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From Commune to Household: Statistics and the Social Construction of Chaianov's Theory of Peasant Economy

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Categorization plays an integral part in how we see and interpret the world. This is especially true when we attempt to comprehend the complexities of human society, where the heterogeneity of human activity across time and space demands that some criterion (class, gender, age, profession, etc.) be used to reduce the number of variables examined. From the mid-nineteenth century—as statistics evolved from the simple “political arithmetic” of tax collectors and army recruiters into a potential science of human behavior—categorizing the population became a contentious issue that reflected the social and political agendas of data collectors.¹ At the same time, when data refused to be molded to researchers’ assumptions, the task of putting people and their activities into analytical categories challenged the validity of the categories themselves. In this way, statistical representations and categories became socially constructed knowledge.

Attempts by Russia’s zemstvo statisticians to discover underlying “universal laws” of peasant society illustrate this tension in the process of collecting data and categorizing it for analysis.² These attempts reflected researchers’ assumptions and necessitated a shift in the way they perceived their subject. What began as investigations of the Russian peasant’s repartitional land commune (*mir* or *obshchina*) soon shifted focus to individual peasant households. An examination of this process reveals the socially constructed nature of the household model of peasant economy offered in the work of A. V. Chaianov and others of the so-called Organization and Production School.³ On one hand, his approach to understanding the dynamics of the peasant economy differed substantively from that of zemstvo statisticians; while statisticians hoped that properly analyzed data would themselves yield general laws of peasant economy, Chaianov approached the data with a hypothesis (a modern economic model of optimization subject to constraints) and tested it. Yet, his work, which has had a profound influence on our understanding of the dynamics of the peasant economy, emerged within a specific social context, namely the

zemstvo statisticians' focus on the household and their early attempts to evaluate the relative weights of various causal factors in the peasant economy.

The path to the household as a category of analysis and paradigm for understanding the peasant economy was not readily apparent when statisticians began their investigations. Initially, many Russians viewed the past, present and future of Russia's rural economy through the categorical prism of the commune. For reformers the commune was a sign of backwardness—a necessary evil to be tolerated only as long as no other guarantee of rural stability could be found. For conservative officials, it provided not only stability, but also an important locus of contact between state and village. For the populist intelligentsia, peasants were the standard bearers of a Russian nation long suppressed by the state and its noble accomplices: their commune and its perceived socialist (egalitarian) structure served as a model for Russian society as a whole.⁴ Thus, the question of what was right or wrong with Russia was often a question of what was right or wrong with the commune and, especially, the institution of communal land tenure.⁵

Nineteenth century social statistics offered defenders and detractors of the commune a tool with which to examine communal life. Statistics provided the appearance of being objective and, hence, scientific.⁶ In addition, the new statistics held out the possibility that intrepid zemstvo statisticians would one day discover in their mounds of data a communal “law of gravity” that demonstrated that communal institutions need not be abandoned in order to ensure Russia's economic future. The zemstvos' increasing use of statisticians for tax assessment work provided populists with an opportunity to use statistics to investigate the peasantry and its commune. Beginning with a handful of zemstvos in the 1870s (most notably Moscow, Tver' and Chernigov), the number of zemstvos with statistical bureaus increased throughout the 1880s.⁷ Moscow statisticians set out to scientifically verify or (hopefully) disprove the grim depictions of peasant life found in popular periodicals.⁸ However, their statistical research further undermined confidence

in the peasantry and its commune and precipitated a moral crisis within populist ranks.⁹ For the statisticians themselves these early results indicated the need for a deeper level of study that plumbed the peasant economy to the depth of primary causal factors. Unlike the London Statistical Society, which considered causation a subject "to be threshed out by others," zemstvo statisticians considered investigating causation—determining how various factors contributed to the over-all functioning of the peasant economy—to be a crucial part of their jobs.¹⁰

As statisticians set out to make communal life “legible” for themselves and their employers they attempted to examine their subject in a manner that was sensitive to time and place. Ironically, the investigative methods zemstvo statisticians chose undermined the importance of the commune and increasingly highlighted the peasant household as the key element of the peasant economy. The results were two-fold. On one hand, the statisticians’ work provided ammunition for state officials who pressed for the break-up of the commune in the opening years of this century. The “map” they constructed in the course of their research proved useful to those seeking evidence in support of a vision of Russia’s economic future based not on the commune, but on individual private landholding.¹¹ On the other hand, by liberating the analysis of peasant life from the context of the commune their research laid a foundation for Chaianov’s work.

Like Francis Galton’s work on inheritance and eugenics, contemporary social questions shaped the collection and analysis of data.¹² Tracing this evolution from a communal conception of peasant economic activity to one centered on the household requires an examination of the assumptions behind the statisticians’ primary investigative tool, the household inventory (*podvornaia perepis*’). It also requires a look at how these assumptions affected the analysis of data. After determining how data relevant to the peasant economy were to be collected, zemstvo statisticians were left with the question of how these numbers might be used to reveal the secrets of peasant economic behavior. They aimed at studying causal relationships in the sense of studying

the bearing that a given quantity of one factor (e.g., land) might have on another. By compiling "combination" (cross-tabulation) tables, zemstvo statisticians anticipated the statistic "analysis of variation" (ANOVA) perfected by statistician R. A. Fisher in 1918.¹³ As much as this is a story of how contemporary social questions influenced the research process, it also offers insights into the development of statistics.

Constructing combination tables raised the question of how best to represent the peasantry in statistical analyses. In this context the act of making the peasant economy legible proved to be exceedingly complex for sensitive researchers. Given a peasant economy that seemed to change quickly and came in several varieties, which indicators served as the best representatives of peasant well being? Land, labor and capital provided ready answers, but the matter of defining each (particularly land) proved to be controversial. When it came to defining land, statisticians initially categorized households by communal allotment (*nadel*) size—using administrative demands and their own ideological disposition for this ready-made category to guide their investigations. From this perspective, it was the communal nature of peasant economic life—formalized by the commune's status as a juridical person and represented by the allotment—which stood at the base of the peasant economy. However, this raised questions of how to account for rented and purchased lands and of land tenure variations throughout the empire. To solve this problem, statisticians grudgingly began to use "sown area" instead of allotment size as a measure of peasant land resources. The decline of allotment size as an indicator symbolized the decline of the populist paradigm of peasant economic behavior as communal. "Allotment size" told one story, but "sown area" told a story that more closely reflected the world that statisticians encountered in the village: not the story of the commune, but the story of the household. Although Chaianov ultimately considered sown area as only one of several useful analytical groupings, its rise to prominence as an indicator was an important step away from a communal

conception of peasant economic and toward a theory based on the household's organization of labor and capital.

Methodological Assumptions

To understand the zemstvo statisticians' methodological assumptions is to comprehend how Russian statisticians situated themselves within contemporary debates about statistics, especially the debate over statistical determinism. This debate centered on the work of Belgian astronomer Adolphe Quetelet, the inventor of the new social statistics.¹⁴ Based on his fascination with probability and his own experience as an astronomer, Quetelet offered statistics as an investigative tool that held out the possibility of discovering a social physics. Both areas, he noted, employed the so-called "law of large numbers." In the first case, the multiple observations of chance occurrences (e.g., the classic example of drawing black and white balls from an urn)¹⁵ allowed the observer to state with certainty the probability that the event would transpire in a certain way. Indeed, the results were regular enough to be stated as a mathematical equation. In the second case, Quetelet noted that averaging multiple observations (measurements) in astronomy served as the ultimate method of eliminating error from calculations. The average figure stood as the ideal measure—the one closest to the truth. What Quetelet proposed was applying the law of large numbers and the benefits of aggregation to human activities.

This, Quetelet believed, made the collection and study of statistics not just a method of investigation, but a science of society in its own right. Observed regularities such as the age distribution of criminals determined the number of crimes committed by persons of a given age just as certainly as the law of gravity governed planetary motion. As such, Quetelet gave little attention to the question of causation. To the extent that individual human action ("free will") affected the outcome of events, its impact was transitory and insignificant. Planetary motion could be

disturbed by the close passing of another body, but the planet in question quickly returned to a regular orbit. This, Quetelet believed, was what happened when statistical data deviated from their established pattern, as Belgian crime statistics did in the turbulent years 1830-33. Revolutionary activities were transitory—mere perturbations—and the statistical laws governing crime in Belgium, Quetelet noted, reasserted themselves after the cataclysmic event. Causation, particularly the impact of human free will, was a non-issue. As Quetelet remarked, “The moral order falls in the domain of statistics, a discouraging fact for those who believe in the perfectibility of human nature. *It seems as if free will exists only in theory.*”¹⁶

Many found Quetelet’s determinism troubling. This was especially true of the economists and statisticians of the so-called German Historical School.¹⁷ These scholars differed on many issues, but rejected Quetelet’s determinist view of society. From their perspective, society was a living historical organism in which the actions of individuals—what they might have called “cells” had current instruments and knowledge allowed them to extend their biological metaphor—played an important role.¹⁸ As a union of free individuals, society naturally depended on the very differences between individuals that Quetelet sought to aggregate away as error. Furthermore, they also questioned the applicability of any general law that could not be applied to individual cases. Regularities in mass data did little more than indicate the existence of undiscovered genuine laws, the derivation of which necessitated a search for causal factors that ultimately resided in the free will of individuals. From this perspective, human variation and the impact of time and place were the main topics of interest, and all three needed to be respected in the process of inquiry.

This criticism of Quetelet’s determinism was influential in Russia’s universities, where faculty and promising students often received training in Germany and shared their immediate neighbors’ historicist view of the world. Professors Iu. E. Ianson of St. Petersburg University

and A. I. Chuprov of Moscow University linked the debate over causation and the importance of the individual with Russia's future zemstvo statisticians. Their students comprised a majority of the first generation of zemstvo statisticians, and educated a large portion of the second. Together, students and teachers developed a sociological approach to statistics that defined zemstvo statistical positions on statistical inquiry and analysis. The main impact of the German Historical School in Russia was that its conception of an economy pointed to a particular way of measuring and, hence, representing and analyzing the peasant economy.

Ianson's contribution to the development of a sociological school of statistics emerged in his theoretical and methodological work, especially the five editions of his 1885 publication, *The Theory of Statistics*.¹⁹ Ianson was the first to offer Russian scholars a systematic treatment and analysis of both Quetelet and his critics. His position on the issue of causation clearly lay in the camp of Quetelet's critics, and he took Goethe's dictum that "statistics do not direct the world, but only show how the world directs itself" as his own.²⁰ Given the intricacies of human society, one could not predict the course of human life as one could the odds of drawing a black or a white ball from an urn. More than chance lay at the heart of social phenomena, and Ianson believed that Quetelet's use of probability over-simplified this causal complexity.²¹ "Chance," according to Ianson, was simply an indicator of causes yet to be determined. "[I]n nature," he argued, "there is not and cannot be anything chance. This is our subjective evaluation about either phenomena or laws...we do not know, or forces, characteristics and actions which we are not in a position to explain...."²²

In Ianson's eyes, probability, and the "law of large numbers" that supported it, also did violence to the individual. Quetelet based his idealization of the average on the idea that, as long as the researcher maintained the homogeneity of the subject matter—did not seek an average size for apples and oranges—the resultant average would eliminate errors in observation and thus be

true. Thus, the average size of all the houses on a block would simply be a mathematical average. Quetelet's notion of average meant typical; the average size of all two-story houses on the block would stand as an ideal representation of the size of these houses. Ianson doubted that this was possible if one's research moved beyond houses to human beings. As he wrote in 1871, "an infinite number of observations with the maintenance of their homogeneity is here unattainable; it is inconceivable to mix data without also violating their sense and meaning."²³ Averages could be useful tools, but "for social phenomena will, in any case be fictions, since these phenomena are changing in certain directions."²⁴ Society was not a static, but an historical entity. The task of science, therefore, was not simply to label observed regularities as social laws, but to attribute causation. Thus, Ianson preached a theory of statistics akin to that of the German professors he admired.

Chuprov offered a more limited criticism of Quetelet that ultimately had the broadest impact on zemstvo statistical work. His theory of statistics reflected both his admiration for the German Historical School (especially Göttingen professor Wilhelm Roscher) and a Queteletist commitment to the discovery of general laws of society.²⁵ His blend of these two approaches created a theoretical starting point for zemstvo statistical investigations of the Russian peasantry. According to Chuprov, any attempt at the study of individual units risked "losing the forest from the trees."²⁶ Mass observation was the only way to study something as diverse as humanity. Unlike objects in the natural sciences, human beings were much more dependent on variable causes; unlike atoms of gold, human beings were rife with individual peculiarities. For German Historical School members, this meant that it was impossible to reduce human behavior to a number of simple laws. Chuprov was more equivocal. He noted that "individualism does not eliminate regularity." But where Historical School members emphasized that these regularities were simply indicators in need of continued measurement over time, Chuprov attached to regularities the

status of social laws. In his view, even "the development of the most complex person" was "subordinated to the strictest laws no less than the simplest plant." For human beings, these laws were "hidden under a multitude of divergent and altered causes." Rather than making the existence of general laws impossible, these "divergent and altered causes" (individuality) simply prevented the observer from making general conclusions on the basis of a single case. As a compromise, Chuprov proposed preserving individual variations as much as possible through the distribution of individual traits by strictly defined common indicators. In this way, regularities would not impede attempts to examine causal factors in peasant economic life.²⁷

His concern with causality was not only a reflection of the Historical School's influence, but also a social product; the Russian intelligentsia's self-imposed task of assessing the viability of the Russian peasant commune essentially amounted to answering a series of causal questions. According to Chuprov, Malthus' law and the importance of communal allotment size for the peasant household were well-known facts. From these two pieces of information, it was possible to conclude that the population would increase more slowly in a given area as allotment size decreased. Statistics provided a means to investigate this hypothesis (Russian statisticians soon discovered it to be false).²⁸ They also made it possible to evaluate the relative meaning of simultaneous causes (a direction that would be pursued later). Thus, if one sought a comparison between urban and rural life in terms of mortality rates, statistical investigation made it possible to determine the relations between population density, occupation and the "moral influence" of cities in comparison with villages.²⁹ From Chuprov's perspective, rural questions and causal questions were one.

Thus, in spite of his faith that the law of large numbers would reveal social laws governing human society, Chuprov continued to find the Historical School's conception of individualism and emphasis on causal questions compelling.³⁰ In all likelihood Chuprov recognized in this

organic conception of society the traditional view of the peasant commune, which in popular lore organized individual households for the benefit of the communal whole through the common use of land and division of the tax burden. Even though Chuprov maintained an allegiance to the Queteletist concept that laws could be discovered in mass observation, the structure of the research he supported focussed on the individual components of the whole. Initially, this entailed support for a program of research labeled the "household inventory" (*podvornaia perepis'*) method. This so-called "Moscow" type of research proceeded from an organic conception of peasant society and amounted to a first step towards the household, rather than the commune, as a paradigm for understanding peasant economic activity.³¹

Several factors influenced the development of the "Moscow Type." The Moscow zemstvo had an interest in statistical research beyond the needs of tax assessment and this broader interest gave statisticians great latitude for research. The commune's status as a juridical person and the predominance of communal land tenure among the province's peasantry also had a large environmental impact on local research, linking any investigative program to the issue of the nature and viability of communal agriculture. Finally, Ianson, Chuprov and others brought together a sociological school of statistical research and a ready cadre of populist students who saw employment as zemstvo statisticians as a means of understanding and defending the commune. "The study of the commune," as Chaianov's compatriot in the Organization and Production School, N. P. Makarov, later noted, became "an habitual affair."³²

The Moscow provincial zemstvo selected Chuprov's student, Vasilii I. Orlov, to head its new statistical bureau in 1875. The results of the bureau's research, *Forms of Peasant Land Tenure in Moscow Province: The Peasant Economy*, appeared in 1879.³³ The book revealed the basic assumptions and methods that would become known as the "Moscow Type," and set the norms for discussions of peasant communal agriculture based on zemstvo research.³⁴ Later

works took not only their structures, but also major parts of their arguments from this tome.³⁵

The German Historical School's organic conception of society served as a foundation for Orlov's discussion. In Orlov's view, the commune "represented a single well-proportioned whole, a single organism, in which each member knows his place and all communal affairs are managed quickly and simply."³⁶ The diversity of the communal organism and its component parts (*dvora*—households) reflected the surrounding environment. Other statisticians were even more explicit, both in terms of their organic metaphor and the goal of their investigations: "laws" of social organization and behavior along the lines of the statistical laws posited by Quetelet. As one investigator noted,

those who wish to study the structure of a living being and living phenomena in a living organism, those who surround themselves with these organisms, who among corpses do not shun the pestilential atmosphere of the anatomy theater but pass the time in them day and night, with the assistance of a microscope and other instruments are discovering laws of the structure of the bodies and their living phenomena.³⁷

There was no reason to suppose that the study of society differed in any way; although it required different instruments, the goal remained the derivation of laws. The organic conception of peasant society and a more or less explicit search for "general laws" of peasant behavior thus stood as the goal of "Moscow Type" research.

Orlov chose a research methodology aimed at furthering the statisticians' understanding of the peasant commune as "an individual economic organism, comprised of highly diverse groups of participants."³⁸ As it evolved in the 1880s, the Moscow system entailed breaking down each village in the entire province into its component parts, individual households, and col-

lecting information from each one. In order to understand the entire communal being, the activities of each participant household needed to be considered. Within this context, statisticians investigated each aspect of the household economy—soil type, number of workers, amount of land tilled, number of livestock, access to pasture, etc.—in order to measure their impact on the larger economic being. In contrast to state agency studies of local economic conditions on the district or provincial level in terms of average sowing and harvest data, zemstvo statisticians attempted to respect the uniqueness of each household and commune. Instead of studying the peasant economy in terms of total regional production, they figuratively placed the commune under a microscope in order to understand it as a biologist would understand life by observing a single cell.

This was the household inventory method. It fit well with the statisticians' organic conception of peasant society, and was a natural result of a general distrust in sampling; accuracy could be assured only by interviewing each head of household.³⁹ The method also rested on a number of precedents. Somewhat ironically, the practice of inventorying the economic assets of each household was rooted in the serf system of Russia's recent past; serf owners conducted similar surveys for the purposes of assigning *barshchina* (labor dues) or *obrok* (quitrent), as well as fulfilling recruit obligations. Thus a proposed research program of this type must have sounded familiar and reasonable to many of the statisticians' zemstvo employers.⁴⁰ In addition, both the Ministry of State Domains and the Moscow Provincial Statistical Committee had conducted similar research (in 1848-1850 and 1869 respectively).⁴¹

But, there was a big difference between what Orlov intended and past household inventories (as well as the one which would soon be undertaken by Central Statistical Committee Director P. P. Semenov as part of a joint Imperial Russian Geographic Society-Free Economic Society study of the commune).⁴² As the first historian of the household inventory, Chernigov zemstvo statistician E. S. Filimonov explained, these other studies were primarily aimed at creating a ca-

dastre. The key distinction lay in the presentation of data. “In Orlov's tables,” he noted, “all data appear in minute detail for each village, while in cadastral surveys the data are published in summary district totals.”⁴³ Thus the distinguishing characteristics of zemstvo household inventories were their detail and tabulation by discreet units, generally by commune; if the commune consisted of more than one village, then data would be broken down and presented according to these units. Average figures for townships, districts or provinces were of little use for zemstvo work and, more significantly for researchers, obscured important detail necessary to comprehending the organism's (commune's) component parts. The household inventory thus became synonymous with zemstvo statistical research, and zemstvo statisticians came to insist that it was the only research program capable of providing the type of detailed information necessary for both zemstvo decision-making and understanding peasant society.⁴⁴

For those interested in scientific proof of the inherent socialism and economic vitality of the peasant commune, Orlov's studies produced mixed results. He recorded numerous instances of supposedly inherent peasant communalism. When asked to offer an opinion on communal tenure, most peasants gave it a positive evaluation, and Orlov documented several cases of communal cooperation in the rental or purchase of land, introduction of new crops, or improvement of livestock herds. These were all “rational” actions from a neo-classical perspective that most Russian reformers believed were impossible within the constraints of communal tenure. This was enough for Orlov to conclude that the communal idea was so embedded in the peasant psyche that the commune would forever endure.⁴⁵ The tabulation of results by commune gave this idea—and the communal institutions themselves—a numerical legitimacy.

However, much of Orlov's evidence pointed in the opposite direction. Despite his attempt to salvage the peasant commune as a viable entity, his work showed that the commune appeared to be disintegrating internally due to an invasion of the money economy, increasing socio-

economic differentiation, less frequent repartitions, and other factors. One of the most disconcerting revelations of Orlov's work was that the "communal instinct" was a myth—that outside of certain constraints imposed by communal tenure, peasants mainly operated as individual farmers.⁴⁶ In researchers' minds, the commune's component parts took on a greater importance than the organism as a whole. This marked the beginning of the decline of the communal conception of peasant economic behavior. The development of budget studies—an increased interest in household consumption—after the famine of 1891-92 contributed to this decline, as did a growing conviction among statisticians that the peasant economy was structurally unique.⁴⁷ The demands of causal analysis caused further erosion.

Analyzing Causal Factors: The Combination Table

Various forms of the "combination" or cross-tabulation table served as the zemstvo statisticians' primary method of analysis.⁴⁸ Despite the fact that a research focus on the household became the trademark of the "Moscow Type," Moscow statisticians continued to reflect their deeper interest in the commune by presenting data in their tables by commune. Even though the results of their research pointed to the primacy of the household, their analytical tables continued to submerge individual households in the commune. Chernigov statisticians—P. P. Chervinskii, A. A. Rusov and A. S. Shlikevich—although equally encumbered with populist baggage, had little immediate research interest in the commune. The weakness of communal institutions in Chernigov meant that these statisticians had a greater interest in individual households.⁴⁹ This pointed not only to the collection of data by household, but to its presentation and analysis by household as well. If the household inventory stood as the Moscow statisticians' main contribution to zemstvo statistics, combination tables stood as that of the statisticians from Chernigov.

Shlikevich was the first to use combination tables to analyze household inventory data (in this case, data from an 1881 study of Kozelets district).⁵⁰ His work provides the best introduction to combination tables, and illuminates a number of issues. First, it shows how assumptions about preserving individual characteristics were incorporated into the process of analysis, by means of a creative use of aggregation. In effect, Shlikevich's work presaged the analysis of variation statistic perfected by Fisher in 1918. In addition, Shlikevich's pioneering efforts—the act of constructing the tables itself—effaced the communal paradigm of peasant economic activity. In 1890, as a sign of frustration with what he saw as the incorrect compilation of such tables by other statistical bureaus, he published a detailed explication of the motivations behind his tables, their proper construction, and the preliminary results of his analysis of the peasant economy of Kozelets district. His article, "What Household Inventories Provide, and What They Can Provide," epitomized zemstvo statisticians' concern over causation from the 1890s through the early 1900s.⁵¹

To preserve the individuality of the household and have analytical meaning combination tables needed to be compiled and presented by groups of like households; apples could only be compared to apples—one variable needed to remain constant. Creating tables of like households (controlling for one variable) would allow one to examine the effects that a change in one component of the household economy might have on other components or the economy as a whole. The Chernigov statisticians' initial plan called for several tables that featured like household groups based on a variety of indicators (size of landholding, number of adult male workers and draft, method of tillage). However, a shortage of funds forced them to carry out a grouping by only the first of these—size of landholding—which they held to be the defining characteristic of the Ukrainian household's economic condition. Further consideration led to the compilation of tables by areas with like soil types, thus controlling for another variable. Chernigov statisticians

hoped that this would allow them to engage in a causal analysis of the household economy without burying households' individual characteristics in the process.⁵²

The question of individuality was closely intertwined with the question of causation, as the character of the individual household was defined by a combination of various factors or causes. Shlikevich outlined two categories of "causes": 1) the "elementary composition of the household" (land, labor and capital), or those things which "enable the household to perpetuate itself" and; 2) the "general characteristics" or the relationship of land, labor and capital to the size and quality of economic activities. Various combinations of these groups of causes constituted "individualities." As Shlikevich noted, "since these individualities depend on...the mutual interaction of various causes, then the particulars of individuality cannot be arbitrary, and they can and must coincide with primary causes under the influence of which the household has formed and lives."⁵³ Thus, contrary to Quetelet's use of the "law of large numbers" to brush aside the issue of causality, Shlikevich (in line with the German Historical School) was concerned that individualities be preserved and that the question of causality be pursued. His solution to this dilemma attempted to use the "law of large numbers" and at the same time preserve the integrity of individual households.

Shlikevich noted that statisticians already held the key to analyzing individuality and causation, but so far had not used it to advantage. The necessary information was already present in the "raw materials" of statistical work—the household inventory form. Unfortunately, statisticians had missed this in their pursuit of the commune. As Shlikevich noted, "even though household inventories provided an accurate structure of the most simple fact (the household)," statisticians imposed on their data instead "the structure of a more complicated fact [the commune]...a completely artificial fact formed from the blending of varied primary units." This occurred even though statisticians of the Moscow school "themselves distinguished several indica-

tors of individuality in the structure of the commune (horseless households, landless households, etc.)."⁵⁴ This, according to Shlikevich, only served to emphasize his point. Thus, investigating these causes required no new research as their sum—the individual household—already existed in reams of raw data. All that was required, Shlikevich believed, was for statisticians to respect the integrity of the data itself.

The answer to the problem of analyzing the individual household—the way to get at the combinations of causes that determined the individuality of households in the household inventory lists—lay in the "grouping" (*gruppировка*) of like households. As Shlikevich noted,

in groups of households united by given indicators the individual distinctions of the comprised group already do not differ, and the group is characterized by the sum of all indicators. All indicators to which the statistician attached significance and which were registered by him, *in known combination of their magnitudes*, constituted the membership of *each* household—were acquired by each household to a varying degree.⁵⁵

In other words, the individuality of each household could be preserved if it was grouped with other households sharing the same characteristics. Individualities supposedly would not be obliterated by average figures because each member of the data set would be the same. The problem here consisted of the fact that there were thousands of households, and the individuality of each one was determined not by one cause, but several. The question then, was how to construct these groupings on a rational basis. At first, statisticians tried to get at this by compiling simple tables that grouped households by a single indicator or *priznak* (e.g., Table 1). They constructed the groupings by taking the household inventory data cards for a village, township or district and dividing them according to the amount of each indicator (land, number of male

workers, etc.). Knowing that not just one, but several indicators characterized the household, they created tables first by one indicator, and then by another.

Table 1: Example of a Simple Table: Allotment Rental in Tver' Province⁵⁶

District	Households Renting Out Their Allotment	% of Total Households	Number of Rented Allotments	% of Total Allotments
Tver'	927	5.3	1689	3.60
*	*	*	*	*
Novotorzhok	903	4.4	1718	3.20
TOTAL	7410	3.2	13800	2.35

This yielded a series of tables displaying a comparison of data for single indicators. These tables enabled the statistician to say that "in village N, 30 households have one horse, twelve households contain two male workers, 16 households have three desiatinas of land, 7 households sow five desiatinas, 9 households rent out their land and 10 households rent land." The advance of science consisted in the invention of new groupings, such as a distribution of the population of a given village by number of livestock: "To provide an additional grouping, one which had not yet entered into statistical practice," was considered "a real service."⁵⁷

Shlikevich, however, had something more in mind: a methodological plan that would allow researchers to measure the variable impact of several causal factors on population means—in short, a prototypical analysis of variation. As he noted, "the presence of a given indicator in the structure of a household, its intensity, etc., is not important in itself, but...by this or another relationship to another part of the whole. In a word, the *absolute* weight of the indicator is important only under the condition of the knowledge of its *relative* weight. Only the latter provides the substance of the first."⁵⁸ The problem with most tables was that they provided "neither the struc-

ture of individual households, nor even single-type categories of them." Simple tables deprived the analyst of the ability to discover "the real nature (the weight relations of indicators) of even a single household."⁵⁹ In short, Shlikevich believed that the only way to understand the individual character of one household, or a group of like households, was by deriving some understanding of the proportional weight of each of these factors or "causes" that characterized the household as a whole. Such tables, Shlikevich argued, would at last make it possible "to use the methods of experimental science for the study of social phenomena"—i.e., to test the effects changes in several variables had on groups of households.⁶⁰ The modernist search for universal laws could proceed apace in a manner that claimed to respect the individual units of analysis and, at the same time, yield results expressed in formulaic terms.

Proper tables required the construction of household groups "alike in regards to each and every indicator," not simply located in the same area. Only under this condition (i. e. the "distribution of households by the likeness of their complete structure") could "the individuality of each distinct household be preserved inviolably."⁶¹ Such a distribution of households or arrangement of research materials would also help define mutual ties between individual elements, assign causation to various aspects of household life, and make the results manageable.⁶² This distribution or "grouping" was to be done empirically, and in such a way as to limit the breadth of the project. Shlikevich proposed that the latter be accomplished by limiting the list of defining indicators to the three most important: land, labor force, and livestock (capital).⁶³

The key to accomplishing this task lay in using the statistical precepts of Quetelet and his critics. "Mass observation" was to facilitate the empirical aspect of the grouping process. In other words, even though the "law of large numbers" should not be allowed to obscure the various causal factors comprising individual households, the grouping process required a large number of observations (households) in order to ensure proper characterization of the "group." Mass obser-

vation would provide a basis for deriving an ideal "average household" for each type. The "sum of all characteristics" will equal "the sum of the average general characteristics of the type."⁶⁴ By dividing households into like categories prior to averaging, the averaging process would not eliminate individual characteristics, only accidents or errors. In order for this to work properly statisticians could not consider the village or commune in isolation, as this would not provide a large enough sample. As an example Shlikevich noted that the village of Veprik contained 493 households—a number too small to divide into types. In contrast, the fourth table in the volume on Kozelets district contained data on nearly 9,000 households.⁶⁵ Shlikevich stressed that even this table could not be considered complete as there were several types whose small membership did not allow a complete analysis. The analysis of the peasant economy in Kozelets district would be complete only if it included "twenty—fifty times more material" than it did—"even one or two provinces."⁶⁶ Indeed, Shlikevich argued that there was no theoretical justification for the standard practice of compiling zemstvo statistical tables by commune, township (*volost'*), district, or province: "Theory demands that the differentiation of the elementary composition [of the household] be carried out according to conditions of qualitative equality and the likeness of elements. This likeness of elements is not in any way connected with administrative boundaries, but rather the result of many general causes which lie outside of these parameters."⁶⁷

Given current statistical practice, the idea of preserving individuality through the grouping of households by like types was a somewhat unstatistical solution; it amounted to a modification of the standard view of the "normal" (bell) curve, in which the ends of the curve represented error or deviation from the norm or average.⁶⁸ Instead, Shlikevich proposed that the entire curve be viewed as normal. The various types of households were not "error" but natural occurrences. This in itself would work against any attempt to see the commune as an egalitarian enterprise; defining the entire curve as normal meant that neither poor nor rich households (the most glaring

examples of the fact that the commune was not at all egalitarian) were anomalies. The type itself was to be defined in a manner consistent with nineteenth century moral statistics: by its average. There would thus be ideal (“typical”) households holding 0, 2, and 4, etc. desiatinas of land. Quetelet had made a distinction between simple averages and average (national) types. Averaging the circumferences of all apples would be meaningless, but averaging the sizes of Macintosh apples could provide a true average—the ideal Macintosh apple. Quetelet thus spoke in terms of the average height of French conscripts or the average chest size of Scottish soldiers (to use two of his examples).⁶⁹ However, many nineteenth century statisticians (including his critics) tended to ignore this subtlety in Quetelet's work. Restoring Quetelet's emphasis on ideal types allowed Shlikevich to preserve the individual variations of each household because they were to be analyzed not as a collection of apples, but as collections of various types of apples.

Table 2: Tables as a Means of Studying Causation⁷⁰

Characteristics					
	A	B	C	D	E
Type I	A-I	B	C	D	E

	A-n	B	C	D	E
Type II	A	B	C	D	E
	A-I	B	C	D	E

	A-n	B	C	D	E

Thus, after sorting households into like groups the tables themselves were composed by positioning the "types" in vertical rows with corresponding horizontal rows denoting "the measured general characteristics of the type" (Table 2). Shlikevich believed this ordering of material would provide a means to "set apart any of the causes and, in the presence of constant quantities of all remaining causes, examine phenomena comprised of variable quantities of this cause"—

i.e., to conduct an analysis of variance.⁷¹ This would reveal, Shlikevich hoped, "the part played by each actor in this general result [the economic energy of the household]."⁷² Defining the indicators used to determine these relationships, however, was another matter. Before combination tables could be assembled, analysts first had to determine which indicators best represented the peasant economy in numbers. Problems arose when it came to defining these indicators, particularly land. The image of the peasant as inherently socialist (communal)—already damaged by Orlov and the demands of analysis—came up a loser in the ensuing debate.

Paradigm Lost: Indicators and the Communal Notion of Difference

There was little agreement among statisticians on what aspects of the peasant economy should be measured and represented in combination tables. As one economist noted: "If A. P. Shlikevich's knowledge of the peasant economy led him to recognize three elements—land, live-stock and labor force—as components of the household's basic character, then other statisticians' knowledge of the peasant household economy could lead to the setting out of completely different 'elements' or 'causes'."⁷³ This resulted in tables so diverse as to render any attempt at analytical comparison impossible. With their attentions focused on the household, it was natural that zemstvo statisticians' numbers should reflect Russia's variations rather than uniformities. As populist economist V. P. Vorontsov noted, tables in Tauride combined from fourteen to twenty-four characteristics. The tables for Elabuga district in Viatka used twenty-nine, the Orel bureau used forty-two, and the Novgorod bureau improved on this figure by an additional ten. F. A. Shcherbina's combination tables for Voronezh province combined from thirty-four to two hundred fifty-three characteristics.⁷⁴ Vorontsov applauded this depiction of peasant individualism as progress, but statisticians interested in reaching a general understanding of the peasant economic organism found this variation frustrating and counter-productive.

Difficulty in choosing indicators arose mainly because the more statisticians learned about the peasant economy, the more they came to realize that they were dealing with a subject more heterogeneous than they had anticipated. For example, statisticians and economists recognized that a household's stock of draft animals could say a lot about its productive capacity. Methodologically, this indicator also lent itself to frequent use because horses were easy to count, and households easy to group by this criterion (horseless, having one, two, etc. horses). Yet, even in the 1880s statisticians encountered certain limitations in using this indicator in their work. The number of draft animals said little about a household's economic potential if there was nothing for them to do in the off season (such as carting) or if the economy centered on animal husbandry.⁷⁵

The indicator "number of male workers" or "household labor force" also posed problems of definition. Shlikevich pointed to several difficulties with this indicator, as his analysis showed that an increase in the number of male workers had little effect on the amount of land tilled by the household.⁷⁶ He was especially concerned that limiting a definition of the household's labor pool to adult male workers ignored the labor contributions of other family members—so-called "half-workers" (women, older children and the elderly). F. A. Shcherbina objected on other grounds, noting that the role of male workers in the household economy was not uniform; male workers in poor households tended to hire themselves out, but rich households tended to hire in labor. He tried to sort this out in his grouping of households, but found the task impossible.⁷⁷ Given statisticians' organic conception of the peasant economy as an historical entity, a sort of statistical regionalism stood as another barrier to professional consensus on indicators. This was especially true when it came to deciding how to measure the influence of land. Statisticians from regions where communal land tenure predominated were adamant that combination tables reflect this "local condition" in the grouping of households.⁷⁸ But there was more to it than regionalism.

As V. I. Lenin pointed out in *The Development of Capitalism in Russia*, the populist sympathies of many statisticians led them to equate land with allotment.⁷⁹ In other words, from the perspective of populists and their concern with the commune, the land component of any analysis meant allotment land. In this sense, a populist conception of peasant society emerged at the center of the indicator dispute.

Zemstvo statisticians of the Moscow school (and populist economists such as Vorontsov) offered certain practical justifications for choosing allotment size to represent peasant landholding. In areas dominated by communal tenure, they believed that there was little difference between these two items prior to the explosion in peasant land rental and purchase in the 1890s.⁸⁰ In addition, the rental and purchase of land occurred on both an individual and communal basis. In the latter case, statisticians found it difficult to evaluate how much of the communal additions should be assigned to each household. However, there were also considerations of a more ideological hue. The burning issue in the formative years of zemstvo statistics was the question of the "insufficient allotment." One of the original questions that Orlov and others set out to answer was whether or not the communal allotments of Moscow peasants were sufficient for both maintaining the family and meeting obligations. His research took place in the wake of a short work by Ianson which suggested that they were not. The state operated on the same assumption when, in 1881, it carried out a scheduled review (and subsequent reduction) of the redemption payments peasants made for the land they received with their emancipation from serfdom. Budget studies, such as that conducted by A. V. Peshekhonov in Kaluga province, reinforced this perception as they revealed that, translated into monetary (market) terms, peasant expenses greatly exceeded income.⁸¹ This question thus helped entrench allotment size as a key indicator of peasant economic activity.

In addition, for statisticians of populist leanings the allotment was the embodiment of the egalitarian principles of the commune—the principle of "to each according to his needs" which characterized the peasant's supposedly innate socialism. The best example of this can be seen in the work on Khvalynsk district of Saratov province compiled by S. A. Kharizomenov.⁸² Kharizomenov, like Shlikevich, used sown area in his calculations. As he stated, "family labor force, allotment, payments, livestock and sowing—these five indicators, with extremely rare exceptions, completely define the character and level of economic position of any peasant family in Russia."⁸³ He even reached conclusions similar to Shlikevich's, namely that capital (draft animals and inventory) was the most important determinant of peasant well being, and that the influence of labor force size was relatively insignificant. But when it came to the question of representing land in combination tables, their views diverged.

Shlikevich considered total land held, believing sown area (the household's ability to use land held) to be the best indicator of a household's total economic energy. He chose this indicator based on the work of K. A. Verner and the Tauride zemstvo statistical bureau. Kharizomenov, although he believed he was searching for the same thing, equated land holding and allotment size. As such, land holding was considered only within the limits of the communal relationship. Even Kharizomenov's discussion of land rental stressed its communal nature, and Kharizomenov made no attempt to explain the fact that more land was being rented outside the communal structure than within it.⁸⁴ To the extent that he considered sown area, he did so only as an indicator of whether or not a household would need to purchase grain. He noted that sown area was the "complex result of the action of all agricultural factors," but did not attribute to it the same importance as allotment size.⁸⁵ Sown area was simply a practical way of summing up whether or not a household had sufficient draft and allotment land to meet its needs. The commune and the peasant household's communal allotment determined peasant economic success.

This divergence was both a reflection of Kharizomenov's populist roots and a prime example of the social construction of knowledge. In Chernigov the commune was a weaker institution; statisticians were thus less constrained by questions concerning its effects. However, the Moscow statisticians who were largely responsible for Kharizomenov's training were much concerned with the effects of communal tenure. Kharizomenov and his tutor in statistics K. A. Verner, were also deeply committed to the populist idealization of the commune.⁸⁶ They insisted on using allotment size as an indicator of peasant well being because they believed it to be the essence of the peasant economy. Indeed, Verner abandoned allotment size for sown area in his own work in Tauride province only after he was confronted with many households that held no allotment but still farmed. Even though he essentially invented the method of using sown area as a means for dealing with allotmentless households, he still compiled tables by allotment size. "Allotmentlessness" (*beznadel'nost' dvora*) became an important indicator in this and other works.⁸⁷ Combination tables would enable statisticians to discover descriptive "mathematical formulas" for all aspects of the peasant economy, but the communal nature of that economy was already a given. It was simple, "an affair of such singular and uncomplicated phenomena, which has not had a place in the lives of European states for some time."⁸⁸

The use of allotment size as an indicator proved resilient. As early as 1889, at least one Moscow-trained statistician was prepared to argue that sown area was the best of all indicators because it encapsulated all three basic components—land, labor and capital—under one heading. Significantly, N. M. Astyrev made his remarks in relation to the peasantry of Siberia—another area where the bonds of communal tenure were weaker.⁸⁹ The conflict between use of allotment size and use of sown area, however, persisted until the turn of the century. Two arguments contributed to putting the issue to rest. Peshekhonov's statistical description of Kaluga province's Kozel'sk district offered the first challenge. First, he noted that the influence of allotment size on

the economic life of the population had already been studied extensively. Second, he put forward the proposition that the size of the household economy and the size of plowland were almost synonymous for every household. More importantly he stressed the fact that allotment size was "an indicator conditioned mainly by given external circumstances and historical conditions, not by the processes actually happening in the economic life of the population." Sown area, however, defined both these "external conditions" and "contemporary economic relations and processes happening within the peasant mass [peasant land rental and purchase]." Using Shlikevich's terms, the allotment was an element or cause, but sown area was both an element and a general characteristic, "a cause and effect."⁹⁰ As an indicator, then, sown area combined the best of both worlds and thus served as the best measure of the mutual interactions between cause and effect.

Cognizance of the changes taking place in the peasant economy, namely continual increases in peasant land rental and purchase, served as a basis for a second argument in support of abandoning allotment size as an indicator. As the statistician/economist A. E. Lositskii reported to the Free Economic Society's commission on zemstvo statistics in 1900:

Up to this time one frequently encountered grouping by allotment size. But, in the current production of repeated household inventories they [statisticians] have rejected this indicator owing to the fact that it is uncharacteristic. In many locales purchased land already has acquired a large significance in the peasant economy, and almost everywhere the development of rent overshadows the influence of landholding. Thus, it would be desirable that the sub-commission state that grouping by allotment size is unsatisfactory.⁹¹

The commission agreed, and this signified the near end of the populist conception of allotment size as a key economic indicator. A paper by the agronomist V. F. Arnol'd at a conference the following year, which demonstrated a linear ($y = ax + b$) relationship between key indi-

cators, also supported the use of sown area over allotment size (and pointed statisticians in the direction of correlation). Heightened concern with social stratification in the village (among marxists and populists alike) also made the revered allotment seem less relevant.⁹² The peasant's world proved to be exceedingly complex. His economic activity involved much more than tilling a communal allotment.

There were some exceptions. Moscow statistician P. A. Vikhliaev grouped households by allotment size in an attempt to get at the household's relation to allotment, purchased and rented land. The Ekaterinoslav zemstvo's statistical bureau included tables by commune (and sown area), largely because the commune's legal status made it the subject of zemstvo activity. Statistics satisfied the administrative need for "units" and "boundaries" of control.⁹³ The Viatka bureau used allotment size to determine "typical" households for budget studies, but followed the prescriptions of the Free Economic Society's commission of 1900 in compiling its tables. In Tula a zemstvo interest in the effects of the Stolypin land reforms led to compiling tables based on allotment size and sown area. However beyond administrative needs—in the arena of analysis—sown area prevailed. As the dean of zemstvo statisticians in the early twentieth century, Professor N. A. Kablukov, noted, it was essential to provide zemstvos with research results in a form amenable to zemstvo use. Yet, analysis of the peasant economy itself required grouping households by like economic indicators.⁹⁴

Other events also buttressed the case for sown area as an indicator. By the eve of the Great War, work on correlation by Galton, Karl Pearson and others was well known in Russia. In a 1914 presentation to the Chuprov Society, the economist S. N. Prokopovich attempted to use their findings to demonstrate once and for all that sown area should have a prominent place in any analytical scheme. The problem with existing analysis by means of combination tables, Prokopovich argued, was that these groupings did not allow one to define the size of the dependence

of X on Y—they only constituted "the fact of this dependence."⁹⁵ Defining the sizes of these dependencies could only be done through an analysis based on proper groupings and such groupings, he contended, could only be based on the best of indicators. Correlation coefficients provided a means for achieving both of these ends. They would not only provide a measure of causal relationships between various aspects of the peasant economy, but would also demonstrate which indicators best represented these factors.⁹⁶

Using the concept of correlation coefficients, Prokopovich proceeded to realize Shlikevich's dream by constructing tables displaying a specific measure of correlation between: family size, number of male workers, sown area, allotment size, combined size of allotment and purchased land, number of draft animals, and wages from crafts and trades. His study of data from twenty-five districts arrived at two important conclusions. The first was elementary. As an example of how the technique could be used, Prokopovich demonstrated that the correlation between sown area and the other components was tighter (more positive) than that between allotment size and the other components. The method upheld the view that sown area was a better indicator of economic well being than allotment size. "Thus," he noted, "the study of the correlational tie between elements of the peasant economy can give us, in the highest degree, valuable guides relating to the compilation of combination tables, since without this study the selection of indicators proposed for the basis of groupings and also the order of their arrangement carries an arbitrary and chance character."⁹⁷

Prokopovich's second conclusion was more profound and would have a more long-term impact. Referring readers to his correlation tables he noted that, "The main conclusion taken from these tables consists in the fact that in various locales the size of the influence of each indicator, as well as the size of their correlative dependence, is completely varied. In every locale the peasant economy has its own special structure, its special organizational plan." It thus appeared

that the peasant economy was, in fact, so varied that it would defy any general theory of explanation. However, as Prokopovich pointed out next, "in all of this variation it is easy to detect a certain regularity." Sown area was the most reliable indicator of household economic activity and (contrary to Shlikevich) there existed a strong causal link between this economic activity and family size (number of workers).⁹⁸ It appeared as if statisticians and others interested in understanding the nature of peasant society now had a bridge across the abyss of the heterogeneous nature of their subject matter: sown area.

Sown Area, Zemstvo Statistics and Chaianov

In spite of their discoveries, however, zemstvo statisticians and economists like Prokopovich ultimately failed in their quest to derive "general laws" of peasant economy. They failed, in part, because they remained preoccupied with the Queteletist belief that such laws would simply emerge from massive databases. Agronomists noticed this when they tried to make use of zemstvo statistical data and methodology in order to comprehend, and then enlighten, Russia's "backward" peasant majority and found statisticians overly preoccupied with the quantity, rather than the usability, of data. Confronted with plans for budget surveys that required days to complete for each household (e.g., F. A. Shcherbina's Voronezh province program), the agronomists, led by Chaianov, rebelled. More could be gleaned from simplified accounts that did not strain peasant memory or agricultural officers' patience.⁹⁹ In addition, correlation analysis—taken on its own—gained a prominence that overshadowed what ultimately proved to be the most fruitful avenue of statistical inquiry: analysis of variation. Prokopovich's work was one of many that popularized the latest Western fashion.¹⁰⁰ By adding the prestige of the latest statistical science to the indicator sown area it also served as a disincentive to investigate other factors more close-

ly. Shlikevich's innovative work languished in one sense; there was no Russian Fisher who developed the statistic.

However, the issues Shlikevich raised did not disappear. The significance of his work, along with the statisticians' development of the household inventory and general concern with causal questions, is that these products of the populist intelligentsia's quest to understand (and thus connect with and develop) the peasantry, shifted discussion of the peasant economy away from the nature of land tenure (the commune) and toward the individual household's organization of production (i.e., toward an analysis of the relations between structural parts of the household economy as a single unit). Economists and statisticians in the academy, such as Chaianov's teacher at the Moscow Agricultural Institute, A. F. Fortunatov, as well as N. A. Kablukov and V. A. Kosinskii perpetuated the household view—a product of statisticians' attempts to understand the commune. Their conclusion that the peasant household economy was structurally different from its capitalist counterpart endured.¹⁰¹ It provided a Russian context in which the family farm-centered views of such Western economists as J. H. von Thünen (a pioneer in ideas of optimization and marginal productivity) and Ernst Laur made sense. It also provided the basis of Chaianov's disagreement with Laur over the ability to estimate the value of household labor in monetary terms. Just as zemstvo statisticians turned to the household as a means of understanding the morphology of the commune, Chaianov would turn to the organizational structure of household in order to understand this “basic cell (*iacheika*)” of the agrarian economy.¹⁰²

Furthermore, as noted professor of statistics and political economy A. A. Kaufman remarked in his critique of correlation analysis (and Prokopovich's work in particular), the correlation coefficient provided “only, in a summarized and easily understood form, one particular aspect of those facts on which it is based.” A low correlation coefficient, even one of zero, did not “prove the absence of a correlational dependency.” In fact, a coefficient of zero might mean very

little.¹⁰³ Believing that the peasant economy in every locale possessed “its own special structure and organizational plan” there were undoubtedly many cases where “the absence of a *simple* and *spontaneous* connection,” expressed as a correlation coefficient, did not disprove “the absence of a *more complex*, more difficult to perceive dependency....” For this reason, Kaufman argued, contrary to Prokopovich, that groupings for combination tables be constructed by a number of indicators in order to examine the whole spectrum of causal relationships that characterized the household in various settings.¹⁰⁴ As a prominent academic statistician, A. A. Chuprov (the son of A. I. Chuprov) noted in 1904, grouping by sown area could obscure as much as it revealed if the subject of investigation happened to be rent, or if households earned the bulk of their livelihood from animal husbandry or non-agricultural pursuits.¹⁰⁵ The heterogeneity of peasant households was such that any general explanation of their individual peculiarities required the exploration of all possible variables.

The source of Chaianov’s success lay in following this line of thought. In one sense, even the insistence on sown area exemplified the fixation with land that permeated debates on agrarian reform in the first two decades of this century. Yet, while Prokopovich (his main non-Marxist critic) and others came to insist on sown area as a definitive indicator, Chaianov noted in his early work on budget data in Moscow and Smolensk provinces that it was “impossible to find some sort of ideal grouping of material” that would resolve all questions connected to understanding the peasant economy.¹⁰⁶ Thus, in demonstrating the influence of peasant family size on economic activity, Chaianov used data grouped by sown area, including Prokopovich’s findings. Yet, he also indicated that the resultant formulae expressing the relationship between family development and land use could not be applied to individual farms, “since apart from family size and sown area a number of other factors operate which can considerably alter the correlation of figures.” Even the relationship between family size and sown area had to be seen as only a partial

explanation because the correlation coefficients calculated for sown area and family size were “nevertheless, far from 1.00,” and this in itself indicated “the existence of parallel factors” that contributed to the characterization of the household as a whole.¹⁰⁷

Proceeding according to his belief that all the “elements of agricultural production depend on one another technically in the closest manner,” and that each was “a gauge of that which is common to them all”—expressive of the “volume of economic activity”—Chaianov continued the investigations of causal dependencies initiated by combination table analysis.¹⁰⁸ Indeed, studies crucial to the formulation of his theory of peasant economy, such as his analysis of household budgets from Starobelsk district (Khar’kov province), relied in part on combination table analysis. Grouping households by sown area, Chaianov’s combination table analysis demonstrated the influence of family age on household economic activity and confirmed his hypothesis that family needs at various stages of family development served as the primary causal factor in the household’s organization of production.¹⁰⁹ His further success also rested on the development of more sophisticated indicators. Rather than grouping households by simple indicators (e.g., sown area, number of horses, number of male workers), Chaianov experimented with groupings designed to illuminate various aspects of the peasant economy. For the most part, these groupings expressed a more complicated relationship than that used in earlier zemstvo works, the most important of which was the ratio between consumers and workers.¹¹⁰ These complex indicators allowed him to test hypotheses against the data, creating a synthesis of theory and practice from what began forty years earlier as an investigation of the commune.

Conclusion

This discussion ultimately reminds us that, although statistics are impersonal, they are not objective. Rather they are constructed representations that often reflect researchers’ agendas as

much as the social phenomena under study. In this case, the impact of statistics (how they were to be compiled) on the communal conception of peasant economy was complex. Assumptions about what was being counted, how the counting should be done, and how the data should be analyzed—rather than buttressing preconceived notions of the preeminence of the commune—shifted the paradigm of peasant economic activity from commune to household and thus provided the interpretational matrix for Chaianov's household-based theory of peasant economy.

The decline in the communal conception of peasant economic activity stemmed in part from the assumptions zemstvo statisticians made about the goals and proper methods of statistical investigation. They followed Quetelet in their aspiration to find a universal law of peasant economy that would demonstrate the viability of communal agriculture. However, like Quetelet's critics, their organic view of society and their desire to discover the inner workings of the communal organism caused them to temper their enthusiasm for universal laws with a commitment to preserving the individuality of their subjects and exposing causal relationships. This resulted in the derivation of the household inventory method. Unfortunately, for those who hoped that such a microscopic level of research would assist in the defense of the commune, the household inventory method revealed that the fundamental unit of peasant economic activity was not the communal organism, but its individual households. This marked a first step in the decline of the statisticians' communal conception of Russia's peasant economy.

The second blow came when statisticians attempted deeper causal analyses of peasant economic activity. Analysis required an agreement on how best to represent various aspects of peasant economic activity in numbers—how to make the heterogeneity of peasant life legible in a way that facilitated analysis. Of the three primary economic components—land, labor and capital—the most intense disagreement centered on how best to represent land. Given their interest in the fate of the commune, many statisticians clung to communal allotment size as the best indi-

cator of the peasant economy. The allotment symbolized the communal nature of peasant economic activity; the lack of an allotment or its insufficient size symbolized state and noble oppression of these alleged standard-bearers of Russian civilization. The analytical practice of grouping households by allotment size was a statistical expression of this populist idealization of the commune. However, commitment to allotment size as an indicator posed a large obstacle to understanding the intricacies of the peasant economy. As long as statisticians still looked to the commune as the basis of peasant economic activity it was difficult to incorporate the effects of the massive increase in peasant land rental and purchase from the time of the emancipation onward, or to incorporate other aspects of peasant economic activity. Simply put, the only way to formulate a general theory of peasant economy (which was what statisticians wanted) was to acknowledge the decreasing importance of allotment land, and hence, the declining viability of traditional conceptions of the commune.

Such a consensus emerged gradually in the final decades of the empire. Unencumbered by the domination of communal land tenure in Chernigov, statisticians attached to this *zemstvo* sought an indicator suitable for their situation: sown area. As an indicator it proved its usefulness in Shlikevich's combination table analysis of Kozelets district. Even though statisticians of the Moscow school themselves began to use sown area in their work, their ideological commitment to allotment size remained strong. Eventually, however, repeated demonstrations of the efficacy of sown area broke down the use of allotment size. Peshekhonov's work, the product of someone with proven populist credentials, led the way, and by the turn of the century sown area had garnered a general acceptance from a major gathering of statisticians. By 1914, Prokopovich could use correlation coefficients to demonstrate that Shlikevich had been wise in using sown area in his analyses. This victory of sown area over allotment size, as well as the general focus on causal questions and consideration of the variable relations between components of the

household economy, ultimately paved the way—conceptually and methodologically—for what Orlov and other populist statisticians desired: the general explanation of peasant economic behavior offered by Chaianov. As a model, Chaianov’s theory provides important insights into peasant economies of the past and present. Yet, we should not forget that it, too, is a product of time and place.

¹ Theodore M. Porter, *The Rise of Statistical Thinking, 1820-1900* (Princeton, 1986); Stephen M. Stigler, *The History of Statistics: The Measurement of Uncertainty before 1900* (Cambridge, MA, 1986); Stuart Woolf, “Statistics and the Modern State,” *Comparative Studies in Society and History* 31, no. 3 (July 1989): 588-604; Ian Hacking, *The Taming of Chance* (Cambridge, 1990); William Alonso & Paul Starr, eds., *The Politics of Numbers* (New York, 1987); Bernard S. Cohn, *Colonialism and Its Forms of Knowledge: The British in India*. (Princeton, 1996); Benedict Anderson, *Imagined Communities: Reflections on the Origins and Spread of Na-*

tionalism, rev. ed. (London, 1991), ch. 10 ("Census, Map, Museum"); idem, *The Spectre of Comparisons: Nationalism, Southeast Asia and the World* (London, 1998), 29-45.

² The Russian government created provincial and district zemstvos (sing. zemstvo) in 1864 to fulfill local administrative tasks previously handled by serf owners and provide services for the good of the local population (schools, medical services, etc.). See B. B. Veselovskii, *Istoriia zemstva za sorok let*, (4 vols.; St. Petersburg, 1909-1911); Terence Emmons & Wayne S. Vucinich, eds., *The Zemstvo in Russia: An Experiment in Local Self-Government* (Cambridge, 1982).

³ Daniel Thorner, Basile Kerblay & R. E. F. Smith, eds., *A. V. Chayanov on The Theory of Peasant Economy* (Madison, 1986); Teodor Shanin, *The Awkward Class: Political Sociology of Peasantry in a Developing Society* (Oxford, 1972); Mark Harrison, "Chayanov and the Economics of the Russian Peasantry," *Journal of Peasant Studies* 2, no. 4 (1975): 389-417; idem, "Resource Allocation and Agrarian Class Formation: The Problem of Social Mobility among Russian Peasant Households, 1880-1930," *ibid.* 4, no. 2 (1977): 127-61; idem, "The Peasant Mode of Production in the Work of A. V. Chayanov," *ibid.* 4, no. 4 (1977): 323-36; idem, "Chayanov and the Marxists," *ibid.* 7, no. 1 (1979): 86-100; A. Haroon Akram-Lodhi, "M. H. Khan, A. V. Chayanov and the Family Farms of the North-West Frontier Province," *ibid.* 22, no. 2 (1995): 300-26; V. P. Danilov, "The Issue of Alternatives and History of the Collectivization of Soviet Agriculture," *Journal of Historical Sociology* 2, no. 1 (1989): 1-13; N. Figurovskaia, "K stoletiiu so dnia rozhdeniia A. V. Chaianova," *Voprosy ekonomiki*, no. 1 (1988): 52-62; V. V. Kabanov, "Aleksandr Vasil'evich Chaianov," *Voprosy istorii* 95, no. 6 (1988): 146-167; idem, "Shkola A. V. Chaianova, ili organizatsionno-proizvodstvennoe napravlenie russkoi ekonomicheskoi mysli," *Istoriia SSSR*, no. 6 (1990): 86-99; N. L. Rogalina & N. N. Gromova, "Kontseptsii

krest'ianskogo khoziaistva A. V. Chaianova," *Vestnik Moskovskogo Universiteta, Serii 8: Istoriia*, no. 4 (1993): 35-46; Günther Schmitt, "The Rediscovery of Alexander Chayanov," *History of Political Economy* 24, no. 4 (1992): 925-65; Maurice Aymard, "Autoconsommation et Marches: Chayanov, Labrousse, ou Le Roy Ladurie?" *Annales: Economies, Société, Civilisations* 38, no. 6 (1983): 1392-1410; E. P. Durrenberger & Nicola Tannenbaum, "A Reassessment of Chayanov and His Critics," *Peasant Studies* 8, no. 1 (1979): 49-63; Grant Evans, "The Accursed Problem: Communists and Peasants," *ibid.* 15, no. 2 (1988): 73-102; Antoinette Fauve-Chamoux, "Household Forms and Living Standards in Preindustrial France: From Models to Realities," *Journal of Family History* 18, no. 2 (1993): 135-56; M. D. Schulman, "The Persistence of the Black Farmer: The Contemporary Relevance of the Lenin-Chayanov Debate," *Rural Sociology* 56, no. 2 (1991): 264-83; Pierre Vilar, "Reflections on the Notion of 'Peasant Economy'," *Review* 21, no. 2 (1998): 151-89.

⁴ As Esther Kingston-Mann points out, "populist" is a problematic label in the sense that it was assigned to them by marxist political enemies. Nonetheless, it does sum up their idealization of the peasantry and its institutions. See her *In Search of the True West: Cultures, Economics, and Problems of Russian Development* (Princeton, 1999), 126.

⁵ On debates over communal versus private land tenure in the context of Russian economic development see Kingston-Mann, *In Search of the True West*; David A. J. Macey, *Government and Peasant in Russia, 1861-1906: The Prehistory of the Stolypin Reforms* (DeKalb, 1987).

⁶ Porter, *Trust in Numbers: The Pursuit of Objectivity in Science and Public Life* (Princeton, 1995).

⁷ Robert E. Johnson, "Liberal Professionals and Professional Liberals: The Zemstvo Statisticians and Their Work," in Emmons and Vucinich, eds., *The Zemstvo in Russia*, 343-363; David W. Darrow, "The Politics of Numbers: Zemstvo Land Assessment and the Conceptualization of Russia's Rural Economy," *The Russian Review* 59, no. 1 (January 2000): 52-75; Alessandro Stanziani, "Statisticiens, zemstva et État dans la Russie des années 1880," *Cahiers du Monde russe et soviétique* 32 (October-December 1991): 445-68; Martine Mespoulet, "Statisticiens des zemstva. Formation d'une nouvelle profession intellectuelle en Russie dans la période prérévolutionnaire (1880-1917): Le cas de Saratov," *ibid.* 40, no. 4 (October-December 1999): 573-624.

⁸ N. A. Svavitskii, *Zemskie podvornye perepisi (obzor metodologii)* (Moscow, 1961), 42-3.

⁹ Richard Wortman, *The Crisis of Russian Populism* (Cambridge, 1967).

¹⁰ The phrase "*Aliis exterendum*" served as the London Society's motto. See Porter, *The Rise of Statistical Thinking*, 35-7.

¹¹ Zemstvo statisticians earned their livings creating cadastres for zemstvo tax assessment—essentially converting complex social phenomena into numbers legible to administrative institutions. See James C. Scott, *Seeing Like a State: How Schemes to Improve the Human Condition Have Failed* (New Haven, 1999). On zemstvo statistics as ammunition for dismantling the commune see Macey, *Government and Peasant in Russia*; K. F. Golovin, *Sel'skaia obshchina v literature i deistvitel'nosti* (St. Petersburg, 1887); A. A. Rittikh, *Zavisimost' krest'ian ot obshchiny i mira* (St. Petersburg, 1903); P. Lokhtin, *Bezzemel'nyi proletariat v Rossii. Opyt opredeleniia kolichestva bezzemel'nago proletariata, sozdannago sushchestvuiushchimi sposobami krest'ianskago zemlevladieniia* (Moscow, 1905).

¹² Donald A. MacKenzie, *Statistics in Britain, 1865-1930. The Social Construction of Scientific Knowledge* (Edinburgh, UK, 1981).

¹³ MacKenzie, *Statistics in Britain*, 210-13; Stigler, *The History of Statistics*, chs. 9-10 (discussion of F. Y. Edgeworth, Karl Pearson, and G. U. Yule).

¹⁴ This section is based on Porter, *The Rise of Statistical Thinking* & Hacking, *The Taming of Chance*.

¹⁵ Lorraine Daston, *Classical Probability in the Enlightenment* (Princeton, 1988), 230-53.

¹⁶ Hacking, *The Taming of Chance*, 113, 116 (quote—original emphasis).

¹⁷ Porter, *The Rise of Statistical Thinking*, ch. 6; Hacking, *The Taming of Chance*, chs. 15, 16, 22; Keith Tribe, *Strategies of Economic Order: German Economic Discourse, 1750-1850* (Cambridge, 1995), 32-94; Thomas Riha, *German Political Economy: The History of an Alternative Economics. International Journal of Social Economics* 12, nos. 3-5 (1985); Anthony Oberschall, *Empirical Social Research in Germany, 1848-1914* (The Hague, 1965); Paul F. Lazarsfeld, "Notes on the History of Quantification in Sociology," *Isis* 52 (1961): 277-333; Kingston-Mann, *In Search of the True West*, 113-23.

¹⁸ As it turned out, an organic view of society had a profound impact on biology. See Hacking's discussion of Rudolf Virchow (*The Taming of Chance*, 190-1) and Paul Weindling, "Theories of the Cell State in Imperial Germany," in Charles Webster, ed., *Biology, Medicine and Society 1840-1940* (Cambridge, 1981), 99-155.

¹⁹ Ianson, *Teoriia statistiki*, 2nd ed. (St. Petersburg, 1887); idem, *Napravlenie v nauchnoi obrabotke npravstvennoi statistiki. Vvedenie v sravnitel'nuiu npravstvennuiu statistiku. Vypusk I. Kettle-Vagner-Diufo-Gerri* (St. Petersburg, 1871).

²⁰ Ianson, *Teoriia statistiki*, 2nd ed., 461.

²¹ Ianson, *Napravlenie v nauchnoi obrabotke npravstvennoi statistiki*, 52.

²² Ianson, *Teoriia statistiki*, 2nd ed., 464.

²³ Ianson, *Napravlenie v nauchnoi obrabotke npravstvennoi statistiki*, 103-104.

²⁴ Ianson, *Teoriia statistiki*, 2nd ed., 479.

²⁵ Kingston-Mann, *In Search of the True West*, 129.

²⁶ A. I. Chuprov, *Statistika* (Moscow, 1895), 4.

²⁷ *Ibid.*, 7.

²⁸ *Ibid.*, 10-11.

²⁹ *Ibid.*, 12.

³⁰ *Ibid.*, 12-14; Kingston-Mann, *In Search of the True West*, 128-30.

³¹ As opposed to the so-called “Chernigov” type used in Chernigov province. According to Ianson, the distinction between the two lay in the Moscow statisticians’ focus on people instead of land. The Chernigov statisticians believed this to be an over-simplified characterization. See Ianson, *Teoriia statistiki*, 159-67; Svavitskii, *Zemskie podvornye perepisi*, 46-53.

³² A. F. Fortunatov, “Iz vospominanii o deiateliakh Moskovskoi zemskoi statistike,” in *Pamiati Nikolaia Alekseevicha Kablukova. Sbornik statei po statistike*, T. 1 (Moscow: 1925), 237-8; N. P. Makarov, *Krest’ianskoe khoziaistvo i ego evoliutsiia*. T. I (Moscow, 1920), 21 (quote).

³³ *Sbornik statisticheskikh svedenii po Moskovskoi gubernii*. T. IV. Vypusk I. *Krest’ianskoe khoziaistvo. Formy Krest’ianskago zemlevladiiia v Moskovskoi gubernii*. Sost. V. I. Orlov (Moscow, 1879) (hereafter *Formy krest’ianskago zemlevladiiia*).

³⁴ He articulated the method most clearly in a subsequent project in Tambov province. See Svavitskii, *Zemskie podvornye perepisi*, 48-49; *Sbornik statisticheskikh svedenii po Tambovskoi gubernii. Otdel khoziaistvennoi statistiki*. T. I. *Borisoglebskii uezd* (Tambov, 1880).

³⁵ See, for example, A. A. Karelin, *Obshchinnoe zemlevladienie v Rossii* (St. Petersburg, 1893); V. S. Prugavin, *Russkaia zemel'naia obshchina v trudakh eia mestnykh izsledovatelei* (Moscow, 1888); V. P. Vorontsov, *Itogi ekonomicheskogo izsledovaniia Rossii. (po dannym zemskoi statistiki)*. T. I. *Krest'ianskaia obshchina* (Moscow, 1892).

³⁶ *Formy Krest'ianskago zemlevladieniia*, 33.

³⁷ V. Trirogov, *Obshchina i podat' (sobranie izsledovaniia)* (St. Petersburg, 1882), 3.

³⁸ *Otchet upolnomochennago po sel'skomu khoziaistvu Gubernskomu Zemskomu Sobraniu za 1881 godu* (Novgorod, 1881), 5.

³⁹ As Porter notes, the scientific shroud around statistics rendered any thoughts of sampling unconscionable to nineteenth-century statisticians. However, financial constraints soon forced zemstvo statisticians to accept sampling for more complicated aspects of their research programs, such as budget studies. See *The Rise of Statistical Thinking*, 236-7; You Poh Seng, "Historical Survey of the Development of Sampling Theory and Practice," in Maurice Kendall and R. L. Plackett, eds., *Studies in the History of Statistics and Probability*, Vol. 2 (New York, 1977); William Kruskal and Frederick Mosteller, "Representing Sampling IV: The History of the Concept in Statistics, 1895-1939," *International Statistical Review* 48 (1980): 169-95; N. N. Korenevskaiia, *Biudzhetye obsledovaniia krest'ianskikh khoziaistv v dorevoliutsionnoi Rossii* (Moscow, 1954); *Trudy podseksii statistiki IX s"ezda russkikh estestvoispytatelei i vrachei. Moskva. 3-11 ianvaria 1894 goda* (Chernigov, 1894), 52-62.

⁴⁰ Svavitskii, *Zemskaia podvornaia perepis'*, 10; A. I. Vasil'chikov, *Sel'skii byt i sel'skoe khoziaistvo v Rossii* (St. Petersburg, 1881), 25-8.

⁴¹ E. S. Filimonov, *Kratkii istoricheskii ocherk podvorno-statisticheskikh izsledovanii v Rossii* (Viatka, 1889), 26; M. A. Sablin, *Svedeniia o seleniakh i zhiteliakh Moskovskoi gubernii*, Vypusk I (Moscow, 1873); Ministerstvo Gosudarstvennykh Imushchestv, *Materialy dlia statistiki Rossii, sobiraemye po vedomstvu Ministerstva Gosudarstvennykh Imushchestv* (6 Vypuskov; St. Petersburg, 1858-1871).

⁴² *Sbornik materialov dlia izucheniiia sel'skoi pozemel'noi obshchiny* (2 vols.; St. Petersburg, 1880).

⁴³ Filimonov, *Kratkii istoricheskii ocherk podvorno-statisticheskikh izsledovanii*, 29.

⁴⁴ Darrow, "The Politics of Numbers," 63-5; Alessandro Stanziani, "Les enquêtes orales en Russie, 1861-1914," *Annales* 55, no. 1 (January-February 2000): 219-41; *Protokoly zasedanii Statisticheskago otdeleniia Moskovskago Iuridicheskago Obshchestva za ianvar'-fevral' 1887 g.* (Moscow, 1887); S. N. Veletskii, *Zemskaia statistika* (2 vols.; Moscow, 1899).

⁴⁵ *Formy krest'ianskago zemlevladieniia*, 295, 319.

⁴⁶ *Ibid.*, 266-8; Wortman, *The Crisis of Russian Populism*, 33, 72. This was the last straw for people like Georgi Plekhanov, who switched allegiance from peasants to the proletarians (*ibid.*, 144-5).

⁴⁷ Korenevskaiia, *Biudzhetye obsledovaniia; Trudy podseksii statistiki IX s"ezd*; F. A. Shcherbina, *Krest'ianskie biudzhety* (Voronezh, 1900); N. A. Kablukov, *Ob usloviiakh razvitiia krest'ianskago khoziaistva v Rossii* (Moscow, 1908), 377-84; V. Kosinskii, *K agrarnomu vo-prosu* (2 vols.; Odessa, 1906), T. I, 198-247; Darrow, "The Politics of Numbers," 63-8.

⁴⁸ Quetelet developed prototype combination tables, characterized by Porter as merely "a strategy especially suitable for deeply ambitious but fundamentally sensible persons of moderate ability." Lazarsfeld saw them for what they were—the first steps toward multivariate analysis—and lamented the fact that they never caught on within wider statistical circles. They did catch on in Russia. See Porter, *The Rise of Statistical Thinking*, 46; Paul F. Lazarsfeld, "Quetelet" in W. H. Kruskal & Judith M. Tanur, eds., *The International Encyclopedia of Statistics* (2 vols.; New York, 1978), 830; Stigler, *The History of Statistics*, 174-82.

⁴⁹ Svavitskii, *Zemskie podvornye perepisi*, 49-52.

⁵⁰ *Materialy dlia otsenki zemel'nykh ugodii, sobrannye Chernigovskim statisticheskim otdeleniem pri gubernskoi zemskoi uprave*. T. V. *Kozeletskii uezd* (Chernigov, 1882) (hereafter *Materialy dlia otsenki zemel'nykh ugodii...Kozeletskii uezd*).

⁵¹ A. S. Shlikevich, "Chto daiut i chto mogut dat' podvornyia opisi," *Zemskii sbornik Chernigovskoi gubernii*, nos. 3-4 (1890), 9-62.

⁵² Svavitskii, "Kombinatsionnye tablitsy, kak priem izucheniia tipov i faktorov krest'ianskogo khoziaistva v zemskikh podvornykh perepisiakh," *Pamiat' Nikolaia Alekseevicha Kablukova*, T. I, 386-7.

⁵³ Shlikevich, "Chto daiut i chto mogut dat' podvornyia opisi," 12-13.

⁵⁴ *Ibid.*, 11.

⁵⁵ *Ibid.* (original emphasis).

⁵⁶ *Istoriko-statisticheskoe opisanie Tverskoi gubernii*. T. I (Tver', 1882), 58 (abridged). See also Filimonov, *Kratkii istoricheskii ocherk podvorno-statisticheskikh izsledovanii* (appendices).

⁵⁷ Shlikevich, "Chto daiut i chto mogut dat' podvornyia opisi," 16-17.

⁵⁸ Ibid., 15 (original emphasis).

⁵⁹ Ibid., 17.

⁶⁰ Ibid., 22.

⁶¹ Ibid., 18 (original emphasis).

⁶² Ibid., 19, 23.

⁶³ Ibid., 18, 21.

⁶⁴ Ibid., 22, 30.

⁶⁵ For Table IV see pages 134-56 of *Podvornaia opis' Kozeletskago uezda (proizvedena v 1881 g.)*, a supplement to *Materialy dlia otsenki zemel'nykh ugodii...Kozeletskii uezd.*

⁶⁶ Shlikevich, "Chto daiut i chto mogut dat' podvornyia opisi," 26-7.

⁶⁷ Ibid., 43.

⁶⁸ See Hacking's discussion of "normal" in *The Taming of Chance*, ch. 19. As modern statistics originated as a way to eliminate errors resulting from repeated measurements, the normal curve was initially known as the error curve. Francis Galton's research on heredity, which led to the concept of regression, was the key factor contributing to a view of the curve as normal and the error as deviation. Stigler, *The History of Statistics*, ch. 8; Porter, *The Rise of Statistical Thinking*, ch. 9; Hacking, *The Taming of Chance*, ch. 19; MacKenzie, *Statistics in Britain*.

⁶⁹ Stigler, *The History of Statistics*, 170-1, 206-8; Hacking, *The Taming of Chance*, ch. 13.

⁷⁰ Shlikevich, "Chto daiut i chto mogut dat' podvornyia opisi," 23 (abridged).

⁷¹ Ibid.

⁷² Ibid., 46-7.

⁷³ S. N. Prokopovich, "Ob osnovaniakh vybora priznakov dlia postroeniia kombinatsionnykh tablits," *Statisticheskii Vestnik*, kn. 1 & 2 (1914), 148.

⁷⁴ V. V. (V. P. Vorontsov), "Zemskaia statistika," *Russkaia mysl'*, No. 4 (1888), esp. 166.

⁷⁵ Svavitskii, "Kombinatsionnye tablitsy," 396.

⁷⁶ Shlikevich, "Chto daiut i chto mogut dat' podvornyia opisi," 53-4.

⁷⁷ Svavitskii, "Kombinatsionnye tablitsy," 396-7; *Sbornik statisticheskikh svedenii po Voronezhskoi gubernii*. T. III, Vypusk I. *Zemlianskii uezd* (Voronezh, 1886), esp. viii-ix.

⁷⁸ As noted above, Shlikevich disapproved of this, citing presentation by commune or village in the works of the Moscow and other bureaus as examples.

⁷⁹ V. I. Lenin, *The Development of Capitalism in Russia*. (*The Process of the Formation of a Market for Large-Scale Industry*) (St. Petersburg, 1899) in *V. I. Lenin. Collected Works*, Vol. 3 (Moscow, 1972), 103.

⁸⁰ The boom happened sooner than most contemporaries were willing to admit. See Seymour Becker, *Nobility and Privilege in Late Imperial Russia* (DeKalb, 1985), 31-43; Peter Gatrell, *The Tsarist Economy, 1850-1917* (London, 1986), 113-18; V. V. Sviatlovskii, *Mobilizatsiia zemel'noi sobstvennosti v Rossii (1861-1908 g.)*, 2nd ed. (St. Petersburg, 1911).

⁸¹ Ianson, *Opyt statisticheskago izsledovaniia o krest'ianskikh nadelakh i platezhakh* (St. Petersburg, 1877); P. Kovan'ko, *Reforma 19 fevralia 1861 goda i eia posledstviia s finansovoi tochki zreniia*. (*Vykupnaia operatsiia 1861 g.-1907g.*) (Kiev, 1914); Darrow, "The Politics of Numbers," 65-7; Makarov, *Krest'ianskoe khoziaistvo i ego evoliutsiia*, 125-8; *Statisticheskoe opisanie Kaluzhskoi gubernii*. T. I. *Kozel'skii uezd*, Vypusk II (Kaluga, 1898).

⁸² Kharizomenov joined the group "Land and Liberty" (*Zemlia i volia*) after graduating from Moscow University in 1876, and helped found the radical splinter group, "Black Reparti-

tion" (*Chernyi peredel*) in 1879. In the early 1880s he abjured revolution to devote his life to zemstvo statistics. See A. A. Shilov and M. G. Karnaukhova, comps., *Deiateli revoliutsionnogo dvizheniia v Rossii: Biobibliograficheskii slovar' ot predshestvennikov dekabristov do padeniia tsarizma* (3 vols.; Moscow, 1928-1933), T. 1, Vypusk 4 (1932), 1867-70.

⁸³ *Sbornik statisticheskikh svedenii po Saratovskoi gubernii*. T. V. *Khvalynskii uезд* (Saratov, 1886), iii.

⁸⁴ E.g., the table in *Sbornik statisticheskikh svedenii po Saratovskoi gubernii*. T. V, 139.

⁸⁵ *Sbornik statisticheskikh svedenii po Saratovskoi gubernii*. T. V, 183.

⁸⁶ Verner had an equally colorful populist youth. He was expelled from the Petrovskii Agricultural Academy and exiled in 1876. He began his zemstvo work in Moscow under Orlov, and remained there until becoming head of the Tauride bureau in 1884. After losing this position because of political activities, Verner ironically found employment with the Ministry of Agriculture division responsible for administering crown lands. He finished his career as a professor at the Moscow Agricultural Institute. See V. G. Korolenko, *Istoriia moego sovremennika* (4 vols.; Moscow & Leningrad, 1930), T. II, kn. 2, 212-24.

⁸⁷ Svavitskii, "Kombinatsionnye tablitsy," 394-5; *Krest'ianskoe khoziaistvo v Melitopol'skom uезде*. Sost. K. Verner i S. Kharizomenov (Moscow, 1887).

⁸⁸ *Sbornik statisticheskikh svedenii po Saratovskoi gubernii*. T. V, III.

⁸⁹ N. M. Astyrev, "Osobennosti ekonomicheskago byta Sibiri," *Iuridicheskii Vestnik*, no. 2 (1889), 344. Radical repartitions played a small role Siberian communes until late-century state-sponsored migration increased pressure on the land. Within the communal structure, Siberian peasants preserved rights to their "forefathers' arable"—land beyond the commune's jurisdiction. See John Channon, "Regional Variation in the Commune: The Case of Siberia," in Roger

Bartlett, ed., *Land Commune and Peasant Community in Russia: Communal Forms in Imperial and Early Soviet Society* (Houndmills, Basingstoke, Hampton & London, 1990), 66-85; A. A. Kaufman, *Russkaia obshchina v protsesse eia zarozhdeniia i rosta* (Moscow, 1908).

⁹⁰ *Statisticheskoe opisanie Kaluzhskoi gubernii*, T. I, Vypusk II, 17.

⁹¹ Statisticheskaiia kommissiia pri III Otdelenii Imperatorskago Vol'nago Ekonomicheskago Obshchestva. *Trudy kommissii po voprosam zemskoi statistiki. (Zasedaniia s 15 po 22 fevralia 1900 g.)* (St. Petersburg, 1900), 131-2.

⁹² V. F. Arnol'd, "Opyt primeneniia elementarnykh nachal analiticheskoi geometrii k izsledovaniiu statisticheskikh zavisimostei," *Trudy podseksii statistiki XI s"ezda russkikh estestvoispytatelei i vrachei v S.-Peterburge 20-30-go dekabria 1901 goda* (St. Petersburg, 1902): 1-16. On differentiation see, for example: G. I. Baskin, *Sovremennaia differentsatsiia i sovremennye tipy krest'ianskogo khoziaistva* (Samara, 1926); V. G. Groman, "Ob osnovaniakh gruppirovki krest'ianskikh khoziaistv," *Trudy podseksii statistiki XI s"ezda russkikh estestvoispytatelei i vrachei*, 72-92.

⁹³ *Materialy dlia otsenki zemel' Ekaterinoslavskoi gubernii*. T. I. *Ekaterinoslavskii uezd* (Ekaterinoslav, 1899); Bernard Cohn, *An Anthropologist Among the Historians and other Essays* (Dehli & New York, 1987), 158-71, 205-6.

⁹⁴ *Moskovskaia guberniia po mestnomu obsledovaniiu 1898-1900 gg.* T. III. Vypusk I (Moscow, 1907); *Sbornik materialov po otsenke zemel' Viatskoi gubernii*. T. I. *Viatskii uezd*. Vypusk I. *Osnovnyia tablitsy* (Viatka, 1904); *Materialy dlia otsenki zemel' Tul'skoi gubernii*. T. I. *Novosil'skii uezd*. Vypusk I. *Krest'ianskoe khoziaistvo. Podvornaia perepis' 1910 g. Poobshchinnyia tablitsy i tekst* (Tula 1912); N. A. Kablukov, "Ob usloviiakh i deiatelnost' zemskikh

statistikov,” *Trudy podseksii statistiki XI s’ezda russkikh estestvoispytatelei i vrachei*, 23-5, 108-12; idem, *Posobie pri mestnykh statisticheskikh obsledovaniakh*, 2nd ed. (Moscow, 1920), 43.

⁹⁵ Prokopovich, "Ob osnovaniakh vybora priznakov," 146.

⁹⁶ Ibid., 152.

⁹⁷ Ibid., 157.

⁹⁸ Ibid., 155.

⁹⁹ Yanni Kotsonis, *Making Peasants Backward: Agricultural Cooperatives and the Agrarian Question in Russia, 1861-1914* (New York, 1999); Basile Kerblay, "A. V. Chayanov: Life, Career, Works," in Thorner, et al., eds., *A. V. Chayanov: The Theory of Peasant Economy*, xxx-xxxi; Moskovskoe Obshchestvo Sel'skago Khoziaistva, *Moskovskoi oblastnoi s'ezd deiatelei agonomicheskoi pomohchi naseleniiu 21-28 fevralia 1911 goda. Trudy s'ezda. T. III. Materialy po III (podseks. statist.) i IV seks. (Doklady i zhurnaly zasedanii)* (Moscow, 1911), 24-32, 74.

¹⁰⁰ See, for example: A. V. Leontovich [a professor at the Moscow Agricultural Institute], *Elementarnoe posobie k primeneniiu metoda Gaussa i Pirsona v teorii oshibok v statistike i biologii* (3 vols.; Kiev, 1909-11); idem, "Neskol'ko slov v zashchitu 'teorii korreliatsii'," *Statisticheskii vestnik*, kn. 3 (1914-15), 81-93; R. Orzhentskii, "K voprosu o korreliatsii," in ibid., 94-8; E. E. Slutskii, *Teoriia korreliatsii i elementy ucheniia o prirode raspredeleniia* (Kiev, 1912).

¹⁰¹ Chaianov saw Kablukov and Kosinskii as the "spiritual" founders of his school of peasant economy. Kerblay, "A. V. Chayanov: Life, Career, Works," xxix-xxx; Kablukov, *Ob usloviakh razvitiia krest'ianskago khoziaistva*, 377-84; Kosinskii, *K agrarnomu voprosu*, T. I, 198-247.

¹⁰² Kerblay, “A. V. Chayanov: Life, Career, Works,” xxxiv; Chaianov, *Peasant Farm Organization*, 42. All references are to the Thorner, et al. edition of this work (1986).

¹⁰³ A. A. Kaufman, “Korrelatsionnyia formuly kak orudie statisticheskogo analiza,” *Statisticheskii vestnik*, kn. 3 (1914-15), 28-9 (paraphrasing G. U. Yule, *Introduction to the Theory of Statistics*, 2nd ed. [London, 1912], 191, 251).

¹⁰⁴ Ibid., 29 (quote)-30.

¹⁰⁵ A. A. Chuprov, “O priemakh gruppirovki statisticheskikh nabliudenii,” *Izvestiia C.-Peterburgskago Politekhnikheskago Instituta*, T. I, Vyp. 1-2 (1904): 1-26.

¹⁰⁶ S. N. Prokopovich, *Krest’ianskoe khoziaistvo* (Berlin, 1924), 246; A. V. Chaianov, “Metody razrabotki biudzhetnykh dannyykh, primenennyye v Volokolamskom i Smolenskom biudzhetnykh izsledovaniiax,” *Statisticheskii vestnik*, kn. 1-2 (1914): 159-78 (quote—172).

¹⁰⁷ Chaianov, *Peasant Farm Organization*, 60-9 (quotes—63 & 69).

¹⁰⁸ Ibid., 103.

¹⁰⁹ *Biudzhety krest’ian Starobel’skago uezda* (Khar’kov, 1915), esp. the tables on 10-19; Kerblay, “A. V. Chayanov: Life, Career, Works,” xxxiii.

¹¹⁰ A. V. Chaianov, *Len i drugie kul’tury v organizatsionnom plane krest’ianskago khoziaistva nechernozemnoi Rossii*. Vypusk I. *Moskovskaia guberniia* (Moscow, 1912), 55; idem, “Metody razrabotki biudzhetnykh dannyykh,” 174; idem, *Biudzhetye issledovaniia. Istoriia i metody* (Moscow, 1929), ch. VI, esp. 286.