RESOURCE ALLOCATION AND AGRARIAN CLASS FORMATION

The problem of social mobility among Russian peasant households 1880-1930

NUMBER 66

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WARWICK ECONOMIC RESEARCH PAPERS

DEPARTMENT OF ECONOMICS

UNIVERSITY OF WARWICK
COVENTRY

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April, 1975.

This paper is circulated for discussion purposes only and its contents should be considered preliminary. The author acknowledges with gratitude advice and assistance received from Maurice Dobb, Diane Ellwood, Norman Ireland, Dennis Leech, Patrick O'Brien, Mark Partridge, Jeff Round, Teodor Shanin, Harry Willetts and seminars at the Universities of Birmingham and Warwick.

"Just as urban capitalism is characterised by the presence of two social classes - owners of the means of production, or exploiters, and those who sell their own labour-power, the exploited - the same thing is true of the village, as in a mirror..."

S. T. Uzhansky,"Differentsiatsiya krest'yanstva ", Puti sel'skogo khozyaistva, 1927 No. 6-7, p.133.

"No propaganda effort could, in the long run, make the peasants accept a townsman's picture of class relations and class warfare which contradicted their everyday experience. For they knew better".

Teodor Shanin, The Awkward Class, Oxford 1972, p.141.

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Recent years have marked a new stage in western historiography of the Russian and Soviet peasantry. For this development we have to thank a limited number of scholars for some outstanding works devoted to the East European experience, and thereby to an enhanced understanding of agrarian relations in general.(1) This does not mean that the fundamental problems have been solved; but at least discussion of them need no longer be founded upon considerations that are purely technocratic (the peasantry as a "problem" for government policy) or antiquarian.

What has been the practical outcome of this development? It has shown, first, the fundamental importance of Engels and Lenin to

bourgeois science. Secondly it has drawn upon the work of a number of Russian pioneers working in the field in the period 1900-1930. The works of Lewin and Shanin would not have become obligatory reading without their careful collation of evidence and interpretations from contemporary observers, Marxists, Populists and others, themselves devoted to the study of the peasantry for its own sake. In the study of Soviet history these new works have contributed to the reappraisal of the origins and consequences of the Soviet collectivisation of agriculture, and to the revival of Bukharin as a figure of sympathetic interest. In the study of the peasantry, they have made available a serious revision of the Marxist approach to peasant society in economic development.(1a) The content of this revision can be stated roughly as follows.

Traditional Marxism saw the Russian peasantry as a social formation which had never existed in itself, but only by virtue of its subjection to the outside world. It emerged as a distinct social class with the unification of the Russian state. As a serf peasantry it operated differently from the nomadic clan society of pre-feudal times. With the emancipation of 1861 it entered upon a radical transition in which, still shackled by an exploitative but decaying gentry, it struggled painfully in contradictory directions, emerging in the early 20th century as something that was in part no longer a peasantry. Forced industrialisation, the rise of urban capitalism and the development of factor and product markets resulted in a slow <u>differentiation</u> of the peasantry into a rural petit bourgeoisie and a class of rural labourers still largely - but not entirely - attached to the land.(2)

Thus changes in the larger social order brought about a slow assimilation of a traditional peasantry to the classes and class tensions

of bourgeois society. This process, extraordinarily delayed, meant that by 1914 the peasantry faced a choice : the continued development of large-scale capitalist agriculture, or siding with the Russian working class in a socialist revolution, which would ultimately be completed by the socialisation of agriculture. Either way the "third choice" - a progressive agriculture based on household economy - did not exist.

The modern revision gives due weight to the factors described above, in particular to the tendency of class differentiation. Yet, it is argued, Marxist predictions concerning the class struggle within the village have not, in general, been realised. The reason, it is argued, is that there were countervailing factors at work. These factors were of two kinds. External forces and powerful outsiders united the village against its hostile environment (but this was recognised also by the Lenin school). More fundamentally, factors internal and specific to peasant society were at work, which, it is argued, were necessarily left out of account by the Marxist analysis.

The longer tradition of this view locates the internal factors in a specific peasant culture which lends cohesion and levelling tendencies to peasant society. Such a view may be traced back to the origins of Russian populism. Since Chayanov, others have located stabilising factors in the specific peasant economy of the household farm employing non-wage family labour to satisfy family consumer needs. Bringing these two levels of analysis together, it is suggested that hostile outsiders reacted with internal bonds of common experience and levelling economic tendencies to produce a perpetuation of a small-holding economy and a solidary peasant consciousness.(3) Agricultural development strategies which fail to grasp this essential point, and the possibilities of the

"third road", an economically progressive peasant agriculture, are misconceived; if the peasantries of the modern world are doomed, it is not the consequence of an historically inevitable process, but of the threat which emanates from unsympathetic bureaucrats and blinkered urban intellectuals.

The main focus of this paper is on Teodor Shanin's The Awkward Class, the most challenging work of the "new stage". We shall approach this work by way of the early Russian debate of the 1870s to 1930; some fundamental questions will be posed, and some answers documented with new material from the statistical sources to which The Awkward Class refers. We shall deal primarily with theories and statistics of agrarian economic development; space does not, however, permit a detailed critique of the wider reinterpretation of peasant politics and peasant movements in Soviet history presented by Shanin.(4)

1. THEORIES AND STATISTICS IN THE DIFFERENTIATION DEBATE

There is a crucial relationship between the Russian debate and the statistical materials on which it was based. The earliest agrarian censuses of any systematic scale were the household censuses organised by the zemstva ("local organs of self-government") from the 1870s, usually for the purposes of tax registration. The censuses typically covered the population and major items of property for each peasant household in the locality, usually the uezd (district). The district was the territorial unit below that of the guberniya (province), and there were 500 districts spread through the fifty provinces of European Russia. Between 1880 and 1913 there were 383 such censuses, in which a few districts were surveyed twice.(5) They were generally intended to provide a picture of the major resources employed on the farm - land owned or under cultivation, head of livestock, family size; increasingly with time they also registered social relations such as land rented and labour hired. But they made no attempt to measure total wealth or production and expenditure flows. In view of the economic and statistical problems of constructing such accounts for a partly natural and largely illiterate economy, it is not surprising that serious budget studies, based on a variety of sampling procedures and somewhat heterogeneous methodologies, appeared only at the end of the 19th century.(6) That these developments occurred at all is a measure of the impetus to agrarian investigation provided by the debate on the differentiation of the peasantry, the formation of Marxist and Populist tendencies, and the dedication of the zemstvo-statisticians.

The first statistics of the 1870s provided the Russian intelligentsia with an early intuition of the motion of the planets. The peasantry turned out not to be an homogeneous mass, but highly differentiated

in terms of size and wealth of farms. With the discovery of rural inequality came the major and related questions of its meaning and measurement. The meaning of inequality can be seen as determined by the allocation model used to explain it. The question of measurement is basically a matter of aggregative procedures.

The role of aggregation arises in a context where statisticians have not yet discovered the analysis of variance, and the method of presenting data is the one-way classification table. The raw data generated by thousands of questionnaires must be presented for visual inspection in such a way as to minimise the information loss resulting from aggregation. For one-way classifications this means grouping the population according to an explanatory variable which will minimise the intra-group variation and maximise the inter-group variation of dependent variables. However, different theories indicate the use of different explanatory variables.

Thus, early Populists considered that inequality of farm size and wealth was primarily demographic. Different families in a randomly chosen cluster of farms will be at different stages of growth and decay, and will consequently have different family sizes. Moreover, as families grow and decline, their farms will simultaneously grow and decline. The mechanism ensuring the adjustment of complementary factor supplies as family labour supplies and consumer needs expand and contract may be the repartition of communal land by family size, or allocation models of the type proposed by Chayanov.(7) Under these circumstances family size explains the variation in farm size and wealth; therefore a classification of households by <u>family size</u> will maximise the summed inter-group variance of all other variables. However, a population located in more than one

commune, or a comparison of populations in different areas, would involve a variance of farm size and wealth partly based on the fact that different communes in different areas have different per capita land endowments (the recognition of this is historically linked with the development in Russian social science of the idea of "land hunger"). In this case as later Populists argued, inequality of farm size and wealth is not only demographic but also spatial. A grouping index which would take this into account and regain the maximisation of inter-group variance of dependent variables would be communal land per head.

Marxists, however, argued that inequality was neither simply demographic nor spatial, but was socio-economic in nature and existed within communes and regions as well as between them. According to this view, the value of household reproducible assets influenced family size (through fertility, mortality and migrancy) and land actually cultivated (through short-term rent). A favourable supply of on-farm fixed and working capital per family member (factor ratio effect) and per household (scale effect) would enable those families combining size with a favourable capital:family ratio to undermine the gentry and other peasants in the product markets, and compete successfully for land (belonging to the gentry and poor peasants) and poor peasants' labour in factor markets. The result would be the dispossesion of the direct producer and the capitalisation of agriculture. Consequently a stratification of peasant population by relationship to the means of production or value of owned reproducible assets would maximise the inter-group variance of dependent variables, including the development of rent and wage relations between households.

As we have already pointed out, there were no data for aggregate stocks and flows in value terms. Consequently sown area per farm was

used as a proxy variable for farm wealth. By the beginning of the 20th century it had become the standard grouping index in zemstvo-statistics. But the relationship between this proxy and the underlying theory is peculiar and crucial.

In some ways sown area is extremely useful. It is relatively easy to measure, and within broad and recognisable limits it is physically homogeneous. The problem lies in the use of sown area per farm as a proxy for the scale-adjusted value of means of production per head. The particular consequence of this usage was a series of debates between the defenders of sown area and the defenders of communal land in which none of the protagonists believed in the explanatory role of sown area as such. The general consequence of this usage is the need, when comparing populations of farms or farms within a given population, to assume a uniform and stable (though not necessarily linear) relationship between:

sown area and value yields

sown area and non-arable activities

sown area and household wealth

household wealth and wealth per head

Below we shall be much concerned with conditions under which these relationships break down.

But in terms of the contemporary debate, the results of generalised usage of the sown area stratification confirmed the Marxist theory as the only explanation of the comprehensive differentiation of the peasantry as it was revealed. Other theories and other grouping indices failed to generate such large inter-group variances in the dependent characteristics

of farms either per household or per capita. Therefore they and the theories to which they referred were justly criticised for masking the extent of rural inequality and bourgeois social relations.

What enabled Populist social science to fight back? A major support came with the discovery of socio-economic mobility of peasant households in the first decade of this century. Socio-economic mobility, previously attested to by folklore, was first scientifically investigated by Chernenkov and Rumyantsev, and before the October revolution this was further developed by Khryashcheva, Kushchenko and Vikhlyaev. In the 1920s Khryashcheva became head of the agrarian section of TsSU and made the study of rural socio-economic mobility a major subject of mass statistical investigation.(8)

The method of presentation of mobility statistics developed before the revolution was the transition matrix (this method is defined in appendix 1). Where previous tabulations would yield a cross-section distribution of farms grouped at a given time by sown area per farm, the mobility study used a two-way classification by sown area at two points in time to show how farms moved over time within the initial cross-section, and how the membership of a given stratum circulated between strata.

All the mobility studies reveal systematic and large-scale inter-group movement for all periods and regions surveyed. A significant component of observed mobility is long-range. Some minor variations on the theme are listed by Shanin.(9) This discovery had three important consequences. Firstly, there was no explanation of socio-economic mobility inherent in the Marxist approach. Secondly it suggested that

even if elements of the Marxist model were accepted, such as the economic advantage of large and wealthy farms, it by no means followed that agriculture was developing towards a capitalist mode of organisation; some mechanism was at work which constantly broke up large farms or sent them into decline. And if class membership was unstable, it could not be assumed that class consciousness of rich and poor peasants and class conflict in the village would necessarily follow from the existing differentiation. Thirdly, there was a mechanism inherent in the Populist approach which could explain observed inter-group mobility, and which was based on the life-cycle of the peasant family. These propositions have never seriously been challenged. While a handful of those engaged in mobility studies were themselves Bolsheviks (including Rumyantsev and Khryashcheva), the mainstream of Soviet historiography has passed them by. Lenin considered it to be little more than "arithmetical zeal".(10) After the 1920s researchers ignored it altogether. To the participants of the major debate of the 1960s on the nature of agrarian evolution, agrarian socio-economic mobility, in so far as it was considered, was regarded as characteristic only of pre-capitalist property differentiation in the period before 1861.(11) On the rare occasions when materials of the mobility studies have been referred to, the substantive content of the transition matrix has been ignored.(12) Neoclassical economists of the time found the implications equally difficult to absorb;(13) until the recent translations of Chayanov's work and some comments by Kerblay,(14) the matter had been effectively forgotten. Following Kerblay, Shanin wrote an article and a book, The Awkward Class,(15) which have reopened the subject in a way which demonstrates its fundamental importance.

2. SOCIAL MOBILITY AND HOUSEHOLD PARTITION

Shanin's work brings together a number of interpretations of social mobility and attempts to relate them to the overall picture of the mobility statistics. This is summed up in his table of "determinants" reproduced below:

TABLE 1. The Determinants of Household Mobility underlying Differentiation-Processes.

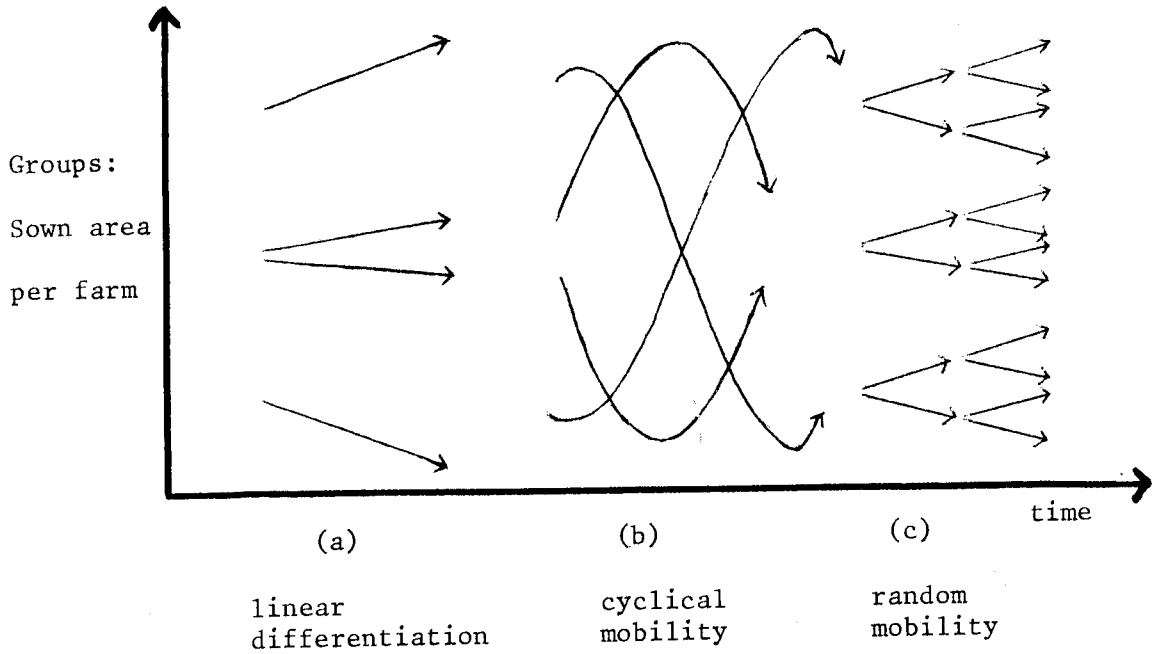
I. Centrifugal trends	II. Centripetal trends
Cumulation of economic advantages and disadvantages	Communal land repartition
	Substantive changes:
	1. Partition
	2. Merger
	3. Extinction
	4. Emigration
Biological life-cycle (?)	Biological life-cycle (?)
Random mobility	Random mobility

Source: Teodor Shanin, The Awkward Class, p.119.

In considering these determinants of the mobility process, the following points should be noticed. The "cumulation of advantages" is the standard economic theory of class differentiation, and is a specifically non-Populist idea which distinguishes the work of Rumyantsev, Khryashcheva, Galeski and Shanin. "Communal repartition" and the "biological life-cycle" (Chayanov and the neo-Populists) are the levelling mechanisms of the Populist tradition. "Random" mobility is a concept

of no particular lineage, although Khryashcheva attaches significance to it; it arises from the violent fluctuations in prices, weather and state policies to which a smallholding economy is prone, but Shanin does not have a great deal to say about it, nor is he able to attach quantitative importance to it. We shall, however, return to it later. This leaves "substantive changes" (i.e. in family integrity and survival). All the above factors, with the exception of "substantive changes" operate on all households. We shall shortly consider them in turn. First it may be worthwhile summarising the types of mobility which have been introduced; this is shown in Diagram 1.

Diagram 1. Types of inter-group household mobility



Mobility may be linear, cyclical or random (multidirectional). "Centrifugal" tendencies induce movements of individual farms away from the mean of the distribution, while "centrifugal" tendencies pull them towards the mean.(16)

Linear differentiation or cumulative advantage is purely centrifugal. Cyclical mobility involves both tendencies simultaneously. A given farm at a given moment will experience a given balance of the two; this balance, changing rhythmically over time will propel it in a determinate cyclical movement. Random mobility also involves both centrifugal and centripetal tendencies, which, within any possible limit set by the aggregate differentiation,will combine on any given farm in randomly distributed proportion to propel it along a randomly fluctuating time path.

These types of mobility may occur in isolation or in combination, but each requires a different explanation.

We noted above that the "cumulation" concept of differentiation seems to be at least theoretically viable and sustained by cross-section data. Large wealthy families have economic advantages which in the absence of countervailing factors may be assumed to cumulate. Among countervailing factors it is hard to attach much significance to communal repartition. Firstly, as Shanin notes, not all peasants lived in repartitional communes; according to Robinson under half the households of European Russia in 1905 belonged to communes which had undertaken a general repartition since 1861.(17) But all areas show similar mobility processes. Even where repartition did take place, resulting in the equalisation of allotment land per head, it is known that poor families would rent their allotments to rich peasants, not for a rent as such but on condition that the lessee would take over the tax liability due on the land.(18) In considering this it is obvious that as a result poor peasants were better off than in a situation in which they had to pay taxes on inalienable land which they could not cultivate, but were no better off compared with a situation in which they owned no land, paid no land tax, and were legally propertyless. Thus it is hard to

see communal repartition contributing to "centripetal" mobility.

The second mechanism of populist economic theory, the "biological life-cycle" is subject to similar strictures which I have dealt with elsewhere.(19) In this case the underlying theory states that as families grow and decline they acquire complementary factors to labour, not necessarily land through communal repartition, but all complementary factors through factor markets and on-farm accumulation. Shanin notes that the evidence in support of this theory is not conclusive.(20) It may however be useful to consider that if this theory is used to explain centripetal trends, the necessary assumptions will directly contradict the assumptions necessary to generate cumulative advantages. Thus, Shanin's query attached to the biological life-cycle is doubly justified.

Under these circumstances, the category of "substantive changes" is particularly important. Table 2 shows these processes over the period 1882-1911 for a sample of farms used for a mobility study to which we shall repeatedly refer. The tendency of farms to disappear, i.e. to migrate or die out (cols. 3, 4) is an inverse function of farm size. Their disappearances, as Shanin notes, actually result from "centrifugal" or linear differentiation processes, but cause statistically observed "centripetal" or levelling tendencies (because those who are the ultimate victims of differentiation processes disappear from the observed population of farms).(21) This point however, while significant, is not central: the Leninist differentiation model relates also to surviving households remaining in the village. Surviving households can be divided into three categories: those which divide, merge, or remain structurally unchanged. Mergers are not registered in Kushchenko's data, but comparative studies suggest that they only affect a negligible proportion of farms.(22) Table 2 shows us

that the tendency to divide increases strongly with farm size. Since other things being equal partition necessarily involves a decline in average farm size, and since a high proportion of large farms are so affected (col. 2), family partition will explain a significant proportion of aggregate downward mobility in terms of sown area. It is assumed in all previous research that this is equivalent to downward mobility in terms of wealth per head and social status.(23)

TABLE 2. Household partitions and disappearances in Surazhsk district, Chernigov province between 1882 and 1911

Arable per farm, des. in 1882	% of farms in each stratum which by 1911 were				Total Number
	Divided	Undivided	Migrated	Extinct	
	(1)	(2)	(3)	(4)	(5)
0- 3.0	6.2	41.9	19.4	32.5	160
3.1- 6.0	15.4	52.0	22.2	10.4	509
6.1- 9.0	26.1	49.8	19.9	4.2	383
9.1-12.0	35.1	45.8	15.6	3.5	199
12.1-00	57.6	33.6	7.1	1.7	226
TOTAL	26.3	46.6	18.1	8.9	1477

Source: G. A. Kushchenko, Krest'yanskoe khozyaistvo v Surazhskom uezde, Chernigovskoi gubernii po dvum perepisyam 1882-1911 g.g., second pagination, pp. 2, 18.

The impact of household partition may further be gauged from Table 3 below which shows two different transition matrices in percentage terms for the surviving farms of Surazhsk district, according to whether or not they experienced family partition during the observed period.

TABLE 3 Households in Surazhsk district, Chernigov province, distributed by arable area in 1882 and redistributed in 1911

Arable per farm, des. in 1882	Percentage redistribution of 1882 strata for 1911 : *						Total Number	
	0 - 3 (1)	3 - 6 (2)	6 - 9 (3)	9 - 12 (4)	12 - 00 (5)	Total (6)	after partition (7)	before partition (8)
Undivided								
0- 3.0	28.4	43.3	22.4	3.0	3.0	100.1	67	67
3.1- 6.0	11.0	50.0	24.2	11.4	3.4	100.0	264	264
6.1- 9.0	7.9	27.7	33.5	15.2	15.7	100.0	191	191
9.1-12.0	2.2	15.4	26.4	22.0	34.1	100.1	91	91
12.1-00	1.3	17.1	23.7	17.1	40.8	100.0	76	76
TOTAL NO.	66	241	185	94	103	-	689	689
Divided								
0- 3.0	28.6	61.9	9.5	0	0	100.0	21	10
3.1- 6.0	38.7	43.5	14.3	3.6	0	100.1	168	79
6.1- 9.0	23.2	44.2	21.5	8.2	3.0	100.1	233	100
9.1-12.0	13.8	47.5	26.3	6.9	5.6	100.1	160	70
12.1-00	4.0	33.6	29.6	15.3	17.4	99.9	321	130
TOTAL NO.	160	373	213	85	72	-	903	389

* Percentages of col. 7.

Source : G.A.Kushchenko, Krest'yanskoe khozyaistvo v Surazhskom uezde, Chernigovskoi gubernii po dvum perepisyam 1882-1911 g.g., first pagination, pp. 11-12.

Both populations experienced considerable inter-group mobility; "divided" farms in general, while concentrated in the upper strata (Table 2, col. 1; Table 3, col. 8), experienced much greater downward mobility. With the exception of the lowest stratum of 1882, the percentages on and to the right of the diagonals are much smaller for the "divided" farms' matrix than for the "undivided" farms.

The question of household partition assumes critical importance for a number of reasons. Firstly it is the only mechanism which works clearly and plausibly to create "centripetal" trends. Secondly the way in which it does so is particularly interesting. It is a dominant tendency among large and wealthy farms, and if it is to result in downward social mobility then it must be implied that large farms which break up lose indivisibilities and the co-ordination of labour, experiencing a relative degradation of reproducible assets. Consequently a limit is set to the development of capitalist enterprise and rich versus poor peasant class-consciousness.

In view of this the explanation of household partition is also of great importance. Peasant property was typically family property and was equally partible between male family members at any time. Shanin argues that the specific peasant culture of the Russian village attached social status only to male heads of household. Consequently junior males within extended families could only attain full social status through marriage and partition. Given that partition was "dysfunctional for economic growth", junior males can be said to have faced a trade-off, explicable in terms of the village culture, between social and economic status in which the choice in favour of partition became more advantageous as the property subject to partition expanded. As soon as the

family became large and wealthy enough to become a potential capitalist enterprise, it disintegrated amid a welter of age-sex conflicts (the role of family quarrels as a proximate inducement to partition is well documented).[24] This argument therefore relates an important levelling tendency of peasant society to peculiar forces internal to the peasantry itself.

In considering this explanation it should be remembered that all explanations hitherto posed have also ultimately depended on features of the specific peasant culture. The most important alternatives have sought to relate partition to family disputes over the distribution of labour and rewards. With industrialisation and increasing rural specialisation, the traditional division within the family of labour-services and rewards is constantly eroded, and with it the traditional authority over family distribution of the head of household. Thus partition results from the failure of the family to contain the accompanying conflict.[25]

The crux of the matter is precisely this "failure", both for Shanin and for his predecessors. We also know of the ability of the peasant family to show internal solidarity, conformism and the ability to repress conflict for the sake of economic advantage.[26] This leaves a number of open questions.

(i) If partition is economically disadvantageous, and motivated by conflicts over the distribution of labour-services and rewards within the family, then in principle there exists a solution which does not involve partition, leaves real output unchanged, and within the family leaves some people worse off than before but everybody better off than if partition had occurred (the "blackmail" optimality criterion).

This may imply maintenance of the integrity of the farm in terms of the principal agricultural activities, but some disintegration of the allocation of family members' incomes. This "decentralisation" of the family purse is reported by Khryashcheva frequently to have preceded partition.(27) A case is reported by Chayanov where such decentralisation had traditional sanction: women's cash incomes from flax cultivation in Volokolamsk district, Moscow province generally remained at their personal disposal, not being passed on to the family purse.(28)

This points to the following question: given the existence of economically feasible solutions to the distributive problem within the extended family framework, why did families find it necessary to take the further step of partition, and why was partition most frequent among those households which had most to lose?

(ii) The apparent explanation is Shanin's argument relating to the distribution of social status. One might see it in the context of the above problem as follows. Full adult status was traditionally attached to the male head of household, as an expression of his patriarchal authority. At a time preceding the period under discussion, this served to cement the extended family together, rather than to encourage its disintegration. By our period, however, junior males had begun to subvert the old family structures by seeking their own adult social status to the

economic disadvantage of the family as a whole. Industrialisation, increasing specialisation and commercial orientation made it increasingly necessary to innovate in methods of household production and distribution of products; failure to do so sparked off the revolt against patriarchal authority and the gradual decline in the extended family after 1861.

The problem posed by this explanation is not the revolt of younger sons against patriarchy, but their failure to deflect the authority of the patriarch within the extended family economy. This question is only partly answered by reference to the vested interests of patriarchs.

Historically there have been many different ways of overcoming the vested interests which have stood in the way of economic development and the formation of a capitalist class. After all this is why patriarchy and partition are apparently important. The work of Gurvich most clearly - and least clearly - shows awareness of this problem; he argued that younger sons within the wealthy household stood in a class relation to the head of household, and that the partition of rich peasant farms was an outcome of the class struggle.(29) But it is still worth considering partition as a point of conflict.

The point is that there is more than one road to modernisation. An analogy might be drawn with the evolution of the British social and economic structure: assisted, it is true, by civil war and regicide, the traditional prerogatives of the landed gentry and the mercantile class

were gradually eroded by a factual transfer of economic power into the hands of capitalist entrepreneurs; the position of the latter was buttressed by their ability to find allies amongst the old regime and to convert it into a political agent of industrial interests.

If the analogy is not too obscure, the question which clumsily emerges is as follows. Why was it impossible, or unnecessary, for junior males to employ the framework of the extended family to transfer family economic initiative into new hands, while retaining the head of the extended household as the recognised representative of the new class in the village community?

Behind all these questions lies a particular conviction, which stems from the Marxist tradition, about the power of ideas and the conventional distribution of income and status to rule men's actions. If "cultural" factors explain economic development, then the cultural factors must themselves be explained. The apparent failure of Russian village traditions to adapt to economic interests must be analysed as much as the rapidly changing "traditions" of British history. Of course ideas and traditions can affect economic development, but the conditions under which they do so must be carefully circumscribed.

Unfortunately there is no ready explanation of the decline of the extended family in terms of the problem as it has so far been posed.

This suggests looking at a different problem. Is partition really "dysfunctional for economic growth"? Do farms which split up, and experience downward mobility in terms of sown area per farm, also experience downward mobility in terms of wealth and wealth per head?

If the answer is yes, then at least we know where we stand; the original problem, however intractable it looks, has been correctly posed. If the answer is no, we can draw three conclusions:

(i) The sown area:wealth relationships implied by one-way classification of populations by sown area, noted above, have broken down.

(ii) Part of the observed inter-group mobility is not true social mobility.

(iii) Partition is not simply conditioned by specifically peasant-cultural factors.

The findings of the next section suggest that the answer is probably no, and that there is support for these conclusions. This will enable us to see in a modified light the relationship between economic development, family structure and partition, and class formation. We can then reconsider the question of "residual" social mobility.

3. ECONOMIC ASPECTS OF HOUSEHOLD PARTITION

We want to test the hypothesis that household partition is "dysfunctional for economic growth". To do this we shall use data from two pre-revolutionary censuses, those of Kushchenko for Surazhsk district, Chernigov province (1882-1911) and of Khryashcheva for Epifan'sk district, Tula province (1899-1911). Tula province is on the northern, and Chernigov on the southern limit of the central agricultural zone of European Russia. Both are black-soil provinces and at the time of observation were notably depressed areas. Chernigov in particular was famous for its preservation of a labour-services gentry.(30)

Of all the studies published between 1905 and 1928, only these two permit an approach to the problem. This is a sad tribute to the power of aggregation procedures to "destroy" information; perhaps time has not literally destroyed the original census returns which must at one time or another have been deposited in the provincial statistical and TsSU archives, and one day Soviet archivists and agrarian historians will investigate them more fully.

The test method is to compare the performance over time of farms which experience partition against those which do not. From Kushchenko's data we can also construct test statistics for farms located in the upper intervals of the initial year, i.e. the "potential capitalists" of 1882. The set of farms under investigation is the set of those observed in the initial year which survived in their existing or fragmented form until the end-year of the survey. This set can also be defined as the set of populations $P : P = \{U,D\}$ where U, D are as defined below; U*, D* are subsets of U,D.(31)

U undivided farms: that group of farms which was sampled in the initial census and observed to survive until the second census, not having experienced any household partition

D divided farms: that group of farms which was sampled in the initial census and which survived until the second census in the form of two or more daughter farms

U* that group of undivided farms the members of which were all located in the highest stratum of land-use in the initial census

D* that group of divided farms which themselves (of which the parent farms) were all located in the highest stratum of land-use in the initial census

The comparison of performance of the populations (U,D) should in principle be in terms of wealth, production and income data standardised appropriately. Thus the effects of corporate decentralisation upon economic activity would be measured in terms of changes in sales or asset growth, or profitability (the effect of decentralisation upon the average size of administrative unit would be trivial, and would not a priori indicate loss of indivisibilities or a decline in the degree of monopoly).(31a) However the only data we possess are figures of sown area, family size (number of consumers and family workers), horse and cattle stocks and some implements. Consequently our hypothesis must be in terms of factor proportions. We shall ask whether the change over time in a given factor proportion on a given group of farms is greater or less than on another group of farms; we shall hypothesise differences in these proportional changes, to be contrasted with a null hypothesis derived as follows:-

For the set of populations P = {U,D}, factors of production (x, y) and time periods t = 1, 2, we have factor proportions r such that

$$r_{Pt} = \frac{\bar{y}_{Pt}}{\bar{x}_{Pt}}$$

and define $\dot{r}$ as the proportional change in r such that

$$\dot{r}_P = \frac{r_{P2}}{r_{P1}} - 1$$

giving us the null hypothesis

$$H_o : \dot{r}_D = \dot{r}_U$$

We shall not be able to attach statistical significance to differences observed between $\dot{r}_D$ and $\dot{r}_U$.

The generation of data, necessary assumptions and the obstacles to tests of significance are fully described in appendix 1. Appendix 2 contains the data thus generated.

In using ratios of specific factors of production it is necessary to know in advance what economic meaning can be attached to each factor. In the absence of price and cost data and quantitative knowledge of production functions, interpretation is complicated by the probable combination of price (quality), income and scale effects. This can be illustrated as follows, from Table 4.

TABLE 4. Factor ratios on peasant farms in Surazhsk district, Chernigov province in 1911

Arable land, des.		Cattle		Horses		Iron Ploughs	
per farm	per worker	per des.	per worker	per des.	per worker	per des.	per worker
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
0- 3.0	.62	.56	.35	.46	.29	.18	.11
3.1- 6.0	1.41	.31	.44	.35	.50	.13	.18
6.1- 9.0	1.99	.25	.49	.29	.57	.11	.21
9.1-12.0	2.34	.24	.57	.26	.62	.10	.34
12.1-00	3.08	.19	.57	.22	.67	.07	.22
Average	1.88	.26	.48	.29	.54	.10	.20

Notes: For calculations the midpoints of the land intervals are used; a midpoint for the upper interval is arbitrarily selected at 16.0 des.

'Workers' are family workers summed on an index basis; (See Appendix 2).

'Iron ploughs' : as opposed to scratch ploughs.

Source: G.A. Kushchenko, Krest'yanskoe khozyaistvo v Surazhskom uezde, Chernigovskoi gubernii po dvum perepisyam 1882-1911 g.g., passim.

Table 4 shows farms grouped by sown area (which is correlated, by inference, with incomes per head). As farm size grows, families appear to substitute capital for labour, and arable land for both. They also appear to substitute arable for non-arable activities (horses and ploughs for cattle).

Let us begin by assuming that each group of farms is internally homogeneous and that, within any group, farms face given and uniform supply-demand parameters. We can assume (from comparative data) that as we move up the scale of farm size the supply price of any given input complementary to family labour will tend to fall, while the demand price for any given output and for labour services will tend to rise (basically a feature of market imperfections).

The patterns of factor substitution shown in Table 4 can then be simply interpreted as a combination of price (quality), income and scale effects in which as farm size and wealth increase, more units of capital (increasing in quality and more efficiently utilised) are combined with the family worker, and spread more extensively over arable land.

With the slow, discontinuous and localised aggregate and per capita economic growth after 1861, changing factor costs, indivisibilities and consumption patterns result in rising agricultural capital: labour ratios on more intensively cultivated land, while there is a small shift from arable to dairy livestock farming (over the period the European Russian horse population fell, and the cattle population rose). Because of combined scale and transport-cost effects, the farm area yielding minimum unit cost will tend to fall with the increased role of dairy farming at a given point in time, but over time (with technical change and accumulation) minimum-cost farm size for any given activity will tend to increase.[32]

Comparison over time of grouped cross-sections of surviving peasant farms shows the preservation of the substitution patterns shown in Table 4, with altered means, dispersions, and (inferred) elasticities of substitution.

Thus the meaning of the change over time in any given factor ratio of any given farm must be understood as a combination of price, income and scale effects resulting from the movement of farms both over time and within the cross-section.

However, the very fact that we are dealing with intergroup movements means that we should abandon the assumption of intragroup homogeneity. Farms in the given group are not identical, because they face different growth-paths. It must therefore follow that, for reasons either internal or external to the peasant family structure, they face different price and income shifts over time. In particular we must seek to distinguish the situations of households who experience partition and otherwise.

Under these circumstances, the relative change in no one factor ratio (such as arable land per head) can fully describe the changing position of the household within the cross-section. Consequently it is necessary to investigate as far as possible the totality of relative changes in factor proportions.

These differential situations can result from internal factors, residing in the structure of the peasant family, or from external factors, such as location within markets. Internal and external factors can be used to generate two alternative hypotheses (a, b) as follows:

Hypothesis (a)

Household partition, reflecting the family life-cycle and the operation of cultural determinants, results in downward social mobility in terms of total wealth and wealth per head. The economic consequences of partition can be considered as an impact effect and a subsequent time-path within the cross-section. The impact effect is the loss of economies of scale, and the probable liquidation of part of the parent farm's indivisible assets; from this we expect an increase in labour and land-intensity. The subsequent growth-path will not fully make up the impact losses, because these losses will be spread more or less evenly over the period of the survey, and the performance of population D is a mean statistic for all farms of that population.

Farms having undergone partition are operated by young nuclear families on the point of rapid family growth (and are therefore experiencing a relative increase in the proportion of persons below working age). Therefore it is predicted that

$$r \text{ (persons : worker)} \; : \; \dot{r}_D > \dot{r}_U \qquad (1a)$$

Experiencing net downward mobility and increased strain on resources complementary to labour, the relative ability of the household to command hired labour-power will decline, i.e.

$$r \text{ (hired workers : worker)} \; : \; \dot{r}_D < \dot{r}_U \qquad (2a)$$

Subsequent growth must be relatively family labour and land-intensive. So we expect, in conformity with Table 4, that :

$$r\ (\text{arable} : \text{worker}) : \dot{r}_D < \dot{r}_U \qquad (3a)$$

$$r\ (\text{capital} : \text{worker}) : \dot{r}_D < \dot{r}_U$$

$$r\ (\text{capital} : \text{arable}) : \dot{r}_D > \dot{r}_U$$

In terms of specific items of capital we would expect divided farms relatively to substitute cattle for horses within a declining total of livestock per worker and per person. Cattle-raising is relatively labour-intensive, due to herding and winter stall-feeding requirements, and raises the land and labour-intensity of arable activities by increasing the supply of manure, yields and transport requirements. In addition the demand for dairy-farming products is not only income-elastic but also age-elastic, and there are young children being added to the family. Therefore we expect downward mobility to be associated with reduced aggregate livestock holdings per worker and person;[33] but holdings of cattle per person may even remain constant, and in this case holdings of cattle per worker may increase. But the arable sector will still decline.

These predictions can be summarised as follows:

$$r\ (\text{arable} : \text{worker}) : \dot{r}_D < \dot{r}_U \qquad (3a)$$

$$r\ (\text{horses} : \text{worker}) : \dot{r}_D < \dot{r}_U \qquad (4a)$$

$$r\ (\text{cattle} : \text{worker}) : \dot{r}_D \blacktriangleright \dot{r}_U \qquad (5a)$$

$$r\ (\text{livestock} : \text{worker}) : \dot{r}_D < \dot{r}_U \qquad (6a)$$

$$r\,(\text{arable} : \text{person}) : \dot{r}_D < \dot{r}_U \qquad (7a)$$

$$r\,(\text{horses} : \text{person}) : \dot{r}_D < \dot{r}_U \qquad (8a)$$

$$r\,(\text{cattle} : \text{person}) : \dot{r}_D \gtrless \dot{r}_U \qquad (9a)$$

$$r\,(\text{livestock} : \text{person}) : \dot{r}_D < \dot{r}_U \qquad (10a)$$

$$r\,(\text{horses} : \text{arable}) : \dot{r}_D > \dot{r}_U \qquad (11a)$$

$$r\,(\text{cattle} : \text{arable}) : \dot{r}_D > \dot{r}_U \qquad (12a)$$

$$r\,(\text{livestock} : \text{arable}) : \dot{r}_D > \dot{r}_U \qquad (13a)$$

Hypothesis (b)

Household partition is a reaction to the selective impact of external economic parameters. In other words, external price and income effects over time affect particular farms differently rather than all farms uniformly (perhaps because of differing proximity to towns and the differential impact of industrialisation through particular transport improvements). This may then lead to a breakdown of the previously noted relationships between sown area per farm and wealth per head arising from scale and substitution effects; one-way classification tables by sown area will reveal the maintenance of overall regularities and conceal an increasing degree of intra-group variance.

Such external price and income effects virtually must imply changes in the ratio of arable to dairy farming. In principle we should

also consider other substitutes (root and vegetable cultivation, handicraft and trade activities); however we shall largely ignore these, because the regions under consideration were remote from the necessary sources of inputs and demands required for multi-rotational and intensive non-rotational cultivation, and traditional handicrafts, to be significantly feasible. In any case dairy farming is particularly important because its products, which are partially competitive with grains in demand, are partial complements with the arable sector in supply (the exchange of by-products: fodder and manure).

Given that, with rising non-agricultural incomes, some farms will face differential price and income changes, we can distinguish a resulting impact effect and a subsequent growth path. The impact effect is, first, the substitution of dairy for arable activities. For given levels of technique and resource endowment, the farm area yielding minimum unit-cost declines with the increased role of dairy-farming; livestock rearing is likely to increase indivisibilities, and yields per hectare in the arable sector through the on-farm provision of manure; but the increased degree of complementarity will disproportionately increase transport costs. The full impact effect will therefore be <u>both</u> the partial substitution of dairy farming for crop farming <u>and</u> decentralisation of production through household partition (the link between "decentralistion" and partition is not spelt out here, and we shall return to it in the next section).

The subsequent growth path will be one of relative advantage to farms in this situation, with continued expansion of dairy farming (made possible by partition) as the <u>primary growth sector</u>. Depending on the relative strengths of the price and income effects, growth will be <u>secondarily if at all</u> present in the arable sector.

This can be formalised as follows. While partition has the initial necessary condition of at least two male family members, there is no particular presumption about the subsequent proportions of family growth. Hence it is only predicted that :

$$r \text{ (persons : workers)} : \dot{r}_D \gtrless \dot{r}_U \qquad (1b)$$

If dairy specialisation is a response to price and income effects through product markets, and reflects a relatively advantageous growth situation, then

$$r \text{ (hired workers : workers)} : \dot{r}_D > \dot{r}_U \qquad (2b)$$

The predicted behaviour of other ratios is as follows :

$$r \text{ (arable : worker)} : \dot{r}_D \gtrless \dot{r}_U \qquad (3b)$$

$$r \text{ (horses : worker)} : \dot{r}_D \gtrless \dot{r}_U \qquad (4b)$$

$$r \text{ (cattle : worker)} : \dot{r}_D > \dot{r}_U \qquad (5b)$$

$$r \text{ (livestock : worker)} : \dot{r}_D > \dot{r}_U \qquad (6b)$$

$$r \text{ (arable : person)} : \dot{r}_D \gtrless \dot{r}_U \qquad (7b)$$

$$r \text{ (horses : person)} : \dot{r}_D \gtrless \dot{r}_U \qquad (8b)$$

$$r \text{ (cattle : person)} : \dot{r}_D > \dot{r}_U \qquad (9b)$$

$$r \text{ (livestock : person)} : \dot{r}_D > \dot{r}_U \qquad (10b)$$

$$r\ (\text{horses} : \text{arable}) : \dot{r}_D \gtrless \dot{r}_U \qquad (11b)$$

$$r\ (\text{cattle} : \text{arable}) : \dot{r}_D > \dot{r}_U \qquad (12b)$$

$$r\ (\text{livestock} : \text{arable}) : \dot{r}_D > \dot{r}_U \qquad (13b)$$

The differences predicted and observed are given in Table 5.

TABLE 5. Predicted and observed differences in proportional changes in factor proportions on peasant farms of Surazhsk district, Chernigov province (1882-1911) and Epifan'sk district, Tula province (1899-1911)

Ratio	Hypothesis		Observation		
	(a)	(b)	O_1	O_1^*	O_2
	(1)	(2)	(3)	(4)	(5)
1. Persons : worker	H	"	L	"	H
2. Hired workers : worker	L	H	H	H	( )
3. Arable : worker	L	"	L	"	L
4. Horses : worker	L	"	L	L	L
5. Cattle : worker	H	H	H	H	(H)
6. Livestock : worker	L	H	L	H	H
7. Arable : person	L	"	L	"	L
8. Horses : person	L	"	L	L	L
9. Cattle : person	"	H	H	H	(H)
10. Livestock : person	L	H	L	H	H
11. Horses : arable	H	"	H	L	L
12. Cattle : arable	H	H	H	H	(H)
13. Livestock : arable	H	H	H	H	H

Notes and Sources : see next page.

Notes : Hypotheses (a, b) as defined in the text.

Observations :

O_1 Surazhsk district, (1882-1911), comparison of populations (U, D)

O_1^* Surazhsk district (1882-1911) Comparison of populations (U^*, D^*)

O_2 Epifan'sk district (1899-1911) Comparison of populations (U, D)

Workers are family workers unless otherwise specified

Livestock indices are based on unknown weights

L lower, i.e. $\dot{r}_D < \dot{r}_U$

H higher, i.e. $\dot{r}_D > \dot{r}_U$

" no difference, either necessarily predicted or actually observed

( ) no direct data

(H) no direct data, but inferred from the fact that horses and cattle are the major components of livestock

For procedure see appendix 1.

Sources : See Tables 8, 9 in appendix 2

Inspection of the table reveals the following. In terms of family growth and resort to the labour market, the Chernigov census is clearly incompatible with hypothesis (a). This is particularly serious since under that hypothesis changes in the ratio of persons to workers are the mechanism from which everything else results. However it should be borne in mind that the wage-labour figures have extremely small bases. The Tula census is compatible with either hypothesis.

Among the factor:labour ratios, the aggregate livestock figure is crucial since it is the only point of conflict between hypothesis (a, b). The Chernigov census is ambiguous. The (U, D) populations support hypothesis (a), while the (U^*, D^*) populations support hypothesis (b). The latter however are of especial significance since they are the "potential capitalist entrepreneurs" of 1882. The Tula census supports hypothesis (b).

The same holds for the factor:persion ratios. Here however we have the addition feature that it would be at least unlikely, though not impossible, for hypothesis (a) to generate $\dot{r}_D > \dot{r}_U$ for cattle per person, as is uniformly observed.

In terms of factor:arable ratios, the comparison of populations (U, D) from the Chernigov census is compatible with either. The comparison of populations (U^*, D^*) and of populations (U, D) for Tula province show patterns of substitution between livestock and land which appear to sustain hypothesis (b).

Thus the results are in part ambiguous. This is not entirely surprising, for hypothesis (a) has been specified so as to make the test of it as weak as possible, while for hypothesis (b) the test is as strong

as possible. Moreover, the areas of ambiguity themselves reflect adversely upon hypothesis (a). In the Chernigov sample, where the secondary symptoms of the family life-cycle are present in some degree, the family structure and wage relation movements are wrong; amongst the most interesting group of farms, the rich households of 1882, even the secondary symptoms are totally absent. In the Tula census, the family structural shifts are compatible with a life-cycle partition, yet partition did not result in relative downward mobility in terms of wealth.

In conclusion, it seems reasonable to suggest that the data do not support the thesis that household partition is economically irrational, but culturally sanctioned, and results in downward social mobility.

The alternative (indeed the only alternative) hypothesis states that differential price and income effects cause shifts in specialisation and optimum farm size, and this is realised in part through division of the farm. However, elements of the evidence for populations (U, D) of Surazhsk district conflict with this. In the next section we shall consider reasons for this.

4. THE EXPLANATION OF HOUSEHOLD PARTITION

If we accept household partition as a concomitant of changing specialisation, it does not follow that we have explained the act of partition. Nor have we taken into account the abundant evidence that family partition was not simply an administrative decentralisation of the rural bourgeoisie but was accompanied by the development of intense age-sex conflicts and an actual disintegration of family life.

Theoretically, household partition is not the necessary outcome of a shift towards activities with lower minimum-cost farm size. The point is that farm specialisation for a number of reasons (principally transport costs and risk) is never complete, and a number of arable and livestock activities, partly competitive and partly complementary, are maintained side by side. Under these circumstances, the decentralisation of productive organisation could in principle take place within the extended family, utilising, for example, Chayanov's principle of "differential optima" (different activities involve different minimum-cost sizes of the unit of production, and ideally one should combine these within a single unit of distribution; this principle underlies both co-operative and socialist forms of agriculture, as a glance at Poland or the Soviet Union will show).[34] So why should specialisation shifts involve the disintegration of family life?

We have established that partition did not necessarily leave everyone worse off than before. It may now be relevant to ask whether it left some people better off than others, and in this light to review the distributive issues raised by the neopopulists. For the controversy so far has assumed not only that partition was economically irrational,

but also that it was equal. However, it would be possible to explain the performance of the Surazhsk populations (U, D) and (U^*, D^*) in the following way, which takes into account the comments of earlier writers on the role in household partition of (i) differential dependency of nuclear families within the extended family, (ii) by-employment and monetisation of incomes, (iii) the revolt against patriarchal authority.(35)

Any extended family will be composed of a number of nuclear units. Each nuclear unit will have its own dependency ratio (persons:workers) and will correspondingly contribute labour-power relative to consumer receipts either less or more than the family average. Resulting conflicts over equity are smoothed over by a reasonably long time-horizon in which all net imbalances sum to zero, and by the authority of the head of household.

The development of product markets, changes in product prices, and the monetisation and individualisation of incomes have three effects. They make new specialisations possible, weaken the traditional authority of the patriarch based on traditional knowledge of routine technologies, and make the definition of equity within the household problematic. For not only does the routine comparison of labour services and rewards now have to take into account the receipt (and concealment) of income in money as well as in kind, but it also has to reconcile long-run conflicting interests. The reason for this latter conflict is the possibility of taking advantage of new product specialisations. The patriarch may seek to maintain his authority over the extended family by inhibiting developments of new activities where his traditional expertise is relatively inadequate, and where decentralised money incomes threaten his authority over the distribution of labour and rewards. Therefore young, small families within the larger unit rebel, because they are faced with <u>both</u> a disprop-

ortionate labour-services contribution to the family budget currently, and the loss of future family income due to failure to exploit possible market opportunities.

By dividing the household at this point, younger sons emerge with a relatively favourable endowment of resources per man, on a scale suitable for new specialisations. This is a result of the fact that inheritance which is equally partible between males must inherently be unequal between nuclear units burdened with differing dependencies. The residual family unit, burdened with old people and children, still subject to patriarchal authority, will thereafter decline. Moreover, considering the population D stratified by sown area, the share of resources taken over by the residual family unit will be larger, the smaller the initial family and farm.

These factors taken together constitute an explanation of

(i) the partial failure of the D population on average to live up to hypothesis (b),

(ii) the comparative success of D^* on average in maintaining its own position, relative to both U^* and D,

(iii) in spite of this, the high dispersion of D^* compared with that of U^* across the sown area strata of 1911.

This suggests that the diffusion of new specialisations and the development of the rich peasant class proceed by way of the shedding of uneconomic and backward fragments. The more powerful the stimulus received,

the less traumatic would be the process of casting off the residual family units; it is interesting to note therefore that the data for Tula province, much closer to the centres of industrialisation than remote Chernigov, are more clearcut in support of the external income-effect hypothesis.

It remains to comment on the discontinuity in the rate of partition noted by Shanin at the time of the Civil War. Shanin ascribes the sudden increase in the rate of partition to the disruption of family life brought by sons returning from the experience of war and military service. This seems to me a reasonable argument, but it is highly unfortunate that the economic correlates of partition in the devastated agriculture of War Communism cannot be further investigated.

In conclusion it would be wrong to exclude family structures and social status from the explanation of household partition. However the probable operation of these factors was not based upon family institutions peculiar to the peasantry as such, or upon a consensual distribution of status within the family or village. The patriarchal domination of some men and women by other men predates the formation of the traditional peasantries, and has survived them in the most advanced capitalist countries. Consequently we need an understanding of patriarchy as such, not of peasants as such. In the present case, we need an understanding of the shifting and eroding basis of the traditional form of patriarchal domination as Russian peasant agriculture developed over the 19th and early 20th centuries, in order to study the ways in which it conditioned the formation of a rural bourgeoisie.

5. THE EXPLANATION OF RESIDUAL MOBILITY

If the external income-effect hypothesis is to be believed, then it follows that a significant proportion of the net downward mobility of large farms is spurious. Part of the gross mobility may be explained by the inequities of partition. However a substantial residual remains, which is present in the observed behaviour of population U and certainly in part of that of D. Moreover the other explanations already considered (communal repartition and the "biological" family life-cycle) are unsatisfactory.

Perhaps the reason why the last two were ever considered seriously is that the transition matrices produced by the statisticians look like cyclical mobility. However, with unclosed upper intervals and lower bounds of zero, they also reveal patterns indistinguishable from random mobility. This recalls the "random factors" - the least articulated elements of Shanin's argument - to which we now turn.

One of the fundamental characteristics of peasant agriculture is its vulnerability to the accidental. The Russian peasant was stalked by fire, blight, disease and death across cornfields, on stormy nights and in dark corners. Market instabilities and local authorities offered disasters and windfalls in rapid succession.

> "Today I am a middle peasant, tomorrow I become a poor peasant. If the horse dies I'll have to hire myself out." (36)

The importance of random factors can be seen as based upon low levels of technology, crop and livestock protection and health, in an economy poorly integrated with high transport costs and highly imperfect

markets, in one sense atomistic but also highly localised and dominated by primitive monopolies over resources and powers of coercion. These are the instabilities of the underdeveloped agrarian economy, and in this sense reference to the random impact of the external world is not a trivial act of analytical despair but a reference to something extremely real.

What is the impact of "random" factors upon social mobility? Within bounds imposed by landlessness at one end, and possible migration of rich peasants at the other, random factors will propel any given population along a random walk (see Diagram 1(c)). Any given stratum of farms will become progressively differentiated over time. The resulting patterns, "bounded" by extinction, emigration and unclosed upper intervals, are observed in the mobility studies.

As has been pointed out, setting bounds on a random walk will result in apparently cyclical movements. That is, a substantial proportion of surviving small farms may appear to escape from the lower strata along a family life-cycle, as a result of windfalls; those hit by disaster will disappear. A minority of the upwardly mobile may reach middle ground or beyond, the remainder being crushed back as disaster follows upon windfall. The converse will be true of wealthy farms.(37) An explanation of social mobility based on random processes is therefore both materially founded and consistent with the evidence. From this we can draw three conclusions :

(i) We can distinguish three mechanisms at work in agrarian social mobility. The instabilities of the underdeveloped agrarian economy result in random processes within any given group or stratum of farms, producing bounded differentiation of the group and intergroup mobility over time.

The disintegrating family structures of the developing agrarian economy result in bounded differentiation of the given stratum through the shedding of inefficient segments of the extended family economy.

The developing cumulation of advantage within the under-developed agrarian economy, and within the world economy as a whole, results in an aggregate differentiation of the whole population, and sets the bounds within which the social division of labour develops.

Our appreciation of this is governed by a fourth mechanism. The theories and categories of the statisticians set the bounds within which the social division of labour is observed to develop.

(ii) Different theories of social mobility have different consequences for understanding intra-rural class consciousness and class conflict. The life-chances for the household economy implied by a theory of cyclical social mobility are radically different from those implied by a theory of random and systematic social differentiation. The latter does not exclude attaching a class meaning to the sudden outbreaks of rural violence, broken by long intervals of "consensual" apathy and submission, which recurred within the pre-collective Russian village.

To find that family structures conditioned this history is by no means to invoke the inherent qualities of the

peasant family founded upon the consensual support of the village culture. Patriarchy is not confined to peasant society. What we do observe is the changing form and content of patriarchal domination as its material basis and class context shift and interact.

(iii) However, the arguments put forward here contain a strong speculative element. While they seem to me to be the only ones which are fully consistent with what we know of the real world, they can be refuted or further confirmed by more research in three possible directions: on ethnographic materials relating to Russian villages and peasant families, on the original census returns if they have survived, and on comparative materials for other peasantries.

6. IS PEASANT SOCIETY DIFFERENT?

Others have argued that there is a certain way to misunderstand peasants. This is to equate rural with urban society. Peasant society is different because peasant families operate differently and because village communities operate differently. Of course most peasant farms are by definition household economies, and it is therefore sometimes useful to take the household as the unit of economic analysis. But Chayanov's theory of the specific structure of the peasant economy, interpreted strictly, is nothing other than a statement of the neoclassical partial equilibrium conditions in relation to labour supplies, a statement which employs the eternal and generalised "human nature" of indifference schedules. I would suggest that in other ways the family is no more the unit of analysis for peasants than for urban dwellers. Anyone who ignores the position of women, children and old people in the peasant family will misunderstand what is going on just as easily as those who fail to understand the role of "pin-money" for women in modern Britain. Similarly the solidarity of the village may be as much of a conditioned phenomenon as the functionalism of Talcott Parsons.

Of course peasant society is different. The differences are not the cultures and rationalities generated by some barbarian dual of civilisation, but are the differences generated by civilisation and economic development. The accident-prone existence of peasant society, and the economic and political oppressions which gave it birth are the fundamental realities with which the social scientist has to come to terms. Peasantries are born out of a particular conjuncture in the battle between men and nature, and between different classes of men. Nor can one ignore the interaction of different levels of conflict. The oppression of women

by men and the "tyranny of elders" have left deep scars on the economic structure, class configurations and political expressions of industrial capitalist societies; therefore it would be idle to see the capitalisation of peasant agriculture in isolation from the study of these conflicts of age and sex. To do so would be the hallmark neither of good economic history nor of Marxist analysis, but would be the opposite of both.

But nor should recognition of the struggle between the generations and the sexes be taken to mean, a priori, that class concepts cease to be relevant to Russian agrarian history.

No one need feel surprise if such ingrained conflicts have conditioned the emergence of a rural bourgeoisie. The trouble is that we can easily be led not only not to feel surprise, but also to feel analytical indifference. This is what happens when we refer to the essential difference of peasant society as a theoretical premise. Then when we come across the anomalies and contradictions thrown up by the zemstvo-statisticians, we cease to study them, and refer them back to the theoretical premise as a shopping-list of "essential differences". Thus the problematic first set up by Russian Populism fails to create new questions and the stimulus to a deeper enquiry, and becomes a self-sustaining but trivial and unscientific construct. An implication of this paper is that perhaps we shall understand Russian peasants better when we can bring to bear the ideas about patriarchy and the sexual division of labour now being developed by radical and Marxist economists and historians in relation to modern capitalism.

FOOTNOTES

1. A particularly important contribution has been made by past and present associates of the Centre for Russian and East European Studies, University of Birmingham and the École Pratique des Hautes Études, Sorbonne, Paris. See, in order of appearance, the translation from the Russian of A. V. Chayanov, The Theory of Peasant Economy, ed. and introd. by Basile Kerblay, Daniel Thorner and R. E. F. Smith, Homewood, Ill. 1966; Moshe Lewin, Russian Peasants and Soviet Power, London 1968; Teodor Shanin, ed., Peasants and Peasant Societies, Harmondsworth 1971; Teodor Shanin, The Awkward Class, Oxford 1972; and the translation from the Polish of Boguslaw Galeski, Basic Concepts of Rural Sociology, ed. and introd. by Teodor Shanin and Peter Worsley, Manchester 1972.

1a. The term "revision" does not imply abuse of the revisionists. It is intended to stress the importance of Soviet history in forcing all of us to think abour peasants, and to think in relation to Marxism, a tradition which has fundamentally influenced the current development; at the same time the revision contains autonomous elements which can be traced back to Russian Populism.

2. Apart from works to be cited later, it is necessary only to refer to V. I. Lenin, "The Development of Capitalism in Russia", Collected Works, Vol. III, Moscow-London 1964.

3. M. Lewin, "Who was the Soviet kulak?", in Soviet Studies, October 1966, pp. 204-209; Boguslaw Galeski, Basic Concepts of Rural Sociology, pp. 34-38.

4. See however Teodor Shanin, The Awkward Class, pp. 1-4, 145-162, and the interesting but inconclusive controversy between Gary Littlejohn and Teodor Shanin in Economy and Society, February, May and August 1973.

5. N. A. Svavitsky, Zemskie podvornye perepisi (obzor metodologii), Moscow 1961, pp. 41-66.

6. A. V. Chayanov, Byudzhetnye issledovaniya: istoriya i metody, Moscow 1929, pp. 26-79 and N. N. Korenevskaya, Byudzhetnye obsledovaniya krest'yanskikh khozyaistv v dorevolyutsionnoi Rossii, Moscow 1954 contain surveys of the development of budget methodology.

7. For example, A. V. Chayanov, The Theory of Peasant Economy, pp. 60-69.

8. N. N. Chernenkov, K kharakteristike krest'yanskogo khozyaistva, Moscow 1905; P.P. Rumyantsev, "K voprosu ob evolyutsii russkogo krest'yanstva", in Ocherki realisticheskogo mirovozzreniya, St. Petersburg 1906; P. A. Vikhlyaev, Vliyanie travoseyaniya na nekotorye storony krest'yanskogo khozyaistva, Vol. 9, Moscow 1915; G. A. Kushchenko, Krest'yanskoe khozyaistvo v Surazhskom uezde, Chernigovskoi gubernii po dvum perepisyam 1882-1911 g.g., Chernigov 1916; A. I. Khryashcheva, Krest'yanskoe khozyaistvo po perepisyam 1899-1911 g.g. Epifan'sky uezd, Vols. I-II, Tula 1916; A. I. Khryashcheva, "Usloviya evolyutsii krest'yanskogo khozyaistva", in Sotsialisticheskoe khozyaistvo, 1925 No. 5; A. I. Khryashcheva, Gruppy i klassy krest'yanstva, Moscow 1926; Statisticheskii spravochnik SSSR za 1927 g., Moscow 1927; Itogi desyatiletiya

sovetskoi vlasti v tsifrakh, Moscow 1927; A. N. Chelintsev, V. V. Matyukhin and I. I. Nikishin, Dinamika krest'yanskogo khozyaistva, Moscow 1928.

9. Teodor Shanin, The Awkward Class, pp. 122-131.

10. V. I. Lenin, "The Development of Capitalism in Rusia", p. 148.

11. N. L. Rubinshtein, "O razlozhenii krest'yanstva i tak nazyvaemom pervonachal'nom nakoplenii v Rossii", in Voprosy istorii, 1961 No. 8, p. 63; I. D. Koval'chenko, "Nekotorye voprosy genezisa kapitalizma v krest'yanskom khozyaistve Rossii", in Istoriya SSSR, 1962, No. 6, pp. 72-78.

12. S. M. Dubrovsky, Stolypinskaya zemel'naya reforma, Moscow 1963, pp. 451-460; A. M. Anfimov, "O melkom tovarnom proizvodstve v sel'skom khozyaistve poreformennoi Rossii", in Istoriya SSSR, 1963 No. 2, p. 149.

13. N. D. Kondrat'ev, "K voprosu o differentsiatsii derevni", in Puti sel'skogo khozyaistva, 1927 No. 5, p. 132.

14. Basile Kerblay, "A. V. Chayanov: Life, Career, Works", in A. V. Chayanov, The Theory of Peasant Economy, p. liv; Basile Kerblay, "Chayanov and the Theory of Peasantry as a Specific Type of Economy", in Teodor Shanin, ed., Peasants and Peasant Societies, pp. 154-157.

15. The article is Teodor Shanin, "Socio-Economic Mobility and the Rural History of Russia 1905-1930', in Soviet Studies, October 1971.

16. Teodor Shanin, The Awkward Class, pp. 76-78.

17. G. T. Robinson, Rural Russia Under the Old Regime, New York-London 1932, pp. 211-216.

18. P. K. Breier, "Sdacha i s"em nadel'nykh zemel'", in A. A. Manuilov, ed., Ocherki po krest'yanskomu voprosu, Vol. II, Moscow 1905, pp. 275-277.

19. Mark Harrison,"Chayanov and the Economics of the Russian Peasantry", in Journal of Peasant Studies, to be published.

20. Teodor Shanin, The Awkward Class, pp. 101-109.

21. Ibid., pp. 101, 119.

22. Ibid., pp. 83-85.

23. "Partitioning the farm is always the worst solution ... " Boguslaw Galeski, Basic Concepts of Rural Sociology, p. 58. See also Teodor Shanin, The Awkward Class, pp. 85-88. This point of view was shared not only by contemporary Russian economists, but also by the Tsarist state, as attempts to legislate against the practice of household partition in the period after 1861 bear witness. The legislation was ineffective.

24. Teodor Shanin, The Awkward Class, pp. 28-32, 85-88; Boguslaw Galeski, Basic Concepts of Rural Sociology, p. 66.

25. I. A. Gurvich, Ekonomicheskoe polozhenie russkoi derevni, Moscow 1896, pp. 60-63; N. N. Chernenkov, K kharakteristike krest'yanskogo khozyaistva, pp. 87-89; P. A. Vikhlyaev, Vliyanie travoseyaniya na nekotorye storony krest'yanskogo khozyaistva, Vol. 9, pp. 51, 76-77; A. I. Khryashcheva, Krest'yanskoe khozyaistvo po perepisyam 1899-1911 g.g., Vol. II, pp. 46-49, 70; A. I. Khryashcheva, Gruppy i klassy krest'yanstva, pp. 55-56.

26. Teodor Shanin, The Awkward Class, pp. 29, 39-40; Boguslaw Galeski, Basic Concepts of Rural Sociology, p. 60.

27. A. I. Khryashcheva, Krest'yanskoe khozyaistvo po perepisyam 1899-1911 g.g., Vol. II, pp. 48, 69.

28. A. V. Chayanov, Len i drugie kul'tury v organizatsionnom plane krest'yanskogo khozyaistva nechernozemnoi Rossii, Vol. I, Moscow 1912, p. XXXIV.

29. I. A. Gurvich, Ekonomicheskoe polozhenie russkoi derevni, pp. 84-85.

30. A. M. Anfimov, Krupnoe pomeshchich'e khozyaistvo Evropeiskoi Rossii, Moscow 1969, pp. 148-150.

31. The test statistics are fully described in appendix 1. For simplicity the text employs the symbol * for the subscript h of the appendix.

31a. The original idea for such a procedure came to me from reading S. N. Prokopovich, Krest'yanskoe khozyaistvo, Berlin 1924, pp. 164-168. Prokopovich also refers to the censuses of Kushchenko and Khryashcheva, and presents a fragmentary and incomplete comparison of the populations (U, D). Both his numbers (where theoretically they stand for comparable concepts) and his anti-Leninist conclusions are different from mine.

32. A. V. Chayanov, Optimal'nye razmery sel'skokhozyaistvennykh predpriyatii, 3rd ed., Moscow 1928, p. 78 provides calculations based on conventional (but not always either explicit or fully justifiable) assumptions.

33. The behaviour of aggregate livestock figures will also depend on the "price" weights attached by the compilers to heterogeneous items. We do not know what weights were used for the given indices.

34. A. V. Chayanov, Osnovnye idei i formy organizatsii sel'skokhozyaistvennoi kooperatsii, Moscow 1927, p. 51.

35. See previous footnotes (24, 25) referring to the works of (i) Chernenkov, (ii) Gurvich, Vikhlyaev, Khryashcheva, (iii), Shanin.

36. Quoted by Teodor Shanin, The Awkward Class, pp. 114-115. See also Moshe Lewin, Russian Peasants and Soviet Power, pp. 28-32, 44.

37. Some original remarks on this subject can be found in A. I. Khryashcheva, Krest'yanskoe khozyaistvo po perepisyam 1899-1911 g.g., Vol. II, pp. 212-226, and A. I. Khryashcheva, Gruppy i klassy krest'yanstva, pp. 14-18.

APPENDIX 1.

The data provided by Kuschenko can be considered as follows, for any population of farms from the set of populations $P = \{U, D\}$. The population is stratified by the single characteristic "arable area" in each of two periods $t = 1, 2$. Let n_i $(i = 1, 2, \ldots, h)$ be the population of the i^{th} stratum in the first period $(t = 1)$. Given that between $t = 1$ and $t = 2$ some of these farms will be split up, the post-division population of the i^{th} stratum is defined as $N_i = q_i\, n_i$, where q is a coefficient of partition (for population U, $q = 1$ and for population D, $q \geq 2$). We are further given a stratification by arable area for $t = 2$, which shows the population of the j^{th} stratum N_j $(j = 1, 2, \ldots, k)$, and a transition matrix (Table 3 above) showing the percentage redistribution of N_i into the j^{th} stratum of period $t = 2$. This gives us a set of simultaneous equations the solution to which is the set of N_{ij}, q_i in Table 7, where N_{ij} is the number of farms allocated to stratum i in $t = 1$ and to stratum j in $t = 2$.

The basic transition matrix from which we work can now be defined for either population (U, D) as follows on page 55.

Finally we know the average endowment with factors of production (x, y) of the farms of the i^{th} stratum of time $t = 1$ and of the j^{th} stratum of time $t = 2$, but not of the ij^{th} cell of the matrix. That is, we know (x_i, y_i) in period 1 and (x_j, y_j) in period 2 but not (x_{ij}, y_{ij}). Our original hypotheses (a, b) are framed in terms of the differences between populations (U, D) of proportional changes over time in factor proportions $r = \frac{y}{x}$. That is, where r_{Pt} is a given factor ratio observed for population P at time t,

(t = 1) \ (t = 2)	1	2	...	j	...	k	Row Total
1	N_{11}	N_{12}		N_{1j}		N_{1k}	$\sum_j N_{1j} \equiv N_1 \equiv q_1 n_1$
2	N_{21}	N_{22}		N_{2j}		N_{2k}	$\sum_j N_{2j} \equiv N_2 \equiv q_2 n_2$
⋮							
i	N_{i1}	N_{i2}		N_{ij}		N_{ik}	$\sum_j N_{ij} \equiv N_i \equiv q_i n_i$
⋮							
h	N_{h1}	N_{h2}		N_{hj}		N_{hk}	$\sum_j N_{hj} \equiv N_h \equiv q_h n_h$
Column Total	$\sum_i N_{i1}$	$\sum_i N_{i2}$		$\sum_i N_{ij}$		$\sum_i N_{ik}$	$\sum_{ij} N_{ij} \equiv N \equiv Q n$
	$\equiv N_1$	$\equiv N_2$		$\equiv N_j$		$\equiv N_k$	$\equiv N$

$$r_{Pt} \equiv \frac{\bar{y}_{Pt}}{\bar{x}_{Pt}}$$

$$\dot{r}_P \equiv \frac{r_{P2}}{r_{P1}} - 1$$

We can then compare hypotheses (a, b) to the null hypotheses

$$H_0 : \dot{r}_D = \dot{r}_U$$

Where we compare the characteristics of the i^{th} stratum of each population, we have,

$$H_0 : \dot{r}_{Di} = \dot{r}_{Ui}$$

(Note: in the text above, we have for simplicity used the superscript * for our present subscript h, when (i = h).)

For both populations (U, D) the factor ratios r_p are found as follows :

$$\bar{x}_1 \equiv \frac{\sum_i n_i x_i}{n} \quad , \quad \bar{y}_1 \equiv \frac{\sum_i n_i y_i}{n} \tag{1}$$

$$\bar{x}_2 \equiv \frac{\sum_j N_j x_j}{N} \quad , \quad \bar{y}_2 \equiv \frac{\sum_j N_j y_j}{N} \tag{2}$$

$$\bar{x}_{1i} \equiv x_i \quad , \quad \bar{y}_{1i} \equiv y_i \tag{3}$$

$$\bar{x}_{2i} \equiv \frac{\sum_j N_{ij} x_{ij}}{N_i} \quad , \quad \bar{y}_{2i} \equiv \frac{\sum_j N_{ij} y_{ij}}{N_i} \tag{4}$$

However we do not know the x_{ij}, y_{ij} terms of equation (4). Therefore we assume that for all j

$$x_{ij} = x_j \quad , \quad y_{ij} = y_j \tag{5}$$

and substitute accordingly. This yields

$$\bar{x}_{2i} = \frac{\sum_j N_{ij} x_j}{N_i} \quad , \quad \bar{y}_{2i} = \frac{\sum_j N_{ij} y_j}{N_i} \tag{6}$$

We now have an operational means of deriving

$$r_1 \equiv \frac{\bar{y}_1}{\bar{x}_1} \quad , \quad r_{1i} \equiv \frac{\bar{y}_{1i}}{\bar{x}_{1i}} \tag{7}$$

$$r_2 \equiv \frac{\bar{y}_2}{\bar{x}_2} \quad , \quad r_{2i} \equiv \frac{\bar{y}_{2i}}{\bar{x}_{2i}} \tag{8}$$

and testing the hypotheses (a) and (b).

Note on comparative census methodology

What makes Kushchenko's census unique is that we can find out the set of N_{ij}, q_i for both populations (U, D). Typically we only have these data for population U. The other unique feature is the provision of (x_i, y_i) and (x_j, y_j). It is the combination of these two features which enables us to derive the $\dot{r}_{U,D}$, $\dot{r}_{Ui, Di}$.

These two features are absent from Khryashcheva's census. The unique feature of Khryashcheva's census is that we are given $(\bar{x}_{U1,U2}, \bar{y}_{U1,U2})$ and $(\bar{x}_{D1,D2}\ \bar{y}_{D1,D2})$ directly. From this, we can simply work out the $\dot{r}_{U,D}$. However there is no way of finding the $\dot{r}_{Ui,Di}$.

Assumptions

In deriving the factor ratios from Kushchenko's data we have made three sets of assumptions. Firstly, where factor x is sown area, the i^{th} and j^{th} strata are defined as intervals of x where we have had to assume midpoints to derive (x_i,x_j). Secondly, (x_h,x_k) are in the form of unclosed intervals, which we have closed arbitrarily with midpoints deriving $(x_h,x_k$ = 16 des.) If sown area is log-normally distributed this may seem somewhat conservative, although comparative data would seem to encourage caution. What would be the effect on our hypothesis test of varying the assumed upper midpoints?

The relevant weights in the relevant populations are as follows (given here to two decimal places).

$$\frac{n_{Uh}}{n_U} = .11 \qquad \frac{N_{Uk}}{N_U} = .15$$

$$\frac{n_{Dh}}{n_D} = .33 \qquad \frac{N_{Dk}}{N_D} = .08$$

$$\frac{n_{Uh}}{n_{Uh}} = 1.00 \qquad \frac{N_{Uhk}}{N_{Uh}} = .41$$

$$\frac{n_{Dh}}{n_{Dh}} = 1.00 \qquad \frac{N_{Dhk}}{N_{Dh}} = .17$$

Whether we raise the mid-points of the h^{th} and k^{th} strata, or only of the k^{th} stratum (i.e. assuming increased dispersion with time), the following results will obtain uniformly for the comparison of $\dot{r}_{U,D}$ and of $\dot{r}_{Uh,Dh}$:

r (capital : arable) : $\dot{r}_D$ will <u>increase</u> relative to $\dot{r}_U$

r (arable : {worker} / {person}) : $\dot{r}_D$ will <u>decrease</u> relative to $\dot{r}_U$

Our test of hypotheses (a, b) is not sensitive to the first result in terms of capital : arable ratios. However, the second result in terms of arable : worker, person ratios is important in that a finding that $\dot{r}_D > \dot{r}_U$ would conflict with hypothesis (a) while being compatible with hypothesis (b). Thus if the assumed mid-points are felt to be unreasonable, the finding

that $\dot{r}_D \leq \dot{r}_U$ ought to be replaced with the finding that $\dot{r}_D < \dot{r}_U$.

The second set of assumptions involves the aggregation of specific (x,y) into indices which have an intelligible economic content.

(i) Persons per family are used as an index of aggregate family consumer demand in an ex ante sense. Following Engel and Quetelet, Russian budget statisticians developed a variety of systems which attached weight by age and sex to family members and summed them over the family to derive an index of ex ante family consumer needs in terms of the adult male. However Prokopovich (1924, p.79) showed that such indices are highly correlated with simple family size for large samples and grouped data. Lacking detailed age-sex breakdowns of the population, we have used simple family size or persons per family in all calculations relating to Surazhsk district. For Epifan'sk district we have used an index of "consumers" compiled by Khryashcheva on an unknown basis.

(ii) Family workers per family are used as an index of ex ante family labour supplies. Again complex weighting systems are available. Constrained by the degree of disaggregation of the population provided by Kushchenko we have used the following system of weights for Surazhsk district.

Male	(0 - 14 years)	0
	(14 - 18 ")	0.5
	(18 - 60 ")	1.0
	(60 - 65 ")	0.5
	(65 - ")	0
Female	(0 - 12 years)	0
	(12 - 16 ")	0.5
	(16 - 55 ")	1.0
	(55 - 60 ")	0.5
	(60 - ")	0

In terms of hours actually worked per year, the data given by Prokopovich (1924, p.108) suggest that these weights are actually more realistic than the more complex systems which underestimate the annual contribution of women. In the case of Epifan'sk district we have used an index compiled by Khryashcheva on an unknown basis.

The hired labour figures for Surazhsk district refer to workers on annual and seasonal contract and therefore exclude the undoubtedly much more significant category of casual workers.

(iii) Aggregate livestock indices are those compiled on unknown bases by Kushchenko and Khryashcheva. In the case of Surazhsk district, the major components would appear to be horses and cattle, with bullocks, oxen, sheep and pigs as minor components.

The third set of assumptions is contained in equations (4) and (5) above and states that, for all j, $x_{ij} = x_j$, $y_{ij} = y_j$. It affects upper stratum farms only.

Neither hypothesis (a) nor hypothesis (b) accept that the mobility between sown area groups is accompanied by uniform and equivalent changes in factor proportions. In particular, if hypothesis (b) is correct, then downward mobility not explained statistically by changing specialisation but due to random disaster, and upward mobility due to random windfalls, would result in farms arriving in the same stratum of $t = 2$ from different strata of $t = 1$, and for that very reason combining different factor proportions as a correlate of their different growth-paths.

While the bias resulting from this assumption is unquantifiable and in many respects qualitatively unpredictable, it seems reasonable to suggest that on balance, for upper-interval farms of $t = 1$ and for all j, $x_{hj}, y_{hj} < x_j, y_j$ where (x, y) are factors of production complementary to family labour. Consequently the estimates of growth of capital per family worker and arable land per family worker for the h^{th} stratum of both populations should be scaled down relative to the estimates for the two populations (U,D) as a whole. There is no obvious way of telling how such an adjustment might affect the comparison between the two h^{th} strata.

Significance of the results

It has proved difficult to attach statistical significance to the comparison of changes in factor ratios, or even to the direct comparison of factor ratios. This is not because of the sampling procedures or previously noted assumptions.

The reasons are that :

(a) We need to know the underlying distributions of (x_{ij}, y_{ij}). Neither Kushchenko's nor Khryashcheva's census tells us this. In the former case we could approximate the terms, using (x_j, y_j). But this would be a crude approach considering that, even if we had (x_{ij}, y_{ij}) as such, the stratification by arable area per farm would still fail to maximise the intergroup variation in the terms.

(b) Even if we used the group distribution of (x_j, y_j), the test of our hypotheses would involve calculating variances for the ratios of the ratios of assumed normally distributed variables, and the critical values for such tests are not easily derived.

However, anyone who would like to try to overcome these obstacles is welcome to obtain from me a copy of the primary data matrix.

In the absence of tests of statistical significance, it may be useful to reflect that with Kushchenko's census we are dealing with a large sample ($n = 1,477$). In the case of Khryashcheva's census the sample may conceivably account for the entire surviving population of the district ($n = 20,594$). All that remains to be said is that these figures are the only ones we have, so we might as well believe them.

APPENDIX 2.

Table 6 shows the distribution of peasant households of Surazhsk district, Chernigov province in 1882 and their subsequent fates, in absolute numbers generated from the percentages (Table 2 above) given by Kushchenko. Table 7 shows the corresponding transition matrices for populations (U, D) and the set of (n_i, N_{ij}) generated from the percentages (Table 3 above) also given by Kushchenko.

Table 8 shows selected values of $(\bar{x}, \bar{y})$ and the set of $(r, \dot{r})$ which underlies Table 5 (cols. 3, 4) above. Table 9 shows the corresponding data underlying Table 5 (col. 5) above.

All definitions and explanations to the Tables are given in appendix 1.

Table 6. Household partitions and disappearances in Surazhsk district, Chernigov province between 1882 and 1911.

Arable per farm, des. in 1882	Number of farms in each stratum which by 1911 were:				
	Undivided	Divided	Migrated	Extinct	Total
0 - 3.0	67	10	31	52	160
3.1 - 6.0	264	79	113	53	509
6.1 - 9.0	191	100	76	16	383
9.1 - 12.0	91	70	31	7	199
12.1 - ∞	76	130	16	4	226
Total	689	289	267	132	1477

Source: calculated from Table 2.

Table 7. Households in Surazhsk district, Chernigov province, distributed by arable area and redistributed in 1911.

Arable per farm, des. in 1882	Number of farms by row of origin (1882) and column of destination (arable area, des., 1911)					Total	
	0-3	3-6	6-9	9-12	12-∞	(N_i)	(n_i)
Undivided							
0 - 3.0	19	29	15	2	2	67	67
3.1 - 6.0	29	132	64	30	9	264	264
6.1 - 9.0	15	53	64	29	30	191	191
9.1 - 12.0	2	14	24	20	31	91	91
12.1 - ∞	1	13	18	13	31	76	76
Total	66	241	185	94	103	689	689
Divided							
0 - 3.0	6	13	2	0	0	21	10
3.1 - 6.0	65	73	24	6	0	168	79
6.1 - 9.0	54	103	50	19	7	233	100
9.1 - 12.0	22	76	42	11	9	100	70
12.1 - ∞	13	108	95	49	56	321	130
Total	160	373	213	85	72	903	389

Source: calculated from Table 3.

Table: 8

Changes in factors of production and factor proportions on land held by undivided and dividing peasant households of Surazhsk district, Chernigov province between 1882 and 1911.

Source:

Kushchenko (1916) passim

8.1. Index $\bar{x}$	Group	$\bar{x}$ 1882	$\bar{x}$ 1911	$\frac{\bar{x}\ 1911}{\bar{x}\ 1882}$
Arable, des per household	Total	8.189	6.763	.826
	U	7.101	7.556	1.064
	D	10.116	6.158	.609
	U*	16.000	10.889	.681
	D*	16.000	8.189	.512
Family workers per household	Total	3.538	3.592	1.015
	U	3.163	3.816	1.206
	D	4.201	3.421	.814
	U*	4.904	4.448	.907
	D*	5.952	3.790	.678
Persons per family	Total	6.602	7.170	1.086
	U	5.898	7.689	1.304
	D	7.848	6.773	.863
	U*	9.013	9.004	.999
	D*	7.848	7.471	.952

8.2. Index r	Group	r 1882	r 1911	$\frac{r\ 1911}{r\ 1882}$
Persons per family worker	Total	1.866	1.996	1.070
	U	1.865	2.015	1.080
	D	1.868	1.980	1.060
	U*	1.827	2.024	1.108
	D*	1.779	1.971	1.108
Hired workers per family worker	Total	.00944	.00892	.945
	U	.01101	.00647	.588
	D	.00734	.01101	1.500
	U*	.02400	.00801	.334
	D*	.00825	.01477	1.790
Arable, des. per family worker	Total	2.315	1.883	.813
	U	2.245	1.980	.882
	D	2.408	1.800	.748
	U*	3.243	2.448	.755
	D*	2.861	2.160	.755
Cattle per family worker	Total	.407	.483	1.187
	U	.412	.475	1.153
	D	.400	.490	1.225
	U*	.440	.510	1.159
	D*	.422	.529	1.254
Draught animals per family worker	Total	.672	.544	.810
	U	.643	.554	.862
	D	.711	.536	.754
	U*	.869	.621	.715
	D*	.834	.587	.704
All livestock per family worker	Total	1.403	1.286	.917
	U	1.371	1.290	.941
	D	1.446	1.283	.887
	U*	1.720	1.430	.831
	D*	1.634	1.403	.859

8.3 Index r	Group	r 1882	r 1911	r 1911 / r 1882
Arable, des. per person	Total	1.240	.943	.760
	U	1.204	.983	.816
	D	1.289	.909	.705
	U*	1.775	1.209	.681
	D*	1.609	1.096	.681
Draught animals per person	Total	.360	.273	.758
	U	.345	.275	.797
	D	.380	.271	.713
	U*	.476	.307	.645
	D*	.469	.298	.635
Cattle per person	Total	.218	.242	1.110
	U	.221	.236	1.068
	D	.214	.248	1.159
	U*	.241	.252	1.046
	D*	.237	.269	1.135
All livestock per person	Total	.752	.644	.856
	U	.735	.640	.871
	D	.774	.648	.837
	U*	.942	.706	.749
	D*	.919	.712	.775

8.4 Index r	Group	r 1882	r 1911	r 1911 / r 1882
Draught animals per des. arable	Total	.290	.289	.997
	U	.286	.280	.979
	D	.295	.298	1.010
	U*	.268	.254	.948
	D*	.291	.272	.935
Cattle per des. arable	Total	.176	.257	1.460
	U	.184	.240	1.304
	D	.166	.272	1.639
	U*	.136	.208	1.529
	D*	.148	.245	1.655
All livestock per des. arable	Total	.606	.683	1.127
	U	.611	.651	1.065
	D	.600	.713	1.188
	U*	.530	.584	1.102
	D*	.571	.649	1.137

8.5 Index r	Group	r 1911 per wkr. (1)	r 1911 per prsn. (2)	r 1911 per des. (3)
Scratch ploughs per ... (1-3)	Total	.188	.094	.100
	U	.195	.097	.098
	D	.182	.092	.101
	U*	.190	.094	.078
	D*	.184	.093	.098
Iron ploughs per ... (1-3)	Total	.197	.099	.105
	U	.191	.095	.096
	D	.203	.103	.113
	U*	.230	.114	.094
	D*	.236	.120	.109
Wooden harrows per ... (1-3)	Total	.464	.233	.247
	U	.473	.235	.239
	D	.457	.231	.254
	U*	.503	.249	.206
	D*	.494	.251	.229
Iron harrows per ... (1-3)	Total	.009	.004	.005
	U	.011	.005	.006
	D	.006	.003	.004
	U*	.017	.008	.007
	D*	.008	.004	.004
Winnowers per ... (1-3)	Total	.002	.001	.001
	U	.003	.001	.002
	D	.002	.001	.001
	U*	.006	.003	.003
	D*	.003	.002	.001
Threshers per ... (1-3)	Total	.003	.001	.001
	U	.002	.001	.001
	D	.003	.001	.002
	U*	.004	.002	.002
	D*	.005	.002	.002

Table: 9

Changes in factors of production and factor proportions on land held by undivided and dividing peasant households of Epifan'sk district, Tula province between 1899 and 1911

Source:

Khryashcheva (1916) Vol. I, pp. 35, 36, 68, 71, 134, 242, 245, Vol. II, p. 57.

9.1 Index $\bar{x}$	Group	$\bar{x}$ 1899	$\bar{x}$ 1911	$\frac{\bar{x}\ 1911}{\bar{x}\ 1899}$
Sown area, des per farm	U	3.95	4.58	1.16
	D	6.61	3.76	.57
Family workers per household	U	3.31	3.82	1.15
	D	5.54	3.01	.54
Persons per household	U	5.93	7.01	1.18
	D	9.71	5.93	.61

9.2 Index r	Group	r 1882	r 1911	$\frac{r\ 1911}{r\ 1882}$
Persons per family worker	U	1.79	1.84	1.02
	D	1.75	1.97	1.12
Sown area des. per family worker	U	1.19	1.20	1.01
	D	1.19	1.25	1.05
Horses per family worker	U	.27	.27	1.01
	D	.27	.26	.96
All livestock per family worker	U	.93	.85	.91
	D	.89	1.08	1.21
Sown area des. per person	U	.67	.65	.98
	D	.68	.63	.93
Horses per person	U	.15	.15	.99
	D	.16	.13	.85
All livestock per person	U	.52	.46	.89
	D	.51	.55	1.08
Horses per des. sown	U	.22	.22	1.01
	D	.23	.21	.91
All livestock des. sown	U	.78	.71	.91
	D	.74	.86	1.16