It appears that almost half of the households were involved in renting-in land, often small amounts, and half were involved in letting-out in various forms, while overall there was less rented land in Bangladesh than in 1930's South China. However, for Bangladesh land arrangements are very complex and mortgaging in land with annual crop payments may be equivalent to renting-in land, so it is easy to underestimate the effect.

Multiplying out total women per household by total children living to age 15 per woman, which should give the actual average number of children for women in each economic category (right bottom of table), there is a smooth increase in number of children with

better economic circumstances. Category A has an eighth less children than the average, and category D has a quarter more than the average; category D has 42% more children than category A. When we look to the household size, we can guess that some of those children are no longer resident in the household, probably because of marriage, employment, household partition, etc.

In sum, then, the van Schendel study has been useful in demonstrating class differentials of fertility together with class differentials of partition and disappearance for the same population.

A glimpse of the process of further accumulation of land by the rich is afforded in Mead Cain's research on population processes in Bangladesh, discussed previously in this chapter in relation to child labor. In two articles (Cain 1978, 1981) he has directly taken on issues of differentiation of landownership over the life cycle, with investigation of the reasons for gain or loss of land. The later article (Cain 1981) compares three Indian villages scattered over three ecological zones with the Bangladeshi village that Cain himself studied intensively in 1976 and 1978, Char Gopalpur, about 100 km. north of Dacca. Char Gopalpur's environmental conditions favored wet rice agriculture, while the Indian villages were semi-arid, with sorghum as the staple. Population density in Char Gopalpur was four to six times that of the Indian villages; the productivity of unirrigated land in Char Gopalpur was three to four times that of the Indian villages, so Char Gopalpur on the whole was only slightly more impoverished. None of the villages had been much affected by Green Revolution technology. The villages were also comparable in occupational structure, with an average of 44% of households having cultivation as their main occupation, and 37% with wage labor, mostly casual labor, as their main occupation. Considering also secondary occupation, agriculture was much more dominant in the Indian villages. Rural crafts were insignificant in all. For the Bangladeshi village about 20% of land was under sharecropping, and the figure ranged from half that to about the same for the Indian villages.

Looking at the life cycle, Cain found that on the average there had been about three partitioners at the point of inheritance for the Bangladeshi village, and two partitioners for the Indian villages, perhaps reflecting higher rates of population increases in Bangladesh. But what he compared specifically was the change in landownership from point of inheritance to the present, i.e. intragenerational change for those who were present to be interviewed about their retrospective experience, like the table in Buck 1931 that we examined previously in Dataset 2.12.1. For the Indian villages he found

modest gains for the landless and poor, and declines in ownership for the wealthiest 20%, which he attributed to government programs of land reform and landownership ceilings. For the Bangladeshi village he found increasing polarization. While the mean (average) holding increased from 1.8 to 2.2 acres there over the period since household establishment, the median holding decreased from 1.1 to 0.7 acres (Cain 1981, p. 16), indicating that the average gain was due to huge advances for a few. We can examine this gain by deciles of households, but first I wish to add a few comments about the comparison between the Bangladeshi and Indian villages.

Although the amelioration of inequality among the Indian villagers (averaging a change in the Gini coefficient from 0.70 to 0.56, or displacement of about 50% falling to 43%) may well have been correctly attributed to government action, still the contrast between Char Gopalpur and the Indian villages seems to also be in sync with what I have proposed about class differentials of reproduction balancing rates of expropriation. Clearly the rate of expropriation is higher in Char Gopalpur, marked by higher numbers of distress sales of land; and Char Gopalpur is the village with higher population density and productivity per land area, and greater inequality between the sexes. We would need a few more measures to fill out the picture, in particular a comparison on juvenile sex ratios and surviving sons by landownership. But the much higher number of partitioners for Char Gopalpur in itself suggests higher class differentials of reproduction (remember the comparison of four regions of Russia in Dataset 3.7.3), because those whose households disappeared due to emigration or lack of reproduction are not there to tell the tale.

Now let us look to Dataset 3.8.3, on change in landownership for 114 households (Cain's matched sample of the whole village). This data is given by Cain in terms of relative shares of land owned (percents) by deciles of households. This increasing polarization is measured by Cain as a change in the Gini coefficient from 0.60 to 0.69 (from 44% to 54% in displacement from equality). This shift may indeed represent increasing concentration of ownership, or, because this is a retrospective sample, it may in whole or part reflect an early demise for those with little property, i.e. landownership may have been just as unequal in the past but those previously at the bottom were not extant for the survey. Let us note again that *average* ownership in acres increased all the same.

Dataset 3.8.3 Changes between Inheritance and Present (1976) in Relative Shares of Land Owned, Char Gopalpur, Bangladesh

Decile	Percent at Inheritance*	Percent at Present*	Change in Share	Change Relative to Beginning
Poorest	0.0	0.0	0.0	0%
2	0.0	0.0	0.0	0%
3	1.0	0.1	-0.9	-90%
4	2.5	0.4	-2.1	-85%
5	5.0	2.5	-2.5	-50%
6	7.5	5.7	-1.8	-25%
7	10.0	8.0	-2.0	-20%
8	13.0	11.7	-1.3	-10%
9	17.6	19.5	+1.9	+11%
Wealthiest	43.4	52.1	+8.7	+20%
Total	100.0	100.0	0	

* These numbers have been read from Figure 1 and Table 4 in Cain 1981, in order to calculate the last column.

Source: Cain 1981, Table 3 and 4, pp. 13-14.

Whichever may be the case, this table clearly shows loss for the poor and gain for the rich. I have calculated the last column just to reinforce this point, and to indicate the drastic consequences of the loss for the poor, whose meager landholdings are virtually demolished.

These various South Asian and Russian studies provide pieces of the puzzle that, once assembled, delineate the same picture of the class relations of reproduction that we have seen for pre-1949 China. This data moreover allows confirmation of some of the features that might be contested in the Chinese case, such as higher female infanticide among the rich, or higher differentials of reproduction where the agricultural surplus per area is higher. Information such as that on the labor of women and children has also added depth to the picture, and it could be further elaborated through research in many directions. The greatest significance of this presentation is not in compiling description, however, but in explaining the logical relationships of the diverse elements.

The next two parts of this thesis, in analyzing the determination of land tenure patterns and the rate of rent on agricultural land, will shed further light on the effect of the agricultural surplus on demographic processes. We will have occasion then to refer back to some of these results for South Asia.