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FOUNDATIONS OF SOVIET STRATEGY FOR ECONOMIC GROWTH

INDIANA UNIVERSITY

INTERNATIONAL STUDIES

FOUNDATIONS OF SOVIET STRATEGY FOR ECONOMIC GROWTH

Selected Soviet Essays, 1924 - 1930

Edited by NICOLAS SPULBER

INDIANA UNIVERSITY PRESS

BLOOMINGTON

This book is published in cooperation with the Russian and East European Institute of Indiana University. Its publication has been assisted by the University's Advisory Committee on International Studies.

A companion volume, Soviet Strategy for Economic Growth, by Nicolas Spulber, published simultaneously by Indiana University Press, presents an integrated discussion of the debates recorded in the present volume and their consequences.

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Library of Congress catalog card number 64-10102

Manufactured in the United States of America by Book Craftsmen Associates, Inc., New York

PREFACE

The crucial Soviet debates on strategies of economic development, pace of growth and efficiency, and the theory and practice of planning which preceded and molded the Soviet era of forced industrialization and of comprehensive planning that opened in 1929 occupy a unique place in the history of economics in general and of Soviet economic history in particular. By their breadth, scope, and intensity these debates shaped for decades Soviet thinking on economic development, and Soviet principles and practice of planning. Yet, thus far, these debates have received relatively little attention in the West. Hardly any of the main Soviet studies of the time have been translated. Some of the basic issues of the 1920's and the positions taken then have been examined from time to time, e.g., the debate on industrialization (by A. Erlich) and the debate on planning (by F. Pollock, A. Kaufman, C. Bobrowski, et al.); but neither an integrated study of all of the debates nor a systematic presentation of the documents involved has so far been attempted.

Since the 1950's, which saw the emergence of many newly independent countries bent on rapid economic growth, preoccupation with massive state intervention in the economy, forced industrialization, and planning has given rise in the West to a whole body of literature on economic development.

Many of the problems under discussion in this literature and in the newly developing countries were already confronting Russia in the 1920's. Hence the interest in clarifying the points of view debated in that country at the time and in making the most significant documents produced during these debates accessible to all those interested in Soviet economic history as well as in the current problems and solutions considered in the newly developing nations.

While the Soviet debates were often couched in a peculiar jargon and while certain questionable theories and assumptions played an undeniable role, they were far from representing

merely a display in doctrinairism. The truth is that the Soviet mid-1920's were teeming with interesting and valuable ideas. This was not only because a complex and challenging task necessarily called forth imaginative solutions, but also because, to start with, the Communist party itself was deeply split by the enormous pressures engendered by its own ambitious goals, the isolation of the country, the country's terrible backwardness, and its conflicting social undercurrents; because, further, under these conditions, differences of opinion were aired openly by opposing journals, ministries, and administrative offices; because, finally, many former "bourgeois" specialists, Mensheviks, and Populists rallied to the regime, and were, in the early years of the so-called New Economic Policy, still shaping up its orientations and its practices.

The "bourgeois" engineers Khrennikov, Gartvan, Kalinnikov—to mention but a few—prepared the first drafts of Soviet long-term plans. The "bourgeois" professor L. N. Iurovski stabilized the Soviet currency in 1924. Professor L. N. Litoshenko pioneered in social accounting and input-output analysis. The former Mensheviks V. G. Groman, V. A. Bazarov, and A. M. Ginzburg formulated some of the most challenging propositions concerning strategies of economic development and planning theory. The former Populists N. D. Kondrat'ev, N. P. Makarov, A. V. Chiaianov, and others contributed new ideas to agricultural planning, planning theory, and business cycles. Among Communists of the "right" faction, N. I. Bukharin formulated a number of propositions which remain basic even today for understanding the rationale of some Soviet institutional arrangements and planning procedures. Among the Communists of the "left," L. D. Trotsky, G. Piatakov, and, above all, E. A. Preobrazhenskii furnished some of the key arguments which continue to support the Soviet strategy of economic development and its specific sectoral and technological options. Among Communist engineers, planners, and statisticians, some, like G. M. Krzhizhanovskii, S. G. Strumilin, and particularly P. I. Popov, M. Barengol'ts, and G. A. Fel'dman made suggestions and contributions which deserve to be known.

The debates of the mid-1920's produced a vast, complex, and widely ramified literature whose survey has required a number of years. A methodical arrangement and analysis of the sources is presented below in an appendix. In a companion volume to the present work (Soviet Strategy for Economic Growth, Indiana University Press, Bloomington, 1964) I have presented an inte-

grated discussion of the various phases of the economic debates of the Soviet pre-planning era, with particular emphasis on the choice of a strategy for economic growth. In the present volume I have selected the fundamental economic articles and documents which uncover the origins, assumptions, and concepts of the Soviet method of industrialization and planning. These assumptions and concepts are basic for understanding the past as well as the contemporary Soviet literature on growth. In making the selection I have, furthermore, kept in mind a valid idea expressed once by Bertram D. Wolfe, also in relation to the Soviet 1920's: "It is not altogether possible to examine the essence of a regime without examining the views of the defeated, the alternatives which were closed off, the truth and aspirations and proposals of those who were later scattered." This volume therefore presents a broad spectrum of all the positions taken and of all the arguments presented in the debates. The work thus furnishes, I trust, both clues to the "essence" of the Soviet model and broader answers to the problems of economic development in general.

The thirty-six articles and documents included herein are grouped into three main sections:

I. Macro-economic Models
II. Economic Growth
    A. Strategies of Development
    B. Pace and Efficiency
III. Planning Theories and Methods.

These studies—with but two exceptions—have never before been translated into a Western language. Most of them are articles from specialized Soviet economic journals like Planovoe khoziaistvo (Planned economy), the journal of the State Planning Committee (Gosplan), excerpts from planning documents, or excerpts from economic books such as the crucial study of E. A. Preobrazhenskii, Novaia ekonomika (New economics), a fundamental Soviet work of the time. The articles and documents were translated under my supervision by Dr. Robert M. Hankin, Andrew McAndrews, Ivo Moravchik, and Myron Moroz. I have resorted to cuts in the originals only to avoid irrelevancies or repetitions.

I am deeply grateful to all who have helped me to complete this work, which spanned a number of years. I am indebted to the translators, who have done a competent job. I thank Mr. Arthur W. Wright for preparing the index. I am particularly in-

debted to Dr. Robert M. Hankin, who has helped me to recheck carefully against originals a number of the final drafts. I am grateful, finally, to the Ford Foundation, the American Council of Learned Societies and its Joint Slavic and East European Grants Committee, and to the Advisory Committee on International Studies of Indiana University, without whose material help this work would not have been possible.

This help should not of course be construed as an endorsement of the ways in which the editor has discharged his responsibilities.

Nicolas Spulber

Bloomington, Indiana

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Part I

Macro-economic Models

INTRODUCTORY NOTE

In attempting to understand the operation of their own economy, under the newly combined influences of a vastly expanded state sector and of market forces "freed," as it were, at its borders (notably in agriculture and trade), some of the Soviet economists of the mid-1920's turned their attention to Marx's celebrated "schema of simple and enlarged reproduction," published in the second volume of Capital. Taking the schema as a starting point, P. I. Popov and L. Litoshenko devised a pioneering input-output type of balance; E. A. Preobrazhenskii explored the "trade" relations among the various types of production systems coexisting in the Soviet economy and pointed out their significance in the process of growth; and G. A. Fel'dman devised a new two-sector model in order to clarify the interrelations between sectoral rates of growth and the "limits" which they set to the pace of industrialization.

Those who used as a point of departure Marx's schema—presented in the opening paper of this section—thought that it was, as Fel'dman put it, "applicable to any social formation since it represents, in its most abstract form, the process of production and exchange apart from its historical specificity."[1] What allegedly differed from one system to another were the "historical content" of the categories which entered in its structure (e.g., profits under capitalism and under socialism) and the form of the schema itself. Fel'dman, for instance, affirmed that the form of Marx's schema corresponded "to the requirements of analysis of market relations," and that it had to be modified in order to disclose the connections among income, consumption, accumulation share, capital formation, effectiveness of capital utilization, and productivity—i.e., the connections between "the economic categories which determine the possibility of realizing the basic conditions of our development: 'to catch up with and surpass the capitalist countries.'"

1. The numerous implications of the assertion that the same economic model (Marx's schema) could portray both a capitalist and a socialist system are discussed in the second chapter of my book, Soviet Strategy for Economic Growth, Indiana University Press, Bloomington, 1964.

The Popov and Litoshenko texts which are given below are excerpted from the Balance of 1923/24, the first and still unique complete Balance published by the Russians for any year. The first text shows the theoretical connection between Marx's schema and the Balance; the second, the specific sectoral and product input-output connections. These texts are followed by two critical reviews made at the time, by Professor W. Leontief and by V. G. Groman—reviews which are of historical interest today. The input-output view of the economy is completed by a paper by M. Barengol'ts, the first to suggest the use of input coefficients in Soviet planning. The Preobrazhenskii article presented here was originally meant to form a sequel to his principal work, New Economics, of which large excerpts are given below in Part II. The paper presented in this section is, however, self-contained and attempts to present in a detailed way the relations among the state, "capitalist," and "small producers'" sectors under various assumptions concerning capital formation in the state sector and particularly in its "Department I" (producers' goods).

Finally, the Fel'dman study, included in this section (Part I of his "On the Theory of Growth Rates of National Income"), sets out his own growth model and the core equations relating its variables. The author shows how, in order to achieve given changes in the growth rate of output, "accumulation" (investment) should be allocated either to increase efficiency in use of existing capital or to change the structure of the economy, i.e., the ratios of capital stocks of his sectors u (producers' goods) and p (consumers' goods). The second part of Fel'dman's article is included in Part II below, since he explores there the interdependence between the rates of growth of the key variables of the model set out in Part I.

P. I. Popov

INTRODUCTION TO THE BALANCE OF THE NATIONAL ECONOMY

THE AIM OF THE BALANCE AS A STATISTICAL OPERATION

The word balance means equilibrium, from the Latin bilanx—two scales, that is, equal weight—the French bilan, and the Italian bilancia, scales. When bookkeepers prepare a balance sheet, they equilibrate debit and credit. Applied to a study of the national economy, the balance signifies a statistical operation intended to show how the social economy is reproduced in specific conditions.

The unity of production and distribution represents the system of the national economy, which is the system of equilibrium of social economy: equilibrium of production and distribution in the national economy at large, equilibrium of its branches, of the elements and relations within each branch, and finally, equilibrium of classes and social groups which is established in the spheres of production and distribution. Portraying the relations of equilibrium in statistical magnitudes, the balance classifies the relations of the national economy by production and distribution from the standpoint of equilibrium, and finds a niche for every phenomenon and every fact of the national economy in the system of equilibrium. But insofar as the balance studies the system of production and distribution in the concrete forms of the historic moment, it studies at the same time disturbances in the balance of the production and distribution system, since in money-commodity relations the conditions for imbalance are comprised in the very system of the national economy. The balance, therefore, as a statistical operation, seeks to show how and in what form the equilibrium of the national economy is

---

From "Vvedenie k izucheniiu balansa narodnogo khoziaistva," in P. I. Popov, ed., Balans narodnogo khoziaistva Soiuza SSR 1923/24 goda (Balance of the national economy of the USSR 1923/24), Trudy Tsentral'nogo Statisticheskogo Upravleniia (Works of the Central Statistical Administration), Vol. XXIX (Moscow, 1926), pp. 1-37.

achieved or disturbed in any given year in the process of production and distribution, and how the economic relations of various types of economic enterprises and classes of society are established when a given system of production and distribution obtains.

Consequently, the balance offers an approach to the disclosure of the laws of production and realization of a specific enterprise's products and, therefore, to an understanding of the mutual relations which are established, through production and distribution, among individual branches of the national economy and among classes. At the same time it furnishes the key to the class policy which the proletariat should pursue and an insight into the class policy which the other classes follow and are bound to follow.

The balance of the national economy as a statistical operation, then, is a scheme for studying society at a given historical moment—a system in which all market relations are jettisoned and production-and-distribution relations emerge in their pristine form, and one which reveals the social functions performed in the national economy by individual enterprises which prima facie are in no way interconnected.

The balance of the national economy is not yet a theory, that is, not a total conceptual system which exhaustively explains the processes of a concrete national economy, nor does it disclose all the laws of the given society's movement. The balance provides the material for a theory, for in analyzing statistical evidence it shows how the annual output of the Soviet economy, plus imports, plus reserves, is actually realized and distributed among the branches of the national economy and the classes of society in any given year, through a system of exchange and planned regulation.

Since the balance resolves problems which are associated with the system of production and distribution, the purposes of the balance as a statistical exercise are interrelated with problems of theoretical political economy.

THEORETICAL FOUNDATIONS OF THE BALANCE: QUESNAY AND MARX

The search for the theoretical premises of the national economic balance as a statistical operation brings us to political economy, which investigates the relations of production and,

therefore, the relations which are established on the basis of distribution.

"Whatever the social form of the process of production may be, this process must be continuous, or must periodically traverse all the same stages anew. Just as society cannot cease to consume, so it cannot cease to produce. Regarded, therefore, in terms of its incessancy and the perennial flow of its renewal, every social process of production is at the same time a process of reproduction." (K. Marx, Capital, Vol. I, Popov Publishing House, p. 470.)

The continuity of the process of reproduction presumes a definite relationship, a determinate balance, of the production and distribution of the social national product.

In the second volume of Capital Marx proved with telling cogency that in the capitalist society taken in the abstract the system for distributing the yearly national product is so organized as to encompass both simple reproduction, i.e., reproduction on the same scale as in the preceding year, and expanded reproduction, i.e., production on a larger scale. His arguments are founded on the assumption that the components of and the system of distribution itself and the classes of society are conditioned by and stem from the system of production and its social relations.

In his analysis of the system of reproduction, simple and expanded alike, Marx proceeds from a breakdown of the total social product into two major subdivisions—producer goods (I) and consumer goods (II)—and from the assumption that society at large comprises two classes—capitalists and workers.

In the process of production and distribution, categories I and II enter into definite relations and the results of production—the yearly product—are so distributed that the productive process takes place smoothly and without halt or interruption, to the extent that capitalist relations allow of this.

In his analysis of the way in which the annual social product is reproduced and distributed, Marx provided all the basic prerequisites for computing the balance of a specific national economy.

As he presents it, Marx's scheme for the distribution of the two main categories of the yearly national product—(a) producer goods and (b) means of subsistence—among the classes of society and branches of production, in effect contains the methodological premises for preparing the balance of a specific national economy. Actually, what Marx did was to uncover the

theoretical laws by which capitalist society in the abstract functions and show the mechanism by which products move from one branch and class to another. However, in throwing light on the laws by which capitalist society operates, Marx at the same time disclosed the laws by which the social economy of the nation functions, since whatever the "social form of the process of production may be," the process must be continuous, that is, must take place without interruption, and this continuity of production presumes rigorously defined correlations between the output of producer goods and the output of means of subsistence, the two main categories of national economic production; that is, it presupposes a definite system of distribution. The methodological leads which Marx provides in his analysis of capitalist society in a pure form can also be put to maximal use in solving theoretically the problems of reproduction in socialist society in a pure form and, to an even greater extent, the problems of the reproduction of the national economy in the epoch of transition.

But if Marx clearly and exhaustively demonstrated the reproductive mechanism of capitalist society in the abstract, it was Quesnay, at the dawn of bourgeois economics, who, Marx writes, was first to show in his "Tableau économique" "in a few bold strokes, how the annual production of the national output, of specific value, is distributed through the processes of exchange in such fashion that its simple reproduction is possible, i.e., reproduction on the same scale—all other things being equal."...

Quesnay's scheme, however, immediately derived from the fundamentally erroneous proposition of the physiocrats, to wit, that surplus value is created solely in agriculture. Inasmuch as the physiocratic doctrine made way for other economic systems of study, focused on a capitalist society in which industry was the foundation, this "brilliant essay," as Marx termed it, remained no more than a first, brilliant try. Marx was the first to show the full significance of Quesnay's endeavors and to present the elaborated system of reproduction and distribution in capitalist society.

Quesnay's scheme was an attempt "to present the entire process of capitalist production as a process of reproduction, distribution being merely a form of this process of reproduction, and monetary circulation an aspect of the distribution of capital. This was also an attempt to consider from the standpoint of the process of reproduction the origin of income, the transformation of capital and income, and the relation between productive and

final consumption; and, from the standpoint of the process of distribution, the interchange between consumers and producers (in reality between capital and income). Finally, it was an attempt to present, given these aspects of the process of reproduction, the interchanges between the two major spheres of productive labor—extractive and processing industry" (K. Marx, Theory of Surplus Value, Vol. I, Part I, pp. 72-73.)

Quesnay's mistakes in political economy were exposed by Marx both in his Theory of Surplus Value, pp. 68-99, and in the second volume of Capital, p. 268 ff., to which we refer those who are interested. We, I reiterate, are interested here in the methodological side only, and this side was manifested vividly in Quesnay's diagrams as well as in Marx's comments.

Marx did not confine himself to criticizing Quesnay's scheme but, in Volume II, unfolded a fully developed system of both simple and expanded reproduction of the economy. With stunning clarity his system bares the laws which guide the processes of reproduction in capitalist society. As we have stated above, Marx's system provides the methodological foundations on which a balance sheet may be drawn for the national economy. For this reason we feel it necessary to expatiate in detail on his system for reproduction. ...

Marx investigates simple reproduction, i.e., production which is reproduced in the identical magnitude and identical dimensions, and expanded reproduction, i.e., production on a scale greater than when the process was initiated.

Simple reproduction can take place only given specific conditions of proportionality among the branches of the national economy. Marx depicts this proportionality as follows.

The country's aggregate output breaks down into two major categories:

I. Production of producers' goods (machines, raw materials, etc.).

II. Production of consumers' goods (food, clothing, housing, etc.)....

In his theoretical study Imperialism and the Accumulation of Capital N. Bukharin gives Marx's schemes for simple and expanded reproduction an algebraic expression.

If constant capital is designated as C, circulating capital as V, and surplus value as M, the value of the annual product equals C + V + M (on the supposition that C wears out completely in the course of a single full production cycle or assuming that C equals only the consumable part of constant capital).

The total social product, and social production as a whole, broken down into the two categories, is expressed by the following formulas:

I. (output of means of production) $C_1 + V_1 + M_1$

II. (output of means of subsistence) $C_2 + V_2 + M_2$.

In the case of simple reproduction, assuming, that is, that M is consumed by the capitalists in its entirety and that reproduction proceeds properly, that is, the mutual exchange of products between I and II, we shall have the equations:

(1) $C_1 + V_1 + M_1 = C_1 + C_2$

(2) $C_2 + V_2 + M_2 = V_1 + V_2 + M_1 + M_2$

(3) $C_2 = V_1 + M_1$.

If we deduct C_1 from both parts of the first equation and the sum of $(V_2 + M_2)$ from the second equation, we obtain the third equation $C_2 = V_1 + M_1$.

"This," says N. Bukharin, "is what constitutes the prerequisite for the smooth course of simple reproduction: the sum of income in the first category must be equal to constant capital in the second category."

In expanded reproduction the process is more complicated and proceeds, says N. Bukharin, using Marx's characterization, "not in a circle but in a spiral."

The following formulas will obtain in expanded reproduction. Assuming that $M_1 = A_1$ (the part going for the capitalists' personal consumption) + B_1 (the part of surplus value which is turned into capital), M_2 may be equated to $A_2 + B_2$. Assuming that $B_1 = B_1c$ (the part subject to accumulation as part of constant capital) + B_1v (the part subject to accumulation as part of variable capital) B_2 may be equated to $B_2c + B_2v$. The general formula for the product of both categories will then look as follows:

			B_1
I.	$C_1 + V_1 + A_1$	+	$B_1c + B_1v$
II.	$C_2 + V_2 + A_2$	+	$B_2c + B_2v$
			B_2

.

The quadrangle ropes off the problem of simple reproduction, and the exchange of products between I and II consequently takes place according to the formula which was given for simple reproduction. As for those parts of the product which stand outside the quadrangle, it must be kept in mind that "since we are confronting the problem of expanded reproduction, besides the factors of equilibrium requisite from the standpoint of simple reproduction, the breakdown of the surplus value subject to accumulation in categories I and II must occur in such a proportion that the additional variable capital of category I equals the additional constant capital of category II." (N. Bukharin, Imperialism and the Accumulation of Capital, p. 8.)

The formulas for expanded reproduction may be reduced to three equations, which, in turn, may be reduced to one.

(1) The total product of category I must equal the sum of constant capital in both categories. We have, therefore:

The sum of means of production (total annual product of category I)	$=$	C_1	$+$	$V_1 + A_1$	$+ B_1c +$	B_1v
The sum of all constant capital	$=$	C_1	$+$	C_2	$+ B_1c +$	B_2c

The magnitudes included in quadrangles—the first the prerequisite for simple reproduction, the second the prerequisite for expanded reproduction—are equal. The equations reduce to the following expression:

$$V_1 + A_1 + B_1v = C_2 + B_2c$$

(2) The product of category II, that is, the product going for personal consumption, should equal the sum of all income, including additional capital as well as variable capital which is transformed into income from additional work.

The sum of all consumer goods (total product of category II)	$=$	C_2	$+ V_2 + A_2 +$	B_2c	$+ B_2v$	
The sum of all income (wages and individually consumed surplus value)	$=$	$V_1 + A_1$	$+ V_2 + A_2 +$	B_1v	$+ B_2v.$	

The aforementioned equation contained in the quadrangle comes down to the following: $C_2 + B_2c = V_1 + A_1 + B_1v$, which

may be expressed in this fashion: $(V_1 + B_1v + A_1) = (C_2 + B_2c)$, that is, says Bukharin, "All the new variable capital of category I and the portion of that same category's surplus value which is subject to nonproductive consumption should equal the new constant capital of the second category."

Bukharin observes that the result of expanded reproduction is that "society's constant capital grows; the workers' consumption grows; the consumption of the capitalists grows.... Coupled with the growth of production is the growth of the market for that production: the market for producer goods is augmented and there is also larger consumer demand (since, in absolute figures, the consumption of both capitalists and workers rises). In other words, the possibility is here offered of equilibrium among the various parts of the aggregate social production on the one hand, and between production and consumption on the other. Moreover, equilibrium between production and consumption is itself conditioned by productive equilibrium, that is, equilibrium between the various parts of functioning capital and its various branches." (N. Bukharin, Imperialism and the Accumulation of Capital, p. 11.)

In arriving at an algebraic solution of the problem of simple and expanded reproduction N. Bukharin, like Marx, proceeded from a number of simplifying premises: a capitalism characterized by two classes, by the absence of foreign markets, by the equality of value and price, etc.

N. Bukharin emphasizes—and this is of extreme importance—that expanded reproduction culminates not only in the growth of producers' goods, but of means of subsistence as well—that is, the consumption of the workers likewise rises. The reason why this point is significant is that economists like Tugan-Baranovsky, forgetting that capitalist production is social production as well, advanced the thesis that capitalist production could expand exclusively through the expansion of means of production, that "given proportional distribution of national output the supply of and demand for commodities will always balance, however total national income may change and however popular consumption may be trimmed." (Cited from A. Finn-Yenotayevsky's book Capitalism in Russia, Vol. I, Moscow, 1925, p. 23.)

Production can itself expand only through the satisfaction of social wants, and not independently of them. This is Tugan-Baranovsky's mistake.

In their solutions of the problem of reproduction Quesnay and Marx in effect posed the question of what conditions are required for the process of reproduction, and therefore of the process of

distribution, to take place. At the same time, however, both of them attempted a purely theoretical solution of the problem as an abstraction from the concrete conditions in which the process of production occurs. ...

To the extent that the historically given concrete form of production and distribution in capitalist society conceals the forms of social economy, to that extent the laws by which capitalist society effects reproduction are, to a certain extent, also the laws governing the reproduction of social economy in general. Marx's schemes for reproduction are doubtless applicable in some measure to an understanding of the reproduction mechanism of a social economy constructed on socialist foundations, but there is no question at all that his schemes do apply to an analysis of the productive relations of Soviet society, which is a transitional form as society moves from a capitalist to a socialist economy. In analyzing Soviet economy, therefore, we can without fear of error and with absolute confidence make use of Marx's theoretical analysis of the social economy, the historical form of which is capitalist production. And we can be absolutely confident in basing our efforts on the methodological principles to be found in the schemes of Quesnay and, especially, of Marx, who obviated all of Quesnay's theoretical faults and brought to light the laws of reproduction in their pure form and in rigorously scientific terms.

In Quesnay's interpretation, as we have seen, distribution is not economically isolated from production; on the contrary, the very reason why the particular acts of distribution occur is that they correspond to acts of production, that is, the distribution system derives from productive relations. Each share of the monetary funds shifting from one class to another can be realized to the extent to which it is convertible into tools and means of production or means of subsistence. The system of distribution arises out of the social relations of production. To the extent to which social production develops, consequently, social consumption is achieved through a specific form of distribution. ...

In putting together his scheme Quesnay started from a definite division of social labor, as a result of which there existed a separate agriculture and a separate industry with the corresponding property relations and with social classes. The entire economic table is constructed on the idea that through exchange dealings individual economies perform the social functions of a national economy, functions deriving from the fact that there is

a division of labor, and that the individual economies make up a social economy rather than the sum of uncoordinated, socially unconnected economies. In the national economy production and distribution are two facets of one and the same social system; before products can be consumed they must first pass through a number of exchange transactions, the proportions of product distribution between classes being determined by productive relations and not stemming from the relations of exchange.

Marx, developing Quesnay's idea but discarding its basic error, viz., that surplus value is created solely in agriculture, offered a rigorously scientific and theoretically validated system of simple and expanded reproduction and hence a system of distribution in capitalist society. At the same time, since capitalist production is merely an historic form of social production, he identified the cardinal premises for the system of reproduction of social economy in general.

In Marx's scheme the system of reproduction is constructed on exchange between the two major categories—production of producers' goods and production of means of subsistence. Thanks to its schematism his system conveyed a vivid and penetrating disclosure of the laws governing the process of reproduction. Production can repeat itself to the extent to which exchange between means of production and means of subsistence is effected continuously and, most important, in explicit proportions, the extent to which the restoration of consumed means of production is continuously effected by the individual branches of the national economy. Equilibrium between production and consumption constitutes the key prerequisite for the reproduction of the social economy. But under capitalism this equilibrium, essential for the social economy, is sharply impaired. The problem of equilibrium is therefore the most important problem of economics. N. I. Bukharin is right when he affirms: "It is the discovery of the law of this equilibrium which is the chief problem of theoretical economics." (N. Bukharin, Economics of the Transition Period, p. 128.) Referring to Marx's approach to this question, Bukharin observes: "Marx always formulates the problem this way: equilibrium exists—how this is possible. Equilibrium is disturbed—how it is restored." (N. Bukharin, Economics of the Transition Period, p. 129.)

When, guided by Marx's scheme, we take stock of the statistical materials of the balance, we must first of all find out what are the relationships owing to which the reproduction of the Soviet economy takes place at the given moment in history. We

must find out, that is, the form and system assumed by the distribution of the annual product among the separate branches of the national economy and classes of society; we must find out the proportions in which the means of production and means of subsistence were produced in the course of the operational year and thereby ascertain the proportionality of the individual branches of the national economy. We must then discover which branches of the economy and which classes of the population were the recipients and consumers of what was distributed in the national economy in the course of the year, thereby elucidating the relationships of equilibrium between production and consumption and, at the same time, the role which ties with the world economy, played in the establishment of equilibrium. These are the demands which we must make of the balance on the basis of an analysis of Quesnay's, and especially Marx's, schemes....

CONCLUSIONS

At any given moment the national economy in any one of its social forms (capitalist, socialist, or transitional to socialism) is a social economy which is ultimately based on a definite equilibrium (stable or otherwise depending on the form of the economy and the conjuncture of the moment) of branches producing capital goods (machines, buildings, structures, raw materials, fuel) and branches producing means of subsistence (bread, meat, ..., footwear, fabrics, etc.). This equilibrium, furthermore, comes about as a result of the exchange of the products of one branch for the products of another (distribution through exchange and market methods in capitalist society, through a distribution plan in socialist society, and through both of these in a society in transition). ...

Any social economy, regardless of the historical system of which it is a part, may be classified at any given moment, according to the way production and accumulation are organized, as belonging to one of three economic types—decadent, static, or developing. The first type exists when the national economy as a whole is not expanding but contracting or when production, though not contracting, functions only because the country's basic capital stock is being consumed (there are no deductions for the depreciation fund, no capital repairs are carried out, forests are rapaciously exploited, the riches of the soil are plundered, etc.). The second type is the economy in which pro-

duction is reproduced in the same dimensions, that is, neither expands nor contracts. The third type of economy, finally, is one in which production is expanding. In the first type not only is accumulation absent, and the conversion of that accumulation into capital, but capital is consumed in its constant form. In the second, although accumulation is absent, basic capital is not consumed, the depreciation fund is normally renewed, and repairs are made opportunely. Finally, in the third type there is accumulation, and the more intensive it is the more intensively is production expanded. ...

It is only in Marx's theory, in his system of reproduction, that we find a general methodological basis for drawing up the balance of the national economy.

The conclusions which we draw from our analysis of the reproduction and distribution schemes of Quesnay and, principally, Marx, an analysis of the system of socialist economy proffered by Ballod and his followers, and the methodological premises by which we must be guided in compiling the balance of the national economy, are the following.

(1) The study of the process of reproduction requires that the branches of the national economy be systematized and broken down, for purposes of investigation, in such a way that the country's production is divided into two major subdivisions: (a) output of producers' goods and (b) output of consumers' goods. Since, however, the balance of the national economy is being computed for a concrete economy, the Soviet, the scheme of the balance will differ from the one Marx gives. It differs mainly in that we are studying production as well as the system of distribution in the forms which these have assumed in reality. It is only theoretically that we can imagine the existence of producing units which supply only means of production and those which turn out solely means of subsistence; in fact, many products such as coal, grain, kerosene, sugar, etc., are not designated as being for production or consumption purposes until they reach the stage of use. It is impossible, therefore, to offer a grouping of producing units according to Marx's scheme in its pure form.

Furthermore, at this stage in computing the first balance, we are unable to offer a grouping of consumers which would assign them to one social subdivision or another, that is, link them with the branches manufacturing means of production or with those producing means of subsistence. Instead, we trace the consumption of products not only by each branch and even group of producing units but, in the case of certain products, trace it in

the form of productive consumption as well as personal consumption by the principal classes of consumers. The nature of the materials precludes our isolating the consumption of purely bourgeois classes. We also had no opportunity at this stage of study (of the first Balance) to isolate and define the dimensions of surplus value. When it was in process of construction the Balance did not and could not pose the problem on this plane. We were operating with gross output and its distribution among branches and classes. We arrived at net income by ascertaining national income but could not, of course, elaborately investigate the manner in which net income is used. This question and a number of others remain to be considered when future Balances are compiled.

(2) Since specific conditions of production for a given historical moment are under investigation (the historical moment being the Soviet economy), products and branches must be systematized and classified in maximum detail and, so far as possible, this systematization and classification must deal with the ultimate product or group of products of homogeneous significance for production or consumption. The role which each product plays in social production—whether it acts, that is, as a means or production or a means of subsistence—must be ascertained.

(3) In a theoretical analysis of reproduction in an abstract society it is practicable and even essential to proceed from generic and specific groups of economic phenomena and operate with the symbols of the social productive relations of the abstract economy; in elaborating and probing the statistical data pertaining to a concrete social economy (the Soviet), however, to the end of disclosing the relationships and laws of that economy's structure, it is necessary that the synthesis be reached only through an analysis of phenomena and facts in their concrete forms, in the concrete conditions of time and space.

(4) Since production and distribution constitute an integral entity, are two facets of one and the same social whole, analysis of concrete and theoretical economy alike should proceed in two directions—first, to reveal the social relationships in the system of reproduction and, second, to do so in the system of distribution; in the third place, it must establish the interconnection between these two systems. It follows from this that in arriving at and clarifying the amount produced by any branch of the national economy we must at the same time bring up and study the problem of consumption of the product, that is, the system of its realization and distribution. Since it is a concrete economy

which is undergoing analysis, all those groups and classes of the population which play the roles of producer and consumer of the social product are the object of the inquiry, both in the sphere of production and in that of distribution. Again, it is not the abstract product of social production which is involved, but the products of the given Soviet economy in their concrete forms—grain, meat, fabrics, metal ware, machines, tools, etc.

(5-6) Taking the principles of Marx's theoretical analysis as our premise, when we take stock of the Soviet economy we must establish the fact that this economy is an historical form of social economy, the activity of which is ultimately aimed at gratifying the needs of the population living in it.

(7) In analyzing reproduction in an abstract capitalist society it was feasible and essential to study the consumption (distribution) relationship between the two groups of the social subdivision—means of production and means of consumption—without breaking them down into groups and subgroups depending on the nature of the products. When, on the other hand, a concrete economy (the Soviet) is analyzed, the exchange relationships must be ascertained in their detailed subdivision and the exchange of individual products must be established. In the balance every branch of the economy and every product must have its definite place in production and the manner of its realization must be indicated, that is, how and with whom it is associated, upon whom it depends, and which specific need it satisfies, economic or personal.

(8) Since, when a concrete economy (the Soviet) is explored it is the relationships of production and distribution which are studied, these relationships must be studied in their material representation, that is, as the sum of concrete products in their concrete movement from producer to consumer. In an analysis of the Soviet and a theoretical economy alike money must play the role of yardstick, a means of reducing the assorted fruits of social production to a common denominator; the role of payment media in circulation, of credit, is held in abeyance. The balance, therefore, studies the relationship of production and distribution of products in kind, lest a monetary evaluation of products obscure (which, to a certain extent, it does) the relationships which are established in the production and consumption of products as a material process.

(9) Since the balance studies the relationships of production and distribution in material terms, it must consider the social economy (the Soviet economy) as a kind of natural economy,

measuring production as the sum of materials and things produced in the course of the year and exploring the distribution of products in their material expression.

By reason of the fact, however, that production consists of a quantity of objects of varying material form, it was altogether impossible to analyze production and distribution relationships by composite groups and aggregates, or to make comparisons. It was therefore essential that all products, diversified in their material form, be reduced to comparable units. With monetary-and-commodity relations prevailing, the way to reduce objects of diversified material substance to such comparable units was to place a money value on them....

L. N. Litoshenko

METHODS OF CONSTRUCTING A NATIONAL ECONOMIC BALANCE

I

The concept of a national economic balance is closely linked with that of the national economy as a unified economic process. The balance must give a diagram of this economic process.

In general, a national economic balance must be conceived of as a statistical summary of the economic activity of the millions of economic units and the combinations of these units which form the national economic body.

As is apparent from this definition, the conception of a national economic balance sheet is not the same as the conception of a balance sheet for an individual enterprise.

A balance sheet is usually the final account of an enterprise which presents the balances of various accounts for various branches of the enterprise. Each of these branches gives something to or receives something from other branches or other enterprises. As a result of the comparison of all the credit and debit items for each branch, we can obtain the excess of one over the other. The final balancing of all the individual accounts shows whether an enterprise operates at a profit or a loss. It must be noted that the enterprise as a whole does not figure in any of these accounts either as creditor or debtor. Only under this condition is it possible to construct a balance sheet of an enterprise without risking double counting of individual items.

These elementary propositions of accounting do not apply to a national economic balance sheet. Of course, the national economy too could be subjected to accounting analysis by breaking it down into a huge number of individual accounts and introducing into the account all the nonmaterial values which play an important role in the relations of each sector of the economy to all the other sectors. Such an accounting balance would, however,

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"Metodika sostavleniia narodno-khoziaistvennogo balansa," in P. I. Popov, ed., Balans narodnogo khoziaistva Soiuza SSR 1923/24 goda (Moscow, 1926), pp. 56-70, Part I.

necessitate the conventional construction of many individual accounts. In the account for the workers, for instance, we should have to decide whether man-hours and wages are of equal value and, therefore, whether for this account credit and debit must be considered to be balanced or whether one of them exceeds the other. Then, all the assumptions made in constructing individual accounts would pass into the general national economic account. Moreover, the national economic balance sheet would be like the balance sheet of an enterprise and would purport to give the net profits of the national economy.

This, however, would be pushing the concept of unity in the national economic process too far. A private enterprise exists for the sake of profit; the accounts of its various branches must show how profitable they are individually while the general balance sheet must show whether the whole enterprise is operating at a profit or a loss. National economic profitability cannot be measured by adding the imaginary balance of artificially broken down sectors and forms of economic activity. In the accounts of each group of the population, the volume of the satisfied needs would be concealed by the balancing parts of credit and debit whereas the general national economic balance would include only a more or less imaginary, unreal value—the balance of credit and debit.

The desire to adhere to reality leads us to give up "profitability" of any sort as a criterion of the national economy. This unreasonable concept is replaced by a realistic presentation of the production process, which is the production and distribution of physical items in one single national economic process. This limits considerably our conception of a national economic account. Now it will not aim at determining the "profitability" of the national economy. Its problem is much more limited: it does not pretend to provide anything more than a conscientious picture, as complete as possible, of the process of production and distribution of physical commodities.

The balance sheet covers the national economy as a whole, taking into account the objective results of the economic activity of the individual economic atoms insofar as they are expressed in the production of a determined volume of physical goods and in the simultaneous distribution of these goods among various categories of consumers. Here, the balance is conceived of as the equality of credit and debit items. The reserves on hand at the beginning of the year are considered as credit, while the funds remaining at the end of the year are entered into the debit column.

II

The turnover record[1] of the physical items produced and distributed in the national economy during the fiscal year represents the basic part of the national economic balance for 1923/24 constructed by the Central Statistical Administration. To this are added balance sheets for the fixed-capital assets of the national economy and the fuel and power balance for the economic year.

The fixed capital balance sheets give the composition and the costs of all the basic means of production at the country's disposal at the beginning and at the end of the economic period under study. This includes the buildings and equipment of industrial enterprises, machinery, livestock and the machinery and equipment of agriculture, all sorts of housing, national buildings, municipal services, transportation, installations and equipment, and finally the cost of the land in general including the cost of the land used for economic pursuits.

As can be seen from this enumeration, in the composition of the country's capital we have included types of assets that are not used directly in the production process. But housing, civic buildings, and municipal services indirectly contribute to the economic life and are a prerequisite for the successful economic activity of the population. Their cost must be added to the cost of the assets that are more obviously a part of the production process. The capital balance sheets in the national economic account must show not only the sum of producer goods used directly in producing the stream of physical items during the fiscal year, but also the volume of the durables which were previously created and accumulated through the prior efforts of the population and which exist at the given moment. Here the conception of capital comes close to the conception of goods, excluding only household goods because these cannot be taken into account and are destined exclusively for private use.

The capital balance sheets try not only to determine the state of the capital at a given moment but also to show the changes undergone in a given interval of time. These changes may be due, on the one hand, to the wear and tear or the amortization of the assets or of the capital and, on the other, to the addition of new assets or capital created during that period. The first of these

1. "Turnover record," translation used throughout for oborotnaya vedomost'.—Ed.

capital turnover items has a minus sign, the second a plus sign. Balancing these items and comparing them with the capital assets at the beginning of the year, we can see whether in the course of the year there has been an accumulation of assets and of capital or whether, on the contrary, more products have been consumed and exported than newly created within that period. Thus the capital balance sheets can be used, on the one hand, to determine the absolute amount and composition of the assets and capital with which the society works and, on the other, to show whether further accumulation has taken place that year or whether the national income and consumption have been balanced at the expense of the old capital reserves.

It must be noted that these balance sheets do not serve any other purpose in the system of national economic accounting. When constructing the balance sheet of an enterprise, the accounting of capital is organically inseparable from the rest of the accounting of the enterprise. Without an account of the movements of capital, it is impossible to determine whether an enterprise has operated that particular year at a loss or at a profit. But the national economic process in the social-organic concept cannot show either a profit or a loss. The capital balance sheets are of interest in themselves and precede the turnover record only because the existence of a reserve of producer goods is a logical prerequisite for the production process. In the sequel, however, in the main tables on the production and distribution of physical commodities, the data on capital are not repeated.

III

The data on the fuel and power balance have a similarly independent place in the system of national economic accounting. Here we want to present as complete as possible an account of the motive power which is at the disposal of the Soviet national economy and which, to some degree or other, has been used in the production process during the fiscal year. In motive power, we must include first of all the reserve of manpower in the section of the population that supplies physical labor for economic processes. Another source of motive power is the draft animals, which are the main source of motive power in agriculture. Finally, the fuel and power balance must include the potential power of all the steam, water, electric, and other prime movers which are counted as part of the country's fixed capital.

As in the case of capital, we determine for each type of power not only the reserves at the beginning of the fiscal year, but also the expenditure in the course of the year on production and the state of the sources of power at the end of the year.

In a private-enterprise balance sheet, of all these calculations, the most important would be the amount of power expended, which, expressed in money terms, would be a major debit item in the production expenditure.

The conception of the national economic process, as we have explained, has no category of profits nor does it have a complete record of expenditures, these categories applying only to private enterprise.

Therefore, elements of the fuel and power balance cannot enter into the turnover record of the national economic balance sheet. The fuel and power balance, like capital balance sheets, remains an independent section in the national economic balance sheet, a section showing what reserves of motive power are at the disposal of the national economy and to what extent it has been able to utilize these reserves for production purposes in the course of the fiscal year.

IV

The turnover record, as has been pointed out above, forms the basic part of the national economic balance sheet. It is here that, by balancing the credits and the debits, we obtain the turnover of the physical items reaching the national economy and expended one way or another in the course of the fiscal year.

The turnover record is presented in the form of a table where the stub contains the various sectors of the national economy and the columns show all the debit and credit items.

For the stub, the question arises as to how the individual sectors of the national economy should be subdivided. To take the total output as a whole would limit excessively the practical significance of the balance sheet, which would then show only the total volume of the national economic process and turnover of goods without imparting any information on the share of even the large individual sectors. The opposite extreme would be to represent the process of division of labor in all its actual complexity. However desirable it may seem to follow through on each commodity, this is impossible in practice because of the lack of adequate statistical data both for production and for distribution. A solution has been found in the division of the national economy

into major sectors covering the production of more or less homogeneous products and goods. The balances for certain consumer goods of major importance are presented separately on special lines.

Finally, the stub of the turnover record has been given the following form:

Agriculture

A. Farming and pasturage

1. Grain crops
2. Potatoes
3. Oil-bearing seeds
4. Other seeds
5. Flax
6. Hemp and jute
7. Raw cotton
8. Sugar beets
9. Fodder
10. Fruit and vegetable gardens
11. Fruit orchards and vineyards
12. Wine
13. Tobacco
14. Grass seeds
15. Field and forest hay
16. Straw, chaff, etc.
17. Other products of farming and grass lands

B. Animal husbandry

1. Milk
2. Butter
3. Other dairy products
4. Meat and animal fats
5. Wool
6. Bristle
7. Leather raw material
8. Increment in livestock
9. Fowl (slaughter weight)
10. Eggs
11. Feathers and down
12. Increment in fowl (live weight)
13. Honey
14. Wax
15. Silkworm breeding
16. Other animal farm products

C. Forestry

1. Timber materials
2. Firewood

D. Hunting and fishing

1. Fresh fish and caviar
2. Hides and skins (undressed)

Industry

A. Mining

1. Mining and primary processing of minerals
2. Mineral fuel
3. Other branches of the mining industry

B. Manufacturing

1. Processing of minerals
2. Metal industry
3. Wood-processing
4. Chemical industry
5. Food industry
6. Processing of hard materials of animal origin
7. Textile industry
8. Paper processing
9. Printing
10. Production of physical energy and water supply
11. Art and applied-science supplies

Publishing Industry

Construction

As can be seen from the above listing, the national economy is taken in sufficiently fractioned subdivisions to make it feasible for the balances of individual lines to serve practical as well as scientific purposes. It must, however, be kept in mind that the national economy has been broken down into separate branches on logical rather than formal grounds. Obviously, the independent production of grain or of milk in agriculture does not exist. Similarly in industry, on the one hand, the processing of wood, for instance, encompasses a whole series of industries which are united in various noninterconnected industrial and trading organizations; while, on the other hand, there are frequent instances when one single combination turns out products which belong to various groups of logically classified industries. For practical purposes, especially where the study of markets for state industry is concerned, it is important in grouping the industries to keep in mind the division that exists in practice in the system of the state trusts and syndicates. However, if we adhered to this classification in the horizontal line we should not always be able to follow the destiny of the product of the group of trusts under study in the stub, where, in production and distribution, the products of national and small-scale private industry are inseparably

fused. Insurmountable difficulties would also arise regarding the distribution of the product of individual organizations in cases where this product is of a mixed nature and where some of its component parts have to be supplemented by manufacturing or by foreign imports corresponding to other groups of industrial combines.

In drawing up a physical credit-debit balance, it is necessary to adhere strictly to the homogeneity and the uniqueness of the product entered into that column of the balance. Only in this way can we guarantee that we have not counted a product twice or failed to count it at all. The construction of the turnover record has been subjected to this principle, and this is why the grouping of the national economic industries is based on logical rather than formal premises.

For the same reason, in the main balance tables, the national economy is not divided according to the nature of the enterprises. However important it may be to differentiate between the economic activities of state, cooperative, and private enterprises, their products still melt together and become inseparable during the distribution process and it remains impossible to follow through on each of the products in all the sections of the turnover record. Therefore, within the limits of the turnover record all the forms of production are viewed as fused and are classified only according to logic. In special tables devoted to a more detailed description of a manufacturing process, this process is broken down according to the nature of the enterprises and light is shed upon the proportions in which the individual and communal economies have participated in the process.

A special explanation is needed on the manner in which construction is included in the turnover record.

Construction in this case is logically conceived of as a component part of the national economic labor-division process, like any other branch of manufacturing, be it of producer or consumer goods. Construction must include all forms of housing and industrial buildings regardless of who is carrying out the construction—the state, the cooperatives, a private organization, or individual citizens. The value of the projects completed in the course of the year is considered as the product of construction. In the expenditure column of the turnover record will be entered the categories of users to which the construction projects have been allotted.

It is somewhat different with transportation. Transportation could be viewed as an independent branch of the national econo-

my and, on an independent horizontal line, followed through as "gross value of output," considering as such the gross cost of all the transportation services, as well as the distribution of this "output" among the various categories of users. However, giving transportation a separate line causes insurmountable obstacles. First, one would need to have the cost of all services, not only of mechanical but also of the total land transportation; second, one should seek the nonexistent distribution coefficients of the gross value of transportation services throughout the entire list of expenditure items of the turnover record; and third and finally, by introducing a horizontal line for transportation, one would be forced, artificially, to take the cost of transportation out of the consumer price for all the physical goods whose turnover appears in all the other horizontal lines of the turnover record. In order to avoid artificial constructions of this sort, transportation has not been given a special line in the list of sectors of the national economy in the turnover record. Instead, when the expenditure items were determined, real market prices were taken for each group of physical goods. These prices paid by each category of consumers included, by this very fact, the costs of transportation to the place of consumption of the product. The total cost of the transportation services, its "total value of product," has thus been included in the column on the difference between the entries evaluated in costs of production and the prices paid by the consumers. From the total sum of this column for all the branches of production, by using actual data on the value of the services of mechanical transportation and by an approximate estimate of the value of other means of land transport, it is possible to calculate the total cost of the transportation services for all branches of the national economy.

Another important branch of the national economy which, it would seem, should be handled in the same way is trade. Most of those who worked on constructing the balance thought that the trade addition to the production costs is in principle of a different nature from the cost of transportation services. While transportation, in moving the products, creates a new value, trade merely derives its profits from the cost of the goods at the place of their consumption. Therefore trade cannot be considered as one of the productive branches of the national economy, and it has a place only in a vertical column of the turnover record. This does not prevent us from including the trade income together with the value of the transportation services and the net value of output of other branches in the total sum of the national income.

But the calculation of the latter is already a derivative accounting operation to which are subjected the individual items entered in the horizontal lines and in the vertical columns of the turnover record. In a balance sheet of physical items trade has no horizontal line, since the balance is based on a logical classification of the economic branches which represent the productive activities of the population.

In order to make a complete examination of the turnover record, we must give some further explanation of the way in which the total product of the national economy has been broken down into groups of goods according to their destination, at the same time as the products have been classified according to the branches of production. All the actual variety of products of agriculture can be reduced to four groups according to the purpose they serve. Some products (a), both durable and nondurable, are produced for direct consumption by the people. Others are producer goods for the production of direct consumer goods. This vast group of goods can be subdivided into three subgroups: (b) raw materials, (c) fuel, and (d) tools of production, according to their function in the production process. In classifying all goods in the above-mentioned four categories, we come across some natural difficulties which are due to the fact that the same item can, according to circumstances, be used as a producer or as a consumer good. Bread can be consumed by humans or be used as raw material for feeding pigs; a pail can be a household utensil or it can be a tool of production on a dairy farm; crude petroleum can be used either as fuel or as a raw material in the refining industries. Many products change their function according to whether they are used for production or for consumption. In practice, a part of the bulk of these products goes to one destination, another part to the other. It is impossible to reflect this process in the turnover record completely. The destination of the goods that can be used either way is determined in the process of the market turnover. At the moment the good is being produced, its destination is not known. A yard of calico can go directly to the peasant or to the factory for ready-made clothing. If we had tried to break down all the products according to their actual destination in the fiscal year into categories a, b, c, and d, we should be reversing the problem of balance. In that case, instead of starting from the production and then seeking the distribution channels of the goods produced, we should have to do the reverse and start from the distribution, and, having described it in detail, determine the proportion in which the production

branch is broken down into the product categories a, b, c, and d. Without even mentioning the fact that we should thus find exactly the same products in different groups, we should stumble upon insurmountable difficulties in trying to divide the whole of exports into categories. And then, when the proportions between a, b, c, and d were finally found, they would, within the limits of each branch as well as for the whole national economy, refer only to the year under study and be true only for the given economic situation.

For this reason, another basis has been used for the classification of goods according to their destination as consumer or producer goods. The categories a, b, c, and d must show the general type of production of a country. The ultimate aim of each country, as we have said earlier, is the satisfaction of the needs of the population by the means of commodities suitable for personal consumption. But in actual fact the total quantity of commodities consumed can be obtained in different ways. All of it can be produced by the national economy by expending in the course of the production process a corresponding quantity of values—raw materials, fuel, means of production; or it can be imported from abroad; both ways can be used. What must be revealed by the division of all the commodities circulating in the national economy into categories a, b, c, and d, in combination with the corresponding credit-debit items in the vertical columns of the turnover record, is the way the national economy is constructed in this respect: what quantity of direct consumer goods it produces; how much raw materials, fuel, tools of production; what use it makes of each of these groups of products, whether its production is a self-regulating one in which the quantity of consumer goods determines the quantity or production of other commodities; whether, on the contrary, it specializes in the production of one of the consumer goods; and what, in this case, it does with that goods' surplus.

All these questions assume that the products have some sort of permanent classification rather than being scattered haphazardly through various groups according to the conditions prevailing in a particular year. This is why a fixed nomenclature for the products has been laid down as a foundation for the breakdown of the products into categories a, b, c, and d.

The category (consumer goods, raw materials, fuel, or tools of production) to which each product belongs is determined beforehand, regardless of the actual destination of the product in the current year. Products that can be used in one category or

another are put into the most important one. Thus, finished fabrics belong entirely to the category of consumer goods, grain is considered a raw material, oil is classified as fuel, etc. Then, throughout all the credit-debit items, each product figures only on the line (a, b, c, or d) to which it belongs. It may happen that consumer goods will be spent partly in production processes and, on the other hand, that fuel will figure in personal consumption. These occurrences are not as peculiar as they may seem at first glance. The main purpose of the classification of products into the categories a, b, c, and d, as we pointed out before, is to show the structure of the national product and follow through on what happens to each one of its parts. England mostly produces tools of production, which she exports. We specialize in consumer goods and raw materials. A portion of the raw material is exported abroad while the tools of production we produce serve the internal demands of our national economy exclusively. The classification under study is an effort to detect such characteristic features of the Soviet national economy. It is clear that to achieve this aim it must follow the principle that we have described above.

However, the classification of the products into categories a, b, c, and d on the basis of their actual destination is not completely eliminated from the questions studied in this paper. The independent interest of this type of classification lies in the fact that it shows in what relations were, in the accounting year, on the one hand the mass of products expended in the process of production under the form of raw materials, fuel, and capital goods, and on the other hand the mass of consumers' goods produced, with the help of these expenditures. Besides answering the extremely important question of the level of material expenditures, this breakdown of the annual production, when examined jointly with the capital balance sheets, will show precisely in which industries the accumulation of capital takes place.

It goes without saying that the breakdown of products into goods for personal consumption (it would be more correct to speak of finished products), raw materials, fuel, and capital goods on the basis of actual destination can be done only in tables of production and of industrial consumption. It is impossible to make such a breakdown for all the credit-debit items throughout the turnover record, since it has been made from the viewpoint of the role of the products in the production process. If a product is also expended, say, by being exported, for satisfying the needs of the population, for trade, etc., we cannot say whether it is expended at its destination as a raw material, a fuel, or a tool

of production, because the classification of destination cannot be fully applied to the enumerated debit items.

V

Turning now to an examination of the vertical columns of the turnover record, we shall first dwell on its credit items. In each group of products entered in the individual lines of the stub, these items comprise all the sources from which a given quantity of a product could pass into the national economic circulation.

In the first place, the source of most of these products is the domestic production of the current year. This credit item in the balance receives the closest attention and much effort has been spent in determining the amount of production in the individual branches of the national economy.

The turnover record requires information on the size of the gross product of each economic sector because it is the gross product of each sector that enters into the course of the distribution process, whether this is haphazard or planned, and it is the gross product which is distributed among the individual debit items of the turnover record.

We should not be taken aback by the fact that in the summing up of the lines in the stub we have to add cotton, cotton yarn, and then fabrics made of cotton yarn; iron ore, metal, metal products, as well as the products of the machine-building industry manufactured from the semifinished products of the same metal. In reality, this is the way it happens. The production process is uninterrupted: there is a stream of raw materials coming from the entrails of the earth, from forests and bodies of water and arriving at the places where they are processed; then the semifinished product is moved from one industrial establishment to another, the finished product being placed at the disposal of the consumer. Each quantity of raw material passes successively through all the phases of production and is never in two places simultaneously. But as soon as it moves on, it is replaced by exactly the same amount of the same material in the preceding phase of its processing.

If we could imagine an instantaneous photograph of the national economy, we should find all the compartments of this labor division process filled by absolutely real quantities of material in various stages of processing. If, instead of an instantaneous photograph, we take a section of time and add up the total amount

of raw material mined in that period, then the total amount of semifinished products produced by the industries, and, finally, the total quantity of finished products put at the disposal of the consumers during this same time, we are not distorting the real picture. We simply find by this method the sum of the heterogeneous values which in actual fact have turned over within the year in the national economy and which form the real basis for economic activity and economic interdependence of all the economic units of which the national economy is composed. And, since the turnover record of the balance sheet must show the circulation in the national economy of physical goods within a given period, the gross product of each branch of the national economy must figure in the income section of the turnover record.

It must be noted here that the combined analysis of production that was adopted in the balance sheet for industrial products is abandoned and separate account is taken of the amount of production in each group—the large-scale industry and the small-scale artisan and handicraft industries. The reason for this division of industrial production is, above all, the fact that different methods have been used in giving a statistical account of "census industry" (using more than 16 workers) and of non-census industry, with different degrees of reliability. Whereas for large-scale industry there is direct data from a comprehensive and uninterrupted follow-up, for small-scale industry we must base ourselves on pre-1914 norms of labor productivity and on later data for the number of artisans and handicraftsmen of various specialties. Besides these technical considerations, the division of the product into that of large- and small-scale industry is also useful because it immediately brings out one of the most essential features of the Soviet economy, the shares of the state and private enterprises in various branches of industrial production.

In other branches of the national economy, the statistical method does not require that the production of individual categories of economic units be brought out, and information on the scope of production is given by one common figure for all types of economic units.

The attempt to grasp the production process fully in all its actual variety of forms leads us to another, perhaps quite unusual, broadening of the concept of gross industrial production.

In the USSR, where the rural economy still to a considerable extent retains the features of a barter economy, it is only from

a technological viewpoint that it can be said that a considerable share of agricultural raw materials is processed in industrial enterprises—usually small ones—that have detached themselves from agriculture. From the economic viewpoint, the raw material does not leave the hands of the peasant who has produced it; it remains his property. The extent of this type of relation between agriculture and industry is considerable. It comprises, for instance, all milling (except for the trade chain), a considerable part of vegetable oil production from oil-bearing seeds, blacksmithing, tailoring, carpentry, and the handicraft industries. In all these cases, in taking the grain and the oil seeds to the mills, in sending material to the tailor shop, hiring a carpenter, or taking a horse to the blacksmith, the peasant pays for these economic operations and has his raw material technically processed. In accounting the production of the industrial enterprises, the question arises: should the cost of the wages to the labor incurred in processing the raw material and the cost of the raw material (belonging to the customer) be counted in the production of these enterprises or not? With respect to labor, the answer is yes. It is somewhat more difficult to answer the question of the customer's raw material. Adding it to the gross value of output would inflate the latter by introducing into it values that have never been paid by the owners of these industrial establishments and have never entered into the turnover of these enterprises as real values. If, on the other hand, this raw material is excluded from the gross value of output, considerable difficulties are encountered in compiling the expenditure part of the turnover record. In this case, it becomes necessary to break down the cost of the finished product and write off separately as consumed the cost of the raw material and the cost of its processing. For instance, the cost of the flour obtained from the peasant's grain would have to be written off as consumed partly on the line reserved for grain, in proportion to the cost of the latter; partly on the line for the milling industry, in proportion to the cost of the milling. Along with this, on the line for the milling industry, not only in the cost of milling but also in the cost of grain, the cost of distribution would have to be taken into account since it is purchased by commercial mills and is included in their output. To avoid inconveniences of this sort, which distort the picture of distribution, the convention is adopted of including the cost of the customers' (peasants') raw materials in the gross value of output of those branches of production which, if only partly, use their own raw materials. For the

trades and handicrafts engaged exclusively in processing other people's raw materials, the problem is solved differently. In this case, only the gross earnings of the processors are entered as the product of these branches while the turnover of the processed materials is entered in the horizontal lines reserved for the materials in question.

The method of determining the gross value of output, which we have described above, changes somewhat the usual conception of the interrelation between various branches of production. This fact must be kept in mind when we examine the lines giving the totals of the balance sheet. The largest shift takes place in the ratio of agriculture to industry. Of the huge mass of grain and oil-bearing seeds, hardly any goes through the market, since it is brought to the flour and oil mills for processing by the owners, is entered as part of the gross value of output of these industrial branches, and is thus repeated both in the section for agriculture and in the section for industry. This does not change the absolute volume of agricultural production but it increases, relative to the usual conception, the output of industry, especially of the food industry. As a consequence, in the total sum of the gross national product, industrial production increases while agricultural production remains more or less unchanged. Even greater shifts take place in the debit section of the turnover record, where the expenditure of all raw material foodstuffs other than homemade ones is entered in processed form and, because of this, the share of industrial products in the rural economy appears unexpectedly high.

In general, it is hard to draw a precise line between agriculture and industry. Butter can just as readily be regarded as an agricultural product or as an industrial product obtained from the processing of agricultural raw material. The same can be said of the small mill's output of vegetable oil, flour, etc. Doubts may arise even concerning the first handling of grain—threshing, etc. If the national economic balance is considered as one single production process with division of labor, then the differentiation between agriculture and industry must be based on technological considerations. The public does not consume grain or oilseeds in their raw-material form. Therefore agriculture, just like the mining industry, is concerned with producing raw materials. All this raw material must then be subjected to processing in order to be made suitable for consumption, and so it must all go through the processing industry regardless of who the owner of the raw material is and of whether it has passed

through the market or not. From this technical viewpoint, it is essential to include the raw material of the customer in the value of output of the industry. Although the industry does not pay for the raw material (which, therefore, from the economic viewpoint does not enter into its turnover), when we give as its production figure the total amount of raw material processed, whether it is its own or somebody else's, we thereby indicate the total amount of work of the industry and the total amount of material value that has passed through its technological apparatus.

Such an expanded interpretation of the concept "industrial product" does not, however, include the processing of agricultural raw materials at home.

The boundary between processing by small-scale artisan industry and home-processing is fixed by the fact that the former is linked to the market while the latter is for household needs. The artisan or the handicraftsman, even when he is processing someone else's raw material and working for a customer, is dependent on the market, and, from the organizational viewpoint, his functions are separated from the household. Conventionally, we could add to his earnings the cost of the processed raw material, thus measuring the volume of the technological productive functions actually accomplished. There is no logical reason, however, to add to his production the work he performs strictly to satisfy the needs of his family. All agricultural raw materials which are home-processed must be counted off as consumed in their natural state by the rural population and may not be included in the sum of gross value of output of the industrial branches performing definite technological functions of processing. Thus the cost of the product of home bread-baking is not included in the total cost of the product of the bread-baking industry because it does not join that product on the market.

The gross value of output of various industries is therefore conventionally increased only by the sum of the costs of the raw materials that they process. Moreover, in order to facilitate the economic analysis, this sum is isolated from the total cost of the industrial product and given for each industry in a separate column or in a footnote. This makes it possible to determine the gross value of output of the respective industries in both variants: in the economic variant, which comes close to the actual sum of gross turnover, and in the technological variant, showing the sum of values which have gone through the stage of technological processing performed by the given industrial process.

For the basic divisions of the national economy, i.e., the lines giving the totals for industry and agriculture, the turnover record is also given in the tables in the form of the economic variant. This table is unlike the basic and detailed technological variant in that the cost of grain processed in mills on the order of the rural population is excluded from the gross product of industry and entered in the debit-credit line of agriculture.

The gross product for a given year is the main but not the only source of physical goods entering into the national economic circulation. This circulation can also be increased by imports from abroad and by reserves that have accumulated during preceding years.

These two credit items in the turnover record do not require detailed explanation, as did the gross product.

With respect to imports it must be kept in mind that the total quantity of each commodity coming across the borders of the USSR is entered as a credit item. And it makes no difference whether the commodity is used entirely for home consumption or whether a part of it, in the same or in a processed form, is re-exported abroad. The balance sheet aims at fully accounting the national circulation of goods and considers the exporting agency simply as a transporter of goods.

As to reserves from preceding years, which also go to increase the turnover of a given year, theoretically, we should count here all forms of stocked goods from the storage room of the consumer to the factory depots and the sheds for agricultural products. Each type of reserve, whether consumer, factory, or trade, can be used as an additional source to be offered, one which can increase the circulation of goods and consumption in the country without any increase in production being made that year. Unfortunately the state of statistical data does not enable us to determine fully the volume of the reserves. Information about reserves in the trade system is fragmentary and we do not have much more about the consumers' funds. For this reason, in the 1923/24 balance sheet we had to content ourselves with counting the stocks in the stores of the industrial trusts and syndicates and the visible grain supplies at the main bread factories and others.

The failure to fully account for reserves cannot seriously affect the reliability of the national balance sheet. If we do not know in what direction the reserves have moved at the end of the year—whether they have increased, decreased, or remained unchanged—then when balancing the individual branches of produc-

tion, we shall have no criterion for deciding whether or not the ratio of production to distribution is correct. Thus an excess of consumption over production and imports could be explained either by the actual satisfaction of the demand out of unaccounted-for reserves or simply by an incorrect estimate of production or consumption. But the general idea which we obtain of the 1923/24 economic year, the rapid increase in the turnover of goods, and information about the development of the trade network convince us that the reserves in the trade system and elsewhere could only have increased in the course of the year. Knowing this general tendency toward an increase in reserves, we must expect that, as a rule, when comparing the sum of credit items with that of debit items in the turnover record, we shall find a certain undistributed remainder which, with more or less certitude, can be ascribed to an increase in the unaccounted-for reserves that has developed during the year in the channels of trade turnover. This general precept should cause us to take a calmer view of all instances when, in balancing the circulation of goods by individual branches of production, we find some underconsumption, and to pay more attention to the instances where consumption is found to exceed output and imports.

The accounted-for reserves, the gross product, and imports are the only possible sources from which physical commodities can reach the internal market. Adding these three items, we must obtain for each group of products the amount which, in a given year, has actually entered or could have entered the country's economic circulation. This sum completes the content of the income item of the national balance sheet's turnover record.

VI

The debit items of the turnover record must describe the distribution of various destinations in society of the total amount of products of each group put into national circulation. We use the word "distribution" here in the broad sense, extending it to any expenditure of products in their natural state, independently of whether the product goes first through the market or is taken from the reserves resulting from the whole economic process.

A complete enumeration of the debit items mentioned in the balance sheet includes material expenditures for agricultural and industrial production, construction, transportation, the personal consumption of the rural and urban population, the satis-

faction of collective needs, exports, and reserves at the end of the year.

One of the most important items of expenditure of material resources is their use in the production process: a considerable share of the gross output of coal is used for heating plants and factories and is therefore used in the production process of the goods produced in those enterprises; the gross output of cotton goes to the cotton mills and then to the textile industry; most grain goes to the mills, etc. All this expenditure of products on production is entered in each horizontal line of gross output. One single figure is used for the total for the whole of agriculture; for industry, two figures are used: the large-scale factory and the small-scale artisan industries are entered separately. For each national economic sector and for each group of products of which it is composed, the figure for industrial consumption thus shows what amount of these products has been expended in the process of agricultural or industrial production. The machines and the tools produced or imported that year are also conventionally entered as consumed in production, although in actual fact only a fraction of them is amortized in the course of the production process of that year.

The sum of all the products consumed in the production process gives, over all the horizontal lines, the figures for the physical expenditure in the whole national economy. Contrasting this figure with the sum of the gross value of output computed in the income section of the turnover record, we obtain the net national product. This net product makes up the material part of the public income, used to satisfy the communal needs of the public, to supply transportation, the trade system, and exports, and to accumulate reserves. It must be noted here that by comparing the total sum of industrial consumption with the total sum of gross output one can find the net product only for the national economy taken as a whole. In order to find the net product for each individual economic sector, we do not need to take into account consumption by other branches of the gross product created in this branch. We rather need to know what amount of what products had to be spent in order to produce the gross product of the branch in question. We do not need to find out which branches the gross output of coal is expended in, but rather what quantity of commodities, and from what branches of industry, are consumed in the process of mining the given quantity of coal. In one instance we are finding out the distribution of the gross product while in the other we are determining the material ex-

penditure required to produce it. The gross product minus the industrial consumption shows only what share of the product is consumed on the internal market and what amount goes to other categories of consumers. Only for the national economy as a whole does the sum of the shares of the gross product used in industrial consumption equal the sum of the material expenditures. This is so because whatever share of the gross product of whatever branch of production is written off as productive consumption in the line of that branch, it appears in the material expenditures of production in the branch into which it was entered.

The turnover record, as was pointed out earlier, aims at giving the physical balance for each branch of production. In each case, only the gross product can be the object of balancing and distribution since, in every branch of the national economy, the product is considered as a physical entity suitable for a special purpose and not as an abstract increase in value produced at the given step of the processing. If, for instance, we wish to follow the balance of finished fabrics, then there must figure in the income and debit items only the textile raw material or its value, including the raw material and the semifinished product, but not the value gained in the last phase of processing when the yarn is turned into material. The net product of individual branches of industry presents an independent interest and its calculation for all branches of the national economy is given in section III of the Tables [i.e., the Balance for 1923/24, not reproduced here—Ed.]....

The next expenditure items, closest to industrial consumption, are the consumption of physical commodities for construction, transportation, and trade. In general, under these three expenditure items, we enter all the quantities of the products that were needed in the course of the year for the functioning of these three economic sectors. For construction these products are lumber, bricks, iron, glass, cement, and other building materials expended in the course of the year on the building of factories, national, private, and other houses, and for all types of building repairs.

Transportation of all types is a consumer of various products for ties, rails, locomotives, railroad cars, fuel, and other manufactured goods and materials indispensable for the fulfillment of its functions.

Finally, for trade, physical consumption takes the form of all sorts of equipment for trading premises, containers, fuel, lighting fixtures, etc.

Almost every national economic sector finds a consumer in construction, in transportation, and in trade and, vice versa, each of these three counts among its suppliers of material products a greater or smaller number of economic branches. In examining the vertical columns referring to construction, to transportation, and to trade, it must be remembered, however, that the sum of the physical values shown in them is not equal to the total cost of expenditures on the functioning of these branches of the national economy. The cost of construction and repair work consists mostly of expenditure on wages; the cost of transportation includes the salaries of transportation workers and employees. Similar items exist in the expenditures of trade. Besides wages, the functioning of construction, of transportation, and of trade also involves several other expenditures such as rentals, taxes, etc. None of these debit items are included in the vertical columns for construction, transportation, and trade.

The balance sheet aims at showing the movement of physical items in the national economy, and from this viewpoint, the economic sectors under study, just like industrial consumption, interest us only insofar as they are direct consumers of one form or another of the gross product. The wages paid out in industry, construction, transportation, or trade must figure in the turnover record only in the form of material commodities into which, in fact, they are finally turned. But this happens in the households of the persons receiving the wages. Thus the corresponding expenditure of physical commodities will figure in the debit section of the turnover record in the special items covering the personal consumption of the total population. In exactly the same way, the rental, taxes, and other nonmaterial elements of expenditure are entered on the balance sheet in the form of material products into which they do finally turn in the hands of their ultimate holders. To understand correctly the turnover record it must be firmly kept in mind that the national economy is viewed in it as one single process of production and distribution of physical values. The formal and the real boundaries between the individual sectors of the national economy are viewed as functional limbs of one single productive organism. From this viewpoint the share of the total mass of consumption taken in the course of production by construction, transportation, or trade is measured by the sum of the commodities directly consumed by the branch in question in the process of fulfilling its specific functions within the national division of labor.

The next group of expenditure items of physical values is

their consumption in the process of satisfying the needs of the entire population of the country.

Each member of society, whether he is a worker, a peasant, a shopkeeper, or a beggar, receives in the course of the year a certain income which he spends in consuming some physical commodities. Every time a horizontal line cuts the personal consumption column, the quantity of the group of products which is expended in the national economy in precisely this fashion is entered. From the viewpoint of the national economy, a product is expended on personal use the moment it passes into a private household. Personal consumption is thus taken in a broad sense. Bread eaten during the year, a length of material purchased, a house constructed, all these are considered as expended despite the fact that bread is almost immediately destroyed in the process of consumption, whereas the material and the house will serve the household for a much longer time.

The personal consumption of various products will differ considerably according to the level of welfare and the social position of each group of the population. There are not and cannot be any precise data as to the absolute amounts of consumption of the millions of people in the population. The determination of this debit item for each line of production must, therefore, be done on the basis of complex calculations which will be explained in special papers devoted to methodology and analysis. For the purposes of the turnover record of the balance sheet, we use only the final results which refer to the total population. It was necessary to introduce this division into the turnover record since it describes one of the most important subdivisions of the gross output market. Urban and rural consumption differ considerably in the structure of consumption and in total volume of demand. Definite knowledge of these proportions is indispensable in order to arrive at many conclusions on the basis of the turnover record of the balance sheet.

A horizontal examination of the debit items referring to personal consumption shows, as we already know, what share of the total gross product of an economic branch goes to private consumption. The summing up of the vertical columns of personal consumption gives the total cost of the physical values consumed by the public.

It must be noted that the conception of an agricultural and a nonagricultural population does not coincide with the usual division into rural and urban population. It has been impossible to use the latter, since, from the viewpoint of the difference in con-

sumption level, we must allow for the fact that among the urban population there is a great number of people who have a rural way of life and, conversely, many people in the countryside live on an urban budget. Since in determining total consumption the budget is of prime importance, we have transferred from the rural to the urban category those persons exercising urban-type professions and leading an urban type of life in the country and, vice versa, we have transferred from the urban to the rural category those city inhabitants whose sources of income come from agriculture and who probably lead a corresponding life. A detailed description of the method of dividing the population into agricultural and nonagricultural is given in a special article.

The satisfaction of communal needs also causes a certain expenditure of material commodities. Collecting various types of taxes and income, the state and the public agencies construct their budgets and out of them satisfy a whole series of public requirements such as running the schools, the post office, and the telegraph, organizing medical help, maintaining the armed forces, laying water pipes and sewerage, etc. The performance of these public functions is ensured by the maintenance of workers and employees and by the expenditure of certain material products. The expenditure on the wages or upkeep of the workers, employees, and their dependents cannot be taken into account here because it is all in the form of consumer goods, entered in the section dealing with personal consumption. However, the maintenance of water supplies requires, for instance, fuel, piping, and mechanical devices, medical help needs medicaments, schools need teaching aids and textbooks, etc. All these material resources are needed to enable the public utility establishments to perform their functions. These functional expenditures of material commodities make up the items of the turnover record which deal with what is called communal consumption. This includes all nationalized and communal establishments, inasmuch as they use their income not only to pay for the upkeep of the workers and employees but also to purchase certain other material products.

Public consumption closes the list of expenditure items over which the gross product (including imports and reserves) of each branch of production within the national economy is distributed. Besides these items, the gross product can be expended by being exported abroad. Here, as for imports, the entire sum of exports across all the national borders is taken into account whatever the final destination of the products abroad may be. It must

be understood that material expenditures on the organization of foreign trade are entered together with the corresponding expenditures on internal trade. In the export column only information on exported goods is entered, independently of all other conditions of foreign trade.

What is left at the end of the year forms the last item of the turnover record. It is accounted in the same way as the reserves at hand at the beginning of the year. The remarks we have made concerning the reserves at the beginning of the year also apply to this remnant. For individual branches of production in which the figures of the gross product exceed the sum of various items of distribution, the reserves at the end of the year must be augmented by the difference, which may be considered as an increment within the trade system in the course of the year or as a certain underestimation of consumption.

VII

We now know all the items on the debit side of the turnover record. Adding them, we obtain for every economic sector mentioned in the stub the sum of the products distributed by means of barter to various destinations. This final result of the distribution can be compared to the sum total of the entries on the production or credit side, which is composed, for each sector, of the reserves of the preceding year, the current gross output, and imports from abroad.

In its main features, for the most important articles and for the common consumer goods, the turnover record is composed of physical units.

The comparison of the sum total of the credit items with the sum total of the debit items must produce an equation in physical units: pounds, yards, pieces, etc. These physical balance sheets are composed for almost all the agricultural products, but are joined together in larger, comparatively homogeneous groups. For industrial products, the composition of physical balances is limited to a brief enumeration of the major products of personal consumption, among which figure kerosene, salt, sugar, matches, galoshes, and cotton, woolen, and linen fabrics.

Further additions to the list of products on which the physical balance sheets were based proved impossible, since, for most of the products, there were no data available in physical units for several debit-credit items of the balance sheet.

The advantage of the physical balance sheets lies in the fact that they supply a correct idea of the quantitative proportions of various credit-debit items undistorted by different evaluations of the very same product by various categories of consumers or by the fluctuation of prices over time. In determining the structure of the market for various products, the physical balance sheets play a major role. The selling prices of the producers' cooperatives are more or less equal for everybody, and the share of every category of consumers can be evaluated by the amount of the merchandise purchased by it. As to the sums which are actually paid by each group of consumers, they depend on how the goods can be moved and are not strictly proportional to the quantity of products acquired.

However, despite all the advantages of the physical balances, we cannot be content with them even when there is an actual possibility of finding a common measure for all the infinite variety of commodities produced and consumed.

The physical balance sheet does not enable us, in the first place, to compare the branches of production to one another. We cannot add coal and calico, grape wine and grain products. Each sector of the national economy remains locked inside its physical balance sheet and the total national balance sheet breaks down into an infinite number of unconnected horizontal lines. The turnover record expressed in value is thus indispensable, if only to make it possible to compare the individual items of the balance sheet, to pass from the balance sheets of an infinite number of products to a balance sheet of larger branches of production, and finally to a national balance sheet.

The commensurability of different products is not the only argument for a balance sheet expressed in values. The computation of the difference in the prices of production and consumption and also of the differentiated prices which are actually paid by different categories of consumers is of special and vital interest. In constructing the physical balance sheet, we are interested only in the quantity of the units of the product absorbed by various groups of consumers. In constructing the value balance sheet we have additional information as to how much each of these groups had to pay for the commodities it consumed. These monetary valuations show what sums are in actual fact spent by various groups of consumers to acquire certain products and, accordingly, what share in the total national balance is taken up by the satisfaction of a particular demand. Knowing the sums the public spends on purchasing individual products, it is possible to

study the question of the extent to which the sales of these products can be increased if the price is changed for the general public or for certain categories of consumers. Of course, theoretically, each change of price for one product produces a redistribution of the expenditure budget and a change of prices of other products. In practice, however, the knowledge of sums spent by the public on the satisfaction of certain demands, with prices at their present level, enables us to understand better the prospects of the market than would simple information about the quantities of products acquired. Then, too, in substituting for the physical values the actual pricings in the process of turnover of goods and in comparing the cost of the products with the prices paid by the consumers, we determine the funds out of which are paid the trade addenda, the transportation expenses, the customs duties, and other additions to the cost of the product that are made on its way to the consumer. All of these items, which are important in the national turnover, disappear if the physical measures are used and reappear only with pricing according to differentiated actual prices of the credit-debit articles in the record.

Because of these considerations, the expression of the national balance in monetary terms becomes absolutely indispensable. The entire turnover of physical goods cannot be expressed in physical units, and the general national balance can be constructed only in value terms, taking the different prices into consideration so that the over-all picture reflects the real proportions as closely as possible.

The evaluation which will enable us to obtain such a picture must be based on the use, for all the credit items, of prices which approach the cost of production of the goods, and for the debit items of the prices paid for them by the various categories of consumers in the balance sheet. All the time, the national economy is viewed as a single enterprise which produces, at a determined cost, products purchased by the consumers at a different, higher price. The total difference in the valuation of the goods in the credit and debit sections of the balance is used for the payment of all sorts of additional expenses which go to swell the cost of production as the goods move from the producer to the consumer.

Simple though it may be, this basis of evaluation involves many theoretical and practical difficulties. What these difficulties are and how they should be handled is described in papers devoted to various aspects of the balance. Here we must content

ourselves with the enumeration of the most important problems connected with the evaluation.

When the gross value of output is determined only for large-scale industry, the matter is simple and straightforward. In this case, the bulk of the output goes through the market or through trade accounts between individual enterprises; each product has a determined price at the place of its production, and even the production accounting in industrial statistics is done in the prices required by the balance. In calculating the value of output of small-scale industry, we must have recourse to much more artificial devices, partly because of the complexity of the conception of the gross value of artisan output, which, as we know, consists not only of the finished product but also of the raw material of the customers and of the gross profits, and partly because of the peculiarities of the statistical materials, which require the use of index tables for the conversion of former prices into contemporary ones.

Even more complex is the expression in monetary terms of agricultural products. Most of them do not go through the market at all and are used directly in the peasant household. To evaluate these nonmarketed products at the market prices of agricultural products would be to inflate their volume, since the market prices include additional expenditures for transportation and for the trading system which are not incurred when a producer consumes his own products. The cost of production of agricultural products is also an indeterminate and almost indeterminable entity. A way out is to evaluate the gross agricultural product according to the lowest seasonal market prices. Each product has its own season in the course of which, as a rule, the bulk of it sent to the market is sold. The very fact that it is thus disposed of shows that, on the average, the market price obtained is no lower than the cost of production. And, although it incorporates some additional expenditures, it is the closest to the prime cost of the agricultural product. It is quite obvious too that because of the sharp territorial differences in the prices of agricultural products, one is forced to make the evaluation district by district to avoid the errors possible if one total figure for the nation were given.

Evaluation of the credit items outside the gross output does not present any special difficulties. Inventories of industrial products stored in the trusts and syndicates are evaluated at the same selling prices as the current output. The stocks of agricultural products are estimated at the above-mentioned seasonal

prices. Imports of products of all categories are calculated in prices excluding the customs duties paid at the USSR borders. Adding all the credit items evaluated by the above-mentioned methods, we obtain the cost of all the products that have entered into the national turnover on the basis of production-cost prices or seasonal prices and procurement prices close to them.

Each debit item is given in terms of the prices that were actually paid by the category of consumers concerned. For industrial consumption, for instance, this is the prices paid by the enterprises playing the part of consumers; for construction, transportation, and trade these are the prices these industries paid for the supplies of the materials, tools, and fuel indispensable for the performance of their functions; personal consumption is based on the market prices of the towns and rural districts adjusted by special regional and seasonal coefficients; public consumption is based on the sums assigned for it by the national or local budgets; exports are based on the prices paid by foreign buyers; and finally, the surpluses at the end of the year are, as a general rule, estimated at the same prices as the reserves at the beginning of the year in order to avoid creating fictitious differences one way or the other between the credit and the debit items of the balance. Because of the special circumstances in the evaluation of agricultural products, which are also among the debit items when they are distributed, the industrial and personal consumption of the products of one's farm are evaluated on the basis of the same seasonal prices that are used in the evaluation of the output. The shares of the industrial and personal consumption that go through the market are based on market prices.

The sum of all the debits gives the cost of all the distributed products evaluated in consumption prices. Juxtaposing for each economic sector the sum of credits and the sum of debits, we find a certain difference in favor of the debits, since both sides of the balance are based on the same quantity of physical units of the product and the consumer prices in the debit figure are always higher than the production costs underlying the credit figure.

This difference between the consumer's and producer's prices covers, as we pointed out earlier, all the extra expenditure incurred in the course of the turnover of goods, namely, transportation expenditures, customs, excise tax, and the gross profit of trade. These extra expenditures in the goods turnover make up the additional item of the turnover record that makes it pos-

sible to balance, for each horizontal line and for the record as a whole, the sum of the credit items with the sum of the debit items. Physical balance sheets do not require any additional line and the sum of the credits is directly balanced by the sum of debits. When the material commodities are expressed in value terms, the balance between the credits and the debits is disrupted by the additional expenditures incurred in the process of the goods turnover. These expenditures must be added to the sum of the credits evaluated on the basis of production prices in order to obtain the sum of the debits evaluated in consumers' prices.

If each type of the additional expenditures in the turnover could be determined on the basis of direct statistical data, and, moreover, with just as minute a division into economic sectors as is used for the construction of the whole balance, then, for the expression of the latter in value terms, it would be sufficient to add to the sum of the credits the sum of all the additional expenditures incurred in the process of the circulation of goods. Then the correctness of the balance would be confirmed by a more or less exact equality between the sum of the credits with the total additional expenditures added, on the one hand, and the sum of the debits, on the other.

Unfortunately the form of the additional turnover expenditures, namely, the trade expenditures, cannot be estimated with any precision. The statistics for retail and market prices cover too small a number of goods and thus one of the most important elements causing the difference between the producer's and the consumer's prices remains undetermined. The only solution would seem to be the following: The sum total of the additional turnover expenditures is determined as the difference between the sum of the credits and the sum of the debits for each sector of the national economy represented by a separate line in the turnover record. From this general balance we then isolate the expenditures that can be evaluated by direct statistics. These include excise duties and transportation costs calculated for each group of goods separately according to the special tariffs and to the distance over which they are transported. The remnant that is not accounted for by the excise duties and transportation costs is considered to be trade expenditures.

The absolute values of trade expenditures obtained in this way for each type of product are then subjected to close scrutiny and analysis, because it is on the basis of these remnants that the balance is constructed and that the correctness or error of

its items is tested by the credibility or incredibility of the obtained value for trade expenditures.

The magnitude of the trade expenditures is checked, in the first place, against the fragmentary statistics of retail and selling prices. The ratio of the factory price to the retail price of calico can, with some degree of approximation, determine the value of the trade expenditure on cotton goods. But of course a perfect coincidence of the additional expenditures on calico and the percentage found in adding the sum total of trade expenditures to the sum of the income items cannot possibly be expected.

In estimating the accuracy or the credibility of the figure obtained for trade expenditures, many other considerations must be taken into account. Thus, in computing the average percentage of trade expenditures on the basis of the balance, we must, first of all, isolate from the total sum of the credits that share of the product which actually passed through the market and was affected by expenditures additional to the cost of production.

The following do not pass through the market: the remnant left at the end of the year in the storerooms of the syndicates and trusts and the huge bulk of agricultural products directly consumed in the course of agricultural production.

On the other hand, even the mass of the products which actually goes through the turnover process reaches the buyers at a variety of prices. Industrial consumption, for instance in large-scale industry, incurs very low prices, which often coincide with wholesale prices. Many industries supply other industries and the free market at the same time. Depending on the share of the industrial demand, the sum total of the trade expenditures and its percentage share in the sum of the credit items for the industry in question can be considerably lower than the difference between the wholesale and retail prices of the products of the same industry on the free market.

Special difficulties arise in estimating the trade charges for various branches of agricultural output. Among the debit items are the productive consumption of agriculture itself and the physical share of consumption by the rural population, which are evaluated at the lowest seasonal prices, just like the gross product and the reserves in the credit items. Within these limits, there is no trade charge in the production and consumption of the marketable share of agricultural products. However, the evaluation of the consumption of the marketable share of agricultural products is done on the basis of the average yearly prices district by district. In comparing the estimates of this

marketable share in consumer and in producer prices, we shall find a considerable difference, which is due not only to trade charges in the strict sense of the word and the railroad or waterway transportation charges, but also to the road charges of transportation to the local markets and to the seasonal increases in prices of agricultural products. A considerable part of this seasonal increase and of the local road charges is paid for by the rural population in the process of the local rural market turnover. Thus our trade charges include not only the commercial profit of professional grain merchants, but also the accountable income of the grain farmer who sells his grain at higher prices in the spring than he would be able to get in the fall. This increases considerably the absolute size of the charges incurred in the course of the turnover of agricultural products and raises their percentage share in the sum of credit items evaluated at the lowest seasonal prices.

As can be seen from the above explanations, the concept of trade expenditures is broadly interpreted in the balance. This makes it even more difficult to judge the correctness or incorrectness of the balance of the expenditures and incomes obtained in each horizontal line of the turnover record. In each individual instance, those who compiled the balance, before accepting a figure for trade expenditures, had to examine all sorts of materials and sources, including even expert testimony. Only then could they be satisfied that the figure obtained was not unrealistic either in its absolute size or in its relation to costs.

The determination of the size of trade expenditures is, together with the assumptions on the increase of reserves in the circulation channels at the end of the year, one of the most important and debatable items in the balancing of accounts.

If we had direct statistical information on the subject, the method of balancing and of mutual verification of various items on the debit-credit sheet could be fully expressed. The advantage of the balance method of studying the national economy lies precisely in the way in which the various sources of statistical information complete one another and can be used for mutual checking.

This is the basic method used to construct the 1923/24 balance sheet. The individual credit-debit items in the turnover record have been based on independent statistical data. A detailed description of the use of the sources is available in papers devoted to various parts of the balance. Here it will be enough to note that in order to fill the account balance sheets, statistical

data of almost all sectors were used. The filling of the various parts of the account sheet was assigned to various groups of officials. Each group used all the material at its disposal, compared the data based on various sources referring to the same matter, and tried to give the most accurate picture possible of the movement and state of physical goods within the limits of the economic sector that had been assigned to it. Each of these studies, of the gross product, of industrial consumption, of personal expenditures, transportation charges, etc., is of interest in itself because it describes more or less accurately a certain facet of the national economic life and adds some additional information to the general picture of the country's economic process. This general picture is prepared in the turnover record of the national economic balance sheet, which contains all the individual results obtained by each independent statistical study, and in which these individual results are finally verified and mutually checked against each other. Verification and control take place as soon as the individual horizontal lines and vertical columns of the balance sheet are examined simultaneously. The value of the finished product must exceed the cost of the semi-finished product; the expenditure on producer goods must be less than the total cost of the product; the consumption standards of the nonagricultural population must be higher than those of the agricultural one, etc. These incontrovertible truths are used as a first verification of the balance sheet after it has been filled by the data forthcoming from various independent sources. A more or less exact equality in the total debits and total credits is a much stronger proof of the correctness of the computed figures and of the adequacy of the methods used to obtain them. Of course one cannot expect a perfect coincidence of figures and an absolute equality in the debit and credit items of the balance. Whatever the perfection of the statistics, the picture drawn in figures for a national economy of many millions of units will always remain an approximation resting on many arbitrary assumptions and on conventional coefficients. And the Soviet national economy with its 22 million peasant households presents in this respect special difficulties. A small error allowed in determining the individual norms when multiplied by an eight-digit figure can be the source of very large errors in the general conclusions on national economic processes. Another source of errors is the enormous size of our country. It is impossible to follow through all the diversity in the levels and fluctuations of prices over an area of 21.2 million square kilometers. But it

must be realized that each fluctuation in prices affects, if only a little, the scales of the national balance. Mistakes are thus inevitable and it is impossible to obtain a mathematically exact balance between the debits and the credits, especially in constructing the first balance sheet. In some instances, where the sources disagreed, two sets of figures have been given for the same items instead of insisting that one of them was the correct one. To some extent, the failure of the results to balance can be considered as evidence of the conscientiousness with which the figures were compiled and of the honesty of those who processed them. A too perfect precision gives rise to familiar doubts.

Of course, one must not abuse these considerations. Not all the discrepancies can be accounted for by the difficulties involved in dealing with tens of millions of households. The balancing method makes it possible to uncover many actual shortcomings in statistics which should be eradicated through patient, determined efforts. We have already noted that in constructing the balance for 1923/24 we had to determine two whole items of the turnover record by subtraction and to check them by various indirect indicators: the increase of reserves in the circulation channels, and the trade charges. In the same way, even for the items for which there is a direct source of statistical data, in some of them we had to limit ourselves to incomplete data, in others to use conventional coefficients, in a third group to base ourselves on prewar figures, and in the fourth to content ourselves with expert testimony. All these shortcomings, however, do not detract from the usefulness of the balance.

P. I. Popov

BALANCE SHEET OF THE NATIONAL ECONOMY AS A WHOLE

1. CHARACTERISTICS OF PRODUCTION AS A WHOLE

In its most general outline the national economy of the Soviet Republics in 1923/24 can be described by the data on the dimensions and structure of the output which comes into the national economy from its individual branches and is distributed among the separate branches and classes of society. [See Table 1.]

According to the role they may play in production and personal consumption, i.e., according to their function, all the products are divided into four categories: (1) products used by the ultimate consumer; and (2) raw materials, (3) fuel, and (4) tools of production. Actual consumption introduces certain changes, not in the classification of products, but in their distribution among the aforementioned groups; thus some products, which can be used as means of subsistence, are also used as means of production, and some raw materials, conversely, are used as products of personal consumption. The distribution of products into groups 1, 2, 3, and 4 according to their designation and actual consumption cannot, therefore, coincide. [See Table 2.]

...The aforementioned distribution, characterized by a definite equilibrium between means of subsistence and producer goods, is especially interesting in that it underscores with the utmost clarity the view to which Marx was so emphatically committed, namely, that products used for productive purposes cannot be included in the personal income of the population, i.e., income consumed personally by the population, and accordingly, that a substantial share of the products of annual national production is used for productive purposes and neither does nor can accrue to the population for personal consumption....

The total product mentioned above (minus imports and reserves) was produced by the primary branches of the national

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"Balans narodnogo khoziaistva v tselom," in P. I. Popov, ed., Balans narodnogo khoziaistva Soiuza SSSR 1923/24 goda (Moscow, 1926), pp. 282-300, Part I.

1. Distribution of Output in 1923/24
(in millions of gold rubles)

	Distribution of products which have come into the national economy (output + reserves + imports)					
	By designation				By actual consumption[a]	
	By output prices		By distribution prices		By distribution prices	
	Absolute	%	Absolute	%	Absolute	%
Means of subsistence						
1. Products of personal consumption	8,107.4	45.4	10,041.9	46.9	11,308.6	52.8
Means of production						
2. Raw materials	7,662.9	42.9	8,774.2	41.0	8,306.6	38.8
3. Fuel	867.0	4.9	1,339.0	6.2	718.1	3.4
4. Tools of production	1,219.1	6.8	1,255.0	5.9	1,076.8	5.0
Total	17,856.4	100.0	21,410.1	100.0	21,410.1	100.0

[a] The products which have been exported abroad and those which have remained in reserve are distributed by categories according to their initial designation, assuming that actual consumption will be the same as for the products qualified by designation.

economy in the proportions indicated in the table (see table 3: Production for 1923/24)....

2. THE BRANCHES OF THE NATIONAL ECONOMY AS THE PARTS OF A SINGLE WHOLE

From the point of view of the balance sheet of the national economy, each branch of the national economy performs determinate social functions. The character of these functions is defined on the one hand by the character of production in a given branch, and on the other by the range of social needs which this or that branch of the national economy satisfies.

Social needs break down into those entailed in the reproduction of the social economy and those required to satisfy the wants of the population.

2. Distribution of Products

	Entry of products into the national economy		Distribution according to actual consumption				
	By output prices	By distribution prices	Means of subsistence	Raw and other materials	Fuel	Tools of production	Total
	1	2	3	4	5	6	7
	In millions of gold rubles						
Means of subsistence	8,107.4	10,041.9	8,699.3	1,342.6	-	-	10,041.9
Raw and other materials	7,662.9	8,774.2	1,810 2	6,964.0	-	-	8,774.2
Fuel	867.0	1,339.0	620.9	-	718.1	-	1,339.0
Tools of production	1,219.1	1,255.0	178.2	-	-	1,076.8	1,255.0
Total	17,856.4	21,410.1	11,308.6	8,306.6	718.1	1,076.8	21,410.1
	In percentages						
Means of subsistence	45.4	46.9	86.6	13.4	-	-	100.0
Raw and other materials	42.9	41.0	20.6	79.4	-	-	100.0
Fuel	4.9	6.2	46.4	-	53.6	-	100.0
Tools of production	6.8	5.9	14.2	-	-	85.8	100.0
Total	100.0	100.0	52.8	38.8	3.4	5.0	100.0

Let us examine the social functions which each of the major branches of the national economy performs.

Every one of the branches in the national economy acts one moment as a consumer, the next as a supplier, of products.

Agriculture is a supplier: (a) of human labor power for all branches of the national economy; (b) of raw materials and fuel for itself and for industry, transport, and construction; (c) of foodstuffs for its own population and for the population engaged in all other branches of the national economy. Consequently, it supplies both means of production and means of subsistence, as well as human energy.

Agriculture performs the functions of a supplier by (1) providing the city with the human energy of its excess population, by making temporary workers available (seasonal work), and (2) by directly supplying produce for the market.

As a consumer, agriculture performs its social functions by (a) utilizing the skilled manpower of the city (the labor of teachers, doctors, office workers, and mechanics and drivers who handle the tractors and are involved in other operations requiring technical personnel), (b) utilizing the tools and means of production supplied to agriculture by industry, (c) utilizing the produce of transport, and (d) consuming manufactured consumer goods.

The table offers an idea of who receives the products which agriculture produces, and in what amounts (see table 4.)

Of an aggregate volume of production[1] of 10,651 million gold rubles at distribution prices, 39 per cent is accounted for by foodstuffs, 51 per cent by raw and other materials, 7 per cent by fuel, and 3 per cent by tools of production. Of the aggregate volume of means of subsistence, agriculture consumed 73.2 per cent within the confines of its own economy, and 26.8 per cent it sent outside its own economy—2 per cent to industry, 24.2 per cent to the city, and 0.5 per cent to the world market. Of the total volume of products comprising raw and other materials, it consumed 68.8 per cent in its own economy and supplied 31.2 per cent to other branches of the national economy—19 per cent to industry, 5.9 per cent to the world market, 2.7 per cent to construction, and 3 per cent to the city.

Of the total volume of fuel produced by agriculture, 57.2 per cent was consumed within its own economy and 42.8 per cent

1. After deducting the amount which went to replenish reserves.

3. Production for 1923/24[a]

Categories of products by designation	Produced at output prices					
	By agriculture	By industry		Construction	Transport[b]	Total
		Factory and plant	Small-scale and domestic-craft industry			
	1	2	3	4	5	6
	In millions of rubles					
1. Products of personal consumption	3,664.7	2,115.5	1,460.9	471.5		7,712.6
2. Raw materials	4,567.7	1,760.6	199.3	-		6,527.6
3. Fuel	388.3	343.4	19.5	-	652.8	751.2
4. Tools of production	300.9	272.9	146.8	381.8		1,102.4
Total (2+3+4)	5,256.9	2,376.9	365.6	381.8		8,381.2
Sum total	8,921.6	4,492.4	1,826.5	853.3	652.8[b]	16,746.6

652.8

In percentages

1. Products of personal consumption	47.5	27.4	19.0	6.1		100.0
2. Raw materials	70.0	27.0	3.0	-		100.0
3. Fuel	51.7	45.7	2.6	-		100.0
4. Tools of production	27.3	24.8	13.3	34.6		100.0
Total (2+3+4)	62.7	28.4	4.4	4.5		100.0
Sum total	53.3	26.8	10.9	5.1	3.9	100.0

In percentages

1. Products of personal consumption	41.1	47.1	80.0	55.3		46.0	
2. Raw materials	51.2	39.2	10.9	-		39.0	
3. Fuel	4.3	7.6	1.1	-	100.0	4.5	3.9
4. Tools of production	3.4	6.1	8.0	44.7		6.6	
Total (2+3+4)	58.9	52.9	20.0	44.7		50.1	
Sum total	100.0	100.0	100.0	100.0	100.0	100.0	

[a]Including transport and deducting the output of publishing.

[b]Transport is shown minus cartage and proceeds from the transportation of passengers and mail loads.

4. Agriculture as a Supplier[a]

Groups of products	Supplies to:						
	Agriculture	Construction	Industry	Transport	The city	World market	Total
	1	2	3	4	5	6	7
	In millions of rubles at distribution prices						
Products of personal consumption	3,054.8	-	88.6	-	1,011.2	19.5	4,174.1
Raw and other materials	3,730.3	145.4	1,044.6	21.4	162.8	317.8	5,422.3
Fuel	431.1	-	107.7	28.7	185.8	-	753.3
Tools of production	300.0	-	-	-	1.8	-	301.8
Total	7,516.2	145.4	1,240.9	50.1	1,361.6	337.3	10,651.5

	In percentages						
Products of personal consumption	73.2	-	2.1	-	24.2	0.5	100.0
Raw and other materials	68.8	2.7	19.2	0.4	3.0	5.9	100.0
Fuel	57.2	-	14.3	3.8	24.7	-	100.0
Tools of production	99.4	-	-	-	0.6	-	100.0
Total	70.6	1.4	11.6	0.5	12.8	3.1	100.0
	In percentages						
Products of personal consumption	40.7	-	7.1	-	74.3	5.8	39.2
Raw and other materials	49.6	100.0	84.2	42.7	12.0	94.2	50.9
Fuel	5.7	-	8.7	57.3	13.6	-	7.1
Tools of production	4.0	-	-	-	0.1	-	2.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[a] After deducting the part of the output which is left in reserve by the end of the year.

supplied to other branches of the national economy: 24.7 per cent to the city, 14.3 per cent to industry, and 3.8 per cent to transport. Agriculture consumed within its own economy 99.4 per cent of the tools of production that it produced and sent 0.6 per cent outside. As a whole agriculture consumed within its own bounds 70.6 per cent of the total volume which it produced, and sent 29.4 per cent outside, catering, to one degree or another, to the city and the world market.

Out of its produce agriculture used 40.7 per cent of the consumer goods, 49.6 per cent of the raw materials, 5.7 per cent of the fuel, and 4 per cent of the tools of production to supply its own needs. It provided construction exclusively with raw materials and fuel; it supplied the city with 74.3 per cent of the foodstuffs, 13.6 per cent of the fuel, and 12 per cent of the raw materials which the urban population used as food products and feed for its livestock. It supplied 5.8 per cent of the food products and 94.2 per cent of the raw materials going to the world market.

This was the role which agriculture played as the supplier of the products that it produced.

The point has already been made that while agriculture catered to industry and other branches of the national economy, as well as to the world market, in the capacity of supplier, along with this it acted at the same time as a consumer, and could not but have acted so.

Agriculture as consumer consumed assets of all kinds amounting to 10,146 million gold rubles, i.e., roughly the same amount as it supplied to other branches [see table 5: Agriculture as a Consumer].

Of the total volume of products which it consumed, 50 per cent were consumer goods and 49.6 per cent means of production.

Of the goods which it consumed for personal use 59.8 per cent were products of agriculture itself and 40.2 per cent were products of industry and construction—34.6 per cent products of industry and 5.6 per cent of construction.

Of the total volume of means of production used, it found 88.6 per cent within its own economy and acquired 11.4 per cent from industry and construction; of the total quantity of tools of production it needed it found 40.9 per cent within the bounds of its own production and obtained 59.1 per cent from industry and construction. As a whole it drew 74.1 per cent of what it consumed from its own production and obtained 25.9 per cent from industry and construction.

5. Agriculture as a Consumer

Groups of products	Receives from: Agriculture	Industry	Construction	Total
	1	2	3	4
	In millions of rubles			
Products of personal consumption	3,054.8	1,769.4	285.1	5,109.3
Tools and means of production	4,461.4	374.2	201.6	5,037.2
Incl. raw and other materials	3,730.3	139.0	-	3,869.3
fuel	431.1	3.8	-	434.9
tools of production	300.0	231.4	201.6	733.0
Total	7,516.2	2,143.6	486.7	10,146.5
	In percentages			
Products of personal consumption	59.8	34.6	5.6	100.0
Tools and means of production	88.6	7.4	4.0	100.0
Incl. raw and other materials	96.4	3.6	-	100.0
fuel	99.1	0.9	-	100.0
tools of production	40.9	31.6	27.5	100.0
Total	74.1	21.1	4.8	100.0
	In percentages			
Products of personal consumption	40.6	82.5	58.6	50.4
Tools and means of production	59.4	17.5	41.4	49.6
Incl. raw and other materials	49.7	6.5	-	38.1
fuel	5.7	0.2	-	4.3
tools of production	4.0	10.8	41.4	7.2
Total	100.0	100.0	100.0	100.0

6. Industry as a Supplier

Groups of products	Supplies to:						
	Agri-culture	Construction	Industry	Transport	The city	World market	Total
	1	2	3	4	5	6	7
	In millions of rubles						
Consumer goods	1,769.4	0.1	419.4	10.7	2,668.1	65.0	4,932.7
Tools and means of production	374.2	316.5	1,925.4	386.8	318.0	127.2	3,448.1
Incl. raw and other materials	139.0	316.5	1,516.5	193.2	171.5	124.6	2,461.3
fuel	3.8	-	309.8	105.6	37.8	2.4	459.4
tools of production	231.4	-	99.1	88.0	108.7	0.2	527.4
Total	2,143.6	316.6	2,344.8	397.5	2,986.1	192.2	8,380.8

	In percentages						
Consumer goods	35.9	0.0	8.5	0.2	54.1	1.3	100.0
Tools and means of production	10.9	9.2	55.8	11.2	9.2	3.7	100.0
Incl. raw and other materials	5.6	12.9	61.6	7.8	7.0	5.1	100.0
fuel	0.8	-	67.5	23.0	8.2	0.5	100.0
tools of production	43.9	-	18.8	16.7	20.6	0.0	100.0
Total	25.6	3.8	28.0	4.7	35.6	2.3	100.0
	In percentages						
Consumer goods	82.5	0.0	17.9	2.7	89.4	33.8	58.8
Tools and means of production	17.5	100.0	82.1	97.3	10.6	66.2	41.2
Incl. raw and other materials	6.5	100.0	64.7	48.6	5.7	64.8	29.4
fuel	0.2	-	13.2	26.6	1.3	1.3	5.5
tools of production	10.8	-	4.2	22.1	3.6	0.1	6.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Agriculture's traffic with industry, growing out of the relations of agriculture as a consumer, is expressed in the fact that of the total volume of industrial output consumed by agriculture, 82.5 per cent was consumer goods and 17.5 per cent tools and means of production.

From construction agriculture obtained 58.6 per cent of its consumer goods and 41.4 per cent of its tools of production.

Thus, in its capacity as consumer of products which it itself produced, agriculture was absolutely independent of the other branches of the national economy, but it was wholly dependent on industry in its capacity as consumer of industrial consumer goods as well as of the tools and means of production turned out by industry, and on transport in its capacity as consumer of transport's services

In its consumption of the tools and means of production which are fashioned by agriculture itself, it was, of course, dependent on no one.

In speaking below of the social functions performed by industry, we shall spell out agriculture's traffic with industry in greater detail, but now let us move on to describe the social functions which industry performs in the national economy.

As we see in table 6, Agriculture as a Supplier, agriculture consumed 70 per cent of its produce within the bounds of its own economy and around 30 per cent it sent outside. Industry in turn shows a very close similarity. The city, including industry, transport, construction, the urban population, and the world market, consumed 74.4 per cent of the total volume of industrial output and supplied 25.6 per cent to agriculture.

Speaking of the separate categories of products, industry supplied 35.9 per cent of its consumer goods to agriculture and consumed 64.1 per cent within its own bounds, i.e., the bounds defined by industry, transport, the city, and exports, the city consuming 54.1 per cent out of this 64.1 per cent. Of the total volume of means of production produced by industry, agriculture was given only 10.9 per cent while 89.1 per cent was consumed by industry, transport, construction, exports, and the urban population; of the total volume of tools of production 43.9 per cent was supplied to agriculture and 56.1 per cent consumed by industry, transport, and construction.

Thus agriculture on the one hand and the other branches of the national economy on the other enter into economic relations with one another in the national economy, apportioning around one-third of their output for this nexus.

7. Industry as a Consumer

Groups of products	Receives from: Agriculture	Industry	Construction	Total
	1	2	3	4
	In millions of rubles			
Consumer goods	88.6	419.4	-	508.0
Tools and means of production	1,152.3	1,925.4	95.5	3,173.2
Incl. raw and other materials	1,044.6	1,516.5	-	2,561.1
fuel	107.7	309.8	-	417.5
tools of production	-	99.1	95.5	194.6
Total	1,240.9	2,344.8	95.5	3,681.2
	In percentages			
Consumer goods	17.4	82.6	-	100.0
Tools and means of production	36.3	60.7	3.0	100.0
incl. raw and other materials	40.8	59.2	-	100.0
fuel	25.8	74.2	-	100.0
tools of production	-	50.9	49.1	100.0
Total	33.7	63.7	2.6	100.0
	In percentages			
Consumer goods	7.1	17.9	-	13.8
Tools and means of production	92.9	82.1	100.0	86.2
Incl. raw and other materials	84.2	64.7	-	69.6
fuel	8.7	13.2	-	11.3
tools of production	-	4.2	100.0	5.3
Total	100.0	100.0	100.0	100.0

Industry as such, in the precise meaning of the word, consumed 3,681 million rubles' worth of products, of which 13.8 per cent was consumer goods which it used as raw materials in the productive process and 86.2 per cent was tools and means of production. It must be noted that of the total volume of consumer goods which industry used, some 17 per cent was supplied by agriculture and 83 per cent came from industry's own output; of

the total volume of tools and means of production used by industry, roughly 36 per cent was produced by agriculture, 60 per cent was turned out by industry itself, and 3 per cent by construction; industry as a whole, in its capacity as consumer, took 33.7 per cent of the output of agriculture, 63.7 per cent of the output of industry, and 2.6 per cent of construction

Accordingly, we see that in its capacity as a consumer industry is linked on the one hand with agriculture and on the other with its own branches, with each of which it contracts an economic tie; the output of some branches is the raw material and semimanufactured goods for others.

Closely tied in with industry is the urban population, which provides industry and trade with manpower and the state with white-collar workers; on the other hand, the city acts as a major consumer....

8. Construction as a Supplier

Groups of products	Supplies to:			
	Agriculture	Industry	City	Total
	1	2	3	4
	In millions of rubles			
Consumer goods	285.1	-	186.4	471.5
Tools of production	201.6	95.5	84.7	381.8
Total	486.7	95.5	271.1	853.3
	In percentages			
Consumer goods	60.5	-	39.5	100.0
Tools of production	52.8	25.0	22.2	100.0
Total	57.0	11.2	31.8	100.0
	In percentages			
Consumer goods	58.6	-	68.8	55.3
Tools of production	41.4	100.0	31.2	44.7
Total	100.0	100.0	100.0	100.0

Of the total volume of consumer goods, construction supplied 60.5 per cent to the rural population and 39.5 per cent to the urban; of the total volume of tools of production, it supplied some 53 per cent to agriculture, 25 per cent to industry, and 22 per cent to the city. [See table 8.]

As a whole construction, as a separate branch of the national economy, is linked with agriculture to the extent of 57 per cent of its output and with industry and the city to the extent of 43 per cent; it establishes its connection with agriculture through rural construction, and with industry and the city through urban construction. Organizationally, urban and rural construction are entirely independent of one another and stand on their own.

Let us proceed to describe construction as a consumer.

Construction, in its capacity as consumer, uses exclusively means of production, of which 31.5 per cent is supplied by agriculture and 68.5 per cent by industry, agriculture furnishing

9. Construction as a Consumer

Groups of products	Receives from:		
	Agriculture	Industry	Total
	1	2	3
	In millions of rubles		
Consumer goods	-	0.1	0.1
Means of production (raw and other materials)	145.4	316.5	461.9
Total	145.4	316.6	462.0
	In percentages		
Consumer goods	-	100.0	100.0
Means of production	31.5	68.5	100.0
Total	31.5	68.5	100.0
	In percentages		
Consumer goods	-	0.0	0.0
Means of production	100.0	100.0	100.0
Total	100.0	100.0	100.0

lumber, and industry furnishing products of the extractive industries as well as of the brick, glass, metals, and other manufacturing industries.

In the national economy transport is, like the other branches, both a supplier and a consumer.

As a supplier, transport offers its output (the output of transport represents the conveyance of products from the producer to the consumer) (a) to agriculture, (b) to industry, the city, and the world market.

As a consumer, it uses the tools and means of production supplied by agriculture and industry.

According to approximate calculations, transport supplies products amounting to 653 million rubles.

As a consumer, transport took goods worth 447 million rubles, of which consumer goods comprised 2.4 per cent, raw and other materials in the strict sense 47.9 per cent, fuel 30 per cent, and tools of production 19.7 per cent.

10. Transport as a Consumer

Groups of products	Receives from:					
				Percentage of the total		
	Agriculture	Industry	Total	Agriculture	Industry	Total
	1	2	3	4	5	6
Consumer goods	-	10.7	10.7	-	100.0	100.0
Raw and other materials	21.4	193.2	214.6	10.0	90.0	100.0
Fuel	28.7	105.6	134.3	21.4	78.6	100.0
Tools of production	-	88.0	88.0	-	100.0	100.0
Total	50.1	397.5	447.6	11.2	88.8	100.0
	In percentages					
Consumer goods	-	2.7	2.4			
Raw and other materials	42.7	48.6	47.9			
Fuel	57.3	26.6	30.0			
Tools of production	-	22.1	19.7			
Total	100.0	100.0	100.0			

The total volume of consumer goods which transport received was made up solely of industrial products which it used as means of production; of the total volume of raw and other materials which it consumed, 10 per cent was agricultural and 90 per cent industrial raw material.

Agriculture supplied transport with 21.4 per cent of its fuel, and industry 78.6 per cent; the tools of production were supplied to transport exclusively by industry.

Such is the connection which transport has with agriculture and the other branches, established in the performance of those social functions which transport discharges as an independent branch of the national economy.

Proceeding to a more detailed analysis of the interrelations between agriculture and the separate branches of industry, we find them to be extremely interesting [see table 11: Consumption of Agricultural Products by Industry].

Of the aggregate output of agriculture consumed by industry, the food industry took 61.8 per cent, the textile industry 15.4 per cent, the branches processing solid products of organic origin 12.3 per cent, and the wood-processing branches 6.7 per cent. These four branches consumed 96 per cent of all the products supplied by agriculture, the rest of the industrial branches only 4 per cent. Thus, as a supplier of raw materials and fuel, agriculture is linked mainly with the four branches indicated above....

There can be no room in the national economy, therefore, for pitting against each other the interests of two distinct economic organisms—agriculture and industry—but an opposition does exist between the interests of these two parts of the same whole, the unitary national economy. Our inferences are further corroborated by the data on the distribution of industrial output [see table 12: Distribution of Agricultural and Industrial Products by Categories of Consumers].

It turns out that of the sum total of industrial output agriculture (including rural construction) consumed 23.2 per cent—4.8 per cent productively, as means of production, and 18.4 per cent personally, as means of subsistence.

It is primarily the following branches of industry which supply agriculture:

	Per cent
Extraction and primary processing of minerals	47.5
Food industry	36.3
Processing of solid materials of organic origin	29.4

	Per cent
Processing of minerals	28.1
Wood-working	26.2
Chemical industry	25.5
Mining and metallurgical industry	21.7
Textile industry	19.1
Metals industry	16.7

Agriculture is therefore linked as a consumer with all branches of industry supplying it either with means of production or with consumer goods. Though the nexus with certain branches is

11. Consumption of Agricultural Products by Industry

Branches of industry	Millions of gold rubles	Percentage of the total	
		Including grain milled to order	Excluding grain milled to order
	1	2	3
Food industry			
with grain milled to order	2,073.6	81.4	-
without grain	766.1	-	61.8
Textile industry	191.2	7.5	15.4
Processing of hard materials of organic origin	153.2	6.0	12.3
Wood-working	82.6	3.3	6.7
Processing of minerals	12.3	0.5	1.0
Chemical industry	10.7	0.4	0.9
Metal-working industry	7.8	0.3	0.6
Mineral fuel	7.2	0.3	0.6
Power and water	4.2	0.2	0.3
Other branches of the mineral-extraction industry	2.9	0.1	0.2
Paper-making	1.2	0.0	0.1
Extraction and primary processing of minerals	0.7	0.0	0.1
Printing and publishing industry	0.4	0.0	0.0
Arts and applied sciences industry	0.3	0.0	0.0
Total for all industry			
with grain milled to order	2,548.3	100.0	-
without grain	1,240.8	-	100.0

stronger than with others, all branches of industry are drawn into this interrelation.

Accordingly, whereas agriculture was linked as a supplier primarily with four branches of industry, as a consumer it is linked with an enormous number of industrial branches, the products of which find their consumer in agriculture, in its productive operations and in its population.

Let us elaborate on the production link between agriculture and industry. This connection, as indicated above, is expressed in the consignment of means of production (raw materials and fuel) by agriculture to industry and, conversely, the consignment of means of production (raw materials, fuel, and tools of production) by industry to agriculture.

The statistics in the table, Production Connections of Industry with Agriculture, on pages 76-77 lead to the following conclusions:

(1) Industry receives 35.6 per cent of its means of production from agriculture and 64.4 per cent from its own branches, while of the sum total of means of production turned out by industry it delivered 13.2 per cent to agriculture and consumed 86.8 per cent within the confines of its own productive activity. Taken en bloc, therefore, industry constitutes a vast market for raw materials and fuel, a market seven or eight times as great as the one created by agriculture's consumption.

(2) The greatest tie between industry and agriculture shows up in the industrial branches processing raw materials which originate in agricultural activities; in the food industry, for instance, 71 per cent of all means of production are supplied by agriculture, and in the wood-working branches 62.8 per cent of all means of production come from forestry. The industrial branches processing solid products of organic origin obtain 41.9 per cent of their raw materials and fuel from agriculture, principally from animal husbandry. Agriculture supplies 33 per cent of all the raw materials and fuel used by the industrial branches engaged in the processing of minerals. The textile industry's link with agriculture is not as strong: 18.8 per cent of its fuel and of the raw material which it processes comes from agriculture; this needs qualifying, however, in the sense that agricultural raw materials which have been through preliminary machine processing figure in the textile industry as industrial raw materials. In the case of the chemical industry, agriculture supplies roughly 12 per cent of all the raw materials.

12. Distribution of Agricultural and Industrial Products by Categories of Consumers
(in percentages of the sum total of distribution)

Branches of the national economy	Consumption of agriculture			Consumption of city[a]			Exports and reserves	Total distributed
	Total	Including						
		Productive	Personal	Productive	Personal	Collective		
	1	2	3	4	5	6	7	8
Agriculture								
Cultivation of meadows	87.5	87.5	-	-	11.6	0.9	0.0	100
Field-crop cultivation	74.8	35.3	39.5	15.9	2.9	0.3	6.1	100
Animal husbandry	70.6	24.7	45.9	8.7	19.8	0.6	0.3	100
Poultry raising	66.5	11.3	55.2	0.2	25.9	-	7.4	100
Market-gardening, vineyards	64.0	11.3	52.7	1 6	31.4	0.2	2.8	100
Apiculture and sericulture	62.7	3.2	59 5	17.9	15.0	-	4.4	100
Fishing and hunting	53.7	-	53.7	10.7	12.4	-	23.2	100
Forestry	52.8	16.0	36.8	25.8	15.2	2.1	4.1	100
Total	71.1	31.7	39.4	12.3	12.1	0.6	3.9	100

Industry								
Extraction and primary processing of minerals	47.5	47.5	-	46.0	-	0.4	6.1	100
Food industry	36.3	1.8	34.5	11.3	46.8	1.1	4.5	100
Processing materials of organic origin	29.4	4.1	25.3	25.9	37.7	1.6	5.4	100
Processing of minerals	28.1	15.8	12.3	52.1	7.6	3.2	9.0	100
Wood-working	26.2	22.6	3.6	41.7	8.8	2.7	20.6	100
Chemicals	25.5	1.2	24.3	24.9	19.8	6.2	23.6	100
Other mineral extraction	21.7	-	21.7	20.1	7.0	12.4	38.8	100
Textile industry	19.1	0.7	18.4	33.7	27.3	2.0	17.9	100
Metal-working	16.7	15.4	1.3	48.3	3.1	9.2	22.7	100
Arts and applied sciences	12.7	-	12.7	3.2	36.8	10.8	36.5	100
Paper-making	11.2	-	11.2	48.2	23.2	4.8	12.6	100
Mineral fuel	4.4	1.3	3.1	55.4	4.6	2.7	32.9	100
Printing and publishing	1.3	-	1.3	92.7	1.2	4.8	-	100
Power and water	-	-	-	38.1	56.9	5.0	-	100
Total	23.2	4.8	18.4	31.8	25.9	3.3	15.8	100

[a] The city is interpreted broadly, i.e., as industry, transport, construction, and the urban population.

13 Production Connections of Industry with Agriculture

Branches of Industry	Raw and other materials and fuel supplied by:							Means of production supplied to:[a]		
	Agriculture									
	A. Farming and cultivation	B Animal husbandry	C. Forestry	D Fishing and hunting	Total	Industry	Total	Agriculture	Industry	Total
	1	2	3	4	5	6	7	8	9	10
	In millions of rubles									
A. Mineral Extraction Industry	—	—	10.8	—	10.8	221.3	232.1	12.1	463.2	475.3
I. Extraction and primary processing of minerals	—	—	0.7	—	0.7	2.7	3.4		15.5	15.5
II. Mineral fuel	—	—	7.2	—	7.2	210.3	217.5	12.1	404.8	416.9
III. Other mineral extraction	—	—	2 9	—	2 9	8 3	11 2	—	42 9	42 9
B. Manufacturing	747 1	274 4	184 5	24 0	1,230 0	2,024 6	3,254.6	343 0	1,881 6	2,224.6
I Processing of minerals	0 1	—	12 2	—	12 3	25 3	37 6	1 0	8 9	9.9
II. Metal-working	—	—	7 8	—	7 8	390 1	397 9	173.7	365 2	538.9
III Wood-working	—	—	82 6	—	82 6	49 0	131.6	69 5	71 3	140 8
IV Chemicals	0 1	6 3	4 3	—	10 7	80 0	90.7	2 3	86 9	89 2
V Food industry	666 1	45 6	32 4	22 0	766 1	312.6	1,078 7	45.8	274.5	320.3
VI. Process matrls of organ origin	—	137 5	13 8	2 0	153 3	212 5	365 8	34 9	218 4	253 3
VII Textile industry	80 8	85 0	25 4	—	191 2	825 1	1,016.3	15 8	763 0	778 8
VIII Paper-making	—	—	1 1	—	1 1	31 2	32.3	—	48.4	48.4
IX Printing and publishing	—	—	0 4	—	0 4	25 8	26 2	—	1 9	1 9
X. Power and water	—	—	4 2	—	4 2	65 1	69 3	—	41.8	41.8
XI. Arts and applied sci. ind	—	—	0 3	—	0 3	7 9	8 2	—	1.3	1.3
Total for industry	747 1	274 4	195 3	24 0	1,240 8	2,245 9	3,486 7	355 1	2,344.8	2,699 9
Tools of production	—	—	—	—	—	99 1	99 1			

In percentages

A Mineral Extraction Industry	—	—	4 6	—	4 6	95.4	100	2 5	97.5	100
I Extraction and primary processing of minerals	—	—	20 6	—	20 6	79 4	100	—	100	100
II Mineral fuel	—	—	3 3	—	3.3	96.7	100	2.9	97 1	100
III Other mineral extraction	—	—	25 9	—	25 9	74.1	100	—	100	100
B Manufacturing	23 0	8 4	5 7	0 7	37 8	62.2	100	15.4	84.6	100
I Processing of minerals	0 3	—	32 4	—	32 7	67 3	100	10 1	89 9	100
II. Metal-working	—	—	2.0	—	2 0	98 0	100	32 2	67.8	100
III Wood-processing	—	—	62 8	—	62 8	37.2	100	49.4	50.6	100
IV Chemicals	0 1	7.0	4 7	—	11 8	88 2	100	2.6	97 4	100
V Food industry	61.8	4 2	3.0	2 0	71 0	29 0	100	14.3	85 7	100
VI Process matrls of organ origin	—	37 6	3 8	0.5	41 9	58.1	100	13.8	86.2	100
VII. Textile industry	7.9	8.4	2.5	—	18.8	81.2	100	2.0	98.0	100
VIII. Paper-making	—	—	3.4	—	3.4	96.6	100	—	100	100
IX. Printing and publishing	—	—	1.5	—	1.5	98 5	100	—	100	100
X Power and water	—	—	6 1	—	6 1	93 9	100	—	100	100
XI Arts and applied sci ind	—	—	3 7	—	3.7	96 3	100	—	100	100
Total for industry	21.4	7 9	5.6	0.7	35.6	64.4	100	13.2	86.8	100
Tools of production	—	—	—	—	—	100	100			

In percentages

A Mineral Extraction Industry	—	—	5 5	—	0.9	9 9	6 6	3 4	19 8	17.6
I Extraction and primary processing of minerals	—	—	0.3	—	0 1	0.1	0 1	—	0.7	0.6
II. Mineral fuel	—	—	3.7	—	0.6	9.4	6.2	3.4	17 3	15.4
III. Other mineral extraction	—	—	1.5	—	0.2	0.4	0.3	—	1.8	1.6
B Manufacturing	100	100	94.5	100	99 1	90.1	93.4	96.6	80 2	82.4
I Processing of minerals	0 0	—	6.2	—	1.0	1.1	1.1	0.3	0.4	0.4
II. Metal-working	—	—	4.0	—	0 6	17.4	11.4	48.9	15.6	20.0
III. Wood-processing	—	—	42.3	—	6 7	2.2	3.8	19.6	3.0	5.2
IV. Chemicals	0 0	2.3	2 2	—	0.9	3.6	2.6	0.6	3.7	3.3
V Food industry	89 2	16.6	16.6	91.7	61.7	13.9	30.9	12.9	11.7	11.9
VI. Process. matrls. of organ. origin	—	50.1	7.1	8.3	12.4	9.5	10.5	9 8	9.3	9.4
VII Textile industry	10 8	31.0	13.0	—	15.4	36.7	29 2	4.5	32.5	28 8
VIII. Paper-making	—	—	0.6	—	0.1	1.4	0.9	—	2.1	1.8
IX. Printing and publishing	—	—	0.2	—	0.0	1.1	0.8	—	0.1	0.1
X Power and water	—	—	2.2	—	0.3	2.9	2.0	—	1.8	1.5
XI. Arts and applied sci. ind	—	—	0.1	—	0.0	0.3	0.2	—	0.0	0.0
Total for Industry	100	100	100	100	100	100	100	100	100	100

a. Statistics on what is supplied to agriculture and industry include tools of production

(3) The importance of agriculture as a consumer of means of production produced by industry is especially great in the following branches of industry: wood-processing—49.4 per cent, metals—32.2 per cent, the food industry—14.3 per cent, processing of materials of organic origin—13.8 per cent. The remaining industrial branches have relatively weak ties with agriculture.

(4) Farming sends those of its products which go to industry mainly to the food industry—89.2 per cent—and to the textile industry—10.8 per cent.

(5) Of the products which animal husbandry supplies to the industrial branches which refine these products, 50.1 per cent goes to the leather industry, 31.0 per cent to the textile industry, and 16.6 per cent to the food industry.

(6) Forestry, as a fuel supplier, caters for all branches of industry; as a raw material supplier, it sends 42.3 per cent of its output to the branches engaged in wood processing.

(7) Fishing and hunting cater for the food industry (91.7 per cent) and for the leather and fur industry (8.3 per cent).

(8) Industries supplying their products to agriculture are metal-working (48.9 per cent), wood-processing (19.6 per cent), food (12.9 per cent), leather (9.8 per cent), and textile (4.5 per cent) of all products supplied.

Thus, of the industrial branches linked with agriculture, some supply their products to agriculture while others consume the products of agriculture, several branches concurrently playing the role both of major suppliers and of major consumers. For example, the industrial wood-working branches obtain from agriculture 62.8 per cent of all the raw materials and fuel required by them, while at the same time sending 49.4 per cent of the means of production produced by them to agriculture.

The branches of the national economy are thus interlinked by productive ties, and it follows that these ties are of an organic and not a mechanical character.

Generalizing from the analytical data, one must come to several conclusions which are momentous for resolving the problems entailed in the organization of a planned economy. To the extent that individual branches of agriculture are suppliers of raw materials and fuel for industry, industry has an enormous capacity to influence the way in which the respective branches of agriculture organize their production. This influence is reinforced by the fact that large-scale industry is almost wholly in the hands of the state and consequently impinges on agriculture

not as an atomistic but as a unitary consumer in a position to display a united will, to be a kind of monopolist in the area of consumption. Like any monopolist, it has the economic power to lay down a number of conditions—in the given instance for agriculture—as to the way production is organized in those branches the products of which it consumes as raw materials and fuel. Consequently, state industry as a consumer-monopolist is, theoretically, able to dictate the production plan to several branches of agriculture.

However, agriculture too, to the extent that it is itself a monopolistic supplier of fuel and raw materials to industry, is similarly able to place industry in a state of dependence upon it; but this theoretically enormous dependence is virtually nullified by the fact that agriculture is fragmented, comprising 23 million farms lacking a coherent economic policy. Hence agriculture, strange as it may seem at first glance, itself ends up by being dependent upon the procurement agencies. When it comes to marketing, farmers are interested primarily in only one thing, the level of prices of raw materials and fuel, and are not directly interested in bringing up questions of how industry is organized; for no individual farm has any direct relationship with industry as a whole....

3. THE SYSTEM OF DISTRIBUTION

The balance-sheet data provide all the elements needed to envisage the process of reproduction of the Soviet economy.

As we have seen above (p. 55), material assets amounting to 17,856,400,000 rubles at production prices came into the national economy in 1923/24. But this sum does not exhaust the assets which the national economy has at its disposal: in the first place transport, by moving products from where they are produced to where they are consumed, has created additional assets amounting to 652,800,000 rubles; and besides that, part of the value created in production but not taken into account by production prices has been recovered through marketing and distribution, amounting to 2,900,900,000 rubles. The total sum, therefore, of the assets which came into the national economy for distribution was 21,410,100,000 rubles, of which 46.9 per cent was consumer goods and 53.1 per cent raw materials, fuel, and tools of production.

BALANCE SHEET OF THE NATIONAL ECONOMY

(1923/24)

Names of the Branches of the National Economy	Products Entering the National Economy												Distribution of Products in the National Economy																				
			Including							Including			Consumption in the National Economy																				
													Productive Consumption									Nonproductive Consumption											
													Industry			Construction						Personal consumption and consumption in housekeeping			Collective consumption (consumption by institutions)								
	Reserves in production and held by state procurement organizations as of Oct 1 1923	Gross output at production prices	Factory-and plant (Census listed) industry	Small-scale (non-Census) and domestic-craft industry	Imports	Total which came into the national economy at production prices	Total which came into the national economy at consumption prices	Difference in valuation between production and consumption prices	Created by transport (rail and water)	Recovered through excises	Recovered in the process of commodity circulation and other operations	Agriculture	Factory-and plant (Census listed)	Small-scale (non-Census) and domestic craft	Total	Urban	Rural	Factory and Plant	Total	Transport	Trade	Total productive consumption	Agricultural population	Non agricultural population	Total	Under state budget	Under local budget	Total	Total non-productive consumption	Total consumed in national economy	Exports	Reserves on hand in production and in state procurement organizations as of Oct. 1, 1924	Reserves in trade enterprises and in channels of circulation	Total distributed in national economy
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	14	32	33	34
	In millions of gold rubles												In millions of gold rubles																				
Agriculture	118 7	8921 6	—	—	86 7	9127 0	10738 1	1611 1	245 7	12 4	1353 0	30 6	503 9	437 0	1240 9	25 2	115 4	4 8	145 4	50 1	1 0	4723 3	4230 3	1298 2	5528 5	48 3	14 1	62 4	5590 9	10314 2	337 3	66 5	20.1	10738 1
a) consumer goods	3 0	3664 7	—	—	15 8	3683 5	4192 2	508 7	33 6	12 4	462 7	17 6	34 9	53 7	88 6	—	—	—	—	—	—	827 7	2315 7	992 5	3308 2	18 7	—	18 7	3326 9	4154 6	19 5	18.1	—	4192 2
b) raw and other materials	115 7	4567 7	—	—	70 2	4753 6	5490 8	737 2	168 9	—	568 3	40 3	699 7	344 9	1044 6	25 2	115 4	4 8	145 4	21 4	—	3421 8	1519 9	142 9	1662 8	17 8	2 1	19 9	1682 7	5104 5	317 8	48 4	20 1	5490 8
c) fuel	—	388 3	—	—	—	388 3	753 3	365 0	43 2	—	321 8	4 9	69 3	38 4	107 7	—	—	—	—	28 7	1 0	173 8	394 7	162 8	557 5	10 0	12 0	22 0	579 5	753 3	—	—	—	753.3
d) tools of production	—	300 9	—	—	0 7	301 6	301 8	0 2	—	—	0 2	99 4	—	—	—	—	—	—	—	—	—	300 0	—	—	—	1 8	—	1 8	1 8	301 8	—	—	—	301.8
Industry	1141 9	6318 9	4492 4	1826 5	343 2	7804 0	9717 5	1913 5	403 6	203 5	1306 4	3 6	1721 6	623 2	2344 8	132 4	114 1	70 1	316 6	397 5	146 2	3560 2	1788 5	2515 7	4304 2	273 0	51 2	324 2	4628 4	8188 6	192 2	1113 0	223 7	9717 5
a) consumer goods	244 2	3576 4	2115 5	1460 9	59 7	3880 3	5277 0	1396 7				0 1	107 0	312 4	419 4	—	—	0 1	0 1	10 7	81 5	514 9	1766 2	2453 2	4219 4	98 1	35 3	133 4	4352 8	4867 7	65 0	261 7	82 6	5277 0
b) raw and other materials	721 3	1959 9	1760 6	199 3	228 1	2909 3	3283 4	374 1				3 7	1220 0	296 5	1516 5	132 4	114 1	70 0	316 5	193 2	62 5	2209 2	18 5	42 8	61 3	58 8	7 4	66 2	127 5	2336 7	124 6	712 0	110 1	3283 4
c) fuel	109 1	362 9	343 4	19 5	6 7	478 7	585 7	107 0				—	302 6	7 2	309 8	—	—	—	—	105 6	0 2	415 6	3 8	19 7	23 5	15 9	2 0	17 9	41 4	457 0	2 4	100.9	25 4	585 7
d) tools of production	67 3	419 7	272 9	146 8	48 7	535 7	571 4	35 7				40 5	92 0	7 1	99 1	—	—	—	—	88 0	2 0	420 6	—	—	—	100 2	6 5	106 7	106 7	527 2	0.2	38 4	5 6	571 4
Construction	—	853 3	—	—	—	853 3	853 3	—	—	—	—	23 6	95 5	—	95 5	—	—	—	—	—	15 0	312 1	285 1	186 4	471 5	23 3	46 4	69 7	541 2	853 3	—	—	—	853.3
a) consumer goods	—	471 5	—	—	—	471 5	471 5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	285 1	186 4	471 5	—	—	—	471 5	471 5	—	—	—	471 5
b) tools of production	—	381 8	—	—	—	381 8	381 8	—	—	—	—	52 8	95 5	—	95 5	—	—	—	—	—	15 0	312 1	—	—	—	23 3	46 4	69 7	69 7	381.8	—	—	—	381 8
Publishing (consumer products)	—	70 9	—	—	1 2	72 1	101 2	29 1	3 5	—	25 6	—	—	—	—	—	—	—	—	—	—	—	4 3	13 4	17 7	10 5	9 0	19 5	19 5	37 2	0 4	—	63 6	101 2
Total for all branches of the national economy	1260 6	16164 7	—	—	431 1	17856 4	21410 1	3553 7	652 8	215 9	2685 0	17 9	2621 0	1060 2	3681 2	157 6	229 5	74 9	462 0	447 6	162 2	8595 6	6308 2	4013 7	10321 9	355 1	120 7	475 8	10797 7	19393 3	529 9	1179 5	307 4	21410.1
a) consumer goods	247 2	7783 5	—	—	76 7	8107 4	10041 9	1934 5				7 4	141 9	366 1	508 0	—	—	0 1	0 1	10 7	81 5	1342 6	4371 3	3645 5	8016 8	127 3	44 3	171 6	8188 4	9531 0	84.9	279 8	146 2	10041 9
b) raw and other materials	837 0	6527 6	—	—	298 3	7662 9	8774 2	1111 3				26 4	1919 7	641 4	2561 1	157 6	229 5	74 8	461 9	214 6	62 5	5631 0	1538 4	185 7	1724 1	76 6	9 5	86 1	1810 2	7441 2	442 4	760 4	130 2	8774 2
c) fuel	109 1	751 2	—	—	6 7	867 0	1339 0	472 0				2 7	371 9	45 6	417 5	—	—	—	—	134 3	1 2	589 4	398 5	182 5	581 0	25 9	14 0	39 9	620 9	1210 3	2 4	100.9	25 4	1339 0
d) tools of production	67 3	1102 4	—	—	49 4	1219 1	1255 0	35 9				58 4	187 5	7 1	194 6	—	—	—	—	88 0	17 0	1032 6	—	—	—	125 3	52 9	178 2	178 2	1210 8	0 2	38 4	5 6	1255.0
	In percentages												In percentages																				
Agriculture·	1 3	97 7	—	—	1 0	100	—	17 6	2 7	0 1	14 8	3285 9	7 5	4 1	11 6	0 2	1 1	0 0	1 3	0 5	0 0	44 0	39 4	12 1	51 5	0 4	0 1	0 5	52 0	96 0	3 2	0 6	0 2	100
a) consumer goods	0 1	99 5	—	—	0 4	100	—	13 8	0 9	0 3	12 6	739 1	0 8	1 2	2 1	—	—	—	—	—	—	19 7	55 2	23 7	78 9	0 5	—	0 5	79 4	99 1	0 5	0 4	—	100
b) raw and other materials	2 4	96 1	—	—	1 5	100	—	15 5	3 6	—	11 9	2210 4	12 7	6 3	19 0	0 4	2 1	0 1	2 6	0 4	—	62 3	27 7	2 6	30 3	0 3	0 0	0 3	30 6	92 9	5 8	0 9	0 4	100
c) fuel	—	100 0	—	—	—	100	—	94 0	11 1	—	82 9	36 4	9 2	5 1	14 3	—	—	—	—	3 8	0 1	23 1	52 4	21 6	74 0	1 3	1 6	2 9	76 9	100 0	—	—	—	100
d) tools of production	—	99 8	—	—	0 2	100	—	0 1	—	—	0 1	300 0	—	—	—	—	—	—	—	—	—	99 4	—	—	—	0 6	—	0 6	0 6	100 0	—	—	—	100
Industry·	14 8	81.0	57 6	23 4	4 4	100	—	24 5	5 2	2 6	16 7	355 1	17 7	6 4	24 1	1 4	1 2	0 7	3 3	4 1	1 5	36 6	18 4	25 9	44 3	2 8	0 5	3 3	48 6	84 2	2 0	11 5	2 3	100
a) consumer goods	6.3	92 2	54 5	37 7	1 5	100	—	36 0				3 2	2 0	5 9	7 9	—	—	0 0	0 0	0 2	1 5	9 7	33 5	46 5	80 0	1 8	0 7	2 5	82 5	92 2	1 2	5 0	1 6	100
b) raw and other materials	24 8	67 4	60 5	6 9	7 8	100	—	12 9				120 5	37 2	9 0	46 2	4 0	3 5	2 1	9 6	5 9	1 9	67 3	0 6	1 3	1 9	1 8	0 2	2 0	3 9	71 2	3 8	21 7	3 8	100
c) fuel	22 8	75 8	71 7	4 1	1 4	100	—	22 4				—	51 7	1 2	52 9	—	—	—	—	18 0	0 0	70 9	0 6	3 4	4 0	2 7	0 4	3 1	7 1	78 0	0 4	17 2	4 4	100
d) tools of production	12 6	78 3	50 9	27 4	9 1	100	—	6 7				231 4	16 1	1 2	17 3	—	—	—	—	15 4	0 4	73 6	—	—	—	17 6	1 1	18 7	18 7	92 3	0 0	6 7	1 0	100
Construction	—	100 0	—	—	—	100	—	—	—	—	—	23 6	11 2		11 2	—	—	—	—	—	1 8	36 6	33 4	21 8	55 2	2 7	5 5	8 2	63 4	100 0	—	—	—	100
a) consumer goods	—	100 0	—	—	—	100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	60 5	39 5	100 0	—	—	—	100 0	100 0	—	—	—	100
b) tools of production	—	100 0	—	—	—	100	—	—	—	—	—	201 6	25 0	—	25 0	—	—	—	—	—	3 9	81 7	—	—	—	6 1	12 2	18 3	18 3	100 0	—	—	—	100
Publishing (consumer products)	—	98 3	—	—	1 7	100	—	40 4	4 9	—	35 5	—	—	—	—	—	—	—	—	—	—	—	4 2	13 3	17 5	10 4	8 9	19 3	36 8	36 8	0 4	—	62 8	100
Total for all branches of the national economy	7 1	90 5	—	—	2 4	100	—	19 9	3 7	1 2	15 0	3842 6	12 2	5 0	17 2	0 7	1 1	0 4	2 2	2 1	0 8	40 2	29 5	18 7	48 2	1 7	0 5	2 2	50 4	90 6	2 5	5 5	1 4	100
a) consumer goods	3 0	96 0	—	—	1 0	100	—	23 9				742 3	1 4	3 7	5 1	—	—	0 0	0 0	0 1	0 8	13 4	43 5	36 3	79 8	1 3	0 4	1 7	81 5	94 9	0 8	2 8	1.5	100
b) raw and other materials	10 9	85 2	—	—	3 9	100	—	14 5				2330 9	21 9	7 3	29 2	1 8	2 6	0 9	5 3	2 4	0 7	64 2	17 5	2 1	19 6	0 9	0 1	1 0	20 6	84 8	5 0	8 7	1 5	100
c) fuel	12 6	86 6	—	—	0 8	100	—	54 4				36 4	27 8	3 4	31 2	—	—	—	—	10 0	0 1	44 0	29 8	13 6	43 4	1 9	1 1	3 0	46 4	90 4	0 2	7 5	1 9	100
d) tools of production	5 5	90 4	—	—	4 1	100	—	2 9				733 0	14 9	0 6	15 5	—	—	—	—	7 0	1 4	82 3	—	—	—	10 0	4 2	14.2	14 2	96 5	0 0	3 1	0 4	100

Consumer goods and means of production almost balanced each other, especially when allowance is made for the fact that a part of the raw materials and fuel is consumed by the population as means of subsistence and not as means of production, while a part of the consumer goods is used as raw materials and semimanufactured goods. Of this over-all total of consumer goods, agriculture supplied 49.8 per cent and industry 50.2 per cent. Of the over-all total of means of production, agriculture supplied 50.6 per cent and industry 49.4 per cent.

This aggregate amount was consumed in the national economy as follows: 40.2 per cent was used up in production; 50.4 per cent was consumed inside the country as means of subsistence; and 9.4 per cent was exported or in reserve. [See table 14: Balance Sheet of the National Economy 1923/24.]

If we stop to realize that the bulk of the exports as well as the reserves consisted of means of production, the total output of the national economy breaks down into two equal parts: 52.8 per cent of the output went for personal consumption, and 47.2 per cent for productive consumption.

It was in this way that equilibrium was established in the national economy.

If 100 units of output (in value terms) are to be consumed as means of subsistence, another 90 value-units must be produced for investment in production as producer goods. This is the law of the Soviet economy, as it is precisely in this form that equilibrium is expressed—equilibrium in the production of the two basic categories of products, means of subsistence and means of production....

According to the Balance Sheet (pages 80-81), the bulk of the material assets which entered the national economy for distribution comprised output turned out in the country in the course of the year covered; reserves and imports occupied a relatively small place, as the following figures show:

	Rubles	Per cent
Coming from production	16,164,700,000	90.5
Coming from reserves	1,260,600,000	7.1
Coming from imports	431,100,000	2.4

The national economy of the Soviet Republics in 1923/24 therefore represents an economy of a type in which social needs —both for production and personal consumption—were satisfied from domestic sources. The national economy had only slight ties with the economies of other countries; the small percentage

of reserves shows that economic and personal needs alike were taken care of by the productive activity of the population in the current year. The negligible nature of reserves and the resultant necessity of basing the development of the economy almost exclusively on the current year's production are serious drawbacks, since the slightest fluctuation in output, or fluctuations in general in the industrial or agricultural picture, have immediate repercussions on the state of the entire national economy, lead to distortions of the economic plan, and make our economic policy unstable. This is the inference we must logically draw. The accumulation of reserves is therefore an essential prerequisite for the socialist development of the national economy.

It has been remarked above that assets at production prices do not include, first, the assets created by transport, and second, the assets which, though created in production, can be disclosed only through marketing and distribution transactions. The difference in the amount of assets at production prices and at consumption prices adds up to 3,553,700,000 rubles and consists of:

	Millions of rubles	As percentage of production prices
(1) Assets created by transport	652.8	3.7
(2) Assets recovered through marketing and distribution	2,685.0[a]	15.0
(3) Recovered through excises	215.9	1.2
Total	3,553.7	19.9

[a] Including the costs of cart transport.

...Moving on to describe the distribution of material assets which entered the national economy, we should note that 40.2 per cent of the total was used for productive purposes as means of production, 50.4 per cent was consumed by the population as means of subsistence, 2.5 per cent was exported, and 6.9 per cent remained in reserve; of the latter, 4.9 per cent was means of production and 2.0 per cent means of subsistence.

Specific consumption was as follows:

	Percentage of total	
I. By agriculture:		
(a) consumed productively (consumption of means of production)[2]	19.0	48.5
(b) consumed by the population (consumption of means of subsistence)	29.5	

2. Including consumption of materials in rural construction.

	Percentage of total	
II. By the city:		
(a) consumed productively (consumption of means of production):		
by large-scale industry	12.2	21.2
by small-scale industry	5.0	
by construction (urban and factory-and-plant)	1.1	
by transport	2.1	
by trade	0.8	
(b) consumed by the population (consumption of means of subsistence):		
individually	18.7	20.9
collectively	2.2	
Total consumed by city	42.1	
III. Exports		
(a) for productive consumption	2.1	2.5
(b) for personal consumption	0.4	
IV. Reserves:		
(a) for productive consumption	4.9	6.9
(b) for personal consumption	2.0	
Total consumed in the national economy:		
(1) of means of production:		
(a) by agriculture	19.0	
(b) by industry, transport, construction, and trade	21.2	
Total	40.2	
(2) of means of subsistence, individually and collectively by the population:		
(a) by agricultural population	29.5	
(b) by the rest of the population — individually	18.7	
(b) by the rest of the population — collectively	2.2	
Total	50.4	
Exported — (a) means of production	2.1	
Exported — (b) means of subsistence	0.4	
Total	2.5	
Reserves — (a) means of production	4.9	
Reserves — (b) means of subsistence	2.0	
Total	6.9	
Sum total	100.0	

Of the aggregate national output which entered the national economy, agriculture received 48.5 per cent (19.0 per cent in means of production and 29.5 per cent in means of subsistence), while the other branches, plus reserves, plus the world market, received 51.5 per cent (28.2 per cent in means of production and 23.3 per cent in means of subsistence). Of the total distribution 47.2 per cent was means of production and 52.8 per cent means of subsistence.

Thus, the national economy is a combination of two systems of consumption almost equal in dimensions: (1) the consumption of agriculture (48.5 per cent) and the consumption of the branches technically and organizationally dissociated from it—industry, transport, etc. (51.5 per cent); (2) consumption of means of subsistence by the population—52.8 per cent, and consumption of means of production in production—47.2 per cent.

This is the form of equilibrium between agriculture and the other branches of the economy as it appears in the area of consumption.

The following, not counting reserves, are the categories, in the order indicated, of consumers of goods used in production:

Consumers	Listed in order, by the amount of output consumed:					
	Total	In %	Agri-culture	In %	Industry	In %
Agriculture	1	42.5	1	65.2	2	13.9
Industry	2	40.7	2	24.6	1	61.0
Construction	3	5.1	4	2.9	4	7.9
Transport	4	5.0	5	1 0	3	10.0
World market	5	4.9	3	6.3	6	3.2
Trade	6	1.8	6	0.0	5	4.0
Total	---	100.0	---	100.0	---	100.0

Agriculture retains first place in consumption of output intended for productive purposes both in the total amount of output consumed and in consumption of agricultural products, but it is second in consumption of industrial products. Industry holds first place in the consumption of its own produce, second place in consumption of products of agricultural origin, and second place likewise in the total amount of products consumed. Construction is in third place in the total amount of products and in

fourth place in agricultural and industrial products. In consumption of agricultural produce the world market moves up to third place, while it holds sixth place in consumption of industrial products and fifth place in consumption of total output. The consumption of trade is in last place.

In total consumption of products transport is in fourth place, of agricultural products in fifth place, and of industrial products in third place.

This is the order in the interrelations of consumers, established economically in their consumption of means of production (i.e., of products of productive consumption).

Thus 47 per cent of the products distributed in the national economy are consumed as means of production. Part of these cannot be consumed on a personal basis by virtue of their physical properties (ore, unfinished iron, etc.). The other part has physical properties which would allow of their being consumed personally by the population—for example, meat, milk, grain, etc.—but emerges in production as raw materials or half-finished goods; it cannot, economically speaking, be consumed on a personal basis as such consumption would signify a reduction of means of production which would entail a reduction of products of subsistence as well.

The creation of a disequilibrium, therefore, in the consumption of part of the products destined for production would forthwith be reflected in a reduction of consumption.

The products of personal consumption (means of subsistence—the personal income of the population), comprising 53 per cent of the total produce which came into the national economy

Consumers	Listed in order, by the amount of output consumed:					
	Total	In %	Agriculture	In %	Industry	In %
Farm population	1	57.9	1	75.4	2	39.4
Nonfarm population	2	36.9	2	23.1	1	51.5
Collective consumption	3	4.4	3	1.1	3	7.9
World market	4	0.8	4	0.4	4	1.2
Total	---	100.0	---	100.0	---	100.0

for distribution, consists almost equally of agricultural and industrial products (49.8 per cent and 50.2 per cent). We arrange the consumers of means of subsistence in order of their significance as consumers.

The farm population has the same standing in the consumption of means of subsistence as agriculture occupied in the consumption of means of production, i.e., first and second places.

The nonfarm population has the same standing in the consumption of means of subsistence as industry occupied in the consumption of means of production, i.e., second and first places.

Collective consumption is in third place, and the world market in fourth.

This, in general outline, is the system of production and the system of distribution corresponding to it. These are the forms which equilibrium assumes in the system of production and distribution as it is established in the national-economic processes....

W. Leontief

THE BALANCE OF THE ECONOMY OF THE USSR

A METHODOLOGICAL ANALYSIS OF THE WORK OF THE CENTRAL STATISTICAL ADMINISTRATION

Among various problems which must be solved by contemporary Russian statistics, that of representing in numbers the total turnover of economic life is perhaps the most interesting as well as the most complex. As a result of many years' work by the Central Statistical Administration, the "Balance of the Economy of the USSR in 1923/24" has appeared.[1] The principal feature of this balance, in comparison with such economic-statistical investigations as the American and the English censuses is the attempt to represent in numbers not only the production but also the distribution of the social product, so as to obtain a general picture of the entire process of reproduction in the form of a "Tableau économique" (economic table).

On the income side of the Balance is presented the value of the total amount of goods at the disposal of the whole economy during the year under consideration.

All these goods are divided three ways into separate groups. First, the three large-scale branches of the economy—industry, agriculture, and construction—are separated from one another. Second, all the goods created are divided into four groups in accordance with, so to speak, their functional relationships to the process of production: (1) goods intended for individual consumption (production factor: labor); (2) raw and other materials; (3) fuels; and (4) tools of production. Finally, all values are broken down, in accordance with the formation of prices, into their component parts, which jointly add up to consumer

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"Balans narodnogo khoziaistva SSSR," Planovoe khoziaistvo, No. 12, 1925, pp. 254-258.

1. Ekonomicheskaia zhizn', No. 72 of the current year. Report by P. I. Popov in the Council for Labor and Defense (STO).

prices—namely, local production prices, transportation expenditures, and trade mark-ups.

On the expenditure side, the table shows how the values representing the national economy's income are distributed and used. The distribution of expenditures follows in general the subdivisions of income. The values are divided, according to their origin, into three main groups: products of industry, products of agriculture, and products of construction. The relationship to the process of production is again denoted by subdivisions into (1) consumer goods; (2) raw and other materials; (3) fuels; and (4) tools of production. All goods, whether used in production (namely, in its three main branches), in the process of distribution (transport and trade), or in consumption, are divided into three main groups according to their economic rather than their production and technical functions. They thus find their expression in the income data, which distinguish among expenditures for production, transportation, and trade.

Clearly, this balance scheme is based on the methodological principle of exclusively material accounting. Only material goods are accounted for. The income side of the economic turnover is considered only insofar as it consists of "objectivized" material goods. From this point of view it is fully consistent that the public administration, whose budget has reached almost 1.5 billion rubles, should be represented in the balance by only 475.7 million rubles. The state does not create any material goods; its income is "derived" and as such does not have any counterpart in the income of the economic balance. But neither do its expenditures, e.g., the payments without material counterpart to second parties such as officials; these are also treated as "secondary" (derived) income. Inasmuch as state establishments act as immediate consumers, the corresponding expenditures are reflected in the category of collective consumption. The same device is applied to transportation. Its services are taken into consideration only to the extent that they enter as costs in the prices of goods; consequently, passenger traffic has been omitted.

Although this methodological peculiarity limits the attempt to make the balance represent a complete picture of the turnover of the economy, it nevertheless leaves the internal organic structure of the balance scheme untouched. The same thing cannot be said with regard to the concept and the method of calculation of the total income of the economy. This problem has great importance for the methodology of the entire statistics of production, and in the case of generalizations about the balance,

its role becomes decisive. For example, in the accounting of "value added"—whose purpose is to calculate the net income of the economy—if total product constitutes only an intermediate item, then the "dualistic" concept of the total product represents the model as well as the basic element of the entire balance system.

Let us, therefore, briefly touch upon the general formulation of this problem, since only in this way can we critically evaluate the method which has been used in this scheme.

The total product is the result of the process of production, which, in addition to newly created values, also contains the value of the goods expended and worn out in its creation.

This latter value is usually called costs. In statistical methodology, the definite distinction between these two value sums means that the first of these sums—the net product—can appear no more than once in the process of production. Cost expenditures, on the contrary, can endlessly pass from one stage of production to another and reappear at each stage in the same form. Thus the net product of several branches of production is always equal to the sum of the individual net products; costs, on the contrary, amount to less than the sum of the individual total products, since they constitute only a part of the total value of production and since the same values are accounted again and again in various technically related processes of production. This reasoning, which appears somewhat complicated in abstract form, will become clearer in a numerical example. Let us imagine a complex branch of industry with three production stages. On the first—the lowest stage—a value (net product) of one unit is added to the value of expended raw materials and other expenditures equaling 2 units.

In this way, total product consists in 2 + 1 = 3. Further processing occurs at the second stage. To the 3 units, which occur here as expenditures, 4 new ones are added. Consequently, total product comprises 3 + 4 = 7. In its turn, the second production stage is included in the third and last stage, where to these 7 units 5 more are added. The values of costs, of the net product, and of the total product of all three stages are summed up in the table on the following page.

But if we imagine the same process of production as a single phenomenon, then the corresponding formula will appear as 2 + 10 = 12, where the first figure represents costs; the second, the net product; and their total, the total product. A comparison with the first conclusion shows that the sum of the net

Growth of Value in the Total Product

Stages	Costs	Net product	Total product
I	2	+ 1	= 3
II	3	+ 4	= 7
III	7	+ 5	= 12
Total	12	+ 10	= 22

product remains the same in both cases (10); the costs, on the contrary, which were expressed by 12 value units in the first method, are expressed by 2 units in the second method thanks to the exclusion of all double counting. In accordance with this, the sum of the total product amounts to 22 units in the first case and 12 in the second. Each of these two magnitudes of the total product—the real one, i.e., that found after excluding any double counting (equal to 12 in our example), as well as the second, designated by us as the "total turnover" (equal to 22 in our example)—has a scientific meaning. The total turnover is more suitable for balance accounting than the real sum, for the same reason that the real gross product is much more suitable than the net product: the more deeply and widely individual relationships are included, the more clearly the organic structure of the economic whole appears. On the other hand, however, it is much more difficult to obtain a total turnover which can be applied in a scientific way than to obtain a corresponding real magnitude.

Every statistical sum should be constituted in such a way that the relationship among the values of its component parts fully corresponds to the actual relationships of individual data included in the subject of statistical investigation. Both component parts of the real sum of the gross product—the net product as well as the original costs, i.e., those computed without any double counting—are accurate and indisputable. For this reason the requirement mentioned above is automatically fulfilled to a certain degree.

The matter of the total turnover is completely different. We have seen above that double calculation consists in considering the same value of costs repeatedly in several parts of a connected process of production. The larger the number of these partial stages, the greater the extent of such double counting, and the greater the corresponding total turnover. If the total turnovers of several branches of industry are to be compared

with one another, the dissection of all these processes of production, which is necessary for such a calculation, should be performed in a uniform manner. Such dissection can be undertaken from two points of view. The first is the technical point of view. In this case the various stages of production which are technically analogous are looked upon as separate subjects of calculation. If, for instance, the individual branches of production of the textile industry are to be compared with one another, the production of yarn and fabrics of each branch—cotton, silk, and wool—should be computed and totaled. We thus obtain several total turnovers, computed in an identical manner, whose comparison is methodologically possible; but such a method can lead us to our goal only in the case where a statistical investigation is limited to a narrow circle of related areas of production.

If branches of industry which do not have anything in common technically are included in the investigation, this method will be completely inapplicable; there can be, for instance, no question of analogous stages of production in machine construction and paper production. In an economic balance, however, not just some but all the areas of the economy are compared, and the above method is, as a result, inapplicable. But even in this case various objects of investigation can be reduced to a common denominator, if the necessary dissection is performed from an economic point of view. The calculation is based not on any technically separate stages of production, but on economic unity. The total turnover will be the sum of the values of goods which are sold on the free market by the individual enterprises active in the given process of production. It is thus equal to the sum of goods produced by the corresponding enterprises.

Such a method provides a possibility of comparing the economic weight of all the areas of production with one another, leaving aside their technical peculiarities. But even this method is not always applicable; its limitations are greater than those of the method mentioned earlier. Economic dissection of the process of production is possible only when the latter is organized as in a barter economy, while the total amount of goods can be computed only with reference to a commodity economy. Like the ideal socialist economy, a large number of isolated natural economies do not know any intermediate economic division of labor and, consequently, any double economic calculation of costs. Since, for a balanced statistical comparison, subdivisions performed from a technical point of view are insufficient, it fol-

lows that the total turnover should be renounced and the real gross product be considered instead. But if the economy is organized partly as a barter economy and partly as a natural economy, a coherent picture of the whole can be obtained only through the computation of the real total income, since this is applicable to all economic systems, whereas the method of the total turnover—as we have seen—is not applicable to the branches of production with a natural economy (at least not to the extent necessary for balance accounting). The following circumstance must also be taken into consideration: inasmuch as individual branches of production interpenetrate one another to a greater or lesser extent by means of exchange, a certain double counting will take place in totaling their real gross product. Thus the total national gross product will constitute the sum of the turnovers. But a methodological danger will appear only in the case where a comparison with another total national gross product is undertaken.

Let us now turn to the main published table of the balance of production and distribution. The size of the shares marketed by each branch shows that the economy of our Union is still organized, in the main, as a natural economy. Agriculture sells a comparatively small part of its products; the largest part is used by the farm households. Nevertheless, the method of total turnover was applied here. Furthermore, the subdivision of agricultural production shows that the calculation of the total turnover was based on technical dissection: cultivation of the soil and of meadows, animal husbandry, forestry, fishing, and hunting. This method should be recognized as wholly wrong. As we have seen, such a method inevitably leads to a series of discrepancies, since there is no principle on the basis of which an objective calculation can be made of the total amounts of the total product of individual branches of production. Hence it is completely meaningless to compare the shares of the total products obtained in the various branches of production "per worker engaged in production" or "per capita" of the population (as shown in the balance table).

The balance does not give any references to the sources which served as foundations of its construction. Four categories of data can be assumed: (1) current statistics; (2) censuses, namely, the general population and industrial census of 1920 and the urban census of 1923; (3) statistics of the budget; and (4) other sources as, for instance, the data of state and trade organizations, of the cooperatives, etc.

As the first attempt of our statistics, the balance needs fur-

ther methodological discussion. And such discussion will acquire a firm foundation only with the publication of all materials and with the indication of the methods used for their processing.

V. G. Groman

THE BALANCE OF THE NATIONAL ECONOMY

...Marx himself had no occasion to construct a balance of a national economy. He lacked the statistical data to accomplish this. In undertaking, however, to explore the reproduction and circulation of all social capital, Marx came close to balance formulations. His scheme for simple and expanded reproduction is the pivotal element of the balance....

The balance of the national economy should, in accordance with Marx's idea, show production, distribution, exchange, and consumption in their mutual interdependence as an organic unity. A planned economy assumes that a balance of the national economy will be constructed. From its very first efforts, therefore, Gosplan set about drafting the outline for the balance and began itself to fill it in. In this, however, it encountered an insuperable obstacle in the absence of statistical data, and in the summer of 1924 Gosplan proposed to the Council of Labor and Defense that it commission the Central Statistical Administration to draft a balance for 1923/24. This work was not published until June 1926.

The editor of the book, Comrade P. I. Popov, former director of the Central Statistical Administration, proceeded from the fundamental idea that the balance of the national economy "signifies a statistical operation intended to show how the social economy is reproduced in specific conditions." (Introduction, p. 1.) In his opinion, "the balance of the national economy, as a statistical operation, is a system for studying society at a given historical moment." Unlike Marx, P. I. Popov avers that "all market relationships are jettisoned and production-and-distribution relations emerge in their pristine form." In the chapter entitled "Theoretical Bases of the Balance" he presents Quesnay's scheme as well as Marx's scheme for simple and expanded reproduction, as we have done. He refers to Comrade Bukharin's attempts to give Marx's scheme an algebraic expression. He also describes Ballod's attempt at constructing a balance for the future society in his work "The State of the Future," and finally, Comrade Sotnikov's attempts at a theory of a global economy.

"Balans narodnogo khoziaistva," Planovoe khoziaistvo, November, 1926, pp. 62-80.

While he is critical of Ballod's and Sotnikov's ventures, he himself expatiates on the following scheme.

He divides the national economy into branches, selecting agriculture, industry, construction, and transport. In the case of each of these branches he investigates income, consisting of reserves plus production plus imports, expenditure with its subdivision for productive and nonproductive purposes, and then exports and reserves at the end of the year. He breaks nonproductive consumption down by the agricultural and nonagricultural population and public institutions. Industry he divides into large- and small-scale. The output of industry as well as of agriculture is broken down into products of personal consumption, raw and other materials, fuel, and tools of production; and the output of construction is broken down into only two groups: products of personal consumption and tools of production. Strictly speaking, he does not define the output of transport.

This scheme, of course, has very little in common with Quesnay or with Marx. It is rather a balance sheet of the national economy. This scheme for the balance does not show class divisions, capital, outlays of manpower and mechanical energy, or national income. The publication of the Central Statistical Administration therefore includes, separately from the balance of the national economy, a balance for capital, for outlays of manpower and mechanical energy, and a study of national income. The most essential idea of a balance–the organic unity of all fundamental factors: production, distribution, exchange, and consumption–therefore remains unrealized....

The study of the history and theory of the problem and critical examination of the national economic balance prepared by the Central Statistical Administration oblige us to propose a positive outline, the oldest form of which is the preparation of a scheme for a balance sheet.

In application to the Soviet economy we must select the social forms of the economy as the broad headings, e.g., state-socialist, cooperative, state-capitalist, private-capitalist, small-scale commodity, and seminatural. Next come the branches of the national economy, in which we include agriculture, industry, housing, transport, trade, credit institutions, and state and local budgets.

The listings will be a combination of these two subdivisions and will thus have the following appearance:

Social forms	Subdivision of each of these forms into branches
I. State } socialist	1. Agriculture
II. Cooperative }	2. Industry
III. State-capitalist	3. Housing
IV. Private capitalist	4. Transport
V. Small-scale commodity	5. Trade
VI. Seminatural	6. Credit institutions
	7. Budget

In each of the first five branches which are directly concerned with the creation, promotion, or distribution of material values, the following must be shown: capital at the beginning of the year, subdivided into fixed—in its two forms, construction and equipment—and circulating—with a breakdown for material objects, monetary values, and excess of credits over debits. Next to be shown are wear and tear of fixed capital, new investments in fixed capital, the change in all the factors of circulating capital (including what is received from the state treasury), capital increment and diminution, and, therefore, the state of capital at the end of the year. Next, the scheme should contain the total figures for production. For transport this will be the total of receipts; for trade, gross profits after deducting defrayals for transport; for housing, total rental receipts in a year; and for industry, total output produced by all enterprises, deducting only raw materials and semifinished goods consumed in these same enterprises (the method of plant appraisal). Next, productive expenditures must be established, e.g., amortization deductions, outlays on raw materials and fuel (capital investments have already been shown under the section on capital). After deducting productive outlays from gross output we get the net product, which should be divided into wages of workers and employees, supplementary wage charges, overhead, interest, and taxes; accumulation (profits) or losses must be ascertained. For trade, for example, in the productive expenditures category should be placed the purchase price of goods.

All the first five branches can be totaled.

Credit institutions may be entered in the table in analogous fashion. For example, the total of active transactions should be entered in the chart of production, and passive transactions un-

der productive outlays. The state budget can be included in the table in reverse order: expenditures should be balanced with the respective charts of receipts from the state treasury (left-hand side) and income with payments to the treasury.

These sections of the table complete the analysis of capital, production, and accumulation. The table must next include a calculation of human and mechanical power used by the given branch and social form of the economy, and then the number of dependents supported by persons employed in the given branch; it must show the total sum of consumption as well as savings both of material products and for the satisfaction of other needs, effected by both employed persons and dependents.

This scheme will make it possible to express the mutual interconnections of branches and social forms of the national economy.

This scheme will be consonant with the pivotal idea which Marx expressed in his "Introduction to the Critique of Political Economy": production, distribution, exchange, and consumption are parts of a whole, diversity within unity.

M. Barengol'ts

CAPACITY OF THE INDUSTRIAL MARKET IN THE USSR

1. INTERINDUSTRY CONSUMPTION OF PRODUCTS OF AGRICULTURE AND FORESTRY

Before we proceed to analyze the data on the dynamics of interindustry consumption of the products of agriculture and forestry, we must agree to understand by the latter only those forms of vegetable and animal raw materials that are turned over to industry for primary processing. But when raw materials of the same type are, after primary processing, handed to the same industry or to another one for further processing, we shall consider them as products of industrial origin since they have already been counted once before as products of agricultural origin at the moment they were handed over for primary industrial processing.

Thus, raw cotton reaching the cotton-ginning plants is counted as an agricultural product. But when, after primary processing, it is sent to the cotton-spinning mills, it is considered as a product of industrial origin, and we count this as interindustry turnover. In the same way, grain arriving at a mill is an agri-

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"Emkost' promyshlennogo rynka v SSSR," Planovoe khoziaistvo, No. 7, July, 1928, pp 325-348.

[Editorial note of the journal:] This work was started a few years ago on the initiative of the Industrial Economic Council of the Supreme Council of the National Economy. It was felt, however, that it could not be carried out on the intended scope at that time because of the state of the available data. Yearly figures are reported with great delays and thus the latest year we could use in this work was 1924/25. Then, for 1922/23 and 1923/24 the data are rather unreliable since during these years a falling currency was used alongside the chervonets. Moreover, because of the incompleteness of data, many gaps had to be filled by the use of indirect data and approximations. All this diminishes considerably the reliability of the coefficients calculated by the author. Nevertheless, the ratios of the figures found for the various years and industries are significant and can be used as preliminary estimates in this as yet very little explored problem of the capacity of our market

cultural product, while flour reaching a bread factory is an industrial product. In brief, a raw material is counted only once as an agricultural product—at the moment of its passage from the nonindustrial sphere to the industrial sphere—while its further movements within that sphere are viewed as interindustry turnover.

Accepting this limited definition of products of agriculture and forestry, their share in the total volume of materials used in industry is estimated as follows (see Tables 1, 2, and 3).

In comparing the data in Table 1 for the present and prewar (1913) consumption of raw materials and fuel in "census" factory production, we note above all the sharp decrease in the share of consumption of agricultural and forestry products. Here, on the one hand, we see a certain change in the structure of industrial production and, on the other, the divergence of the price indexes for agricultural and industrial products. It is obvious that with a higher index of industrial prices, the share of the raw materials and materials of industrial origin used in industry, even if the physical ratio remains the same, will increase in value terms, while that of the agricultural products will, on the contrary, decrease. The changes in the structure of the gross turnover of industry itself reduced the share of the agricultural raw materials used in the "census" industry even further. The most striking example of this we find in Group X—the cotton-processing industries—in which we find the sharpest reduction in the relative consumption of agricultural raw materials. This share dropped from 49.49 per cent in 1913 to 2.52 per cent in 1922/23 and 7.23 per cent in 1924/25. It is true that the data for 1913 in the form presented in Table 1 are not fully comparable with those of 1922-25, since the latter cover only the raw cotton that reached the cotton-ginning plants, whereas the 1913 figure apparently includes the total volume of ginned cotton that reached the cotton-spinning mills, including imports which, according to the assumption underlying our calculations, should be counted as industrial raw material. However, if we consider the figure of 431 million rubles for cotton consumption in Table 1 as industrial raw materials, and if we estimate the value of the raw cotton processed in Russian cotton-ginning plants at 180 million rubles, still the total volume of consumption of agricultural products for 1913 will amount to 20.7 per cent for Group X, i.e., several times higher than the figure for 1922-25. This is explained entirely by the change in the production structure in Group X, in which the share of the production of the cotton-

ginning plants has been considerably reduced, as can be seen from the following comparison (in millions of gold rubles expressed in prices at the place of consumption):

Years	Total consumption of cotton	Value of raw cotton arriving at cotton-ginning plants	Ratio in per cent of col. 2 to col. 1
	1	2	3
1913	431.2	(180)	41.7
1922/23	122.0	10.2	8.3
1923/24	189.7	24.2	12.8
1924/25	294.5	67.0	22.7

Fuel and Raw Material Consumption in "Census" Industry
(in millions of gold rubles)

		1913	1922/23	1923/24	1924/25
Total industry	(a)	3,263*	1,727	2,380	3,722
	(b)	1,044*	462	722	1,160
	(c)	31.9	26.8	32.4	30.8
Total industry excluding cotton processing	(a)	2,212	1,324	1,857	2,857
	(b)	865	452	748	1,093
	(c)	22.2	33.3	40.1	38.2
Total industry excluding flour milling	(a)	2,744	1,557	2,054	3,210
	(b)	803	314	472	657
	(c)	29.3	20.1	22.9	20.5
Total industry excluding cotton processing and flour milling	(a)	1,873	1,153	1,534	2,292
	(b)	552	304	447	591
	(c)	25.7	26.4	29.2	25.7

(a) Total consumption of raw material and fuel; (b) consumption of raw material and fuel by agriculture and forestry; (c) the ratio of (b) to (a). *For the sake of comparability, these are corrected figures; they are obtained, as indicated in the text, by using for cotton arriving at cotton-ginning plants the correction 180 million and for the cotton consumed, transferred from the agricultural to the industry column, the figure of 431 million.

Table 1

Utilization of Raw Materials, Fuels, and Auxiliary Materials in Factory Industries
(in thousands of chervonets rubles in prices at the place of utilization)

Consuming Industrial Branches	Years	Total consumed	Including products of agriculture, forestry, hunting, and fishing							
			Agricultural and animal products		Forestry products				Total	
					Total		Of which fuels			
			Rubles	Per cent	Rubles	Per cent	Rubles	Per cent	Rubles	Per cent
A	B	1	2	3	4	5	6	7	8	9
I Extraction and processing of minerals	1913	56,320 5	369 8	0 66	17,029 4	30 24	17,013 5	30 22	17,399 2	30 90
	1922/23	22,517 7	—	—	7 199 5	31 97	7,035 8	31 25	7,199 5	31.97
	1923/24	33,743 7	—	—	8,369 8	25 05	8,293 0	24.82	8,369 8	25.05
	1924/25	49 484 0	—	—	10,298 6	20 81	10,298 6	20 81	10,298 6	20 81
II Mining extraction and mining industry	1913	304,390 6	224 5	0 07	35,373 8	11 70	28 246 0	9 34	35,598 3	11 77
	1922/23	261,909 1	—	—	2,124 9	0 81	1,973 0	0 75	2,124.9	0 81
	1923/24	276 950 5	—	—	7,315 1	2 64	5,256 9	1 90	7,315 1	2 64
	1924/25	373,381 2	—	—	9,293 7	2 49	9,035 2	2 42	9,293 7	2 49
III Metal-working industry	1913	112 614 3	—	—	2,850 0	2 53	1,826 2	1 62	2,850 0	2 53
	1922/23	60,165 2	—	—	1,372 9	2 28	1,372 9	2 28	1,372 9	2 28
	1923/24	84,999 4	—	—	1,340 3	1 58	1,340 3	1 58	1,340 3	1 58
	1924/25	133,632 3	190 7	0 14	1,346 2	1 01	1,346 2	1 01	1,536 9	1 15
IV Machine construction	1913	165,607 7	14 1	0 01	11,477 5	6 93	2,774.3	1 68	11,491 6	6 94
	1922/23	72,474 3	—	—	3,731 2	5 15	3,731 2	5 15	3,731 2	5 15
	1923/24	102,175 9	—	—	3,111 6	3 05	3,111 6	3 05	3,111 6	3.05
	1924/25	174,526 6	228 6	0 13	2,497 8	1 43	2,497 8	1 43	2,726 4	1.56
V Wood-working industry	1913	97,745 1	86 8	0 09	60,484 3	61 87	1,358 4	1.39	60,571 1	61.96
	1922/23	57,306 0	3,235 0	5 65	47,416 1	82 74	2,242 2	3 91	50,651 1	88.39
	1923/24	89.349 3	—	—	75,669 1	84 67	21,088 2	23.60	75,669 1	84 67
	1924/25	126,095.3	3,860 7	3 06	100,400 0	79 63	10,068 8	7 99	104,260 7	82 69
VI Chemical industry	1913	146,048 1	7,576 2	5 19	24,261 9	16 61	22,076 1	15 12	31,838 1	21 80
	1922/23	70,462 2	7,474 9	10 67	3,673 8	5 21	3,095 0	4 39	11,147.8	15.82
	1923/24	85,194 1	3,429 8	4 03	3,675 0	4 31	2,875 0	3 37	7,104 8	8 34
	1924/25	151,967 9	1,199 9	0 79	3,635 4	2 39	2,709 9	1 78	4,835.3	3.18

VII. Food processing	1913	922,398 5	523,887 4	56 79	36,450 4	3 95	18,842 3	2.04	560,337.8	60 74
	1922/23	314,074 2	193,164 6	61 50	45,997 5	14 65	45,997 5	14.65	239,162.1	76.15
	1923/24	595,126.0	459,253 8	77 15	13,648 3	2 29	13,648 3	2.29	472,902 1	79 44
	1924/25	1,043,853 6	716,157 9	68 61	34,925 1	3 34	34,925 1	3.34	751,083.0	71.95
VIII Processing of solid materials of organic origin	1913	8,106.0	287 0	3.54	210 1	2 59	210 1	2.59	497.1	6.13
	1922/23	5,008 2	2,768 5	55 29	1,094 4	21 85	1,094 4	21.85	3,862 9	77.14
	1923/24	7,292 4	4,170.2	57.17	248.4	3 41	248 9	3.41	4,419 1	60 58
	1924/25	12,450.2	2,637 5	21.19	448 4	3 60	448 4	3.60	3,085.9	24.79
IX Leather and fur industry	1913	50,579 6	38,268 4	75.66	9,421 3	18 62	846 3	1.67	47,689 7	94.28
	1922/23	81,061.9	59.905 7	73 92	9,326 1	11 51	9,326 1	11 51	69,231.8	85.43
	1923/24	112,075.1	83,226.6	74.26	3,224.7	2 88	3,224.7	2 88	86,451.3	77.14
	1924/25	162,118 3	117,782 5	72 65	4,695.4	2.89	4,695 4	2 89	122,477 9	75.54
X Cotton processing	1913	871,474.0	431,275 7	49 49	10,355.7	1 19	10,355 7	1 19	441,631.4	50 68
	1922/23	403,763.9	10,160.3	2.52	9,907 2	2 45	9,907.2	2.45	20,067 5	4 97
	1923/24	522,466 3	24,250 7	4 64	15,591 1	2 99	15,591 1	2.99	39,841.8	7.63
	1924/25	914,988 2	66,989 1	7 32	13,260.5	1 45	13,260.5	1 45	80,249.6	8 77
XI. Wool processing	1913	120,348 3	20,493 4	17 03	2,192 0	1 82	2,190 9	1.82	22,685.4	18.85
	1922/23	101,341.7	8,034.8	7 93	2,877 7	2 84	2,877 7	2.84	10,912.5	10.77
	1923/24	140,410 5	3,720 0	2 65	3,847.1	2 74	3,847 1	2.74	7,567 1	5.39
	1924/25	190,559.9	5,491 3	2 88	2,319 4	1 22	2,319 4	1 22	7,810.7	4.10
XII. Silk processing	1913	26,701.0	3,823 3	14 32	412.8	1 54	412 8	1.54	4,236.1	15.86
	1922/23	10,890.8	2,355 7	21 63	128 5	1.18	128 5	1.18	2,484.2	22.81
	1923/24	14,045.5	2,769 4	19 72	290 3	2.07	290 3	2.07	3,059 7	21.79
	1924/25	13,361 4	5,329 5	39.89	304.1	2 27	304.1	2.27	5,633.6	42.16
XIII. Flax processing	1913	57,748.4	26,215 7	35.97	2,825 4	3 87	2,825.4	3.87	29,041 1	39.84
	1922/23	46,099 2	17,807 8	38 63	2,339 9	5 07	2,339.9	5.07	20,147 7	43.70
	1923/24	60,824.3	26,250 1	43.15	3,381.1	5 56	3,381 1	5.56	29,631 2	48 71
	1924/25	71,889 7	26,217.7	36.47	2,672 4	3.72	2,672 4	3.72	28,890 1	40.19
XIV. Processing of hemp and other vegetal fibers	1913	21,178 2	16,632 8	78.54	134 4	0.63	134.4	0.63	16,767.2	79.17
	1922/23	12,799 6	4,488.5	35.07	1,811 3	14 15	1,811.3	14 15	6,299.8	49.22
	1923/24	17,218.3	7,727.4	44.88	304.8	1 77	304.8	1 77	8,032.2	46.65
	1924/25	26,560.7	11,918.0	44.87	113.9	0 43	113.9	0.43	12,031.9	45.30

(Continued on next page)

Table 1 (continued)

(Utilization of Raw Materials, Fuels, and Auxiliary Materials in Factory Industries)
(in thousands of chervonets rubles in prices at the place of utilization)

Consuming Industrial Branches	Years	Total consumed	Including products of agriculture, forestry, hunting, and fishing							
			Agricultural and animal products		Forestry products				Total	
					Total		Of which fuels			
			Rubles	Per cent	Rubles	Per cent	Rubles	Per cent	Rubles	Per cent
A	B	1	2	3	4	5	6	7	8	9
XV Processing of mixed vegetal fibers	1913	13,146 7	14 8	0 11	92 4	0 70	92 4	0.70	107.2	0.81
	1922/23	4,492 5	—	—	139 5	3 11	139 5	3 11	139 5	3.11
	1923/24	7,391 7	427 7	5 78	268 6	3 64	268 6	3 64	696.3	9 42
	1924/25	11,500 8	—	—	121 1	1 05	121 1	1 05	121.1	1.05
XVI Clothing	1913	23,245.4	4.149 4	17 85	776 1	3 34	151 8	0.65	4,925 5	21 19
	1922/23	111,008 3	—	—	645 1	0 58	645 1	0 58	645.1	0.58
	1923/24	124,724 8	2,866 1	2 30	946 2	0 76	946 2	0 76	3,812.3	3 06
	1924/25	150,255 7	3,294 9	2 26	707 4	0 48	707 4	0 48	4,002.3	2.74
XVII Paper industry	1913	37,601 9	126 6	0 34	6,811 0	18 11	4,373 1	11 63	6,937 6	18 45
	1922/23	24,541 9	628.7	2 56	7,965 4	32 46	5,425 5	22 11	8,594 1	35.02
	1923/24	34,693.5	264 3	0 76	8,844 2	25 49	6,683 0	19 26	9,108.5	26 25
	1924/25	53,519 2	679 2	1 27	8,878 9	16 58	6,347 8	11 86	9,558.1	17 85
XVIII. Printing	1913	32,298 1	—	—	86 1	0 27	86 1	0 27	86.1	0 27
	1922/23	24,121 2	—	—	304 9	1 26	304 9	1.26	304.9	1 26
	1923/24	42,935.8	—	—	495.4	1 15	495 4	1.15	495.4	1.15
	1924/25	77,240 4	—	—	345 4	0 45	345 4	0 45	345.4	0 45
XIX Arts and applied sciences industry	1913	5,980 6	—	—	38 2	0 64	38 2	0 64	38.2	0.64
	1922/23	606 8	—	—	31 1	5 13	31 1	5 13	31.1	5 13
	1923/24	1,457 9	—	—	77.4	5 31	77.4	5 31	77 4	5.31
	1924/25	3,473.5	—	—	27.1	0 78	27 1	0 78	27.1	0.78
XX Power and water	1913	11,686 1	3 1	0 03	450 8	3.99	447 0	3 96	453 9	4.02
	1922/23	42,879 3	—	—	4,304.5	9 99	4,304.5	9 99	4,304.5	9 99
	1923/24	(26,518 9)	—	—	(3,000 0)	1 13	(3,000.0)	1 13	(3,000.0)	1.13
	1924/25	30,995 2	—	—	2,178.5	7 03	2,178 5	7 03	2,178.5	7.03
Total of census industry	1913	3,083,219 1	1,073,449 0	34.81	221,733.6	7 19	114,301 0	3 71	1,295,182.6	42.00
	1922/23	1,727,524.0	310,023 6	17 95	152,391 5	8 82	103,783 3	6 01	462,415.1	26.77
	1923/24	2,379,593 9	618,356 1	25.99	153,649 0	6.45	93,971 9	3 95	772,005.1	32.44
	1924/25	3,771,854 1	961,977 5	25.50	198,469 3	5 26	104,423 0	2.77	1,160,446.8	30 76

As the production of the cotton-ginning plants increases, the share of agricultural raw materials in Group X will grow. We find something similar to what we have seen in Group X for cotton processing also in Group VII—the food industry—in which the share of grain milling has undergone sharp fluctuations, during the years under study, which could not fail to affect the figure for the total consumption of agricultural raw materials. We can obtain an idea of the way the share of agricultural raw materials is affected by changes that took place within the cotton processing and food industries from the following comparison of the total figures for all industry, excluding the two branches mentioned above.

We can thus conclude that if we eliminate the effect of the structural changes in the food and cotton processing industries, the share of agriculture remains more or less the same as it was in 1913, except for 1923/24, when we witnessed a sharp fluctuation in the price index.

Finally, along with the factors already mentioned as causes of the variation of the share of agricultural raw materials, we must also point out the recent greater use of mineral fuels in industry, which, of course, reduces the consumption of firewood, which has already been reflected in the figures for 1922-25. Although there is a certain fluctuation in individual industries, especially in 1922-25, when the consumption of firewood in the metallurgical industry increased (owing to the growth of the Urals iron and steel industry, which used charcoal), on the whole, the share of the consumption of firewood decreased steadily during the period under study.

For small-scale industry (see Table 2), for which we have data only for 1923/24 and 1924/25, there are rather sharp fluctuations in the consumption of agricultural raw materials in

(in millions of chervonets rubles)

Years	Total raw materials consumed in small-scale industry	Of which agric. and forestry products		Total raw materials consumed in small-scale industry excluding food industry	Of which agric. and forestry products	
		Absol.	In %		Absol.	In %
1923/24	2,367	1,744	73.68	562	113	20.1
1924/25	2,765	1,954	70.69	733	144	19.6

Table 2

Utilization of Raw Materials and Products of the Small and Handicraft Industries
(In thousands of chervonets rubles in prices at the place of utilization)

Consuming Industrial Branches	Years	Total raw materials and fuels consumed	Including products of agriculture, forestry, hunting, and fishing							
			Agricultural and animal products		Forestry products				Total	
					Total		Of which fuels			
			Rubles	Per cent	Rubles	Per cent	Rubles	Per cent	Rubles	Per cent
A	B	1	2	3	4	5	6	7	8	9
I Extraction and processing of minerals	1923/24	2,893.5	50 9 50 9	1 76	980 5	33.89	980.5	33.89	1,031.4	35 65
	1924/25	6,377 5	118 3 118 3	1.85	2,751 5	43.15	2,751 1	43.15	2,869.8	45 00
II Mining extraction and mining industry	1923/24	—	—	—	—	—	—	—	—	—
	1924/25	—	—	—	—	—	—	—	—	—
III Metal-working industry	1923/24	64,872 6	—	—	2,595 2	4 00	2,595 2	4.00	2,595 2	4 00
	1924/25	66,383 6	—	—	438 7	0 66	160 4	0 24	438.7	0 66
IV Machine construction	1923/24	5,575 6	—	—	458 0	8 11	458 0	8 11	458 0	8 11
	1924/25	5,968 9	—	—	906 6	15 19	12 5	0 20	906 6	15.19
V Wood-working industry	1923/24	51,309 9	—	—	14,101 2	27 48	3,748.7	7 30	14,101 2	27.48
	1924/25	40,403.3	—	—	16,292 2	40 32	484 3	1 20	16,292 2	40.32
VI Chemical industry	1923/24	13,750 2	—	—	391 2	2 85	391 2	2.85	391 2	2 85
	1924/25	15,362 3	466.1	3 03	3,380.8	22 00	675 8	4.40	3,846 9	25.03
VII Food processing industry	1923/24	1,805,797 1	1,614,902 3 1,794,210.8	89 43	16,275 6	0 90	16,055 3	0 89	1,631,159 9	90 33
	1924/25	2,031,736 9	34 4	88 32	16,740 8	0 82	15,364 8	0 76	1,810,951 6	89.14
VIII Processing of solid materials of organ origin	1923/24	1,057 3	710.3	67.18	127 9	12 10	127 9	12 10	838 2	79 28
	1924/25	4,903 1	727 6	14 84	137 0	2 79	137 0	2 79	864 6	17 63

IX Leather and fur ind	1923/24	61,128.4	55,561 5 604.8	90 90	2,229 8	3.65	830 0	1 36	57,791 3	94.55
	1924/25	78,649 6	9 4	65 58	1,088.5	1.38	888 5	1 13	52,693 3	66 96
X. Cotton processing	1923/24	4,132 1	—	—	108 5	2 61	108 5	2 61	108.5	2.61
	1924/25	38,013.1	65.2	0 17	60.2	0 16	60 2	0.16	125.4	0.33
XI. Wool processing	1923/24	14,738 8	6,650.5	45 12	187.6	1.25	187.6	1 25	6,838 1	46.40
	1924/25	43,012.8	34,271 7	79.68	129 5	0 30	126 5	0.29	34,401.2	79 98
XII. Silk processing	1923/24	3,102 1	615.6	19 85	61.6	1.98	61.6	1.98	677 2	21.83
	1924/25	3,216 7	1,799 2	55 94	71.3	2.21	71.3	2 21	1,870.5	58.15
XIII. Flax processing	1923/24	2,594.5	2,359 6	90 94	107 8	4.15	107 8	4 15	2,467.4	95.09
	1924/25	1,609.3	42.0	2 61	0.8	0 05	0.8	0.05	42.8	2.66
XIV. Processing of hemp and other vegetal fibers	1923/24	7,020.1	3,920.6	55 83	183.6	2.61	183.6	2.61	4,104.2	58.44
	1924/25	18,345.8	1,805.7	9 85	0.5	0.003	0.5	0 003	1,806.2	9.853
XV. Processing of mixed vegetal fibers	1923/24	1,876 9	68 4	3 64	125 1	6 67	125.1	6.67	193.5	10.31
	1924/25	874.2	86.2	9.60	—	—	—	—	86.2	9.60
XVI. Clothing	1923/24	318,951.8	9,200 4 23,932.4	2.88	11,958 2	3.75	11,958 2	3 75	21,158.6	6.63
	1924/25	389,649 3	3.3	6.14	3,002 4	0.77	2,516 1	0.65	26,934 8	6.91
XVII. Paper industry	1923/24	1,080.1	—	—	60 0	5.55	60.0	5.55	60.0	5.55
	1924/25	4,416.3	—	—	8.1	0.18	8 1	0.18	8.1	0.18
XVIII. Printing	1923/24	2,003.2	—	—	167.0	8.34	167.0	8.34	167.0	8.34
	1924/25	6,365.1	—	—	40.4	0.63	40.4	0.63	40.4	0.63
XIX. Arts and applied sciences industry	1923/24	5,716.3	—	—	230.0	4.02	230 0	4.02	230.0	4.02
	1924/25	9,317.4	52.6	0.56	18.7	0.20	—	—	71.3	0.76
Total industry	1923/24	2,367,600.5	1,694,040.1 50.9	71.55	50,330.8	2.13	38,376.2	1.62	1,744,370.9	73.68
	1924/25	2,764,605.2	1,909,182.6 165.4	69 06	45,068.0	1.63	23,298.3	0.84	1,954,250.6	70.69

Table 3

Utilization of Raw Materials, Fuel, and Auxiliary Materials in Factory Industries, Small Industries, and Handicrafts
(In thousands of chervonets rubles in prices at the place of utilization)

Consuming Industrial Branches	Years	Total Consumed	Including products of agriculture, forestry, hunting, and fishing							
			Agricultural and animal products		Forestry products				Total	
					Total		Of which fuels			
			Rubles	Per cent	Rubles	Per cent	Rubles	Per cent	Rubles	Per cent
A	B	1	2	3	4	5	6	7	8	9
I. Extraction and processing of minerals	1923/24	36,637.2	50.9 / 50 9	0.14	9,350 3	25 52	9,273.5	25 31	9,401.2	25.66
	1924/25	55,861 5	118 3 / 118.3	0 22	13,050 1	23 36	13,049 7	23 35	13,168 4	23.57
II. Mining extraction and mining industry	1923/24	276,950 5	—	—	7,315 1	2.64	5,256.9	1 90	7,315 1	2.64
	1924/25	373,381 2	—	—	9,293.7	2 49	9,035.2	2.42	9,293 7	2.49
III Metal-working industry	1923/24	149,872.0	—	—	3,935 5	2.32	3,935 5	2 32	3,935.5	2 32
	1924/25	200,015.9	190.7	0 10	1,784 9	0 89	1,506 6	0 75	1,975 6	0.99
IV Machine construction	1923/24	107,751 5	—	—	3,569 6	3 31	3,569 6	3.31	3,569 6	3.31
	1924/25	180,495 5	228.6	0 13	3,404 4	1 88	2,510 3	1 39	3,633.0	2.01
V. Wood-working industry	1923/24	140,659 2	—	—	89,770.3	63 82	24,836 9	17 66	89,770.3	63.82
	1924/25	166,498 6	3,860.7	2 32	116,692 2	70 08	10,553.1	9 21	120,552.9	72.40
VI. Chemical industry	1923/24	98,944.3	3,429 8	3.47	4,066 2	4 11	3,266 2	3.30	7,496.0	7.58
	1924/25	167,330.2	1,666.0	1 00	7,016.2	4.19	3,385 7	2.02	8,682.2	5 19
VII. Food processing ind.	1923/24	2,400,923.1	2,074,156.1	86.39	29,905.9	1 24	29,703 6	1 24	2,104,062.0	87.63
	1924/25	3,075,590 5	2,510,368.7	81 62	51,665 9	1.68	50,289 9	1 63	2,562,034.6	83.30
VIII Process. of solid matrls of organ origin	1923/24	8,349.7	4,880.5	58.47	376 8	4 51	376.8	4.51	5,257 3	62.98
	1924/25	17,353.3	3,365.1	19 39	585 4	3.38	585 4	3 38	3,950.5	22.77
IX Leather and fur ind.	1923/24	173,203 5	138,788.1	80.12	5,454 5	3.15	4,054 7	2.34	144,242.6	83.27
	1924/25	240,767.9	169,387 3	70 35	5,783.9	2 40	5,583.9	2 32	175,171.2	72.76

X Cotton processing	1923/24	511,007.3	24,250 7	4.75	15,699.6	3 07	15,699 6	3.07	39,950.3	7 82
	1924/25	939,740 8	67,054.3	7 14	13,320.7	1 41	13,320 7	1.41	80,375.0	8.55
XI. Wool processing	1923/24	155,149 3	10,370 5	6.68	4,034.7	2 60	4,034 7	0.26	14,405.2	9.28
	1924/25	233,572.7	39,763.0	17 02	2,448.9	1 05	2,445.9	1.04	42,211.9	18.07
XII Silk processing	1923/24	17,147 6	3,385 0	19 74	351 9	2.05	351.9	2.05	3,736.9	21.79
	1924/25	16,578 1	7,128 7	43.00	375.4	2 26	375.4	2.26	7,504.1	45.26
XIII. Flax processing	1923/24	63,418.8	28,609 7	45 12	3,488 9	5.50	3,488 9	5.50	32,098.6	50.62
	1924/25	73,499 0	26,259 7	35.74	2,673.2	3 64	2,673 2	3.64	28,932.9	39.38
XIV Processing of hemp and other vegetal fibers	1923/24	24,238.4	11,648.0	48.06	488.4	2.01	488.4	2.01	12,136.4	50.07
	1924/25	44,906.5	13,723.7	30.56	114.4	0.25	114.4	0.25	13,838.1	30.81
XV. Processing of mixed vegetal fibers	1923/24	9,268.6	496 1	5 35	393.7	4.25	393.7	4.25	889.8	9.60
	1924/25	12,375.0	86.2	0.70	121.1	0 98	121.1	0.98	207.3	1.68
XVI. Clothing	1923/24	443,676.6	12,066.5	2.72	12,904.4	2.91	12,904.4	2.91	24,970.9	5.63
	1924/25	539,905 0	27,227.3	5 05	3,709 8	0.68	3,223 5	0.60	30,937.1	5.73
XVII Paper industry	1923/24	35,773.6	264.3	0 74	8,904.2	24.89	6,743.0	18.85	9,168.5	25.63
	1924/25	57,935.5	679 2	1.17	8,887.0	15.34	6,355 9	10.97	9,566.2	16.51
XVIII. Printing	1923/24	44,939 0	—	—	662 4	1.47	662.4	1.47	662.4	1.47
	1924/25	83,605.5	—	—	385 8	0.46	385.8	0.46	385.8	0.46
XIX Arts and applied sciences industry	1923/24	7,174.2	—	—	307 4	4.29	307.4	4.29	307.4	4.29
	1924/25	12,790.9	52.6	0.41	45 8	0.36	27.1	1.21	98.4	0.77
XX. Power and water	1923/24	(26,518 9)	—	—	(3,000.0)	11.31	(3,000.0)	11.31	(3,000.0)	11.31
	1924/25	30,995.2	—	—	2,178.5	5.40	2,178 5	5.40	2,178.5	5.40
Total industry	1923/24	4,731,603.3	2,312,396.2	48 87	203,979.8	4.31	132,348.1	2 80	2,516,376.0	53.18
	1924/25	6,523,198.8	2,871,160.1	44.02	243,537.3	3.73	127,721 3	1.96	3,114,697.4	47.75

Table 4

Interindustry Turnover. Census Industry 1922/23

(In thousands of chervonets rubles in prices at place of utilization)

Branches	Total turnover	Of which further processed and used in construction and for personal and office needs within the industry										
		In the same branch					In other branches				Of which	
		In the same establishment	In other establishments				In establishments of the same trust	In establishments of other trusts	Total	Total: Cols. 6 + 9	In other establishments: Cols. 5 + 9	Within the same trust: Cols. 2 + 3 + 7
			In the same trust	In other trusts	Total	Total: Cols. 2 + 5						
	1	2	3	4	5	6	7	8	9	10	11	12
I. Extraction and processing of minerals	73,438	2,365	976	218	1,194	3,559	7,379	10,057	17,436	29,995	18,630	10,720
II Mining and extraction ind.	788,195	125,370	174,542	20,703	195,245	320,615	69,849	96,255	166,104	486,719	361,349	369,761
III. Metal-working industry	128,191	2,795	1,080	163	1,243	4,038	5,042	3,124	8,166	12,204	9,410	8,917
IV Machine construction	171,932	15,544	1,058	176	1,234	16,778	—	22,824	22,824	39,602	24,058	16,602
V Wood-working industry	105,317	—	468	100	568	568	—	19,791	19,791	20,359	20,359	468
VI Chemical industry	171,315	7,427	7,347	6,075	13,422	20,849	2,365	34,510	36,875	57,724	50,297	17,139
VII Food processing industry	580,955	—	24,853	5,751	30,604	30,604	—	21,437	21,437	52,041	52,041	24,853
VIII. Processing solid materials of organic origin	9,506	—	80	51	131	131	612	492	1,104	1,235	1,235	692
IX Leather and fur industry	209,596	47,289	16,606	2,936	19,542	66,831	—	8,810	8,810	75,641	28,353	63,895
X. Cotton processing	885,192	250,659	203,232	33,698	236,930	487,589	—	35,506	35,506	523,095	272,436	453,891
XI. Wool processing	358,903	150,073	28,210	44,509	72,719	222,792	—	25,109	25,109	247,901	97,828	178,283
XII. Silk processing	12,631	—	—	7,649	7,649	7,649	—	—	—	7,649	7,649	—
XIII. Flax processing	166,640	76,246	13,220	9,805	23,025	99,271	—	4,040	4,040	103,311	27,064	89,466
XIV. Processing of hemp and other vegetal fibers	31,413	9,346	2,218	1,703	3,921	13,267	—	4,093	4,093	17,360	8,014	11,564
XV Processing of mixed vegetal fibers	7,429	354	—	—	—	354	—	642	642	996	642	354
XVI. Clothing	148,169	—	—	—	—	—	—	20,555	20,555	20,555	20,555	—
XVII Paper industry	40,023	—	300	6,347	6,647	6,647	—	24,889	24,889	31,536	31,536	300
XVIII Printing	76,313	—	—	337	337	337	—	1,433	1,433	1,770	1,770	—
XIX Arts and applied science	2,781	—	—	—	—	—	—	—	—	—	—	—
XX Power and water	134,799	—	—	—	—	—	—	23,133	23,133	23,133	23,133	—
Total industry	4,102,738	687,468	474,190	140,221	614,411	1,301,879	85,247	356,700	441,947	1,743,826	1,056,360	1,246,904

Table 5

Interindustry Turnover Census Industry 1923/24

(In thousands of chervonets rubles in prices at place of utilization)

Branches	Total turnover	Of which further processed and used in construction and for personal and office needs within the industry										
		In the same branch					In other branches				Of which	
		In the same establishment	In other establishments			Total Cols. 2 + 5	In establishments of the same trust	In establishments of other trusts	Total	Total Cols. 6 + 9	In other establishments. Cols. 5 + 9	Within the same trust: Cols. 2+3+7
			In the same trust	In other trusts	Total							
	1	2	3	4	5	6	7	8	9	10	11	12
I. Extraction and processing of minerals	133,191	26,633	1,565	449	2,014	28,647	17,263	41,344	58,967	87,614	60,982	45,821
II. Mining and extraction ind.	1,077,653	247,276	152,040	32,988	185,028	432,304	28,031	126,937	214,968	647,272	399,993	487,347
III. Metal-working industry	196,072	33,510	7,190	558	7,748	41,258	6,350	11,147	17,497	58,755	25,245	47,050
IV. Machine construction	245,498	44,304	3,752	90	3,842	48,146	—	117,479	117,479	165,625	121,321	48,056
V Wood-working industry	159,823	2,743	556	122	678	3,421	4,524	44,272	48,796	52,217	49,474	7,823
VI. Chemical industry	212,317	32,056	14,026	10,078	24,104	56,160	2,638	64,018	66,655	122,815	90,759	48,720
VII. Food processing ind.	1,014,250	19,446	32,778	12,454	45,232	64,678	1,430	29,228	30,658	95,336	75,890	53,654
VIII. Processing solid materials of organic origin	14,161	950	120	659	779	1,728	1,020	1,481	2,501	4,229	3,280	2,090
IX. Leather and fur industry	252,226	84,665	26,287	3,287	29,574	114,239	—	12,839	12,839	127,077	42,412	110,952
X. Cotton processing	1,192,987	381,876	195,440	55,908	251,348	633,224	9,200	33,664	43,864	677,088	295,212	586,516
XI. Wool processing	419,156	191,455	35,705	34,491	70,196	261,651	—	24,365	24,365	286,016	94,561	227,160
XII. Silk processing	30,565	9,323	—	9,847	9,847	19,170	—	1,606	1,606	20,776	11,453	9,323
XIII. Flax processing	250,914	137,109	16,553	10,084	26,637	163,746	—	9,728	9,728	173,474	36,364	153,662
XIV. Processing of hemp and other vegetal fibers	38,186	14,164	2,620	1,862	4,482	18,646	545	8,680	9,226	27,871	13,707	17,329
XV. Processing of mixed vegetal fibers	156,607	2,326	—	1,624	1,624	3,950	—	25,857	25,857	29,807	27,481	2,326
XVI. Clothing	81,817	10,567	528	12,717	13,245	23,812	—	37,350	37,350	61,162	50,595	11,095
XVII. Paper industry	89,245	—	—	2,035	2,035	2,035	—	2,774	2,774	4,809	4,809	—
XVIII. Printing	4,990	178	—	—	—	178	—	—	—	178	—	178
XIX. Arts and applied science	154,826	—	—	—	—	—	—	21,271	21,271	21,271	21,271	—
XX Power and water	14,988	4,030	—	—	—	4,030	—	1,235	5,235	5,265	1,235	4,030
Total industry	5,739,473	1,242,611	489,160	189,252	678,412	1,921,023	131,361	616,274	747,635	2,668,658	1,426,047	1,863,133

Table 6

Interindustry Turnover Census Industry 1924/25

(In thousands of chervonets rubles in prices at place of utilization)

Branches	Total turnover	Of which further processed and used in construction and for personal and office needs within the industry										
		In the same branch					In other branches				Of which	
		In the same establishment	In other establishments									
			In the same trust	In other trusts	Total	Total Cols. 2 + 5	In establishments of the same trust	In establishments of other trusts	Total	Total Cols. 6 + 9	In other establishments: Cols. 5 + 9	Within the same trust: Cols. 2 + 3 + 1
	1	2	3	4	5	6	7	8	9	10	11	12
I. Extraction and processing of minerals	202,718	35,295	3,385	601	3,986	39,281	29,276	72,076	101,352	140,632	105,337	67,956
II Mining and extraction ind.	1,402,500	446,064	145,468	56,572	202,040	648.104	110,383	216,619	327,002	975,106	529,042	701,915
III. Metal-working industry	338,305	89,294	7,189	1,427	8,616	97,909	10,000	27,771	37,771	135,680	46,387	106,403
IV Machine construction	500,846	116,888	10,063	1,841	11,904	128,792	—	183,959	183,959	312,751	195,862	126,951
V Wood-working industry	233,260	14,909	1,731	163	1,894	16,803	6,937	75,512	82,449	99,252	84,343	23,578
VI. Chemical industry	389,861	59,212	36,490	14,293	50,783	109,995	6,001	121,383	127,384	237,378	178,167	101,703
VII Food processing ind.	1,655,673	55,793	105,814	23,842	129.656	185,449	2,807	75,799	78,606	264,055	208,263	164,414
VIII. Processing solid materials of organic origin	24,702	—	189	7,416	7,605	7,605	1,683	3,107	4,790	12,395	12,395	1,872
IX. Leather and fur industry	343,231	115,798	45,505	4,633	50,138	165,936	—	15,198	15,198	181,134	65,336	161,303
X. Cotton processing	1,961,449	568,955	411,682	110,534	522,216	1,091,171	19,538	48,699	68,237	1,059,407	590,453	1,000,175
XI Wool processing	519,315	220,901	54,060	3,664	57,724	278,625	—	58,602	58,602	337,227	116,326	274,961
XII Silk processing	30,564	7,208	—	4,640	4,640	11,848	—	1,724	1,724	13,572	6,364	7,208
XIII. Flax processing	279,071	147,914	19,956	10,561	30,517	178,431	—	14,875	14,875	193,306	45,392	167,870
XIV. Processing of hemp and other vegetal fibers	72,613	32,761	3,859	6,697	10,556	43,317	805	13,448	14,253	57,569	24,808	37,425
XV Processing of mixed vegetal fibers	26,523	7,135	—	—	—	7,135	—	2,977	2,977	10,112	2,977	7,135
XVI Clothing	174,836	85,416	—	3,030	3,030	88,446	—	31,681	31,681	120,127	34,711	85,416
XVII. Paper industry	124,995	2,211	954	22,017	22,971	25,182	—	84,890	84,890	110,072	107,861	3,165
XVIII. Printing	170,998	—	—	3,444	3,444	3,444	—	9,471	9,471	12,915	12,915	—
XIX Arts and applied science	10,327	898	—	—	—	898	—	—	—	898	—	898
XX Power and water	158,602	10,904	—	—	—	10,904	—	36,762	47,666	36,762	10,904	147,698
Total industry	8,620,389	2,017,556	846 345	275,373	1,121,718	3,139,275	187,429	1,094,553	1,281,982	4,421,257	2,403,701	3,051,330

various industries. These fluctuations, like those in the "census" industry, can be accounted for mainly by the changes that have taken place in the internal structure of certain industries or production groups. But, on the whole, if we exclude the food industry, we obtain for these two years a stable figure of about 20 per cent.

Because of the above-mentioned changes in the consumption of agricultural raw materials in factory and small-scale artisan industry, the total figure for the consumption of agricultural raw materials in industry as a whole (see Table 3) will be as follows:

(in millions of gold rubles)

Years	Total consumption of raw and other materials, and of fuel in "census" and small-scale industry	Of which agric. and forestry products		Total consumption in factory and small-scale industry excluding food industry	Of which agric. and forestry products	
		Absol.	In %		Absol.	In %
1923/24	4,732	2,516	53.2	2,332	412	17.7
1924/25	6,523	3,115	47.8	3,448	553	16.1

2. INTERINDUSTRY CONSUMPTION AND INTERINDUSTRY TURNOVER

The interindustry consumption of industrial products is broken down according to function into the following four categories:

(1) the consumption of the means of production—machines, tools, raw materials, semifinished products, fuel, auxiliary materials;

(2) Consumption in construction;

(3) Personal consumption (work clothes, special food rations);

(4) Consumption of office materials (the last two groups, of course, account for only a small fraction of the total volume of consumption).

The consumption of the means of production can be again subdivided into (a) the consumption of advance fixed capital and (b) consumption of objects of working capital. The first (a), being a problem of the balance of reproduction, does not enter into

Table 8

Consumption for Current Production and Repairs of Industrial Products by the Census Industry[a]
(In chervonets rubles)

Producing Branches	Years	Consuming Branches: Gross value of output	Extraction and processing of minerals	Mining and metallurgy	Of which: Fuels	Of which: Metallurgy	Metal-working (excluding machine building)	Metallurgy	Woodworking industry	Chemical industry	Food processing	Leather industry	Textile industry	Other industrial branches	Total industry
			1	2	3	4	5	6	7	8	9	10	11	12	13
I Extraction and processing of minerals	1922/23	71,073 5	5,400 7	1,769 4	—	1,769 4	628 9	2,270 6	47 4	2,022 8	522 2	270 6	111 1	117 8	10,890 9
	1923/24	106,557 9	8,339 0	2,584 6	90 3	2,494 3	1,869 4	4,168 2	77 3	1,491 0	2,081 0	235 8	171 8	500 9	17,350 8
	1924/25	167,423 1	11,111 7	7,110 5	318 7	6,791 8	5 329 9	11,267 7	111 4	2,081 6	8,792 2	356 9	284 0	1,684 0	36,862 2
II Mining and metallurgy of which	1922/23	662,825 4	3,523 7	217,702 1	164,867 5	52,834 6	74,559 2	126,428 7	184 8	6,449 4	6,147 3	984 7	10,014 4	30,336 4	349,902 0
	1923/24	830,377 5	4,693 9	212,334 9	134,159 5	78,175 4	109,603 0	186,604 9	284 1	9,347 4	7,868 5	1,483 1	14,151 4	15,486 6	375,252 9
	1924/25	956,435 5	8,011 5	254,692 5	112,447 0	142,245 5	164,736 2	305,126 3	425 5	10,470 8	12,320 1	1,448 3	24,526 8	20,222 9	496,855 6
a Fuels	1922/23	500,813 8	3,425 9	186,399 8	164,762 2	21,637 6	11,995 5	32,814 0	158 2	4,542 5	6,141 1	819.0	10,014 4	29,967 4	253,463 8
	1923/24	578,631 4	4,576 4	156,646 9	133,681 6	22,965 3	13,546 3	35,507 6	247 6	6,684 0	7,760 2	1,453 4	14,151 4	15,062 8	220,129 0
	1924/25	557,220 4	7,828 2	155,387 4	109,033 9	46,353 5	17,730 1	62,677 9	368 5	5,948 7	11,936 0	1,400 2	24,526 8	19,217 4	244,344 3
b Metallurgy	1922/23	162,011 6	97.8	31,302 3	105 3	31,197 0	62,563 7	93,614 1	26 6	1,906 9	6 2	165 7	—	369 0	96,438 2
	1923/24	251,746 1	117.5	55,688 0	477 9	55,210 1	96,056 7	151,097 2	36 5	2,663 4	108 3	29 7	—	428 8	155,123.9
	1924/25	399,215 1	183 3	99,305 1	3,413 1	95,892 0	147,006 1	242,448 4	57 0	4,522 1	384 1	48 1	—	1,005 5	252,511 3
III Metal-working (excluding machine building)	1922/23	281,784 1	287 4	89 8	—	89 8	6,776 6	6,860 8	493 7	478 2	48 0	20 2	576 4	548.9	9,319 2
	1923/24	363,756 3	488 6	3,039 7	904 3	2,135 4	16,980 1	19,115 5	620 2	1,522 2	560 8	71 6	1,939 1	1,434 7	26,666.0
	1924/25	632,968 7	937 4	21,076 5	15,365 6	5,710 9	35,648 1	41,345 5	2,293 3	5,177 1	2,296 7	107 5	11,927 9	2,594.4	82,059 2
a Same including metallurgy	1922/23	431 195 2	385 0	31 246 1	20 918 5	10 327 6	69 340 3	100 323 0	519 9	2 195 6	480 0	20 2	576 4	917 9	105,573 6
	1923/24	596 232 3	605 7	58,531 7	22 865 6	35 648 1	113 036 8	167 054 7	665 7	3 935 3	659 2	71 6	1,939 1	1 858 5	181 303 6
	1924/25	L016 977 6	182 5	119 885 7	60 313 4	59 572 3	182 654 2	276 283 6	2,350 3	9 325 0	2 625 1	107 5	11 927 9	3.588 7	332,646 9

IV. Wood-working industry	1922/23	105,317.4	322 5	6,024 3	2 972 5	3,051 8	2,667 5	5,692 8	2,748 9	1,410 5	768.8	62 8	516 7	448.8	14,970 8
	1923/24	157,079 7	1,299 3	13,390 7	3,107 1	10,283 6	5,573 4	15,794 0	7,938 9	2,273 3	3,394 2	263 3	669 3	761 5	35,563.9
	1924/25	218,351 1	2,221 3	24.538 3	7,512 8	17,025 5	12,481 3	29,269 9	12 085 6	4,328 9	6,418.2	501 2	1,297 3	1,707 6	65,578 6
V Chemical industry	1922/23	163,887 6	1 808 7	1,964 9	1,268 5	696 4	2,086 7	2,730 4	573 7	16,107 9	255 0	7 951 7	16,005.1	3,198.1	49,951.8
	1923/24	180,260.7	4,649 3	3,660 3	540 4	3,119 9	4,112 4	7,203 3	1,033 2	31,072 5	2,448 9	9,084 6	27,110 6	6,705 9	89,877.7
	1924/25	330,648 9	6,379 2	7,272 3	1,244 8	6,027 5	8,887 0	14,691 5	2,035 8	66,042 7	5,439 9	13,207 4	57,975 1	9,735.1	176,974 5
VI Food processing	1922/23	580,955.2	1 2	—	—	—	64 4	64 4	—	7,890 2	41,973 3	280 7	1,115 4	21 2	51,346 4
	1923/24	994,803.9	1 2	—	—	—	82 1	82 1	—	7,722 0	64,260 3	572 2	1,568.5	5.8	74,212 1
	1924/25	1,599,880.6	1.9	—	—	—	125 5	125 5	39 5	19,533 8	182,308 8	1,382 4	2,466 3	90 8	205,949 0
VII. Leather industry	1922/23	171,813 9	22 4	—	—	—	336 8	390 8	13 4	147 7	42 0	651 2	774 0	23,550 7	25,538.2
	1923/24	180,772.7	105.4	108 3	108 3	—	555 5	555 5	49 4	267 4	76 1	10,499 9	1,157 9	26,078 6	38,898.5
	1924/25	252,135.3	203 0	1,073.2	1,073 2	—	1,813 3	1,813 3	98 5	497 4	217 4	24,947 6	2,008 5	40,699 0	71,557.9
VIII Textile industry	1922/23	975,532.5	120 8	31 0	31 0	—	1,079 9	1,080 5	127 4	9,087 1	989.8	100.0	348,964 4	53,134 1	413,634.5
	1923/24	1,208,838.5	252.2	28 8	28.8	—	1,399 6	1,400 4	34 3	5,028 5	4,943 1	197 1	371,648 9	68,999.5	452,532 0
	1924/25	1,904,661 4	490 6	706 5	706 5	—	4,439 6	4,439 6	333 5	10,809 7	4,839 1	308 9	689,440 3	74,952 1	786,320.4
IX Other industrial branches	1922/23	402,084.9	215 7	2,123.8	1,889 7	234.1	4,637 0	4,829 6	581.1	4,047 7	8 159 6	355 2	1,762 0	36,191 5	58 ,073 6
	1923/24	474,414 5	221 1	5,417 1	5,213 2	203 9	4,178 3	5,330 6	553 1	3,661 5	10,185.7	702 9	3,168.1	51,604 6	79,692 4
	1924/25	540,328.7	574 4	11,002 5	10,656 7	345.8	6,877 8	9,314 9	921 8	7,142 0	24,010.7	855 9	4,827 0	104,805 5	161,017 6
Total· Absolute figures	1922/23	3,415,274.5	11,703 1	229,705 3	171,029 2	58,676 1	92,837 0	150,348 8	4,770 4	47,641 5	58,906.0	10,677 1	379,839 5	147,547.5	983,627.4
	1923/24	4,496,861.7	20,649 8	240,564 4	144,151 9	96,412 5	144,353 8	240,254 5	10,599 5	62,385.8	95,818.6	23,110 5	421,585.6	171,578 1	1,190,046.3
	1924/25	6,602,833 3	29,931 3	327,472 3	149,325 3	178,147 0	240,338 7	117,394 2	18,344 9	126,084 0	246,643 1	43,116 1	794,753 2	256,491 4	2,083,175 0
Percentages	1922/23	100 0	0 34	6.73	5 01	1 72	2.72	4.40	0 14	1 39	1.71	0 31	11 12	4.32	28 80
	1923/24	100.0	0 45	5 35	3 21	2.14	3 21	5 34	0 24	1 39	2 11	0 51	9 38	3.82	26.46
	1924/25	100 0	0 45	4.96	2 26	2.70	3 60	1 78	0 28	1 91	3 74	0 65	12.04	3.88	31 55

a. Excluding military production

the scope of this study, which is limited to questions connected with interindustry consumption within a given year. Therefore we shall concern ourselves only with the consumption of objects of working capital in the production process and with the relation among individual industrial enterprises and individual industries (interindustry turnover).

Since the scope of construction, and therefore the consumption in construction, determines to a considerable extent the further capacities for the development of industrial production, while itself depending not only on the level of industrial production attained but also on the general economic and political situation (the ratio of productive to nonproductive consumption, the redistribution of accumulation in the country, the influx of foreign capital, etc.), it follows that the annual consumption of the means of production in production is a function of the given annual production.

Under given technological conditions (i.e., if there are no changes in the technology of production itself which result in a reduction of consumption of raw materials, fuel, or auxiliary materials per unit of output or which cause the replacement of one raw material or fuel by another one, cheaper or more economical), the physical volume of consumption remains constant relative to the volume of production. And if the value of consumption changes it will be due to the fluctuation of prices. Therefore, as long as there is no technical revolution in production, the coefficients of interindustry turnover relative to the so-called gross turnover will provide, in physical terms (and, with a correction for price fluctuations, in value terms), fairly stable dynamic indicators to determine the total volume of consumption and of interindustry turnover as well as to establish the specific relations among various industries.

This must be our main assumption in examining interindustry turnover, as it has been our assumption in our study of interindustry consumption. Here, however, we must note that for "gross production," in the sense this term is used in our industrial statistics, the dynamic coefficients of interindustry turnover are less significant and do not display the same regularity of pattern as in the case of "gross turnover." This is due to the constant structural changes in the organization of production (greater specialization and the separation of certain auxiliary production processes into independent production units increase statistically the size of "gross production"; conversely, the unification of several production units into one enterprise statisti-

cally decreases "gross production" without, however, changing the physical volume of production). Therefore, when we analyze the data on interindustry turnover, we must base ourselves on the "gross turnover" of the consuming industries, which determines the volume of the products of other industries consumed by them. In this connection we should look at the organizational structure of interindustry turnover.

From the organization viewpoint, interindustry turnover has three aspects:

(1) The total turnover of materials taking place in the process of production and reproduction within industry;

(2) The turnover only between establishments, which, in Marxist terms, would be more aptly described as turnover of goods;

(3) Exclusively the market turnover of goods.

"The total turnover of materials" should be understood not in its literal but rather in its statistical meaning, i.e., not as the turnover of materials taking place between different phases of each production process, but as the turnover between production processes in the same industrial concern which are included in what is called "gross turnover." Thus the total turnover of materials is connected with "gross turnover" and includes, besides the turnover between concerns, the turnover within a concern between the individual statistically accountable production processes. In other words, "gross turnover" minus "total turnover of materials" equals "gross production" minus "turnover between concerns."

By market turnover we mean the turnover between the trusts or the turnover carried out through the market, i.e., the turnover between all concerns minus the turnover between concerns of the same trust.

Speaking of the organizational structure of interindustry turnover, we must also differentiate between the turnover between the "census" industry and the small-scale artisan industry (see Tables 4 to 6).

3. INTERRELATION BETWEEN INDIVIDUAL BRANCHES OF THE "CENSUS" INDUSTRY

Before we pass on to an examination of the organizational structure of the total interindustry turnover in the "census" industry as a whole, we must give a detailed description of the

various forms of consumption and, in the first place, consumption in the production process (including current repairs), of raw materials, fuel, auxiliary materials, and packaging materials, which consumption, as we have already noted earlier, determines and conditions the constant functional relation that exists between various industries.

Here it must be noted that for the period under study, which is 1922-25, in our industrial statistics, the industrial concern was used as the accounting unit. Now, if one single concern combined several production processes pertaining to different industries (e.g., flour milling and sawmilling, shoes and lasts, etc.), then the concern as a whole was still classified in one industry on the basis of preponderance. Thus the turnover between different industries that took place within one concern was missed by our industrial statistics.

Therefore the connection between individual industries can be examined only within the limits of the turnover between industrial concerns.

That turnover between concerns for 1922-25, expressed in prices at the place of production, is given in Table 8.

In examining interindustry consumption, we base ourselves on physical values, which, for convenience, we have re-evaluated in the prices in which the production of each individual commodity was evaluated. In this way we obtained an adequate expression in value terms of the physical volume of consumption, which we termed the conventional physical balance and which enabled us to compare consumption and production in various industries and to determine the share of consumption.

However, although to obtain the conventional physical balance we must study consumption expressed in prices at the place of production, from the viewpoint of the balance of reproduction, it is important to know the final gross value of the product when it leaves the sphere of turnover, i.e., in prices at the place of consumption. This is also necessary to study of net production. Therefore our tables for interindustry turnover between individual enterprises,[1] according to production groups

1. As for the turnover within an enterprise itself, this differentiation ceases to apply since here the price at the place of production is the same as the price at the place of consumption. Thus, when further on we examine the total turnover of materials (i.e., including the turnover within an enterprise) in the "census" industry, the latter will be expressed in production prices.

and subgroups, give consumption both in producer and consumer prices.

At this point we feel it necessary to warn against attempting to deduce from the comparison of prices at the places of production and consumption the "surcharges" and their dynamics throughout the years. Such attempts, although theoretically quite legitimate, are, it must be stated emphatically, liable to give very unsatisfactory results. In the state of affairs that prevails in our industrial statistics to this day, there is no guarantee that prices at the place of production are really the factory prices, as they are supposed to be. Rather it must be assumed—and we are led to this conclusion by an analysis of prices for individual goods—that at the place of production the statistical valuation of production is not done at factory prices, but more often either at cost prices or at the prices fixed by the trust, or at any other conventionally fixed prices. Thus the estimated gross value of production is usually a statistical accounting or any sort of conventional expression rather than a reality. From the viewpoint of the conventional physical estimate with which we are concerned here, it does not matter that this estimate does not correspond to any concrete reality, for we are concerned here only with one thing: that the prices in which the consumption of certain goods is estimated should correspond to the prices in which their production is statistically estimated. But these prices obviously cannot be used to draw definite conclusions about the price increase between production and consumption and about industrial expenditures on distribution. Since this last matter is of current interest, especially for the correct organization of interindustry turnover, we only wish that our industrial statistics would pay more attention to determining concretely the prices in which the estimate of the gross production is made, and thus enhance the importance of this estimate.

Coming back to the table on interindustry consumption of the means of production in the "census" industry, we note that (except for the fuel and textile groups, in which, for the reasons given below, there was a decrease in the share of interindustry consumption in production in 1923/24) there has been a constant increase in interindustry consumption not only absolutely but also relative to the gross production.

Concerning the fuel industry, the above-mentioned reduction in 1923/24 can be accounted for by the overproduction of Donets Basin fuel and by an accumulation of considerable reserves of coal which caused the planners to reduce the scheduled production of coal for 1924/25.

In the oil industry, starting with 1923/24, the share of exports increased while the share of kerosene and of distillation in general decreased, which inevitably caused a relative reduction of the share of interindustry turnover. Along with this, we can point to considerable success in saving of fuel; the fuel expenditure rate per unit of production has been declining since 1922/23. This has the most obvious effect on the fuel industry itself, where its own consumption dropped not only relatively but absolutely despite the continuous growth of production. This is also noticeable in the iron and steel industry, where, in 1923/24, the consumption of fuel increased only slightly while its own output increased 50 per cent in prewar prices.

In the textile industry, the reduction of the share of the interindustry turnover was due to a reduction of the relative share of the internal turnover within the textile industry itself, for which there are several reasons. In the first place, imported cotton has not been included in the sum of consumption which is compared with production.[2] If we do count it, the internal turnover as a percentage of the textile industry increases somewhat relative to the gross production. In the second place, during these years, owing to the increase in the variety and the quality of the goods produced, we observe an increase in the share of products of other industries in the total volume of the materials consumed, especially dyes, and at the same time a drop in the share of textile raw materials. This trend is especially pronounced in the cotton industry.

The textile raw materials, as can be judged from Tables 1 and 8, accounted in the "census" industry for 91.8 per cent, 88.3 per cent, and 82.9 per cent of the total costs of raw materials and materials of industrial origin consumed in production in 1922/23, 1923/24, and 1924/25, respectively. Thus the growth of gross production exceeds the growth of the consumption of the textile raw materials and semifinished products, and the ratio of consumption relative to gross production decreases.

Thus the fluctuations in the interindustry consumption of producer goods relative to gross production can be accounted for mainly by the above changes in the fuel and textile industries. If we exclude these, we obtain a more even picture of uninter-

2. I must remind the reader here that ginned cotton, according to our method, must be classified as an industrial commodity In our table by industries, we use the total figure, which includes imported cotton in the denominator.

rupted growth of interindustry consumption, which can be seen from the following figures (in per cent of gross production):

	Means of production of industrial origin consumed in "census" industry	Same, excluding fuel and textile industries
1922/23	28.7	16.3
1923/24	26.5	18.8
1924/25	32.2	25.3

The scope of this paper prevents us from giving a more detailed analysis of industrial consumption in the "census" industry and the interconnections between the various industries that are due to it. We shall, therefore, limit ourselves to a few observations on the cases in which, instead of the expected even development of the dynamic series, we come across sudden leaps, upward or downward.

Here it would be appropriate to emphasize once more the incorrectness of comparing the growth rate of the gross production of an individual industry and the growth of consumption in that industry of the products of other industries and expecting to find a strict correspondence. Besides the different dynamics of the prices and the structural changes within the gross turnover, we must also know the changes that have taken place in the quality of the raw material and in the variety of goods produced. Thus the replacement in the soap industry of animal fats by hydrogenized vegetable oils decreases the share of agricultural products and increases that of industrial products, but this does not happen in proportion to the increase of the gross output of the soap industry. The assortment of cotton fabrics determines the consumption of dyes and other auxiliary materials such as starch, dextrine, etc. Therefore, for an analysis of interindustry consumption we must always take into account the various changes that may take place within individual industries. In this connection, when studying interindustry turnover, it is better to use the data referring to subgroups rather than total figures for groups of goods, which often play down and conceal substantial changes.

Thus the sharp increase in the consumption of products of extraction and primary processing of minerals in the mining industry in 1924/25 can be accounted for by the relatively rapid growth in the iron ore and machine-building industries of shaped

steel castings and, as a consequence of this, the increase in the production of fire-clays (see table of consumption of the products of Subgroup Ia). The leap in the consumption of the products of Group I in the food industry is explained by the increased output of vodka products and the increase in the consumption of glassware.

In the iron and steel industry, on the whole, the dynamics of consumption follows the dynamics of production. For the metal processing industry, the interindustry consumption increases somewhat faster owing to the reorganization and improvement of the current repairs since 1923/24.

We observe the same trend in the woodworking industry, where, owing to more current repairs, the consumption of all sorts of timber supports has increased in the fuel and ore industry. The consumption of timber has also increased in metal processing and machine building, and in the food, paper, garment, and footwear industries, where wooden crates are used more and more. In the last three industries, electrification has been introduced in the past few years, which reduces their mineral fuel consumption.

Above we examined only productive consumption. Below we give data on consumption by the "census" industry of building materials, working clothes, and office materials.[3] To answer the question about the amount and composition of the expenditures of materials of industry in construction, we possess no direct statistical data, such as those on industrial consumption, for which there are yearly reports. This is due to the unfortunate fact that up until now, except for the balance reports in the total sum of expenditures, we have no regular statistics on individual construction and consumption of building materials. Hence, in making up our table, we had first to separate the sum spent on the purchase of building materials from the total sum of expenditures on construction. To find these figures, we have used the industrial balances of the Soviet Union and the Russian Republic for 1923/24 and 1924/25. The coefficients thus obtained, with some corrections, were extended to industrial construction as a whole. For the electric power stations and housing construction, we had to use estimated figures.

To find the specific composition of the expenditure of mate-

3. Data on consumption by the census industry of building materials, working clothes, and office materials are given in the original in Table 7. This table has been deleted as nonessential.—Ed.

rials, these expenditures were broken down, on the basis of the direct balance sheets, into expenditures for: (1) capital repairs; (2) new construction (various types); (3) equipment.

Further, the composition of expenditures was calculated partly on the basis of the norm data and partly on the basis of various estimates. The composition of expenditures on new construction was determined on the basis of the Supreme Council of the National Economy's study of the trusts' construction work, which yielded some preliminary information for the determination of the nature of the construction projects.

Thus we have calculated the physical amounts of consumption of the various forms of building materials which were later evaluated in the same prices as was industrial consumption.

For working clothes, we had to use the normative calculations based on the approximate number of persons entitled to one type or another of special work clothing.

The consumption of office equipment was based on consumption per office employee. In view of the considerable increase in the consumption of building materials due to the development of capital repairs and new construction, we observe a relatively faster growth in the consumption of products of machine building and metal industries.

The relatively slow increase in the consumption of special working clothes is accounted for both by the price changes and by the revision of the norms for this clothing. On the whole, it must be noted that the growth of the expenditure on working clothes is nevertheless increasing at a faster rate than the growth of manpower engaged in the "census" industry.

Inversely, expenditures on office materials increase very slowly—above all because of the limitation and reorganization of office personnel, whose numbers increase very little in industry.

E. A. Preobrazhenskii

ECONOMIC EQUILIBRIUM IN THE SYSTEM OF THE USSR

....PRELIMINARY OBSERVATIONS

...Analysis of equilibrium conditions in the system of the present-day Soviet economy necessitates the division of the economy into three sectors: (a) state; (b) private-capitalist; and (c) small-scale producers. However, the nature of the investigation will frequently require opposing the first sector to the other two taken together, since the latter two represent a unified sphere of the private economy in general, and the absence of necessary data for the capitalist sector makes possible a concrete study of economic growth only along the lines of division into two sectors.

The second characteristic—and this creates the difficulty of the investigation—is the fact that equilibrium of the system is not attained on the basis of the law of value and of equivalent exchange, but on the basis of a collision between the former and the law of primitive socialist accumulation. For this reason we cannot, in analyzing equilibrium, start from Marx's premise that, as a rule, commodities are sold at their value. In the second volume of Capital, in the formulation of the question of analyzing reproduction, Marx makes the following reservation on this point: "It is furthermore assumed that products are exchanged at their values and also that there is no revolution in values of the component parts of productive capital. The fact that prices diverge from values cannot, however, exert any influence on the movements of the social capital. On the whole, there is the same exchange of the same quantities of products, although the individual capitalists are involved in value relations no longer proportional to their respective advances and to the quantities of surplus value produced singly by every one of them."[1]

"Khoziaistvennoe ravnovesie v sisteme SSSR," Vestnik Kommunisticheskoi Akademii, No. 22, 1927, pp. 19-71.

1. Das Kapital, II. [Vol. II, English edition, Foreign Languages Publishing House, Moscow, 1957, p. 393.]

...This premise of Marx is quite correct in the analysis of equilibrium of the capitalist economy. On the other hand, when we analyze reproduction in our system, we start from deviation of prices from values, as a rule, when we compare our domestic prices with world prices. From the viewpoint of equilibrium, the specific characteristic of our economy during the period of primitive socialist accumulation consists precisely in the absence of equivalent exchange, which is the dominant tendency toward which the capitalist economy gravitates, and which is attained, with smaller or greater deviations, primarily on the basis of free competition and free expression of the law of value with respect to the allocation of social labor. Under capitalism the equivalent exchange can be considered the dominant tendency, no matter how numerous the deviations from the general rule, and no matter how much these deviations increase historically with the development of monopolization. On the other hand, in the Soviet economy, during the period of change of the entire technological basis of the state sector, the rule is nonequivalent exchange....

It is clear from what was said above that while the Marxian analysis of proportional distribution of labor under reproduction in pure capitalism started from equivalent exchange as a necessary premise, and while we also started from this premise in our analysis of equilibrium in actual capitalism, yet our investigation of reproduction in the economy of the USSR, which is to follow, must start from nonequivalent exchange, though the latter is to be gradually and systematically liquidated. But this means that we always assume, as a basis of the entire process, the existence of two different systems of ownership of the means or production, and two different regulators of economic life, i.e., the law of value and the law of primitive socialist accumulation....

ALGEBRAIC SCHEMA OF REPRODUCTION IN THE USSR

The algebraic schema of the three sectors of economy which —to use tentatively the Marxian terminology—relates to the capitalist sector, the state sector, and the small-scale producers' sector will have the following form [Department I = producers' goods; Department II = consumers' goods]:

State Sector

Department I	c + v + surplus product	(surplus product from other
Department II	c + v + surplus product	sectors)

Capitalist Sector

Department I	c + v + m
Department II	c + v + m

Small-scale Producers' Sector[2]

Department I	c + consumption fund + surplus product
Department II	c + consumption fund + surplus product

However, the above schema is not adequate for our purpose because it does not provide an idea of how the individual magnitudes are broken down from the viewpoint of their exchange with various departments of different sectors. A more detailed schema which we shall use in what follows—frequently, however, taking the two private sectors together—should have the form shown on pages 128 and 129.

We shall say a few words to clarify this schema, which does not cover, even in the given form, all of the lines of direction along which exchange proceeds in expanded reproduction in our system.

From the viewpoint of exchange, constant capital of department I of the state sector divides itself into three parts: the first part is reproduced within the department itself; the second is reproduced via exchange with the first department of the capitalist and small-scale producers' sectors; the third is reproduced via imports of means of production from abroad.

Wages of the first department of the state sector are divided into two parts: one part is exchanged for consumers' goods produced in the second department of the state sector; the second part is reproduced via exchange with departments II of both the capitalist and the small-scale producers' sectors.

2. Preobrazhenskii uses interchangeably the expressions "sektor prostago tovarnogo proizvodstva" (literally, "sector of simple commodity production") and "melko-burzhuaznyi sektor" (literally, "petty-bourgeois sector"). These expressions refer to the handicrafts and cottage industries as well as to the small-scale peasant economy. We have substituted throughout this text for Preobrazhenskii's two expressions the single designation, "small-scale producers' sector."—Ed.

The surplus product of the same department divides itself into: (1) an accumulation fund which is divided proportionately between c and v with a corresponding exchange of the additional v for consumers' goods; (2) a fund of nonproductive consumption. The latter is consumed in natura in the same department, but in the form of the means of production of war industry, while the remaining part goes into exchange with departments II of all sectors.

Constant capital of department II of the state sector is reproduced in the following ways: by way of exchange of consumers' goods against one part of the wages fund of the first department of the state sector; via exchange with the consumption fund of the capitalist and the small-scale producers' sector (chiefly for peasant raw materials); by way of imports of means of production (both in the form of machinery and in the form of raw materials such as cotton, wool, rubber, hides, etc.).

Wages of department II of the state sector are reproduced in part within the department itself, in part via exchange for the consumption fund of the small-scale producers' sector, in part by mutual exchange for v_{II} of the capitalist sector.

The surplus product of department II of the state sector is divided in the same way as the surplus product of department I: it thus consists of an accumulation fund and a fund of nonproductive consumption. The latter is consumed in natura; the former is divided into two parts: one consists of additional v and is reproduced on the model of the entire v_{II} of the state sector, the other is intended to purchase means of production and is reproduced on the model of c_{II} of the state sector.

We leave without detailed examination the exchange between the capitalist sector and the other sectors, inasmuch as this process is clear from the analysis of the departments of the state sector made above. There is a difference in the division of surplus value. We have here consumption of the capitalist class which modifies the exchange of means of production for consumers' goods of the individual sectors, and we have also a deduction from m into the fund of socialist accumulation which also makes the analysis of reproduction more complex.[3]

3. We do not yet raise the question of how one should calculate reproduction complicated by the levy into the fund of socialist accumulation of the surplus value of the capitalist sector and the surplus product of the small-scale producers' sector. This is a methodological problem of major significance. In solving it, we must raise the question of the relationship of domestic prices and world market prices.

State Sector

	c	+ v	+ m
Dept. I	Part of constant capital reproduced each year on an expanded scale.	Wage fund.	Surplus product (1) to expand existing enterprises
	(a) via reproduction within the department	(a) part covered via exchange of c II with the state sector	(a) accumulation fund (2) to build new enterprises
	(b) via exchange with departments I of other sectors	(b) via exchange of c II with other sectors	(b) nonproductive consumption fund of the Soviet administration going into c II of all sectors and into c of war industries
	(c) via imports		
Dept. II	Part of constant capital reproduced each year on an expanded scale	Wage fund	Surplus product
	(a) via exchange with department I of the state sector	(a) part covered within the department itself	(a) accumulation fund within the department itself (additional v, additional increase of own c)
	(b) via exchange with the consumption fund of departments I of other sectors	(b) part covered via exchange with the consumption fund of other departments II	(b) nonproductive consumption fund of the Soviet system
	(c) via exchange with a part of the nonproductive consumption fund of department I		
	(d) via imports		

Surplus fund of socialist accumulation[a]

a The progress of the physical composition of the fund of socialist accumulation is clear from the entire scheme of reproduction. More detail about this will be given in the numerical analysis of the Control Figures of Gosplan.

Capitalist Sector

	c	+ v	+ m
Dept. I	Same as in the state sector except imports	Same as in the state sector	(a) accumulation fund (b) fund of capitalist consumption (c) fund of nonproductive consumption of the Soviet administration (d) expropriation for the fund of socialist accumulation
Dept. II	Same as in the state sector except imports	Same as in the state sector	Same as in department I of the capitalist sector

Small-scale Producers' Sector

	Means of production for the production of means of production	Consumption fund	Surplus product
Department I	(a) reproduced within the department	(a) reproduced via exchange with c II of the state sector	(a) accumulation fund: (1) part that remains within the department; (2) part exchanged for additional fund of consumption; (3) part exchanged for additional means of production from other sectors
	(b) via exchange with c I of the state and capitalist sectors	(b) via exchange with c II of the capitalist sector	(b) fund of nonproductive consumption of the Soviet administration
	(c) via imports	(c) via exchange with c II of its own sector	(c) expropriation for the fund of socialist accumulation
	Means of production for the production of consumers' goods	Consumption fund	Surplus product
Department II	(a) produced within the department	(a) produced internally (prevalent part)	(a) accumulation fund: (1) fund of additional consumption produced internally; (2) exchange for additional means of production from other departments of other sectors; (3) own additional means of production
	(b) reproduced via exchange with the fund of consumption and a part of the fund of nonproductive consumption of its own sector	(b) via exchange with a part of v II of the state sector, and v II of the capitalist sector	(b) fund of nonproductive consumption of Soviet society, in physical form
	(c) via exchange with v and c part of the fund of nonproductive consumption of department I of the state sector		(c) expropriation for the fund of socialist accumulation
	(d) via exchange with a part of v and m of department I of the capitalist sector		

The means of production of department I of the small-scale producers' sector, which consist of machinery, cattle, seed, fertilizer, etc., of peasant farms engaged in producing technical crops, as well as of the equipment and raw materials of a certain part of handicraft industry, divide themselves into two parts: one is reproduced within the department itself; the other may be obtained only via internal exchange for c_I of the state sector, and partly via imports.

The consumption fund of department I of the small-scale producers' sector, which has the physical form of means of production, is exchanged in two ways: for c_{II} of the state sector and the capitalist sector on the one hand, and for a part of the fund of means of production of department II of the small-scale producers' sector itself.

The surplus product of department I of the small-scale producers' sector is divided into three basic parts: (a) an accumulation fund; (b) a fund of nonproductive consumption whose volume is determined by the extent to which the department in question is forced to participate in covering it; and (c) a fund of socialist accumulation, which goes into the state sector.

In its turn, the accumulation fund consists of (a) additional means of production produced within the department which go to increase in natura its own c by way of internal redistribution, i.e., without bringing in other sectors; (b) means of production which are exchanged for means of production produced in department I of the state and the capitalist sector; (c) means of production in physical form which serve as a fund of additional consumption of new workers. These means of production must therefore, in order to come into consumption, be exchanged for consumers' goods of departments II of all three sectors in the same proportions in which is exchanged the entire fund of consumption of a given department.

The fund of nonproductive consumption, similar to the fund of nonproductive production of department I of the state sector (excluding means of production of war industry), must be transformed into consumers' goods by way of exchange, in respective proportions, with department II of all three sectors, replacing their constant capital.

Withdrawals into the fund of socialist accumulation include that part of taxes levied from small-scale production destined for nonproductive consumption (of the agents of the state and of the distribution network) and for increasing capital funds of the state sector, including state funds of agricultural credit. They

include, second, that part of the fund of primitive socialist accumulation formed as a result of the exchange of the export fund of small-scale, chiefly peasant, output valued in terms of domestic prices (which are lower than world prices) for the import fund of the means of production for the state sector valued in terms of domestic prices (which are much higher than world prices). If we consider the entire system of reproduction in the USSR in terms of the value relationships of the world market, we should include in this fund the entire active balance which is formed in the exchange of state output for private output, considering the production of both the state sector and the private sectors in terms of world market prices and deducting from the total that part which is absorbed by unproductive consumption.

The means of production of department II of the small-scale producers' sector consists of four parts. The first and largest part is reproduced in department II itself to the extent that we are concerned primarily with peasant agriculture. Here are included seeds earmarked from the harvest, own production of draft animals, own production of feed or livestock, own fertilizer, own buildings, etc. The second part is reproduced via exchange for the consumption fund of department I of the small-scale producers' sector or for v_I of the capitalist sector; the third part is exchanged for a part of the wage fund of department I of the state sector; the fourth part is reproduced via imports.

The consumption fund of department II of the small-scale producers' sector consists of two parts: the first and dominant part is reproduced within the department itself; the second, considerably smaller, part is exchanged for a part of the wages fund of department II of the state and capitalist sectors.

As far as the fund of surplus product of department II of the small-scale producers' sector is concerned, it is divided into the same four parts as the surplus product of department I of that sector; the difference consists in all the changes in the system of exchange which are associated with another physical form of the total product. As a matter of fact, the fund of accumulation is divided, first of all, proportionately into a fund of additional consumption and a fund of additional means of production, where the fund of additional consumption has the same composition as the basic fund of consumption. The distinction between the process of reproduction of this fund and the reproduction of the same fund in department I of the small-scale producers' sector consists in the fact that in department I, before exchange takes place, this fund has the physical form of means

of production, all of which must be exchanged for consumers' goods, whereas here, i.e., in department II, this fund has, from the very beginning, the physical form of consumers' goods, and, in its basic part, is also consumed there. Only its smaller part is exchanged for consumers' goods of the other two departments II. In its turn, the fund of additional means of production has the same composition as the means of production of the given department in general. This means that a part of the fund of additional means of production is produced in the small-scale producers' sector itself while another part is obtained via exchange with other sectors.

As far as nonproductive consumption is concerned, it includes, as before, that part of the surplus product of a given sector which becomes the income of groups in Soviet society which represent unproductive consumption: expenditures of the state apparatus, the army, the nonproductive part of expenditures of trade exchange, etc. The difference between the second and the first department of the same sector consists in the fact that in a given case the fund of nonproductive consumption has, from the very beginning, the physical form of consumers' goods and is not destined for further exchange with other departments, as is necessary for the fund of nonproductive production which has the physical form of means of production.

As far as the surplus product destined for the fund of socialist accumulation is concerned, all that was said with respect to department I of the small-scale producers' sector applies without change to department II as well.

The schema of reproduction in the system of the USSR, which we have introduced, enables us to clarify the general conditions of proportionality in an economy of the type under investigation and during the period examined. We must necessarily clarify these general conditions before we use the above schema for an analysis of numerical data of specific years and before we attempt to substitute concrete arithmetical figures, such as those of the fiscal years 1925/26 or 1926/27, for the algebraic symbols.

FIRST CONDITION OF EQUILIBRIUM

Let us begin with the conditions of equilibrium between the state sector and both private sectors taken together, from the viewpoint of securing expanded reproduction in the state sector

and abstracting, for the time being, from the physical composition of the output that is exchanged.

Let us assume that the gross output of the state sector equals 12 billion chervonets rubles annually and is divided in the following ways: 8c + 2v + 2m. (In 1925/26 the gross output of the state sector in terms of producers' prices plus the revenue from transportation, communications, the communal economy, and forestry plus the gross output of construction equaled 14.35 billion rubles, excluding some minor items.)

Let us further assume that the trade turnover with the private sector as a whole equals 6 billion rubles, i.e., that the state sector sells to the private sector means of production, consumers' goods, and transportation services worth 3 billion chervonets rubles and obtains from the latter an equivalent amount of means of production, chiefly peasant raw materials, consumers' goods, and the export funds. We thus have equality without an active balance in favor of either sector, i.e., without unilateral accumulation of unrealized commodity surpluses. Assume, now, that the entire economy of the USSR is integrated into the world economy on the basis of the free play of the law of value and that our industry is compelled to adopt world market prices with unchanged volumes of exports and imports, i.e., omitting, for the time being, the possibility of changes in the volume of trade. The over-all equilibrium will then be disturbed; in particular there will be disturbance of equilibrium of the mutual relationship between the state sector and the private sector. As a matter of fact let us suppose that the entire output of the state sector is now valued in world market prices, i.e., not more than half of present domestic prices. If that part of the output of department I of the state sector which is destined to replace a part of the constant capital of department II of the state sector (machines, fuel for production of consumers' goods) equals approximately that part of the output of department II of the state sector destined to go, in exchange for the latter, into department I, and consisting of textiles, shoes, sugar, etc., then the mandatory lowering of prices will not change essentially the physical proportions of exchange within the state circular flow, provided the percentage rise of the prices of the output of heavy and light industry of the state sector does not differ appreciably from the price indexes of heavy and light industry in the world economy (if, let us say, consumers' goods produced in our state industry are twice as expensive as the output of light industry in the world economy, and the prices of machinery are twice as high

as the prices of machinery produced abroad). In this case one of our machinery trusts will now sell its machines to our textile industry, at half the present price, and the textile industry in turn will sell its textiles, destined for the consumption of the workers and employees of the machinery industry, at half the present price. In short, because the purchasing power of money will change proportionately for both sides, the natural balance of exchange will remain the same, as if the parties valued their production not in 1927 chervonets rubles, but in another monetary unit, let us say, in terms of the purchasing power of pound sterling in the world market. Particular branches may gain or lose where the deviations from world prices are of differing magnitudes. If the exchange between the first and second departments of the state sector were not in balance, and the residue were covered through exchange with the private sector, a great loss would be suffered by that department of the state sector which was closely bound, with respect to the exchange, to the private sector.

But the most important change in this case will occur with respect to the interrelationships of the state sector as a whole and the private sector as a whole. The connection of the state sector and the private sector as a whole is by no means limited by the size of the active balance which is not covered domestically by state exchange. The first department of the state sector must sell under any circumstances to the private sector a quantity of means of production equal in price to that part of the wages of its workers used to buy consumers' goods of peasant origin plus a corresponding part of means of production to compensate the part of nonproductive consumption of the first department of the state sector, excluding the means of production of war industry. Even larger is the volume of exchange of department II of the state sector with the private sector. This exchange offsets a significant part of c_{II} of the state sector and also a significant part of the wage fund of that department. In our example, which is numerically close to the actual figure of exchange between the state sector and the private sector during the fiscal year 1925/26, purchases of the private sector from the state sector and of the state sector from the private sector equal 3 billion rubles for each side.

If the state sector buys from the private sector goods valued at 3 billion rubles (in domestic prices), but sells its output to the private sector (in world market prices) for only 1.5 billion rubles, the state sector will receive only one-half as much as it

would in conditions of nonequivalent exchange. The kind of disturbance that this would create in all conditions of reproduction in the state sector is clear from a single look at our numerical example. The shortage of 1.5 billion absorbs, in the first place, the entire accumulation fund and affects, secondly, some part of nonproductive consumption. In the third place, it must lead, later on, to an impossibility of proper amortization of fixed capital as well as that part of circulating capital which consists of peasant raw materials. On the whole this will mean complete frustration of the process of expanded production and, with continued significant nonproductive consumption, may make impossible even simple reproduction at the level of the preceding year.

An even greater disturbance will result if the establishment of world market prices for raw materials and consumers' goods produced in the private sector means an actual increase as compared to the existing situation.

We thus arrive at a first conclusion of vast importance, namely, that in the presence of divergences between world industrial prices and domestic industrial prices in the economy of the USSR, i.e., when the domestic prices of Soviet industry are much higher than world prices, economic equilibrium, which ensures expanded reproduction in the state sector, can exist only on the basis of nonequivalent exchange with the private sectors.[4] This means that, given the divergence of prices described above, the law of primitive socialist accumulation is the law of maintaining equilibrium of the entire system, primarily with respect to its relations with the world economy. This law must inevitably operate until the time when the economic and technological backwardness of the proletarian state, compared to the foremost capitalist countries, is overcome.

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4. This proposition, which is the foundation of my construction of the law of primitive socialist accumulation, has called forth numerous laments from my critics, concerning the "destruction of the workers' bond with the peasantry [smychka], a policy of raising prices, etc.," but when I invited my critics to prove that in the existing stage of development of the state sector, expanded socialist reproduction is compatible with equivalent exchange, no one was heard from. And one can understand why not. The formulation which I have introduced merely states what exists in reality. I am merely trying to understand scientifically that which exists. If we already had equivalent exchange, the problem of the smychka would not exist at all.

SECOND CONDITION OF EQUILIBRIUM

Let us now turn to the following condition of equilibrium of the system, confining ourselves again, for the time being, to the sphere of mutual relationships of the state sector as a whole and the private sector as a whole.

Let us take our numerical schema of the state sector and assume that a new economic year begins on the basis of the results of accumulation of the previous year. We thus assume that with a surplus product in the state sector equal to 2 billion rubles, of which one-half is devoted to nonproductive consumption and the other half to productive accumulation, and with an increase of the state sector's trade with the private sector from 3 billion to 3.25 billion rubles, equilibrium in the economic system as a whole is secured. Let us now consider the opposite case, namely that actual accumulation, for some reason, either because of a sharp decline of wholesale prices not justified by costs, or because of a growth in nonproductive consumption, does not equal one billion but only 700 million rubles. To what consequence must this insufficient accumulation in the state sector inevitably lead?

It is clear that this will lead to a disturbance of proportionality between the state and the private sector of the Soviet economy. An accumulation shortage of 300 million rubles will mean the impossibility of expanding the reproduction of c to the necessary limits in both departments, while the shortage of means of production will equal 240 million rubles. At the same time the expansion of v in both departments of the state sector will be 60 million rubles less than the norm, which in addition to everything else will mean a slower increase of workers engaged in production and therefore a relative increase of unemployment. Finally this will result in a decrease of 60 million rubles of surplus product in the state sector as a whole. With respect to the total output of the state sector, we shall have at the end of the year a shortage of production of 360 million rubles as compared to the first example. If the share of the private sector in the realization of the output of the state sector is equal, as we have shown, to 3.25 billion rubles, i.e., almost one-quarter of the total gross output of the state sector, a shortage of 360 million rubles of output can mean a shortage of commodities for the private sector of a minimum of around 90 million rubles.[5]

5. We say minimum because the commodity demand of the city for state output is naturally first to be satisfied and, in the case under con-

But this will mean that well-known phenomenon which we call the goods famine. If of these 90 million rubles, two-thirds relates to consumers' goods produced in the state sector, the nonsatisfaction of the effective demand of the private sector, primarily of the peasants, will necessarily lead to a decline of personal consumption in the village of the products of light state industry and to substitution for factory output of domestic handicraft output, hence to an increase of fabrication of raw materials (leather, wool, flax, hemp) by primitive domestic methods and to a slowing down of economic development in this sector. Secondly, it will lead to abstention of the peasantry from selling output for export and to an increase of peasant consumption of their own foodstuffs. Thirdly, this disproportion will increase the divergence between retail and wholesale prices in domestic trade, primarily in private-trade exchange. As far as the remaining one-third is concerned, which consists of unsatisfied demand for means of production, considering the impossibility of metal being produced by handicraft methods and the impossibility of handicraft production of complex agricultural machinery, etc., the disproportion will have much more harmful consequences. It will prevent peasant agriculture from increasing, under conditions of expanded reproduction, the necessary quantity of machines, stocks, and other means of production. In both departments of the small-scale producers' sector, the goods famine will inevitably lead—since sales cannot lead to purchases—to abstention from selling a part of the peasant output and to the appearance of the phenomenon of accumulation of unsold physical supplies in the peasant sector, with which we are already familiar. This disproportion can be alleviated only by monetary accumulation in the peasant sector, which is generally possible only with a stable currency or if the purchasing power of money is rising because of falling prices. However, it is self-evident that such accumulation, inasmuch as it corresponds to that part of the reserves of the peasant sector which should be transformed into means of production produced by the state sector, inevitably means an artificial impediment of the process of expanded reproduction in the peasant sector, as compared to the possibilities which exist in the peasant economy itself.

From what has been said it follows clearly that (1) the volume of accumulation in state industry, given the price level, is

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sideration, the deficit may in its major part be transferred to the demand of the private sector.

not an arbitrary magnitude; it is subject to iron laws of proportionality, to reveal which is one of the most important tasks of the theory of Soviet economy and of the practice of planned guidance of economic life; (2) a disturbance of the necessary minimum of accumulation not only is a blow to the state economy and to the working class, but also delays the development of the peasant sector, artificially depressing the rate of growth of expanded reproduction in agriculture.

Let us now consider the same question, but from a different angle: let us examine what some economists who draw uncritical analogies between the Soviet system and capitalism and who fall into petty-bourgeois philistinism tended at one time to call overaccumulation in state industry and running ahead of industry. To start with, we must agree what we mean by the term "overaccumulation." If we mean a relationship between production and consumption in society as a whole such that new means of production introduced into operation in both departments lead, in the last result, to so sharp an increase in output of consumers' goods that these goods cannot be absorbed by the market at existing prices, and as a result the accumulation in the first department turns out to be useless, then such a phenomenon is very well known in the capitalist economy and must inevitably bring about a sales crisis, the ruin of many enterprises in both departments, a mandatory decline of prices, and a fall of the rate of profit. In the theoretically possible case that our state sector, on the basis of accumulation of the previous year, should turn out consumers' goods in excess of the effective demand of both the workers and the entire private sector, given the planned prices, the situation would be considerably less serious than in the capitalist economy, for the following reasons. Among the premises of dynamic equilibrium in our system are, among other things: (1) growth of workers' wages; (2) gradual decline of industrial prices; (3) re-equipment and expansion of the entire technological base of the state sector. The appearance of a sales crises may, under these conditions, mean one of three things:

(1) That we have incorrectly estimated the time of the realization of the program with respect to the first two points. Equilibrium may then be attained either by raising wages above the planned wages or, radically, by lowering more rapidly the prices of consumers' goods produced in the state sector as compared to the program. The disproportion may in that case be overcome very rapidly and without any particular shocks, and "over-

accumulation" will turn out to be merely a crisis of the production plan with respect to the incorrect estimation of the time required for the fulfillment of the first two tasks. In addition, one must not forget that, with our general shortage of credit reserves, production reserves, and trade reserves, the disproportion cannot continue for long in hidden form as is usual in capitalism, and that its liquidation will necessarily begin much earlier, before the entire process goes too far. The harmful consequences of the error in planning calculation which we are discussing will show themselves later, in the sense that fulfillment of the third of the tasks mentioned above will be delayed in time.

(2) That we have incorrectly calculated the time of realization of the third task, i.e., we have expanded the production of consumers' goods, with given prices, beyond the volume permitted by the readiness of the entire technological base of the state sector and by the level of the achieved rationalization of work with respect to lowering of costs, lowering of sales prices, or, in the worst case, an increase of wages alone. In such a situation "overaccumulation" turns out to be the result of incorrect distribution of productive forces within the state sector, the result of a lag in the process of technological re-equipment of industry and in the general development of the entire economy. What we have here is an internal disproportion within the framework of the state sector, but not overaccumulation from the viewpoint of the mutual relations of the state sector and the private sector. The solving of such a crisis, either by lowering prices—that is, by an economically unjustified lowering of costs —or by maintaining prices and letting part of the output stay in the form of a nonliquid fund, may temporarily impede the entire process of expanded reproduction. This lack of correspondence will continue until a shift in the allocation of productive forces restores equilibrium.

(3) That the re-equipment of fixed capital, which proceeds discontinuously, draws so many means of production into production of means of production capable of yielding an output only after several years that all of this retards the growth of the consumption fund of the population and, given the goods famine, checks the process of lowering prices. In that case, we shall not have general overaccumulation (otherwise it could give rise to a goods famine, even with respect to consumption goods) in the state sector, but a nonproportional distribution in time of the particular tasks of expanded reproduction. In our case, we shall have before us not so much an error in the drawing up of the

plan as a natural result of the transition from the so-called recovery process to the reconstruction process. We shall have before us the natural consequences of the situation when the fixed capital of the country, diminished significantly by failure to amortize in previous years, is replaced, given limited relations with the world economy and general shortage of domestic accumulation, in the natural form of means of production. What has the external appearance of overaccumulation in heavy industry is merely a particular form of insufficient accumulation in the state sector as a whole. The very nature of the replacement of fixed capital under the conditions here described is such that this process must be of a discontinuous nature. In order to expand, let us say, by 100 million rubles the annual output of consumers' goods in light state industry, one must start by increasing the output of means of production by 400 to 500 million. This may temporarily retard the necessary advance of the production of consumers' goods, create a goods famine of a particular nature, and delay the lowering of prices, particularly if a change in the structure of the peasant budget leads to an increase in the demand for consumers' goods as compared to the prewar situation. But on the other hand, this will yield a few years later an opportunity at once to reduce the cost of production, lower sales prices, and increase rapidly the consumption fund. Instead of a steady lowering of prices, say by 2 to 3 per cent per year, and of a steady increase in the output of consumers' goods, say by 6 to 7 per cent per year, this will achieve the same results in the course of three to four years, but only in a more discontinuous way. If we ignore the political difficulties of this period, the harmful impact of such a development of the state sector can be reduced, up to the time when production of crops for export in the peasant sector is retarded and production of technical crops turns out to be less than what is demanded by the rapid development of light state industry. This last difficulty, as far as our economy is concerned, still lies for the most part ahead, whereas the artificial diminution of peasant exports is already taking place. From the viewpoint of a general progressive advance of the state sector, the case under investigation will not mean a crisis of overaccumulation and overproduction in the precise sense of the word, but only the physical impossibility of arranging harmoniously the development of all aspects of expanded reproduction in time. During the transition from the recovery process to the reconstruction process such a state of affairs is, generally speaking, inevitable, because the

transition itself, as we shall see in greater detail below, means a sharp change in the over-all proportions of the allocation of the productive forces of the country. The fact that new plants will begin to turn out output three to four years after the start of their construction is the result of a technical rather than an economic necessity. First a delay, then a forward jump are inevitable. To even out this discontinuity would be possible only on the basis of larger exports and foreign loans. The reason why the latter is impossible is precisely the fact that in our country there is taking place not merely expanded production but expanded socialist production in industry, and world capitalism is not inclined to help it.

And so we arrive at the conclusion that the volume of accumulation in the state sector is not an arbitrary magnitude in any given year, and that a certain minimum of accumulation is forcefully dictated by the over-all proportions of the distribution of the productive forces between the state sector and the private sector, as well as the magnitude of our relations with the world economy. Second, we conclude that overaccumulation in the state sector, given the tremendous task of rapid re-equipment and expansion of fixed capital of industry (not even decades will be sufficient to accomplish this task), is, generally speaking, impossible. This re-equipment presents a genuine domestic market of colossal capacity, even if we ignore the growth of the domestic market which results from the growth of demand on the part of the private sectors of our economy. We cannot speak of a crisis of overaccumulation in the state sector, whose goal is not the production of surplus value, but of a colossal underaccumulation which is reflected also in the peasant sector by retarding its development. We may also speak of insufficient accumulation in the sphere of peasant production of industrial raw materials. We shall deal with this disproportion when we analyze the physical composition of the exchange between the state and the private sector.

It must be also stated here that the two general conditions of equilibrium which we have just examined differ from each other in the following respect: equilibrium of nonequivalent exchange under conditions of divergence of internal prices and world prices, i.e., equilibrium of an economy regulated by the law of primitive socialist accumulation in a struggle with the law of value, is a specific characteristic of our economy, the law of our existence as a soviet system throughout the period of overcoming our economic backwardness in relation to advanced

capitalism. Equilibrium is attained as a result of a constant struggle of the still backward collective production of the only country with a proletarian dictatorship against the capitalist world and against the capitalist and petty bourgeois elements of our own economy. Equilibrium of this type is an unstable equilibrium of a struggle between two systems, and it is attained not on the basis of a world-wide law of value but on the basis of constant violation of this law, of a definite break with the world market, of the removal from the sphere of regulation by the world market—if not entirely, then part—of an enormous economic area.

Things are quite different when we deal with the second condition of equilibrium, i.e., the proportions of accumulation in the state sector necessary to maintain equilibrium in the economic organism after the first condition of equilibrium has been secured for some time. Maintenance of equilibrium within an economic organism divided into a system of collective production and a system of private production brings into a different kind of conflict the planning policy of the state, guided by the law of primitive accumulation, and the law of value. If we do not capture, through planning, the required proportions of the distribution of the productive forces, given the existing relationships of the indices of domestic and world prices, the law of value will break through with elemental force into the sphere of regulating economic processes and, forcing the planning principle to a chaotic retreat, will encroach upon those specific proportions of the distribution of labor and means of production which will have been created as a result of the existence of the collective sector of the economy—proportions which secure not merely expanded reproduction, but an expanded reproduction of a soviet-type system.

THE THIRD CONDITION OF EQUILIBRIUM

Let us turn now to the third condition of equilibrium, which is connected with the magnitude of our participation in the world division of labor and with the specific conditions of realizing these relations.

Consider our previous numerical example, which relates to reproduction in the state sector. Now, however, in order to explain our problem, we must divide the annual output of the state sector into two departments. Assume that the distribution of the

productive forces and of production between the two departments is as follows: department I, 40 per cent; department II, 60 per cent.[6]

In order not to depart from reality, we assume further that the organic composition of capital in department I is lower than in department II (in contrast with the Marxian schemata; more on this later). The ratio of c to v in department I is 3:2, and in department II it is 2:1. Let us further assume that the surplus product equals 100 per cent of the wages, and is divided in both departments into two equal parts: one part is devoted to accumulation in the same department, the other goes into the fund of nonproductive consumption of Soviet society. The entire schema will then have the following form:

(I) 2,100c + 1,400v + 1,400 surplus product (700 fund of accumulation and 700 fund of nonproductive consumption) = 4,900;

(II) 3,550c + 1,775v + 1,775 surplus product ($887\frac{1}{2}$ fund of accumulation and $887\frac{1}{2}$ fund of nonproductive consumption) = 7,100.

Even when we pay cursory attention to this schema we observe a major difference as compared to the corresponding Marxian schemata of capitalist production. Here c_{II} of the state sector is not only considerably higher than wages and nonproductive consumption in department I of the state sector, but it is also larger than the wages plus the entire surplus product of department I. All this is quite natural in a peasant country where a very large c_{II} of the state sector is reproduced by exchange with the small-scale producers' sector, which provides our light industry with such means of production as cotton, flax,

6. In 1925/26 the output of consumers' goods was equal to 58.8 per cent and the output of producers' goods to 41.2 per cent of the total output of our industry. See Perspektivy razvertyvaniia narodnogo khoziaistva SSSR na 1926/27 - 1930/31 gg. [Perspectives of development of the national economy of the USSR for 1926/27 - 1930/31], Gosplan SSSR, pp. 123-124, and table on pp. 54-58. The corresponding data for 1913 and 1924/25 presented in the Kontrol'nye tsifry na 1926/27 [Control figures for 1926/27], p. 163, seem incorrect to me; more about that later.

hemp, hides, wool, sugar beets, oil-bearing seeds for the oil-manufacturing industry, grain for the mills, potatoes for the alcohol industry, etc. Let us assume that one-half of c_{II} of the state sector, i.e., 1,775 c is reproduced by exchange in the private sector, i.e., we take first a figure which exceeds the actual volume of reproduction of c_{II} by exchange with the small-scale producers' sector. We ask now how the second half of c_{II} can be reproduced.

For the reproduction of that half, we have first the wages fund of department I, equal to 1,400. However, all of this sum cannot go to replace one-half of c_{II} because a part of the wages of the department I must be exchanged for peasant consumers' goods. Let us assume that the latter exchange requires one-third[7] of 1,400, i.e., 466.6. There remains for exchange against c_{II} a fund of 933.4 which has the physical form of means of production. Furthermore, since 700 of the surplus product is devoted to accumulation in department I, there is left of the surplus product, for exchange with departments II of the other sectors, a fund of nonproductive consumption equal to 700. If we take the same proportion of exchange of that fund with department II of the state sector on the one hand, and with the private sectors on the other, that is, if we assume that into department II of the state sector go two-thirds, or 467, while the rest, that is, 233, goes into the private, the entire exchange fund of department I of the state sector which replaces one-half of c of department II will equal 933.4 + 467 = 1,300.4 or, rounding, 1,300, while it is necessary to replace 1.775. There is a deficit of means of production in the state sector equal to 455 million.

If we assume further that this deficit is somehow covered, it is sufficient for us to construct a schema of expanded reproduction for the following year on the basis of the data of the initial schema, in order to see how the disproportion which we have noted will persist, decreasing a little under one set of conditions, increasing under another set. As a matter of fact, of the 887.5 of surplus product in department II subject to accumulation, 295.8 will be devoted to increasing v, and 591.7 to increasing c. Thus c_{II} will now equal 4,141.7, while that part of it which

7. A study of workers' budgets shows some 40 per cent plus, i.e., more than the proportion which we have selected. However, when we consider the processing of grain into flour and bread in state flour mills, the volume of state and industrial wood-cutting, etc., the figure which we have selected will not be very far from the truth.

must be covered by exchange with department I will be equal to 2,070.8. At the same time, the exchange fund of department I increases proportionately as a result of the growth of v and of the growth of nonproductive consumption, and that part of it which must go to replace c_{II} will now already equal 1,680 instead of 1,300. This means that in the following year the deficit of means of production will equal 2,070.8 – 1,680 = 390.8 million instead of 455—with the same rate of growth of nonproductive consumption. And, conversely, the preservation of the same absolute volume of nonproductive consumption must increase the disproportion because the preservation of the old volume, or the decrease of the rate of growth of nonproductive consumption, will cause the exchange fund of department I of the state sector to diminish, at the same time that c_{II} of the state sector relatively rises. The question has been raised whether the disproportion which we have observed is the result of the numerical relationships which we have taken as an illustration (though the proportions may be close to the actual proportions), or whether it represents a real disproportion in our economy.

There can hardly be any doubt that the illustration which we have chosen illustrates precisely the real disproportion which exists in our economy and which is caused by: (1) the interruption of foreign capital investment in our industry; (2) the decline of nonproductive consumption of the bourgeois class; (3) the failure to amortize fixed capital in prior years; (4) the withdrawal of a part of the means of production for the construction of new plants which are not yielding any output; (5) the general necessity of a more rapid development of accumulation in department I, under the conditions of industrializing the country.

And thus we observe the fact of a sharp and continuously rising shortage of means of production in our state sector. The question is now raised: what role can be played in liquidating this disproportion by foreign trade, which we now must introduce into our analysis? This role is of exceptional importance. Assume that the shortage of means of production in department II means a shortage of machinery for light industry, for the electric power industry, for the basic chemical industry, etc., and that the deficit in heavy industry expresses itself in a shortage of equipment in the fuel industry, in machine-building plants, of turbo-generators of large capacity, of blast furnaces, and of other equipment of ferrous and nonferrous metallurgy, etc. What do we achieve by introducing foreign trade?

When we introduce imports, we achieve the following:

1. Light industry, instead of being arrested in its development and awaiting the time when department I, on the basis of its own development, will be able to provide it with the needed elements of c, covers its deficit immediately from abroad—i.e., the problem of time is solved, whereas the solution of the problem via the lengthy, roundabout way of developing a domestic department I would mean increasing crisis and piling up one difficulty upon the other, including difficulties in the area of exchange between the state sector and the private sector. In this connection we must keep in mind another circumstance of exceptional importance: if light industry, in order to increase its output by 100 units, must expand its constant capital correspondingly—in the present case by that part of the latter which is reproduced in department I—but if it is precisely the means of production required by light industry of which there is a general shortage in that department, then the additional orders of light industry can be satisfied only by constructing new enterprises in the heavy industry. But this construction necessarily withdraws from the general fund of accumulation of the state sector, for the period of construction, much larger amounts of resources every year, as compared with the value of the means of production required to supply light industry with additional elements of fixed capital. The addition of a new 100 c to the constant capital of department II may require at the same time an investment in department I of 400 to 500 elements of new capital. Yet by turning to the world market we can solve this problem, directly and without delay, through imports of the necessary means of production for department II.

2. Heavy industry, instead of awaiting the time when its own shortage of means of production will be covered by internal development, and instead of equipping new industries with machinery of its own production, which would mean an extreme delay in the beginning of operations of the new enterprises and would lead to a crisis within department I itself as well as in the sphere of its exchange relations with department II, will cut the contradictions by importing such equipment, the domestic production of which would intensify the crisis and would draw accumulation, which is inadequate anyhow, into enterprises whose construction, provided relations with the world economy exist, is by no means of first importance.

3. Both light and heavy industry not only solve the temporal aspect of the problem of the development of their production, but they also solve, to a certain degree, the tremendously im-

portant question of accumulation at the expense of the private sector. As a matter of fact, in our example the state sector has a shortage of means of production going to replace fixed capital in the amount of 400 million rubles, in terms of domestic prices. In order to cover this deficit, our state needs only to export, let us say, consumption goods produced by the peasants in the amount of 200 million rubles or 100 million dollars, and to purchase foreign equipment for this sum. This foreign equipment, which costs in terms of world prices 100 million dollars or 200 million chervonets rubles, would cost 400 million rubles in our country if we consider the difference between our domestic industrial prices and foreign prices. Consequently, thanks to imports of means of production, we use the difference between world and domestic prices and automatically accumulate fixed capital in our developing industry.

And so relations with the world market, while solving the temporal aspect of the problem of reconstruction and expansion of fixed capital of both departments of the state sector, also solve, to a certain degree, the physical aspect of the problem of accumulation, to wit, by means of primitive socialist accumulation.

But there is another disproportion which can also be overcome through imports. This concerns the replacement, in physical form, of a certain part of the elements of c_{II}, to the extent that domestic production of raw materials is insufficient in some branches. We would most likely delay for decades the normal development of our textile industry if we awaited the development of our own cotton production to the point of satisfying the entire demand of this industry for raw materials.

In addition to the cases which we have listed, imports are absolutely necessary for us in cases where a particular raw material (for example, natural rubber) or a particular consumers' good (for example, coffee) cannot be produced at all for natural reasons. But I purposely refrain from discussing this aspect of our relations with the world economy, because in that case it is advantageous and necessary to participate in the world distribution of labor in general, regardless of the structure of the economy and the degree of its development. I am discussing imports of such means of production as we can, generally speaking, produce ourselves, and whose domestic production will be expanded but which, at the present stage of development of the state sector, we must import in order to maintain the equilibrium of the system of expanded socialist reproduction in the first

place, and in the interest of accumulation of fixed capital in the second place.

Thus we arrive at the conclusion that the third premise of equilibrium in our system is a maximum of relations with the world economy built upon the very special nature of our exports and imports. Under conditions of a general shortage of domestic production of the means of production, particularly under conditions of relative backwardness of heavy industry, as compared with the needs of the domestic, state, and private market, and as compared with the necessary general rate of industrialization of the country, our planned imports of the means of production must be of such size and such physical composition as to serve, so to speak, as an automatic regulator of the entire process of expanded reproduction, without ceasing to be a source of accumulation.[8]

THE FOURTH CONDITION OF EQUILIBRIUM

The fourth condition of equilibrium of our economic system is proportionality in the distribution of labor, in particular, proportionality of exchange between the state sector and the private sector within the country, both from the viewpoint of the value magnitudes of exchange, with given prices, and from the viewpoint of the physical composition of this exchange. It is assumed that the equilibrium of value exchange is understood in a provisional sense, i.e., as nonequivalent exchange, as exchange which is a mechanism of socialist accumulation. For greater clarity in examining this fourth condition of equilibrium, we

8. Of course, the above disproportion could also be resolved, from the viewpoint of the private sector and its interests, by direct imports of consumers' goods from abroad; but it is quite clear that such a solution of the problem would mean a most serious delay, if not liquidation, of expanded socialist reproduction. Generally speaking, many problems of the private sector could be solved by liquidating socialist industry or even by merely liquidating the monopoly of foreign trade. The entire struggle between the state and the private sector of the Soviet economy reduces itself at once to the question on what basis equilibrium can be achieved in the Soviet economy: on the basis of integration within the world economy "on general conditions," i.e., on the basis of the law of value; or in a new way, unprecedented in economic history, through planned imports subordinated to the task of primitive socialist accumulation.

shall take our provisional numerical example, which relates to the state sector, and combine with it the arithmetic schema of reproduction in the private sector; and for simplicity we shall not divide the private sector into two subsectors, the capitalist and the small-scale producers' sector, as we should have to do in a more detailed analysis. As in the state sector, we introduce a division of the surplus product of the private sector into two parts: a fund of actual accumulation in each department and a fund of nonproductive consumption in each department.

We shall assume that the annual volume of output of the private sector as a whole is 17 billion rubles.[9] Let us assume that this gross output is divided between the two departments of the private sector in the following way:

(I) 2,200 c + 2,200 consumption fund + 1,100 surplus product = 5,500;

(II) 3,300 c + 6,600 consumption fund + 2,100 surplus product = 12,000.

Department I contains the production of technical crops in peasant agriculture as well as of all raw materials in general, and, in handicraft and cottage industry, enterprises which produce means of production such as private blacksmiths' shops; repair shops; handicraft production of agricultural implements, wheels, carts, carting products destined for further fabrication, etc.

Department II contains the entire production of consumers' goods in peasant agriculture, which is the overwhelming part of the total output of this department, namely: tillage, animal husbandry (that part of it which yields consumers' products such as milk, butter, meat), truck farming, fisheries, manufacture of homemade clothing, etc. This department also includes handicraft and private capitalist industrial production of fabrics and clothing, the private leather industry, the private food industry, etc.

Having thus divided peasant agriculture into two departments, we must always keep in mind that this division is a methodological abstraction. The same indivisible peasant farm almost al-

9. In the fiscal year 1925/26 the total output of the private sector, according to the Control Figures of Gosplan, equaled, in terms of producers' prices, 16,397 million rubles.

ways belongs simultaneously in each department, because no matter how extensively it produces consumers' goods, it produces also, necessarily, some means of production. On the other hand, a peasant farm which specializes in technical crops always produces some consumers' goods.

Reproduction in department I proceeds so that a part of the means of production of peasant agriculture, which produces raw materials as well as means of production of handicraft and cottage industry, is produced within the same department I of the private sector. Here is included production of seeds of flax, cotton, sugar beets, hemp, etc., which are to be planted for further production of flax, cotton, etc. The same sector supplies working cattle, feed, and animal products (a part of the output of raw materials; sheep which yield wool are a means of production of wool and an increase of sheep is production of equipment used in producing wool). But there remains another part of the means of production which can be obtained only from department I of the state sector. Here is included metal and coal for blacksmiths' shops and small repair shops, agricultural machinery for peasant production of raw materials, artificial fertilizers, railroad and water transportation, which serve to replace c_I of the private sector, etc. The following question arises: department I of the state sector, represented by machine building, the fuel industry, metallurgy, electric power construction, and electricity, etc., buys very little from department I of the private sector—in any case, less than what the latter must buy from heavy industry. But all that heavy industry sells to replenish its wage fund requires a corresponding amount of consumers' goods which department I of the private sector cannot provide. Hence the extremely complicated interconnection of the entire system of reproduction, which Marx did not investigate directly in his excellent chapters concerning accumulation in the second volume of Capital because he operated on the assumption of purely capitalist reproduction, where the general equilibrium of exchange is concentrated merely in the relation of the magnitude c_{II} and the rate of its growth to the magnitude $v + (m/x)I$ and the rate of its growth. That part of c_I of the private sector which is not covered by internal production of means of production of this sector and by internal exchange with c_I of the state sector may fall into department I of the private sector also, via realization of the fund of nonproductive consumption of department I of the state sector. This problem may also be partially solved by way of foreign trade: flax, hemp, raw wool, bristles, etc., are ex-

ported abroad and the necessary amount of means of production is obtained from there.

We thus observe that the reproduction of one part of c_I of the private sector represents a rather complicated task, which can be solved by drawing into exchange all the departments of all the sectors, primarily through the channel of nonproductive consumption plus foreign trade. It is not enough that the part of c_I of the private sector which we are discussing and which has initially the physical form of industrial raw materials, say of means of production of private industry, is sold, but it is also necessary that the money obtained can buy a sufficient amount of the necessary means of production. The systematic shortage of means of production which we have established above, mainly in the form of fixed capital—a shortage which characterizes the period of reconstruction of the technological base of the state sector—must increase further as a result of the disproportionality in the exchange of c_I of the state sector for c_I of the private sector that we have just noted.

The consumption fund of department I of the private sector consists, until exchange takes place, of the same elements, i.e., of industrial raw materials of all kinds, produced in peasant agriculture, as well as means of production of cottage and handicraft origin: the output of blacksmiths' shops, repair shops, and cart shops, the production of any agricultural implements, the cutting of wood for further fabrication, etc. A part of these means of production is realized in the same private sector, a part proceeds to reproduce c_{II} of the private sector, which figures in our illustration as 3,500 c. Department II of the private sector provides consumers' goods in exchange to department I of its own sector. The second part of the means of production of department I of the private sector which replaces the consumption fund goes into department II of the state sector in the form of raw materials for the textile industry, the hide industry, the sugar industry, the dairy industry, the alcohol industry, etc., and is exchanged for textiles, shoes, sugar, etc.

The surplus product of department I of the private sector, to the extent that we are concerned with its main and most interesting part, i.e., the surplus product in the production of technical crops in peasant agriculture, consists of three basic parts: the fund of nonproductive consumption from which are paid part of state taxes, outlays on trade, etc.; second, the fund of productive accumulation in the same department; and third, a fund which goes into socialist accumulation of the state sector. In

our illustration, the entire surplus product of department I of the private sector equals 1,100 million, of which, say, 500 million goes into the fund of accumulation, 400 million into the fund of nonproductive consumption, and 200 million into the fund of socialist accumulation.

As far as the fund of nonproductive consumption is concerned, it must be exchanged in an overwhelming part against consumers' goods of department II of the state and private sector, because means of production are not consumed personally. The transit channel of such exchange is the reproduction of c in all three departments II of all sectors of the economy. As far as the fund of accumulation of 500 million is concerned, this fund must also be divided into two completely different parts: (1) a fund of additional consumers' goods for expanded reproduction, i.e., that part of these 500 million which must be exchanged against consumers' goods and serve as the consumption fund for new workers who will be employed in production; (2) a fund of additional means of production in the proper sense. If we assume that the division between the fund of consumption and the fund of means of production occurs in the same proportion as in the previous year, then the fund of accumulation of the means of production will equal 250 million. Let us now consider the elements of which the latter figure consists. The smaller part of this 250 million will consist of those means of production which department I of the private sector must buy in department I of the state sector, i.e., from state heavy industry. The larger part consists of means of production which are produced in peasant agriculture itself and are added, to express it inexactly, to the capital of production. This includes: (1) seeds of technical crops obtained within the department itself and going to expansion of the sown areas; (2) the expanded reproduction of cattle, feeds, manure for fertilizing; (3) improvements of all kinds destined to extend the area of cultivation of technical crops and increase the fertility of the soil; (4) farm buildings constructed of peasant timber by the peasants' own means; (5) additional means of production obtained within the department itself but by way of exchange with private and handicraft industry.

It is quite clear that expanded reproduction of technical crops, to the extent that such reproduction requires means of production from the state sector, is most intimately connected in its development with the conditions of reproduction and of accumulation in state heavy industry. But on the other hand, department II of the state sector is intimately connected, as far as expanded

reproduction is concerned, with the achievements of expanded reproduction of technical crops in peasant agriculture, which form its raw material base. Thus, when all is considered, expanded reproduction of department II of the state sector requires prior expanded reproduction of department I of the private sector, specifically that part of the latter which produces technical crops, while expanded reproduction of technical crops requires a prior expanded reproduction of that part of department I of the state sector which supplies it with the required additional means of production. It is therefore in the general interest of light state industry and of peasant production of technical crops that accumulation in heavy industry, which must always precede expanded reproduction of these branches, should be as rapid as possible.

Let us introduce one more example which one must often find in a peasant country and which is related to the question under consideration. As is known, the process of accumulation in our peasant agriculture proceeds discontinuously in years of good harvests. Hundreds of thousands of peasant farms succeed in "getting above water" in one year of good harvest, and increase their means of production to an extent that they may not be able to achieve again for perhaps another five years. Let us assume that we have an above-average harvest of flax, cotton, oil-bearing seeds, etc. As a result, peasant agriculture is in a position to allocate to the fund of accumulation an amount of resources which exceeds the average usual annual increment of accumulation. This gives rise both to increased demand—among other things—for means of production produced by state industry and increased demand for means of production produced by the handicrafts. However, since there is no good harvest of machines, metals, etc., in heavy industry, the demand for additional means of production which originates in peasant agriculture will not be satisfied unless accumulation in heavy industry runs systematically ahead of accumulation in the other branches of the economy as a whole, in particular if it does not insure the existence of necessary commodity reserves. Then, in a favorable case, the fund of accumulation earmarked for the purchase of means of production in the heavy industry will be temporarily frozen in monetary form, and, with a developed credit system, it will make possible, on the basis of redistribution of monetary accumulation, an increased flow of credit and thereby also additional production in the corresponding branches of heavy industry. In an unfavorable case, this fund of accumulation will be

exchanged for consumers' goods and will be simply consumed in peasant agriculture, having increased the consumption expenditures of the peasant department of technical crops. We do not consider the case in which the disproportion will be even greater, namely when heavy industry has already exhausted all reserves of existing equipment, and the new additional demand can be satisfied only by new fixed capital investment greatly exceeding the total commodity shortage of the current year.

Let us now turn to department II of the private sector. If we exclude private industrial output of consumers' goods (household and handicraft production of shoes, clothing, fabrics, private food industry)[10] we shall have here mostly peasant production of consumers' goods. Reproduction of constant capital—equal in our case to 3,300 c—occurs as follows: Its major part consists of means of production obtained in the peasant branch of consumers' goods itself. This includes seeds of grain crops, cattle feed, manure for fertilizing, reproduction of cattle, construction from own timber by own means, improvements, clearing of forests to add new arable land, fresh cultivation of virgin soil, etc. The second part of the means of production is obtained by exchange of consumers' goods of the department in question against means of production purchased in department I of the private sector of the economy. Finally, a third part of the consumers' goods of department II of the private sector which replaces its c goes for sale to the workers of heavy industry in the state sector, and in exchange there are received from heavy industry means of production in the form of agricultural machines, equipment, nails, roofing iron, other forms of iron, transportation services, etc.

The major part of the consumption fund of department II of the private sector is produced and consumed within the department itself, and its major part does not enter at all into the so-called marketed part of the output of peasant agriculture. Only a minor part of this fund enters into internal exchange with the wage fund of department II of the state sector, i.e., with state light industry. In other words, if we take the wage fund of state light industry to be 1,000, and if we take that part of this fund which consists of consumers' goods of peasant and other private origin to be 400, then the worker in light industry will buy that

10. Total private industrial output—capitalist, handicraft, household—was equal in 1925/26 to 2,165 million chervonets rubles, including both the production of means of production and production of consumers' goods.

amount from the consumption fund of department II of the private sector in the form of what he requires according to his expenditure pattern—cereals, fats, etc.—while the peasants and the craftsmen of department II will buy consumers' goods produced in the state sector.

However, this does not mean that we must have here either a complete or an approximate arithmetical equality, such as is postulated by Marx in his analysis of capitalist reproduction when c_{II} is exchanged for $v + m/x$. We have already established, in our analysis of exchange between department I of the private sector and department I of the state sector, that department I of the private sector—because of the physical composition of the exchanged commodities—must obtain more from heavy industry than heavy industry can buy in this department. But this means that department I of the private sector must sell its producers' goods in the amount of the net balance somewhere else and with the money thus obtained must buy producers' goods from heavy industry. It is quite clear that this problem may be solved through the medium of foreign trade. A part of the flax, hemp, etc., is exported; heavy industry obtains, through imports, the equipment which it needs; and the sellers of flax, hemp, etc., purchase for chervonets from Soviet heavy industry the means or production which they require. In this way the disproportion in the physical composition of exchange between department I of the private sector and department I of the state sector is liquidated by bringing in the foreign market, which makes it possible to shift the elements of production in department I itself, and to free the resources required for exchange with department I of the private sector. The problem may be solved even more simply in a direct way, i.e., by importing from abroad machinery and other means of production for department I of the private sector. If it is impossible to solve the problem to a sufficient quantitative extent—either because of underdevelopment of the domestic machine-building industry, or the production of artificial fertilizers, etc., or because of limitations of the import quota left to the private sector—we shall have a goods famine of the means of production of heavy industry, i.e., one of the forms of disturbance of equilibrium between the state and the private sector resulting from underdevelopment of our heavy industry.

In exactly the same way, if, say, peasant agriculture producing consumers' goods must exchange more of its products for consumers' goods of industrial origin than can be provided by the wage fund of light industry of which we spoke above, then the

solution of this problem is also possible, generally speaking, by bringing in foreign trade. It is another question whether recourse to foreign trade is practically possible under existing circumstances. Let us assume that the workers and employees of light industry purchase in the private sector consumers' goods worth 400 million rubles while the private sector of the department of consumers' goods requires in exchange for its consumption fund not 400 million but 600 million rubles worth of goods, and that its demand for the products of state light industry is equal to this amount. Concretely, the peasantry has an extra 200 million rubles' worth of marketable cereals, fats, eggs, etc., and desires to purchase with these extra 200 million an additional amount of clothing, shoes, sugar, and other consumers' goods of manufactured origin. Let us assume, however, that department II of the state sector, i.e., state light industry, produces only 400 million rubles' worth of goods and cannot provide more. An escape via foreign trade is also possible in this case; it would consist in additional exports of the products of peasant agriculture in the amount of 200 million rubles, and the money obtained in this way would be used to import foreign manufactured consumers' goods for the peasantry. In practice, however, given the shortage of export resources even for the importation of the more important producers' goods, this method turns out to be impossible for the Soviet state during the first years of the reconstruction process because, in order to bring into circulation those 200 million rubles of additional export resources, one must first purchase from abroad products of light industry out of the import fund of the year in question, i.e., at the cost of diminishing the imports of producers' goods which are insufficient even without this. Because of the impossibility of such an operation, and because of the insufficient development of the domestic state light industry, there must also appear in the Soviet economy a creeping goods famine for manufactured consumers' goods. As a result, a part of the liquid resources out of the fund of consumption of the peasant sector does not enter commodity circulation, and there begins in the Soviet village the well-known process of using internal consumption of eggs, fats, etc., increasing stores of cereals in excess of the contingency reserves against poor harvests, and many concomitant phenomena. When all is considered, the marketed share of agriculture as a whole turns out to be below the level which would be objectively possible with a more rapid development of Soviet industry, even with the existing high prices. We do not consider here the pos-

sibility of still more rapid growth of the marketed share as a result of more rapid decline of production costs and industrial prices. This is the source of a second disproportion between state industry and peasant agriculture for which there is no solution, in the present circumstances, except more rapid development of state industry.

Theoretically, the problem can also be solved in the following way: Out of the additional export fund of consumers' goods in the above amount of 200 million rubles, only 100 million goes to buy consumption goods from abroad, while these are sold at domestic prices, making use of the divergence between internal and external prices, for a sum that is perhaps equal to the 200 million rubles. At the same time, the other 100 million rubles of the export fund are used to purchase abroad means of production; as a result the consumption demand of the peasantry is being partially solved simultaneously with the problem of accelerating development of domestic industry. It is, however, quite clear that such a solution of the problem, while theoretically fully possible, represents in practice, under existing circumstances, only a somewhat mitigated form of the difficulty which was pointed out, and not its elimination. Even in this case it is necessary to advance 100 million rubles out of the import fund for the purchase of consumers' goods.

Our examination of the present question would not be complete if we did not point out that the disproportion that we have shown has one positive aspect. This consists in the fact that the accumulation in the village of unsold surpluses of consumers' goods makes it possible to hold prices of agricultural products at a given stable, low level. What seems here to be fully the product of the planning principle in economic life appears, as a matter of fact, to be much more the result of the disproportion which we have shown, i.e., a phenomenon that is well known to all exchange economies. The fact that we hold prices more or less stable is the result of the planning principle; the fact that we hold these prices stable at a low level is, to a very great degree, the result of blocking up the development of agriculture in the sphere of production of consumers' goods, which is in turn the result of the underdevelopment of our industry and its inadequate actual accumulation.

In analyzing the conditions of equilibrium between state industry and the private sector we have so far left aside the changes brought into this whole process by the presence of the fund of nonproductive consumption. We return to this question

below when we examine concretely reproduction in the economy of the USSR in 1925/26. This question cannot be examined without examination of several new questions which are not directly related to the theme under consideration.

In view of all the above we can formulate the following very important proposition on the law of proportionality of exchange between the state sector of our economy and the two private sectors.

If, in the Soviet economy, c_{II} of the state sector plus c_{II} of the private sector minus the means of production received by department II of the unified private sector within its own department equals v plus nonproductive consumption of department I of the state sector plus the fund of consumption and the fund of nonproductive consumption of department I of the unified[11] private sector, then: (1) With a shortage in department I of the unified private sector of means of production of department I of the state sector, the disproportion may be liquidated only on the basis of relations with the world economy. (2) The consumption fund of department II of the unified private sector—or that portion of it which consists of consumers' goods of light state industry—must equal that portion of the wage fund of department II of the state sector which consists of consumers' goods of department II of the private sector purchased with wages, i.e., to a very large extent of consumers' goods of peasant origin. (3) If internal exchange of the consumption fund of department II of the unified private sector against a corresponding part of v_{II} of the state sector reveals an excess of demand on the part of the private sector, the disproportion may be solved either by means of relations with the foreign market, or by means of such redistribution of national income as would provide the resources for additional development of department II of the state sector, which assumes, however, an even more rapid development of heavy industry. (4) When it is not possible to overcome the disproportion in the economy in the above ways, there arises a goods famine, in the entire private sector, for both means of production and consumers' goods produced in the state sector.

In our entire analysis we started from a division of the peasant sector into two departments, applying the same principle as that used by Marx with respect to the capitalist economy. Is this a correct method, considering the extreme lack of differentia-

11. Minus means of production of war industry, as is clear from all that was said above.

tion of the peasant sector from the viewpoint of the division of labor in it between various branches of agriculture? Does not one and the same medium-sized farm on which the production of grain predominates produce along with consumers' goods such as grain, fats, meat, butter, etc., also raw materials, such as wool, hides, etc.? Is it not true that in regions which grow cotton or flax, there is simultaneously produced meat, fats, eggs, grain, etc.?

All of this is true. Nevertheless, the Marxian method of division of the peasant sector into departments I and II, which we have applied, remains the most purposeful. In the first place, we must not forget that it was capitalist agriculture which entered into the Marxian analysis, which—though more differentiated with respect to crops specialization—nevertheless always exhibits a close intertwining of the production of consumers' goods and of means of production. For example, a large modern farm in Germany unites animal husbandry and land tillage with the production of sugar beets, etc. And secondly, if we begin the analysis from another angle, if we consider the peasant sector of the USSR economy as a whole in its relationship with state industry, we should, nevertheless, find it necessary to use the same method. Let us assume that we want to ascertain what aggregate quantity of raw materials the peasant sector can provide for our industry and for export; without this the solution of the problem of proportionality of development of agriculture and of industry would be unthinkable. In ascertaining all the raw-material possibilities of peasant agriculture, we thereby necessarily segregate that part of its output which belongs in department I. In ascertaining the marketable surpluses of food products in agriculture we again segregate what we call department II. Just as in the Marxian analysis one part of the output of every large capitalist farm figures in department I and another part in department II, so with us each individual peasant farm which produces a mixed output figures in our calculation now in department I, now in department II. The fact that one and the same horse, etc., figure at the same time both as means of production of producers' goods and as means of production of consumers' goods makes the general analysis of reproduction more complicated, but is not a sufficient ground for rejecting the Marxian method of investigation. It does not appear possible to substitute for the Marxian method any other method of investigation. In detailed analysis of reproduction in agriculture it is merely necessary to make an additional study concerning the

relative extent to which these means of production figure in department I and in department II.

We must now consider the role of nonproductive consumption in the economy of the USSR from the viewpoint of the influence of this consumption on the conditions of equilibrium between the unified state sector and the unified private sector.

In order to clarify this question, let us take one of the Marxian schemata which relates to expanded capitalist production. Let us take, for example, the following numerical schema:

(I) 4,000c + 1,000v + 1,000m (500 accumulation fund + 500 capitalist consumption fund);

(II) $1{,}500c + 500v + 500m \left(\frac{500}{x} + \frac{500}{y}\right)$.

In this case $1{,}500c_{II}$ is exchanged against 1,000v plus 500 capitalist consumption fund of department I. Assume now that nonproductive consumption, with the volume of output unchanged, declines by one-half in department I. We shall then have in department I:

(I) 4,000c + 1,000v + 1,000m (750 accumulation fund + 250 consumption fund).

In this case, because of the increase of accumulation at the expense of nonproductive consumption, department I decreases its exchange fund with department II from 1,500 to 1,250, while the reproduction of c_{II}—if no changes have occurred in department II—requires means of production from department I in the amount of 1,500. Even if there is no absolute decline of nonproductive consumption, but only a relative decline, i.e., if the nonproductive consumption fund of department I either remains unchanged at the level of 500 while the accumulation fund grows, or if both these magnitudes grow, but the accumulation fund grows more rapidly than the fund of nonproductive consumption—in other words, if the change is not as drastic as in our example—nevertheless the tendency will remain the same. This tendency consists in a growing shortage of producers' goods in department II. This is explained by the fact that the exchange fund of department I regularly lags behind the demand for producers' goods on the part of department II.

If the corresponding decline of the nonproductive consumption fund occurs in department II, it is sufficient for us to do the

same operation in department II which we have done in the numerical example of department I, in order to see what it must lead to. In this case the additional accumulation fund obtained by the decline of nonproductive consumption is divided between c and v of department II proportionately with the organic composition of capital, and department II will no longer demand producers' goods from department I in the amount of 1,500, but considerably more. This means that the disproportion will grow simultaneously from two ends: as a result of the relative decline of the exchange fund of department I and as a result of both the absolute and the relative growth of c_{II}. How this disproportion in the economy can be later liquidated is another question. (Clearly, it can be done by a general reallocation of productive forces between departments I and II on the basis of the new proportions.) However, when we are concerned simply with the transition to a lower nonproductive consumption and a higher level of accumulation, this inevitably changes the proportions of exchange between departments I and II, increasing the demand of department II for producers' goods and decreasing their current supply. In that case the economy is becoming more progressive from the viewpoint of the allocation of productive forces, the surplus product throughout society is growing, the aggregate gross and net output of society grows at an accelerated pace, accumulation grows more rapidly, but the transition itself, on the new path of increased relative share of department I, must cause a temporary disproportion throughout the economy. From this general theoretical proposition we must draw the following important conclusion for the economy of the USSR. If, throughout the economic sphere in which the state sector replaced private prewar capitalist production,[12] the accumulation fund increases as a result of a decline of nonproductive consumption of the industrial bourgeoisie, this must necessarily mean a decline of the exchange fund of department I of the state sector, accompanied by an increase of accumulation in department II, which means—with a relative growth of c_{II}—also an increased demand of c_{II} for means of production. However, since the means of production of department II of the state sector consist not only of machinery, fuel, and other means of production obtained from department I of the state sector but also of a tremendous quantity of raw materials of peasant origin, the actual

12. It is assumed that production of surplus product remains at the same level.

transition to a system of diminished nonproductive consumption and more rapid accumulation, when the prewar level of output in department II of the state sector and the prewar level of output of raw materials in the peasant sector has been reached, must necessarily call forth a chronic crisis of raw materials supplies for light state industry. Hence, even if we do not mention changes in the structure of the peasant budget associated with the revolution (which will be discussed below), the diminution alone of nonproductive consumption in industry itself must lead to both a more rapid accumulation and a more rapid growth of shortage of means of production.

But the formation of the state sector of the economy of the USSR means the liquidation of only a part of the nonproductive consumption which existed in the bourgeois economic system. Let us assume that out of every 100 units of surplus product of prewar capitalist industry 40 was devoted to accumulation, while of the remaining 60 the capitalists consumed nonproductively 20 and 40 was devoted to nonproductive consumption of the entire capitalist system, i.e., formed the contribution of industry to the maintenance of the bureaucratic apparatus, the army, the payment of interest on foreign loans, the coverage of nonproductive apparatus, etc. Our state industry can use for additional accumulation this 20 per cent of surplus value, but it has--in place of the capitalist nonproductive consumption--its own Soviet nonproductive consumption: the army remains, and so does the government apparatus, the outlays on nonproductive consumption of the distribution apparatus, etc. What is more, should nonproductive outlays of this type turn out to be larger in our economy than they were under capitalism, they could swallow the entire saving of 20 per cent and could even diminish the accumulation fund in comparison with its prewar level, especially if the funds of surplus product in Soviet industry should turn out to be less in absolute terms than before the war. I do not discuss, in this connection, how matters stand in fact, i.e., expressed numerically. It should be pointed out that some of our nonproductive outlays have risen (distribution apparatus) while others have diminished (state budget). What is important for the present is to establish two facts: first, if the nonproductively expended part of our surplus product is declining or has declined as compared to prewar circumstances, this must necessarily change the proportions in the allocation of productive forces, calling forth a more extensive demand for means of production; second, non-

productive consumption[13] continues necessarily to exist to some extent in our economy. This in turn means different proportions in the allocation of productive forces as compared to the schema which could be constructed for the Soviet economy when abstracting from nonproductive consumption. Indeed, given the presence of nonproductive consumption in the Soviet system, a certain part of the economy is earmarked for the support of the nonproductively employed groups of the population. In order to produce this fund of nonproductive consumption, there must be produced somewhere the means of producing this fund. But this means that all departments of all sectors of the economy must be employed, to some extent, in serving the requirements of nonproductive consumption. However, this does not at all mean that the distribution of the burden of nonproductive consumption between the individual sectors of the economy and between the individual departments of these sectors must be proportional to those changes in the equalizations of exchange between individual departments called forth by the very fact of the existence of this nonproductive consumption.

Concretely, matters stand as follows, with respect to individual departments: the nonproductive consumption fund of department I of the state sector consists, physically, of producers' goods. Out of this fund there will go into nonproductive consumption, in the form of producers' goods themselves, everything which will be used by war industry: equipment for armaments plants, metal for the production of means of defense, fuel burned in these operations, etc. The second part of the nonproductive consumption fund of department I must proceed into exchange with department II of both the state and the private sector. Matters are approximately the same with respect to the fund of nonproductive consumption of department I of the private sector, the only difference being that the role of war industry in absorbing the means of production of the department in question, with the possible exception of horses for the cavalry, etc., is not very great. As for the departments which produce consumers' goods, their fund of nonproductive consumption proceeds, in physical form, into the consumption budget of those population groups which are not employed in productive work. It is quite

13. The term "nonproductive" is used here in a socio-economic sense and not at all in an ethical sense. After all, necessary nonproductive consumption also exists.

clear that in value terms the entire fund of personal nonproductive consumption will be less than the share by which the second departments of both sectors will participate in the over-all burden of nonproductive consumption, since one part of this consumption will be covered by the departments I in the form of supplying departments II with their own means of production, less means of production going into war industry. But this means that the presence of nonproductive consumption in Soviet society on the one hand diminishes accumulation and the rate of growth of gross and net output of society, but on the other hand it decreases—true, only by purely negative methods—the disproportion between the first and second departments of both sectors of which we spoke above, which reduces to a shortage of producers' goods. In particular, with respect to the exchange of a part of the consumption fund of department II of the private sector against a certain part of the wage fund of the workers of department II of the state sector, the relative decline of the growth of c_{II} of the state sector diminishes the exchange fund with that department, while the decline of accumulation in department II of the private sector decreases the demand for additional consumers' goods of department II of the state sector and the demand for producers' goods of department I of the state sector.

On the other hand, when nonproductive consumption declines, the gross and the net social products and accumulation increase, and, along with that, the goods famine of means of production increases. However, as we have already shown, the development of the economy as a whole on a broader basis will create, in the future, in the economy itself, a means of overcoming the disproportion, in particular on the basis of exports and imports.

In order to conclude the problem of nonproductive consumption we must dwell on one very important methodological problem whose practical significance will become clearer below.

How should we correctly determine the volume of nonproductive consumption in the USSR and the influence of this consumption on the entire process of production? Two methods can be used. The first is the method used by Marx in his analysis of capitalist reproduction in volume II of Capital, where he means by v that part of the capital which is actually spent by the working class. Hence Marx relates all taxes on wages to surplus value. The advantage of this methodological approach consists in the fact that the entire v then enters fully into exchange, uncomplicated by that part of v which, though it formally represents wages, in reality is a payment for a part of the nonproduc-

:ive consumption of the bourgeois society. In a detailed investigation of the economy of any actual country, this requires only a supplemental study of exchange within the fund of nonproductive consumption, which is necessary, in particular, for taking account both of the role of war industry in this consumption and of the nonproductive part of the expenses of the trade apparatus. This will also require supplementary investigation of money savings of the working class. With respect to the small-scale producers' sector, this method means the necessity of calculating only the real fund of consumption of independent producers engaged in production, while their entire real accumulation in the economy, plus the nonproductive consumption of the social system in question—as regards that part of it which falls upon this sector—should be included in surplus product. This does not prevent an analysis of the exchange of the real magnitudes of means of production of departments I which go in exchange for consumers' goods to replace the constant capital of departments II. The difficulty here is, speaking generally, that it is never possible to clarify precisely what is to be understood by the necessary consumption of the class of small-scale producers, since the consumption fund of the latter, as we have already shown, is not regulated by the law of value, even in actual capitalism, and in our economy it is regulated besides, to some extent, by the law of primitive socialist accumulation. In addition to that, it must be recalled here that the concept of productive labor changes as compared with the meaning of this term in Marx.[14]

The second method would consist in simultaneous derivation of two balances: the balance of production and the balance of consumption. This second method does not exclude the first approach but must, in our opinion, follow it, since to begin at once with a double balance would mean to begin not with a simple solution but with a more complex one, even if we neglect the fact that such a double balance would simply hide the inability to derive a single general balance.[15]

Furthermore, it must be emphasized at this point that it is

14. Among other concepts of Marxian political economy, as far as our economy is concerned, the concept of productive labor as labor creating surplus value must be replaced by another definition.

15. The derivation of a general balance, on a methodologically correct basis, is, among other things, one of the most important methods of verifying all the data of our industrial and general statistics.

very difficult in practice to separate in the outlays for trade the part which is the payment of productive labor from the part which is a payment to nonproductive consumption of the apparatus. The trade mark-ups for payment of transportation expenses are easy to calculate and to include in the production balance of transportation—as freight transportation is a branch of production. In the same way all outlays on fuel, excluding that which returns into production via the state budget, must be included in the fund of nonproductive consumption. On the other hand, it is much more difficult to separate productive labor used in moving commodities to the place where they are personally consumed and outlays on storage, etc., from a number of other outlays not connected with that physical labor, but with expenditures of society on the given system of distribution, including, in the first place, nonproductive consumption of the agents of private trade, of the useless agents of the state-cooperative network, as well as outlays for learning to market in a "Westernized" way.

Another very important methodological problem is the question of what indexes the entire calculation of social production and consumption should be based on. It is quite clear that we shall have to use a dual system of accounting: accounting in prewar prices, which represents a form of physical accounting; and accounting in actual wholesale and retail prices in chervonets rubles, which represents a form of value measure....

THE FIFTH CONDITION OF EQUILIBRIUM

The fifth condition of equilibrium of the economic system of the USSR as a whole is the systematic growth of wages. We are not concerned here with the natural increase of the aggregate fund of v of the state sector resulting from the growth of the number of persons engaged in work, but rather with the growth of this fund which accompanies the rise of the average wage rate of the individual worker. The social structure of our state economy is such that, given a systematic rise in the level of productive forces, the price of labor power is bound to diverge systematically from the value of labor power, and thus the conception of labor power as a commodity is itself bound to be gradually liquidated. A rise in wages is inevitable also because of the fact of industrialization of the country itself, because a change in the technological base of the entire state economy, the growth of rationalization of labor, etc., necessarily require a growth in

the degree of skill of the workers.... Socialist industry must also produce its own type of worker and its labor incentives. This type can be formed only with a sufficiently high general level of material standard of living for the working class, a considerably higher level than that which capitalism can provide for the workers on the same level of technology.[16]

In addition, we must not forget the already established fact that given the impossibility of importing on a large scale consumers' goods of industrial origin for the peasantry which produces consumers' goods, an increase of domestic exchange of consumers' goods between light state industry and department II of the small-scale production sector is limited for the latter by the extent of that part of v_{II} of the state sector which goes to purchase consumers' goods of peasant origin, and private origin in general. Even if we allow for a possible increase of this exchange from time to time as a result of additional imports of consumers' goods, the basic fund of exchange nevertheless consists of the part of v_{II} of the state sector that we have mentioned. This means that, at given prices, an increase of the wage fund of the workers of light industry (and this increase can come about both through an increase in the number of workers and through an increase of the average level of wages of the workers of light industry) must precede an increase of the peasant demand for consumers' goods produced in light state industry. The leading role of state industry comes forward in this field of the economic sphere also. Along with a general lowering of prices, the growth of wages appears as a factor which makes possible the diminution of the disproportion of exchange between agriculture and industry, and we have here a diminution of the dispro-

16. It must be clearly understood that the peasant protest against the growth of wages, against improvement of the entire existence of the workers, is profoundly reactionary not only from the social class viewpoint but also from the narrowly economic viewpoint. Socialism knows only one form of equalization of the material conditions of the city and the village, which consists, if we ignore the temporary improvement of the situation of small-scale producers, in the liquidation of the very foundations of private small-scale production. A highly developed collective economy in agriculture is capable of providing its workers a level of material welfare no lower than that of the socialist industry of the cities. Overcoming the contradiction between the city and the village, which forms one of the historical tasks of socialism, cannot consist in turning the city worker into something like the blacksmith in the village who plays a subsidiary role in small-scale production.

portion not in a negative form but in a socially and economically positive form.

THE SIXTH CONDITION OF EQUILIBRIUM

A sixth condition of dynamic equilibrium in the economy of the USSR is a systematic lowering of the output prices of the state sector. Equilibrium of this type is simultaneously an economic and a social equilibrium.

Let us dwell, to start with, on the economic aspect of this equilibrium. We have already shown that one of the so-called bottlenecks in the development of state light industry is partly even now, and will be more so in the future, the lag of peasant output of technical crops behind the raw material demand of state industry. However, an increase of output of technical crops requires, above all, an increase of accumulation in that branch of the economy. In order to increase accumulation, given the level of personal consumption in that department, there is required: (1) a diminution of nonproductive consumption which occurs in the department in question; (2) an increase of prices of industrial crops; (3) a decline of prices of consumers' goods; (4) a decline of prices of those means of production which department I of the peasant sector obtains from department I of the state sector; (5) a decline of personal consumption in department I of the peasant sector itself; (6) an intensification of labor given the means of production.

Some of these possibilities are purely theoretical. Diminution of personal consumption in the department in question is impossible, or almost impossible, since it is already at a very low level. A decline of prices of the consumers' goods produced by the peasantry is, on the whole, also impossible because these prices are—as compared to industrial prices—at a level considerably lower than before the war, which in turn was very low. The only thing that can be considered is a narrowing of the differential of the selling prices of cereals in regions that produce cereals, i.e., in essence, a decline of the nonproductive consumption of the distribution apparatus, lowering of transportation costs, and improvement of the means of transportation, primarily of highways and country roads. A systematic increase of the prices of industrial crops is also impossible, with the exception of occasional clearly incorrect calculations of the purchasing organs, because such an increase of prices would be a factor

tending to increase prices also of the output of light state industry. Hence there is left only an increase of the intensity[17] and productivity of labor and of fertility of the soil in peasant production of industrial crops, the diminution of nonproductive consumption throughout the entire political and economic system of the USSR, a cheapening of the means of production produced in department I of the state sector, and a cheapening of consumers' goods produced in the state light industry. In the last case it must be a question not of an artificial lowering of accumulation in these branches, but rather of the actual lowering of production costs due to re-equipment of the technological base and rationalization of production. In this respect the interests of state industry coincide with the interests of peasant production of raw materials; the lowering of industrial prices appears as a stimulus of expanded reproduction in department I of the peasant sector. But, on the basis of increasing accumulation in that department of the peasant sector, it will be easier to achieve decisive successes with respect to improving land cultivation, advancing animal husbandry, and increasing labor productivity in general, which will increase the aggregate annual output of industrial crops.[18]

As regards the peasant production of consumers' goods, the situation is somewhat different. The domestic market of the USSR does not absorb all of the consumers' goods of the peasant sector and their export is entirely necessary to maintain the general equilibrium of the entire system. However, the state's import fund obtained from these exports, because of the conditions of reproduction in state industry which were discussed above, cannot be devoted to any considerable extent to imports of consumers' goods for the peasantry and can be used only in part for imports of agricultural means of production. This con-

17. It must be emphasized at this point that peasant agriculture in the USSR could, even with the existing means of production, increase considerably the gross output through increased outlay of physical labor, in particular by putting into effect a number of simple agronomical improvements. The struggle against fear of work in the village and traditional laziness is one of the most important problems of industrialization of the country.

18. This is why the policy of the Soviet government in selling agricultural machinery at artificially low prices is absolutely correct. In the future this must become a part of a system whereby means of production must always sell at low prices (with identical costs of production) and consumers' goods at higher prices.

tradiction, given the unfavorable coefficients of exchange of peasant output for the output of state industry and given the purely physical shortage of the latter, acts to delay the entire process of expanded production of consumers' goods produced by the peasantry, and diminishes the economic effectiveness of accumulation and the purchasing power of that part of the consumption fund which is exchanged against the part of v of light state industry mentioned above. All of this acts as a brake on the development of marketable surpluses of consumers' goods produced by the peasantry, increases nonproductive consumption of the peasant masses themselves, and obstructs the growth of the export fund. However, even when the level of prewar output of agriculture is attained and when the volume of exchange of consumers' goods produced in agriculture approaches that of prewar Russia, the decline of nonproductive consumption of the bourgeoisie, the liquidation of the landholdings of the aristocracy, and the liquidation of foreign debts will create the premise of a very significant growth of surplus product in agriculture, capable of proceeding into the fund of expanded production. The way out of the partial impasse and disproportion consists here also in a more rapid re-equipment of industry and in lowered costs of production, in a systematic lowering of prices, and finally in increased productivity of labor in peasant agriculture itself. The peasant department of consumers' goods, for every 100 units of its output going into exchange against a part of v_I of the state sector which replaces the means of production of that department, will obtain more of those means of production, in their physical form. On the other hand, every 100 units of the consumption fund will permit acquisition of more consumers' goods in exchange for the part v_{II} of the state sector.

But systematic lowering of industrial prices is important from the viewpoint of maintaining not only the economic equilibrium but the social equilibrium of the entire Soviet system. The sharp divergence between domestic industrial prices and prices on the world market, i.e., a regime of far-reaching nonequivalent exchange, is an exceptional, and in the essence of the matter, temporary regime. It corresponds to the infant stage of the development of a state economy in a backward agricultural country. Its historical significance consists in the fact that it provides state industry with the necessary economic resources for replacement of its technological basis, that it gives to it the possibility of accumulating not on the basis of the old, obsolete technology, but on the basis of modern, perfected technology.

Only when this process has been completed will the state economy be in the position to develop—as we have repeatedly stated—those advantages over capitalist production which collective production provides. In that period, however, the peasant sector must also develop. The stage through which socialist reproduction is going is not important for peasant agriculture; what it requires is cheaper industrial goods in the necessary amounts and appropriate quality. This economic contradiction turns into a social contradiction, into a growth of peasant dissatisfaction with the monopoly of foreign trade, into efforts to liquidate the forced attachment of the peasant market to Soviet industry, efforts to break through to the value relationships of the world market, to get rid of the payment of the multibillion tax into the fund of primitive socialist accumulation. This social contradiction is a whip that impels the state economy to bring domestic industrial prices closer to world market prices. Rapid achievements in this way, accompanied by growth of state credit for organizing the production of middle and in particular of poor peasants and providing them with additional means of production, will weaken this social contradiction. Delays on this road will increase this contradiction, threatening to raise against the socialist sector, in the first place, the capitalistically most developed elements of peasant agriculture and the corresponding strata of the peasant population which are most hindered, in their development along the bourgeois path, by the process of expanded socialist reproduction.[19]

THE SEVENTH CONDITION OF EQUILIBRIUM

Finally, the seventh condition of equilibrium of the Soviet system is the gradual absorption by the developing state economy and intensified agriculture of the surplus population of the country, the absorption of both hidden and overt unemployment inherited by the Soviet system, in the main, from the agrarian relationships of the old regime. The situation in this respect is

19. We have come here to the most fundamental question of the relationship between socialist development of the city and capitalist development of the village. The Soviet system in the present difficult period can exist only on the basis of a proportionate rate of growth between the two. A more rapid rate of socialist development will permit the endurance of a larger dose of capitalist development without great danger for the system as a whole.

most difficult and most contradictory. Improvement of the technique of production in the state economy and rationalization of labor, as the natural premises of lower costs and selling prices, mean, in essence, a decline of outlays of labor power per unit of output. These outlays are considerably higher even in the best equipped Soviet enterprises than in advanced European industry, not to speak of America. The process of rationalization of labor will not lead to stagnation of the expansion of cadres of labor in state industry if it is accompanied by a sufficiently rapid absolute expansion of the industrial base of the economy. But such rapid expansion presupposes a considerably more rapid accumulation in industry than that which we have now. The fact that the Soviet economy is at present expanding in breadth not on the basis of advanced capitalist technology but only on the basis of technology which is catching up with this level must necessarily result in a relative slowing down of the rate of growth of the labor force and a relative slowing down of the rate of absorption of the army of unemployed....

On the other hand, intensification of agriculture, whose possibilities are directly proportional to the backwardness of our land cultivation as compared with peasant farming abroad, will mean, on the one hand, the absorption of new labor power by agriculture and, on the other hand, increased productivity of labor in agriculture, i.e., a relative decline of labor outlays per unit of output. But intensification of agriculture requires increase of accumulation in agriculture. At the same time, if this accumulation should proceed at the expense of the part of surplus product which the village provides to the city for socialist reconstruction, it would lead to a slowing down of the rate of expanded reproduction in state industry, i.e., precisely in that sector which is decisive in the sense of overcoming in the future all the basic contradictions of the period of transition.

It was sufficient that we should suggest in the broadest outlines the foundations of dynamic equilibrium of the economic system of the USSR, in order to see the aggregate of economic and social contradictions necessarily bared by our development toward socialism under the conditions of our isolation:

Accumulation based on nonequivalent exchange—and the necessity of liquidating this nonequivalence, and the lack of correspondence in time of these processes.

Accumulation at the expense of the surplus product of the workers—and the necessity of a systematic growth of wages.

The necessity (in order to diminish the "birth pains of industrialization") for the utmost increase in association with the world division of labor—and the growing hostility toward the USSR of the entire capitalist world.

Accumulation at the expense of the peasants producing industrial raw materials, and of the peasants in general—and the necessity of utmost stimulation of expanded reproduction of these raw materials.

Accumulation at the expense of peasant exports of consumers' goods—and the necessity of stimulating these exports under conditions of extremely slowly declining industrial prices.

The economic necessity of increasing marketable surpluses in peasant agriculture—and the social necessity of physical maintenance of those who provide the smallest marketable surplus, namely, the poor and middle-sized groups in the village.

The necessity of lowering prices on the basis of rationalization of production—and the struggle with growing unemployment.

All these contradictions show how closely our development toward socialism is connected with the necessity of making a breach in our socialist solitude; not only for political but also for economic reasons, we must be aided in the future by the material resources of other socialist countries....

G. A. Fel'dman

ON THE THEORY OF GROWTH RATES

OF NATIONAL INCOME - I

1. NATIONAL INCOME AND ITS GROWTH

...The primary objective of this work is to determine the potential volume of consumption of the masses, and its rate of growth as a function of the structure of the economy.

It is quite clear that the volume of consumption and its rate of growth are not simple functions of arbitrarily taken structural indices. It would be futile to attempt to establish a direct dependence of the rates of growth in question on relationships between urban and rural industry, between extractive and manufacturing industry, or, to take a clearly absurd example, between the country's river and sea transportation.

The idea suggested itself of following Marx's example by introducing data on capital invested in the production of consumers' goods and of producers' goods as basic indicators of the magnitude and structure of the economy. However, more detailed analysis indicates that this "principle of division" is inadequate to accomplish by mathematical methods the particular concrete objective stated above.

To the extent that the rate of growth of production depends on the rate of growth of the equipment of the labor force, and productive equipment is made in sector A (producers' goods sector), it may be stated outright that the increase of the rate of

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"K teorii tempov narodnogo dokhoda," Planovoe khoziaistvo, 1928, No. 11, pp. 146-171.

[Note of the editor of Planovoe khoziaistvo:] The present work is a report presented by the author (a worker of the World Economics Section of the Gosplan of the USSR) before the Commission for the General Plan of the Gosplan of the USSR, concerning the question of the interrelationship of the rate of growth of reproduction of individual sectors of the economy among themselves and of the structure of the reproduction process as a whole.

Certain typographical errors in equations in the Russian text of this article have been corrected.—Ed.

growth of production depends on the increase of the capital of sector A as compared with the increase of the capital of sector B (consumers' goods sector).[1]

With expanding reproduction, sector A must supply sector B not only with producers' goods required to continue production at the current level of output, but also with additional fixed and

1. Fel'dman uses in this article, in preference to the usual Marxian symbols, the following notations:

u = producers' goods sector
p = consumers' goods sector
K, K_u, K_p = capital (fixed and circulating capital), total and by sectors
ND, ND_u, ND_p = total and sectoral net income and product
nd_{pv} = real wages
ND_{pv} = consumers' goods for productive labor
ND_{pm} = consumers' goods for the rest of the population
$S(= ND/K)$ and S_u, S_p = effectiveness of capital utilization, by sectors
S_{st} = effectiveness of utilization of old capital
S_{nov} = effectiveness of utilization of new capital
α = accumulation
A_m, A_{mu}, A_{mp} = amortization due to obsolescence, total and sectoral
a = percentage of K replacing obsolescent capital ($A_m = a \cdot K$)
v_p = consumers' goods for workers employed in p
m_p = surplus product in p
m_{pg} = consumers' goods absorbed by government
m_{po} = consumers' goods absorbed by inactive "bourgeoisie"
m_{pp} = consumers' goods absorbed by "bourgeoisie" active in p
m_{pmu} = consumers' goods absorbed by "bourgeoisie" active in u
m_{pvu} = consumers' goods for workers in u
$m_{pmu} + m_{pvu} = m_{pu}$
T, T_u, T_p = rate of growth of ND, ND_u, ND_p
G_k, G_{ku}, G_{kp} = rate of growth of K, K_u, K_p
G_s, G_{su}, G_{sp} = rate of growth of S, S_u, S_p
G_α = rate of growth of α
$I_k(= K_u/K_p)$ = index of the structure of industry ("index of industrialization")
$I_{nd}(= ND_u/ND_p)$ = index of the structure of production
n = number of workers
G_n, G_{nu}, G_{np} = rates of growth of n, nu, np
e = output per man
G_e, G_{eu}, G_{ep} = rates of growth of e, eu, ep
V = arbitrary coefficient
K_n = capital per man
K_{nt} = productive equipment per man
K_{no} = raw materials and intermediate products per man
—Ed.

circulating capital necessary for expansion of reproduction, given constant efficiency of capital utilization.[2]

This gives rise to the idea of dividing the capital of sector A into two sections, of which one (A_2) supplies sector B with the means of production required to sustain output at a given level, and the other (A_1) supplies all industries in both sectors with additional capital to enable reproduction to expand. Given constant efficiency of capital utilization, A_2 must be proportional to B, while the magnitude of A_1 is determined entirely by the rate of growth of production as a whole, and of its separate parts.

Since capital consists of constant and variable parts, consistent application of the foregoing principle of classification requires the transfer to sector A of that portion (B_1) of sector B which provides the increments of variable capital, leaving in sector B only the portion (B_2) required to maintain consumption at any given level. Hence the specific expression on which the rate of growth of total consumption depends will be the ratio

$$\frac{A_1 \text{ and } B_1}{A_2 \text{ and } B_2} .$$

The numerator includes everything that provides the basis of expanded reproduction, while the denominator includes everything that serves current direct consumption.[3]

From the viewpoint of the proposed division, there is no basis for including the capital invested in a weaving factory in sector B, and capital invested in cotton plantations which produce cotton for the manufacture of yarn, or capital invested in spinning factories, in sector A, since in either case both spinning and weaving will take place in the same factory, and weaving di-

2. By efficiency of capital utilization we mean the ratio of the value of net output per unit of time to the value of the fixed and circulating capital in a given enterprise or sector. Both value of net output and capital must be expressed in terms of the cost of reproduction as of the same time.

3. This division is realizable only by the accounting method and does not correspond to the actual breakdown of production according to enterprises. Analytical evidence of the practicability of the proposed division is not introduced in this article, but in another one specifically devoted to this subject. [Fel'dman, "Analiticheskii metod postroeniia perspektivnykh planov," Planovoe khoziaistvo, 1929, No. 12.

vides itself into a number of consecutive productive processes which yield semifinished products that are themselves means of production for subsequent stages of production.

A specific structural division with quantitatively interrelated components must therefore be formulated before the dependence of the rate of growth of national income on these structural relationships can be determined. The basic step is a precise economic division of production, in accordance with the principal objective of this work. An absolute and precise criterion is necessary in order to determine the exact extent of the capital required to produce consumer goods at a level sufficient to satisfy current consumer needs.

From the viewpoint of the capacity of the productive apparatus to expand reproduction, there is, therefore, no reason to separate from sector B any portion of production concerned in one way or another with producing final products, and particularly consumer goods, up to the level sufficient to satisfy current needs. It must, therefore, be concluded that in the formulation of the problem it is appropriate to place in sector B all the industries concerned in any way with creating the values of consumer goods up to the level sufficient to satisfy current needs.

In this sector [B], in which Marx's schema places the entire value of consumers' goods, must be included also all of the capital used in producing the consumers' goods. It is understood that this includes neither the increase of fixed and circulating capitals in sector B nor their replacement when they become technically obsolete.

This capital can be obtained only from sector A. The value of the output of sector B can include only the value of raw materials and that portion of the equipment and producers' goods actually used up in the production of consumers' goods. In sector B must not be included the value of producers' and consumers' goods accumulated for expanded production, which will only later, as they wear out and are used up, enter into the value of consumers' goods produced with the expanded capital. Thus the wear and tear of productive equipment in sector B must, by definition, be made good within that sector.

Thus defined, sector B possesses the remarkable property of being capable of existence without sector A, but only for purposes of simple reproduction. Thus, starting from an analysis of what is required for a more precise division of output—from the viewpoint of determining the value of consumer goods re-

quired to satisfy the existing level of needs—we have arrived at a confirmation of the above idea: that production must be divided into sector B, capable of maintaining consumption at a given level even with a cessation of the inflow of producers' and consumers' goods from sector A to be added to the capital of sector B, and sector A, which provides both sector B and itself with all the capital required for expansion of reproduction.

Thus, starting from Marx's division, we have arrived at a new division which corresponds, however, to another division, the Marxian simple and expanded reproduction, the "production of income" and the "production of capital." To avoid confusion, the letter p will henceforth be used for what has been developed from Marx's sector B, and the letter u for the remaining part of production, developed from Marx's sector A.

All parts of sector p consist merely of the stages of a single productive process resulting in the consumers' goods required to satisfy the existing level of needs. The value of net output in the course of a year consists only of labor outlays:[4]

$$v + m .$$

Consequently the end product of sector p is expressed by

$$v_p + m_p ,$$

and the value of net output of sector u is defined by

$$v_u + m_u .$$

These expressions exclude the possibility of overlapping accounts [between p and u].

The only criterion for classifying production into the proposed sectors is whether it serves to increase capital (or replace technically obsolete capital) or only to maintain consumption at a given level.

For greater clarity, the process of expanded reproduction in a closed economy has been schematically represented in Figure 1, on the basis of the division which has been developed from Marx's sectors.[5]

The left part of the figure (area u) represents production

4. Marx, Capital, Vol. II, Book 2 (Gosizdat, 1922), p. 413.

5. The ensuing analysis assumes constant prices.

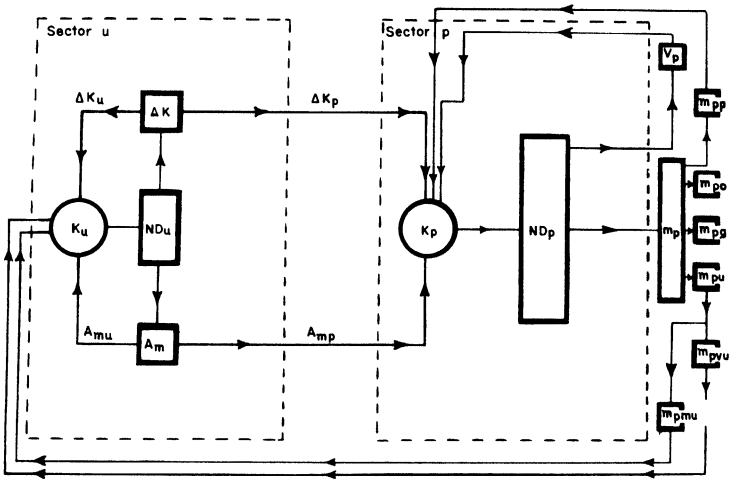


fig 1

serving to increase capital and to replace productive capital becoming technically obsolescent. The total net output (without double counting) of sector u consists of the total value of the end products of sector u—specifically those producers' and consumers' goods which replace the technically obsolescent capital of both sectors (u and p), or which increase the capital.

The right part of the figure (area p) represents production serving to produce consumers' goods and the producers' goods required for maintaining the production of consumers' goods at any given level. The total net output (without double counting) of sector p consists of the total value of the end products of sector p—consumers' goods used to satisfy the existing level of needs.

K_u and K_p represent the total fixed and circulating capital of sectors u and p respectively. ND_u and ND_p represent the net outputs of the means of production and consumers' goods in sectors u and p. $K = K_u + K_p$, therefore, represents total capital, and $ND = ND_u + ND_p$ represents total net output under conditions of expanded reproduction.

Let the effectiveness of capital utilization be defined by

$$\frac{ND}{K} = S \qquad \frac{ND_u}{K_u} = S_u \qquad \frac{ND_p}{K_p} = S_p \ .$$

Let A_m represent the value of equipment and means of pro-

duction used to replace the obsolescent portions of both K_p and K_u. A_m consists of two parts, A_{mp} and A_{mu}, used to replace the obsolescent portion of K_p and K_u, respectively. Thus

$$A_m = A_{mu} + A_{mp}.$$

Δ will be used to denote annual increments. Thus ΔK_u represents the increment of K_u, ΔK_p represents the increment of K_p, and

$$ND_u = \Delta K + A_m = \Delta K_u + \Delta K_p + A_{mu} + A_{mp}.$$

The consumers' goods produced in sector p are divided into a part v_p used up by the working class employed in sector p, and surplus value (surplus production), m_p. In turn, m_p is divided among consumers so that the following basic categories result:

1) m_{pg}—consumers' goods absorbed by the government apparatus;
2) m_{po}—consumers' goods for the bourgeoisie (large, middle, and small) not engaged in any phase of production;
3) m_{pp}—consumers' goods for the bourgeoisie active in sector p;
4) m_{pmu}—consumers' goods for the bourgeoisie active in sector u;
5) m_{pvu}—consumers' goods for the additional workers of sector u.

Therefore,

$$m_p = m_{pg} + m_{po} + m_{pp} + m_{pmu} + m_{pvu}.$$

However, the exchange of goods between sectors u and p need not be equivalent, i.e., it is not necessary that

$$\Delta K_p + A_{mp} = m_{pmu} + m_{pvu} = m_{pu}.$$

The interrelationship of the elements of production and consumption will be considered for three cases: (1) where total consumption is constant; (2) where total consumption increases at a constant geometric rate; and (3) where total consumption increases at a rising rate.

Let the rate of growth be defined as the ratio of the increment per unit of time to the quantity which is increasing. In mathematical language, this is the derivative of the reciprocal of the

function with respect to time, or the derivative of the logarithm of the function with respect to time.

The rate of growth of [net] output (ND) in sectors p and u will be denoted by T_p and T_u, and that of total [net] output by T. The rates of growth of K, K_p, K_u, S, S_p, S_u will be denoted by G_k, G_{kp}, G_{ku}, G_s, G_{sp}, G_{su}.

$$T = \frac{\Delta ND}{ND} = \frac{dND}{dt} \cdot \frac{1}{ND} = \frac{d\ln ND}{dt}$$

$$T_p = \frac{\Delta ND_p}{ND_p} = \frac{dND_p}{dt} \cdot \frac{1}{ND_p} = \frac{d\ln ND_p}{dt}$$

$$T_u = \frac{\Delta ND_u}{ND_u} = \frac{dND_u}{dt} \cdot \frac{1}{ND_u} = \frac{d\ln ND_u}{dt}$$

$$G_k = \frac{\Delta K}{K} = \frac{dK}{dt} \cdot \frac{1}{K} = \frac{d\ln K}{dt}$$

$$G_{kp} = \frac{\Delta K_p}{K_p} = \frac{dK_p}{dt} \cdot \frac{1}{K_p} = \frac{d\ln K_p}{dt}$$

$$G_{ku} = \frac{\Delta K_u}{K_u} = \frac{dK_u}{dt} \cdot \frac{1}{K_u} = \frac{d\ln K_u}{dt}$$

$$G_s = \frac{\Delta S}{S} = \frac{dS}{dt} \cdot \frac{1}{S} = \frac{d\ln S}{dt}$$

$$G_{sp} = \frac{\Delta S_p}{S_p} = \frac{dS_p}{dt} \cdot \frac{1}{S_p} = \frac{d\ln S_p}{dt}$$

$$G_{su} = \frac{\Delta S_u}{S_u} = \frac{dS_u}{dt} \cdot \frac{1}{S_u} = \frac{d\ln S_u}{dt}$$

Finally, the ratio K_u/K_p is denoted by the symbol I_k. This ratio characterizes the potential of the entire productive apparatus for the expansion of reproduction and is the basic index of the structure of the productive apparatus of a country with given S_p and S_u.

As the basic index of the structure of production we consider the ratio

$$I_{nd} = \frac{ND_u}{ND_p} .$$

From the previous definitions of effectiveness of capital utilization and of rate of growth, the following formulas are deduced:

$$T = \frac{dND}{dt} \cdot \frac{1}{ND} = \frac{d(S \cdot K)}{dt} \cdot \frac{1}{ND} = \left(K \cdot \frac{dS}{dt} + S\frac{dK}{dt}\right) \cdot \frac{1}{ND}$$

$$= \frac{dS}{dt} \cdot \frac{1}{S} + \frac{dK}{dt} \cdot \frac{1}{K} = G_s + G_k = G_s + \frac{\Delta K}{K} = G_s + \frac{S \cdot \Delta K}{ND}.$$

Similarly,

$$T_p = G_{sp} + G_{kp} = G_{sp} + \frac{S_p \cdot \Delta K_p}{ND_p}$$

$$T_u = G_{su} + G_{ku} = G_{su} + \frac{S_u \cdot \Delta K_u}{ND_u}.$$

This indicates that the rate of growth of total national income and of its parts equals the sum of the rates of growth of the corresponding capital and of the effectiveness of its utilization. These formulas indicate the dependence of T [and of T_p and T_u] upon the increase of the corresponding capital and of the effectiveness of the use of this capital, but they do not give the interdependence of the rates of growth of the two sectors. This will be discussed in succeeding sections.

On the other hand, ND = n · e, where n stands for number of workers employed in production and e for the output per man. By analogy it is easy to deduce that

$$T = G_n + G_e$$

$$T_p = G_{np} + G_{ep}$$

$$T_u = G_{nu} + G_{eu}.$$

Therefore the rate of growth of capital and of its effectiveness, of the labor force employed in production and of its productivity, determine the rate of growth of production.

These relationships will be discussed in more detail in what follows. It will now be shown only that, if there is a labor surplus, the rate of growth of production is determined by the rate of growth of capital and of the effectiveness of its utilization.

With a limited labor force, the rate of growth of production is determined by labor productivity, because in this case the

growth of the effectiveness of capital utilization is inseparably connected with the growth of labor productivity, since the effectiveness of capital utilization can be expressed in the following way:

$$S = \frac{ND}{K} = \frac{\text{technical coefficient} \cdot \text{subjective factors} \cdot \text{man-hours}}{K}$$

and

$$e = \frac{ND}{n} = \frac{\text{technical coefficient} \cdot \text{subjective factors} \cdot \text{man-hours}}{n}.$$

The numerators of both expressions are equal, and this defines the relationship between e and S.

2. CONSTANT TOTAL CONSUMPTION (ND_p CONSTANT)

We begin with the analysis of amortization due to obsolescence under conditions of constant total consumption in order to clarify the influence of obsolescence on productive processes, independently of any general expansion of reproduction.

With constant consumption and constant percentage replacement of equipment, it can be assumed that $\Delta K = 0$ and $ND_u = A_m$, since the production of sector u serves either to replace obsolescent equipment or to increase the productive apparatus, and the need for the latter is obviated by constant total consumption and a stable rate of replacement of equipment.

Then

$$\frac{ND_u}{K_u} = \frac{\Delta K + A_m}{K_u} = \frac{A_m}{K_u} = S_u, \quad \text{or}$$

$$ND_u = A_m = S_u \cdot K_u = A_{mu} + A_{mp} = a(K_p + K_u) \quad \text{and}$$

$$I_k = \frac{K_u}{K_p} = \frac{a}{S_u - a},$$

where a is the percentage of capital replaced annually because of obsolescence. Thus $f(I_k, a)$ is a hyperbola, and $S_u = a$ when $I_k = \infty$ [i.e., $S_u = a/I_k + a$ is a hyperbola, with asymptote a]. Hence a, the rate of amortization due to obsolescence, cannot exceed S_u.

Now the total value of consumption can be defined by

$$ND_p = S_p \cdot K_p.$$

If S_p, the effectiveness of utilization of capital K_p, is fixed, then K_p must be constant if ND_p is constant. Under these conditions the percentage rate of capital replacement a is a function of the ratio I_k, which is a basic index of the structure of the productive apparatus of a country with given S_p and S_u.

For clarity, Figure 2 presents graphically the dependence of I_k on a for various values of S_u.

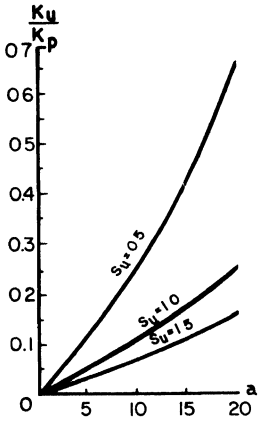


fig. 2

This graph also reveals that capital invested in sector u must grow, even with constant total consumption, if the rate of replacement of the productive apparatus increases, and that it must grow most rapidly when the effectiveness of capital utilization (S_u) is low.

Thus an increase in the rate of replacement of capital necessitates a significant and rapid increase either of utilization of equipment or of the productive apparatus of u, even when total consumption remains constant.

The last conclusion can also be based on the following considerations.

The dependence of the structure on the rate of amortization due to obsolescence is given by the formula:

$$I_{nd} = \frac{ND_u}{ND_p} = \frac{S_u \cdot K_u}{S_p \cdot K_p} = \frac{S_u \cdot a}{S_p(S_u - a)} .$$

But the quantity of newly expended labor is proportional (with constant labor productivity) according to:

$$ND = ND_p + ND_u.$$

Hence with constant S_u, S_p, and ND_p, the increase of ND_u, and consequently also of ND, will inevitably be determined by the increase of a. The amount of expended labor must also increase while equipment is being replaced, even with constant total consumption, and only then can an increase in labor productivity be obtained (except by organizational measures, of which that formula takes no direct account).

According to data on American industry, the effectiveness of

capital utilization (S) in leading capitalist countries has not tended to increase during the last decade. Since we are going to go through an analogous stage of development, this could also be true in the future in our country, if we followed blindly in the footsteps of capitalist economies. Particular attention should be devoted to increasing the effectiveness of old as well as of new capital. A change in our attitude toward the problem of the effectiveness of capital investments may result in a significant change in the behavior of the value of the coefficient S, since we have lagged very far behind outstanding industrial nations in the rational utilization of our productive apparatus....

Table 1 and Figure 3 have been compiled to give a clear notion of the degree of dependence on changes in the percentage rate of amortization due to obsolescence, a, and the coefficient of effectiveness of capital utilization (S) of the following ratios:

(1) The ratio of all labor expended in production ($S \cdot K$) to labor necessary to maintain consumption at a constant level (ND_p = constant),

Table 1

Constant Consumption of the Population (ND_p = constant)

	$S_u = 0.5$			$S_u = 1$			$S_u = 1.5$		
	$\frac{K_u}{K_p}$	$\frac{S_u K_u}{S_p \cdot K_p}$	$\frac{S \cdot K}{ND_p}$	$\frac{K_u}{K_p}$	$\frac{S_u \cdot K_u}{S_p \cdot K_p}$	$\frac{S \cdot K}{ND_p}$	$\frac{K_u}{K_p}$	$\frac{S_u \cdot K_u}{S_p \cdot K_p}$	$\frac{S K}{ND_p}$
a	$S_p = 0.5$								
0.05	0.11	0.11	1.11	0.054	0.11	1.11	0.03	0.10	1.11
0.10	0.25	0.25	1.25	0.11	0.22	1.22	0.07	0.22	1.22
0.15	0.43	0.43	1.43	0.18	0.35	1.35	0.11	0.33	1.33
0.20	0.67	0.67	1.67	0.25	0.50	1.50	0.15	0.46	1.46
a	$S_p = 1$								
0.05	0.11	0.06	1.06	0.05	0.05	1.05	0.03	0.05	1.05
0.10	0.25	0.13	1.13	0.11	0.11	1.11	0.07	0.11	1.11
0.15	0.43	0.21	1.21	0.18	0.18	1.21	0.11	0.17	1.17
0.20	0.67	0.33	1.33	0.25	0.25	1.25	0.15	0.23	1.23
a	$S_p = 1.5$								
0.05	0.11	0.04	1.04	0.054	0.03	1.03	0.03	0.03	1.03
0.10	0.25	0.08	1.08	0.11	0.07	1.07	0.07	0.07	1.07
0.15	0.43	0.14	1.14	0.18	0.12	1.12	0.11	0.11	1.11
0.20	0.67	0.22	1.22	0.25	0.17	1.17	0.15	0.15	1.15

$\frac{S \cdot K}{ND_p}$.

(2) The ratio of the value of replaced capital ($S_u \cdot K_u$) to the value of the production of consumers' goods ($S_p \cdot K_p$) with constant ND_p.

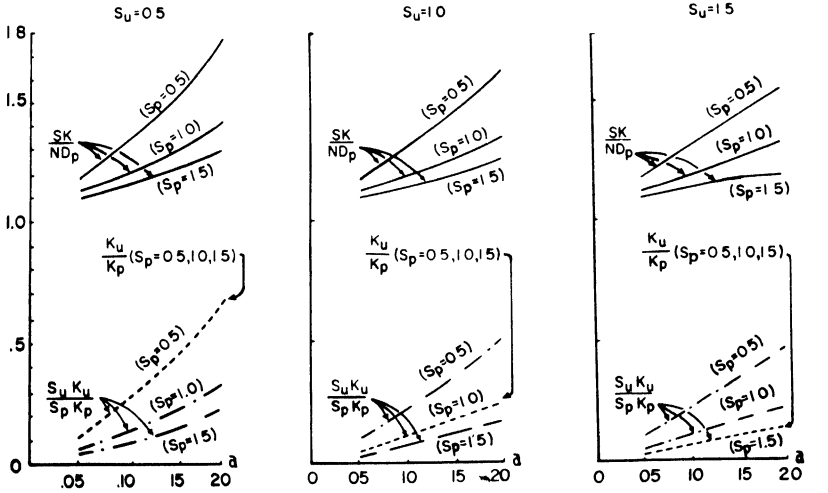


fig 3

(3) The ratio of the value of capital (K_u) serving capital replacement to the value of capital (K_p) serving the production of consumers' goods, with the income of the population constant (ND_p = constant).

Conclusions from these data are formulated as follows:

(1) the functions $\frac{S \cdot K}{ND_p}$, $\frac{S_u \cdot K_u}{S_p \cdot K_p}$, and $\frac{K_u}{K_p}$ increase as a does;

(2) the growth of S_u and S_p is reflected by the rates of growth of $\frac{S \cdot K}{ND_p}$, $\frac{S_u \cdot K_u}{S_p \cdot K_p}$, and $\frac{K_u}{K_p}$ as follows:

$\frac{\text{growth of } S_u}{\text{growth of } S_p}$ yields for $\frac{S \cdot K}{ND_p}$ $\frac{\text{small decrease}}{\text{large decrease}}$

for $\frac{S_u \cdot K_u}{S_p \cdot K_p}$ $\frac{\text{small decrease}}{\text{large decrease}}$ for $\frac{K_u}{K_p}$ $\frac{\text{large decrease}}{\text{no change}}$

Maximum results are obtained when S_u and S_p increase simultaneously. Thus even with constant total consumption, a once-and-for-all replacement of industrial equipment must result in an increase in the utilization of the productive apparatus and of the labor force. Following the replacement there must come again a decrease of capacity utilization and a decrease of employment of labor. This means that sharp fluctuations in economic activity are inevitable in a capitalist economy.

Even in our system, the replacement of fixed capital cannot be continuous in every individual enterprise, but with planned regulation capital can be renewed alternately in various individual sectors of the economy, and this will result in greater stability both of a and of the utilization of the labor force.

Let us consider the question that has been analyzed from a somewhat different viewpoint. An increase in the amortization of capital due to obsolescence requires an additional outlay of labor which can be justified only by a corresponding economy in labor outlays following the re-equipment.

Moreover, amortization due to obsolescence requires an increase in the outlay of labor which is not feasible—with constant total consumption—without a temporary decline of wages, and this is as difficult to bring about as it is to lengthen, even temporarily, the working hours of employed workers and then to shorten them once re-equipment is completed.

In general, constant amortization due to obsolescence can be justified only by a correspondingly constant growth of labor productivity and capital effectiveness.

3. GROWING CONSUMPTION OF THE POPULATION (Closed Economy)

Assume that the percentage increment of total consumption is constant and that there is no amortization due to obsolescence. These conditions may be expressed as follows:

$$T_p = \frac{\Delta ND_p}{ND_p} = \text{constant, and } a = 0.$$

The interrelationships and dependence on each other of the following quantities must be discovered:

(1) T_p, ND_p, ND_u, K_p, K_u, S_p, S_u.

(2) ΔND_p, ΔND_u, ΔK_p, ΔK_u, ΔS_p, ΔS_u.

These quantities are related by the following equations:

$$(1)\quad T_p = \frac{\Delta ND_p}{ND_p}$$

$$(2)\quad ND_p = S_p \cdot K_p$$

$$(3)\quad ND_u = S_u \cdot K_u$$

$$(4)\quad ND_u = \Delta K_p + \Delta K_u$$

$$(5)\quad \Delta ND_p = S_p \cdot \Delta K_p + \Delta S_p \cdot K_p + \Delta S_p \cdot \Delta K_p$$

$$(6)\quad \Delta ND_u = S_u \cdot \Delta K_u + \Delta S_u \cdot K_u + \Delta S_u \cdot \Delta K_u \ .$$

Given these six equations in 13 variables, a broad range of possibilities would appear to exist for the economist to "plan" the economy for a maximum final goal. However, in reality the number of possibilities to choose from for the development of the economy is limited.

First of all, for any year, K_u and K_p must be assumed given. A rolling mill cannot, so to speak, be constructed with the aid of a weaving loom, nor can a rolling mill be adapted for the production of cloth.

The labor force required will not be discussed here, since it is assumed that labor is available in any quantity and composition.

It must also be noted that an arbitrary increase in efficiency of the utilization of K_u and K_p is limited at any given moment by the availability of raw materials. In actuality the planner must take into account many initial premises and realities. This does not lessen the need to discover all the laws which determine the character and degree of the interdependence of economic elements. Furthermore, the longer the period for which the economy is planned, the less the restriction due to the initial situation.

The dependence of T_p on the allocation of accumulation between K_p and K_u, i.e., on their relative magnitudes, will be determined first.

$$(7)\quad T_p = \frac{\Delta ND_p}{ND_p} = \frac{\Delta K_p \cdot (S_p + \Delta S_p) + K_p \cdot \Delta S_p}{ND_p} =$$

$$\frac{\Delta K_p \cdot (S_p + \Delta S_p)}{S_p \cdot K_p} + \frac{\Delta S_p}{S_p} = \frac{\Delta K_p}{K_p} + \frac{\Delta S_p}{S_p} + \frac{\Delta K_p \cdot \Delta S_p}{K_p \cdot S_p} =$$

$$G_{kp} + G_{sp} + G_{kp} \cdot G_{sp} \ .$$

It will be noted that T_p depends on three components: first, on the relative increment of the efficiency of the utilization of capital K_p, i.e., on $\Delta S_p/S_p$; second, on the relative increment of this capital itself; and third, on their product, $(\Delta K_p \cdot \Delta S_p)/(K_p \cdot S_p)$. The following law can be formulated: in calculating the rate of growth of production by means of terminal [as distinct from, say, average] magnitudes (e.g., of annual change), the rate of growth of consumption equals the sum of the rates of growth of capital and of its effectiveness, plus the product of these rates.

The problem will be developed up to the determination of the possible increments of K_p. With given K_u and K_p, recalling that $\Delta K_p = ND_u - \Delta K_u$ at any given time, ΔK_p, the increment of the capital utilized for the production of consumers' goods, will be maximized when ΔK_u is at a minimum and ND_u at a maximum, i.e., when the entire apparatus, K_u, producing means of production for further accumulation of means of production will produce only ΔK_p when fully utilized.

However, it is not difficult to notice, even without mathematical calculation, that if $\Delta K_u = 0$, then ND_u, and hence also ΔK_p, will remain constant with growing consumption ND_p. Consequently, a decline of T_p from year to year will be inevitable. It is quite evident that T_p can be maintained at a given level only if the relationships given for the variables in the six equations are satisfied.

In the ensuing analysis of the equations in this section, S_u and S_p will be fixed, so that the effects of changing them can be traced numerically.

The initial equations now take the following form:

$$(1)\ T_p = \frac{\Delta ND_p}{ND_p} \qquad (4)\ ND_u = \Delta K_p + \Delta K_u$$

$$(2)\ ND_p = S_p \cdot K_p \qquad (5)\ \Delta ND_p = S_p \cdot \Delta K_p$$

$$(3)\ ND_u = S_u \cdot K_u \qquad (6)\ \Delta ND_u = S_u \cdot \Delta K_u\ .$$

From equations (1), (2), and (5) we obtain:

$$(7)\ T_p = \frac{\Delta ND_p}{ND_p} = \frac{\Delta K_p}{K_p} = G_{kp}\ .$$

Thus with constant effectiveness S_p of the utilization of capital K_p, the increment of K_p must be proportional to the increment of consumption. From equations (7), (4), and (3) we obtain:

$$ND_u = \Delta K_p + \Delta K_u = T_p \cdot K_p + G_{ku} \cdot K_u \text{ where } G_{ku} = \Delta K_u/K_u.$$

Thus

$$S_u K_u = T_p \cdot K_p + G_{ku} \cdot K_u,$$

and

$$(8)\quad G_{ku} = S_u - T_p\left(\frac{K_p}{K_u}\right) \quad \text{and} \quad T_p = \frac{K_u}{K_p}(S_u - G_{ku}).$$

So, with a constant ratio K_p/K_u, there must be a constant percentage increment, G_{ku}, of K_u. The magnitude of G_{ku} is determined by the interrelationships of the variables S_u, T_p, K_p, and K_u.

For a clear picture of the dependence of G_{ku} on the change of the ratio K_p/K_u let the following figures be substituted for the unknowns:

$$S_u = 0.94 \quad \text{and} \quad T_p = 0.20.$$

Then

$$G_{ku} = 0.94 - 0.20\,\frac{K_p}{K_u}$$

and when

$$\frac{K_p}{K_u} = 5, \quad G_{ku} = -0.06.$$

This indicates that, for this value of K_p/K_u, incomes can be increased only by using up capital K_u. If $K_p/K_u = 4.7$, then $G_{ku} = 0$. Thus incomes can be increased by 20 per cent without impairing K_u if $K_p/K_u = 4.7$.

However, this condition is valid only at a given time, since to increase ND_p by 20 per cent (with S_p constant) it is necessary also to increase K_p by 20 per cent. Thus if $G_{ku} = 0$, then in the following year the ratio K_p/K_u would become 5.65 and then the rate of growth T_p could be maintained only by using up K_u.

From the same formula,

if $\frac{K_p}{K_u} = 2$, $G_{ku} = .54$;

if $\frac{K_p}{K_u} = 1$, $G_{ku} = .74$;

if $\frac{K_p}{K_u} = .5$, $G_{ku} = .84$;

if $\frac{K_p}{K_u} = .2$, $G_{ku} = .90$.

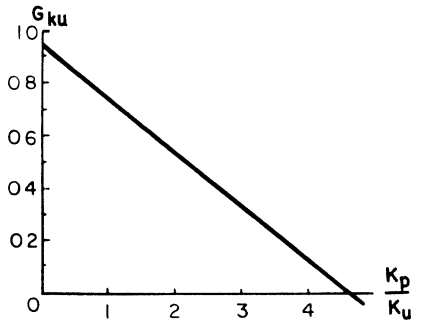


fig 4

The graph of the function is a straight line (Figure 4).

What is the significance of the unusual fact that the growth of G_{ku} decreases K_p as a component of total productive wealth? To understand this, it must be recalled that definite interrelationships have been established among all the elements of the economy. By definition, K_u serves to increase both K_p and $K_u \cdot G_{ku}$ must satisfy these requirements. Thus, whatever remains of the production $S_u \cdot K_u$, after deducting the portion needed to maintain the constant growth of K_p and to cover the depreciation of K_u, must be used to increase K_u, without increasing K_p and consumption.

Such production for its own sake is conceivable in a socialist economy only if it is temporary, and if its goal is to raise the structure of the productive apparatus by increasing the ratio K_u/K_p in order subsequently to give rise to higher rates of growth of consumption. It must also be noted, however, that the increase of capital in sector u must lead to increased consumption in u, unless there is a corresponding increase in labor productivity or a decrease in wages, or unless there is no accumulation of reserve capital in u for future use. Thus, even with constant consumption in p, an increase in production in u may be caused either by an increase in production in p, or by an increase in accumulation in p. Mathematically these relationships are expressed as follows:

If α_p and α_u denote the fraction of net output whose purpose is the accumulation of capital, then, by virtue of the hypothesis that consumption in category u depends wholly on production in p,

$$\alpha_p \cdot S_p \cdot K_p = (1 - \alpha_u). \cdot S_u \cdot K_u$$

and

$$G_{\alpha p} + G_{sp} + G_{kp} = G_{(1 - \alpha_u)} + G_{su} + G_{ku}.$$

Therefore, even with $G_{(1-\alpha_u)} = 0$ and $G_{su} = 0$, G_{ku} can be larger than G_{kp} only if $G_{\alpha p} > 0$ or $G_{sp} > 0$.

$G_{\alpha p} > 0$ is possible with increasing accumulation; $G_{sp} > 0$ may result from an increase in labor skills, from an increase in the number of man hours (several shifts), or from technological improvements.

In the opposite case [$G_{ku} < G_{kp}$], capital accumulated in category u cannot be utilized. In a capitalist economy such a development leads to a crisis.

But what must be the value of the ratio K_p/K_u so that, with T_p constant, it shall be a minimum and shall satisfy exactly the needs of a fixed, constant rate of growth of total consumption? The answer is quite simple.

These requirements can be satisfied if $G_{ku} = 0$ [providing $\Delta S_u = 0$], or if $K_u \cdot \Delta K_p - \Delta K_u \cdot K_p = 0$ and, finally,

$$(9)\quad \frac{K_p}{K_u} = \frac{\Delta K_p}{\Delta K_u}$$

$$G_{ku} \text{ or } G_{kp} = \frac{\Delta K_p}{K_p} = \frac{\Delta K_u}{K_u} = T_u \text{ or } T_p .$$

This shows that, with constant effectiveness of capital utilization, a constant percentage increment, T_p, for all parts of the productive apparatus is necessary and sufficient for the existence of a constant increment of total income. In our case it is necessary that $G_{ku} = 20$ per cent.

However, the additional condition of "proportional growth" in formula (9) transforms formula (8) into

$$T_p = S_u - T_p \cdot \frac{K_p}{K_u}, \text{ and } T_p = \frac{S_u}{1 + \frac{K_p}{K_u}} .$$

This shows that the ratio K_p/K_u predetermines the possible rate of growth, and that, with fixed effectiveness of capital utilization, the rational development of the economy in the interest of consumption requires a definite relationship between K_p and K_u for any given rate of growth, T_p.

The following data in Table 2 are a consequence of this.

Graphically, the function has the form shown in Figure 5.

It is extraordinarily interesting that, with constant effectiveness of capital, the rate of growth of total income cannot exceed a definite limit, namely S_u, the effectiveness of the utilization of capital K_u. Physically this becomes clear if one considers that

Table 2

$\frac{K_p}{K_u}$	T_p in per cent	$\frac{K_p}{K_u}$	T_p in per cent
9.4	10	1	47
5	15.7	.5	52.7
3.7	20	.2	78.3
2	31.3	.1	85.4
—	—	—	94

the means of production produced with K_u cannot exceed what effectiveness, S_u, of the utilization of K_u will permit. $ND_u = \Delta K_p + \Delta K_u$ cannot exceed the total output $S_u \cdot K_u$. In our example, $S_u = 0.94$, and

$$\frac{\Delta K_p + \Delta K_u}{S_u \cdot K_u} < 1, \text{ or } \frac{\Delta K_p + \Delta K_u}{K_u} < S_u.$$

A fortiori, therefore,

$$\frac{\Delta K_u}{K_u} < S_u \quad \text{and} \quad T_p < S_u.$$

The nature of this curve is of great importance in planning the economy, since it indicates that an increase of K_u/K_p beyond 2 yields [proportionally] insignificant results.

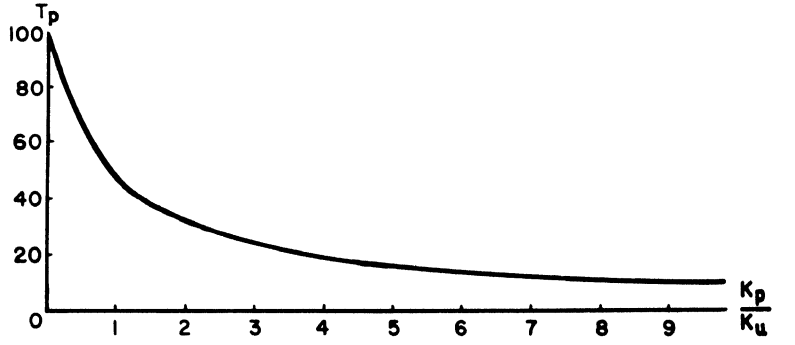


fig.5

The curve also indicates how the rate of growth of income increases as a function of the industrialization of the country at every stage of its development, for the ratio K_u/K_p is undoubtedly one of the primary indicators of the level of industrialization of the country, by virtue of the constantly increasing significance of industry in the contemporary economy. Thus an increase in the rate of growth of income demands considerable industrialization. In order to raise the constant increment of income from 10 per cent to 15.7 per cent, it is necessary to almost double K_u/K_p.

Thus an increase in the rate of growth of income demands industrialization, heavy industry, machine building, electrification....

It is evident from the foregoing that the growth of S_u is enormously important to the development of rates of growth. Therefore the dependence of T_p on K_u/K_p will be traced for three values of S_u: 0.485, 0.94 and 1.38.

Table 3

$\frac{K_u}{K_p}$	T_p		
	S_u = .485	S_u = .94 (in per cent)	S_u = 1.38
0.106	4.6	10.0	13.3
0.2	8.1	15.7	23.0
0.27	10.3	20.0	29.4
0.5	16.2	31.3	46.0
1.0	24.3	47.0	69.0
2.0	32.3	62.7	92.0
5.0	40.4	78.3	115.0
10.0	44.1	85.4	125.5
∞	48.5	94.0	138.0

A graphic representation of these relations is given in Figure 6.

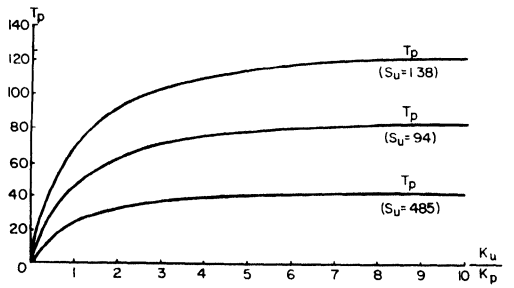


fig 6

From these curves we determine:

(1) that increases in K_u/K_p are particularly effective only up to 1 to 2;

(2) that the rates of growth vary directly with S_u;

(3) that the slopes

of the initial sections of the curves, which are of the greatest interest, increase with S_u, and that, as a result, the effectiveness of "industrialization" also increases with S_u....

Up to this point we have considered the rate of growth T_p only as a function of S_u and S_p, the effectiveness of the utilization of capital K_u and K_p, respectively.

But the effectiveness of the utilization of capital K_u and K_p can also be considered from the viewpoint of the distribution of "national income" as a whole. Consider the distribution of "national income," first, as a result of a change in the rate of growth T_p due to a change in K_u (with constant S_u), and second, as a result of a change in S_u (with constant K_u/K_p).

Consider the ratios

$$\frac{\Delta K_u}{\Delta K_u + \Delta K_p} \quad \text{and} \quad \frac{ND_u}{ND_u + ND_p} .$$

In accordance with the previous argument indicating that

$$\frac{K_u}{K_p} = \frac{\Delta K_u}{\Delta K_p} = \frac{ND_u}{ND_p} \cdot \frac{S_p}{S_u} ,$$

it follows that

$$\frac{\Delta K_u}{\Delta K_u + \Delta K_p} = \frac{K_u}{K_u + K_p} .$$

In other words, for uniform growth of the entire productive apparatus, with constant S_u and S_p, productive accumulation must be distributed in the same proportions as capital, no matter what the value of T_p. Given the ratio K_u/K_p, these proportions are independent of S_u. Therefore, for given constant values of T_p, independently of the magnitude of S_u, we shall have the values of the ratio $K_u/(K_p + K_u)$ shown in Table 4.

This table indicates that a decrease in S_u lowers the rate of growth of income but does not lessen the necessity of allocating capital to sustain a constant rate of expansion of reproduction. Thus the table underscores anew the tremendous significance of full utilization with maximum effectiveness of the capital at our disposal in order to raise the income of the population.

This is the source of the slogans calling for rationalization of the economy and for multishift production.

However, it must be noted that, by hypothesis, K_u and K_p in-

Table 4

$\frac{K_u}{K_p}$	T_p			$\frac{\Delta K_u}{\Delta K_u + \Delta K_p}$
	S = .485	S = .94	S = 1.38	
0.106	4.6	10.0	13.3	0.096
0.2	8.1	15.7	23.0	0.167
0.5	16.2	31.3	46.0	0.333
1.0	24.3	47.0	69.0	0.500
2.0	32.3	62.7	92.0	0.666
5.0	40.4	78.3	115.0	0.833
10.0	44.1	85.4	125.5	0.910
∞	48.5	94.0	138.0	1.0

clude not only fixed capital but also circulating capital. Raising S_p and S_u usually necessitates increasing the circulating capital. It is therefore appropriate to consider the following possibilities:

(1) S_p and S_u increase, but in such a way that the ratio K_u/K_p remains constant. Then the growth of T_p, according to formula (7) on page 188, is given by $\Delta S_p/S_p$ and by the increment obtained from formula (9) on page 192;

(2) S_p and S_u increase, but in such a way that K_u/K_p also increases by virtue of a greater increase in S_u than in S_p.

Then the growth of T_p is again given by formula (7) on page 188, with an increased contribution from formula (9) on page 192. Meanwhile, the industrial structure of the economy is strengthened.

(3) S_p and S_u increase, but K_u/K_p decreases by virtue of a greater increase in S_p than in S_u.

In this case T_p will still increase, but it will be moderated to an unknown extent by the decrease in K_u/K_p. Determining the extent of this moderating effect requires further analysis.

Consider again the ratio

$$\frac{ND_u}{ND} = \frac{ND_u}{ND_u + ND_p} = \frac{S_u \cdot K_u}{S_u \cdot K_u + S_p \cdot K_p} = \frac{1}{1 + \frac{S_p \cdot K_p}{S_u \cdot K_u}} .$$

The values of the ratio $ND_u/(ND_u + ND_p)$ for nine cases are shown in Table 5 (T_p and ND_u/ND in per cent).

For clarity, T_p and ND_u/ND are presented in Figure 7 as functions of the growth of the index of "industrialization" of the country, K_u/K_p.

Table 5

S_p =	S_u = .485				S_u = .94				S_u = 1.38			
	.485 .94 1.38	.485	.94	1.38	.485 .94 1.38	.485	.94	1.38	.485 .94 1.38	.485	.94	1.38
$= \frac{K_u}{K_p}$	T_p	$\frac{ND_u}{ND}$			T_p	$\frac{ND_u}{ND}$			T_p	$\frac{ND_u}{ND}$		
	(in per cent)											
0.106	4 6	9 6	5.2	3.6	10.0	17.1	9.6	6.7	13.3	23.2	13.5	9.6
0.2	8 1	16.7	9.4	6.6	15.7	27.9	16.7	12.0	23.0	36.3	22.7	16.7
0.5	16.2	33.3	20.5	14.9	31.3	49.3	33.3	25.4	46.0	58.8	42.3	33.3
1 0	24.3	50.0	34.0	26.0	47.0	65.9	50.0	40.5	69.0	74.0	59.5	50.0
2.0	32.3	66.6	50.8	41.3	62 7	79 5	66.6	57.7	92.0	85.1	74.6	66.6
5.0	40.4	83.3	72.1	63.7	78.3	90.7	83.3	77.3	115.0	93.4	88.0	83.3
10.0	44.1	91.0	83.7	77.8	85.4	95.2	91.0	87.2	125.5	96.6	93.0	91.0
∞	48.5	100.0	100.0	100.0	94.0	100.0	100.0	100.0	138.0	100.0	100.0	100.0

What deductions can be made from the series of figures and graphs introduced?

(1) The larger the S_p, for a fixed S_u, the smaller the portion (ND_u) of the total national income required to maintain a given rate of growth of the population's income. The less industrialized the country, the smaller the ratio K_u/K_p, and the smaller the S_u, the greater the importance of this decrease of the part allocated to productive accumulation.

(2) With a fixed portion of national income allocated to productive accumulation and a fixed S_u, the rate of growth of income (T_p) increases with S_p. However, this increase of T_p with S_p depends on a higher level of industrialization of the country.

The foregoing analysis does not exhaust the problem, because it fails to give any indication of the extent to which it is advantageous (in quantitative terms) to change the value of T_p to a larger one, whether by means of an increase in the ratio K_u/K_p or by means of an increase in S_p and S_u, which, in turn, depends on an increase in the ratio of circulating capital to fixed capital. Neither does it indicate where it is most advantageous to direct our efforts in the first instance: whether to increase S_p or S_u, and consequently whether to attempt to increase the circulating capital portion of K_p or of K_u.

However, on the basis of the relationships introduced, it is possible to conclude that the following, in the order given, are necessary for achieving the maximum rates of growth within the shortest period:

(1) maximum utilization of K_p, increase of S_p, and expansion of the circulating capital in K_p;

(2) maximum utilization of K_u and increase of S_u in the same sense as in (1) above;

(3) increase of the ratio K_u/K_p.

These requirements will be illustrated by a rough example taken from Table 5 and Figure 7.

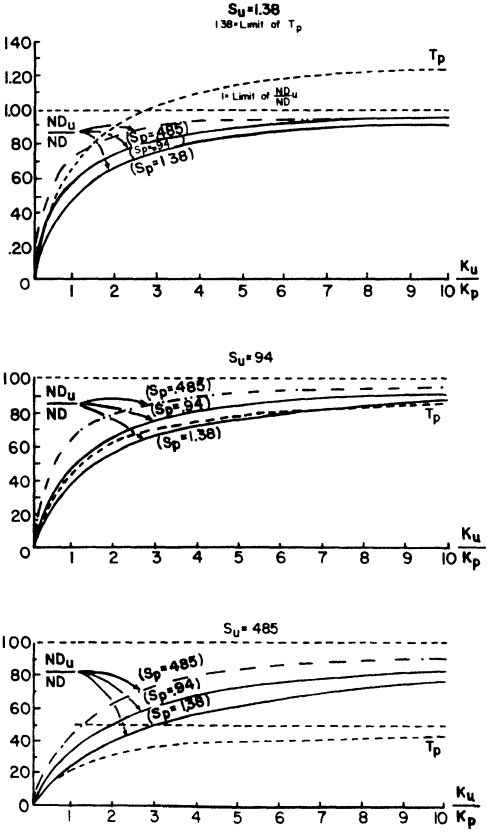


fig 7

Assume that the consumption of the population (ND_p) grows at the rate of T_p = 8.1 per cent annually. Assume also that it is desired to double the rate to 16.2 per cent.

(1) This can be achieved by increasing S_p by 8.1 per cent (see formula [7]). Assume now that circulating capital is pro-

portional to S_p and that it forms 20 per cent of all capital K_p. To increase S_p by 8.1 per cent, K_p must therefore be increased by 1.62 per cent.

(2) If it should be desired to increase T_p from 8.1 per cent to 15.7 per cent (a somewhat smaller increase than before) by increasing S_u, then S_u would have to be increased by [slightly less than] 100 per cent. In Table 5, line 2, $T_p = 15.7$ corresponds to the ratio $K_u/K_p = 2$. Assuming that circulating capital constitutes, as above, 20 per cent of K_u, and that it is proportional to S_u, a 20 per cent [100 per cent] increase in S_u requires a 20 per cent increase in K_u and [this implies] a 4 per cent increase in K_p.

(3) Finally, assume that it is desired to increase T_p by "industrialization" of the country, i.e., by increasing K_u/K_p. Table 5 indicates that an increase in T_p from 8.1 per cent to 16.2 per cent, with $S_p = .485$ and $S_u = .485$, requires an increase in K_u/K_p from 0.2 to 0.5. With constant K_p this implies increasing K_u by a factor of 2.5, or 250 per cent. Expressed as a fraction of K_p, this increase in K_u forms 0.30 of K_p.

Thus, doubling the rate T_p (from 8.1 to 16.2) requires the allocation of capital from the entire national income to implement the following increases:

S_p to be increased by 1.62 per cent of K_p;

S_u to be increased by 4.0 per cent of K_p;

K_u/K_p to be increased by 20.0 per cent of K_p.

This numerical example gives some indication of the extent to which the foregoing arguments are correct. This example, it must be understood, does not settle the question, since it does not account for those outlays which are connected with the increase in the labor force (workers' homes, etc.).

Of course, there is a limit to the increase in S_p and S_u. From United States data we know that S_p and S_u do not have an intrinsic tendency to grow. However, in our case, there are still considerable opportunities for raising S_p and S_u, both by the introduction of multi-shift work and by the rationalization of production....

Part II A

Economic Growth:

Strategies of Development

INTRODUCTORY NOTE

A. STRATEGIES OF DEVELOPMENT

Rapid increases in output may be secured in a number of radically different ways. As Solomon Fabricant once pointed out, the differences arise because (a) "so little is known of the determinants of economic growth" and (b) there are other objectives besides higher output—each of which "may be impeded or furthered by the way the others are sought."

There seemed to be little doubt among the Bolsheviks, on the eve of the era of all-out industrialization, that the key to economic growth was the allocation of as large a share as possible of the total product to investment in productive capital. But this foreknowledge did not suffice to determine what was actually feasible in respect to investment, output, and employment, when all the objectives of the regime were taken into account: what pattern of investment allocation should be chosen between sectors (particularly industry and agriculture) and between industries (heavy versus light); which outputs should be produced, or, alternatively, whose demand—that of the peasants or that of the state industrial complex itself—should be viewed as the most appropriate for propelling the economy onto a new and higher technological plane.

Concerning objectives other than large investments and higher output per se, the Bolsheviks were crucially interested in certain specific "social forms" of economic growth—namely, in the faster growth of the socialist than of the capitalist sector. This from the outset biased their decision in favor of the state-owned industrial complex and against atomized peasant agriculture. Politically industry's faster development was viewed as necessary in order to check the restoration of capitalism and to secure the independence of the country from its capitalist environment.

The articles included in this section present detailed arguments in favor of a strategy emphasizing simultaneous industrial and agricultural development, due account being taken of the output and demand patterns of agriculture, and of an alternative strategy aiming at a one-sided investment effort and a deliberately faster growth of heavy industrial branches in preference to all other branches or sectors. The first strategy stressed the "necessity" of complementarity among sectoral investments; the

second the "necessity" of discrepancies in sectoral growth rates, given the objective of a massive technological shift and the limitation of factor resources. Within this framework, the controversy took on a familiar ring and recalls a dilemma which today besets countries aiming at rapid economic development.

The papers of Shanin, Bazarov, and Bukharin present the strategy of simultaneous agricultural and industrial growth; those of Preobrazhenskii present the thesis in favor of the accelerated growth of heavy industry. Stalin's paper, finally, puts an official end to the controversy. The Shanin paper sets the stage with a discussion of the shortage of industrial goods in the mid-1920's. Shanin questions whether the shortage arose from a lag in industry's growth in capital formation and output or from the fact that its demand for agricultural raw materials exceeded its supplies of manufactured goods to the peasants—a discrepancy created, according to Shanin, because of unduly high investments in industry. The Preobrazhenskii articles, excerpted from his New Economics, present rather bluntly the famous thesis of the need for a massive agricultural "tribute" to industry, if the latter is to be shifted rapidly to a higher technological level. Agriculture, and the peasantry as a whole, are to be "dragged" along until a new, powerful industry is able to mechanize agriculture and "reconstruct" the economy, in its entirety, on a new basis.

L. Shanin

THE ECONOMIC NATURE OF OUR COMMODITY SHORTAGE

We are at present displaying great activity in dealing practically with the shortage of commodities. But our activity is aimed rather at its surface. Meanwhile, commodity shortages are building up and coming to be a sustained characteristic of our whole worsening economic situation. We can therefore no longer be content to react with palliatives alone. We are obliged to take a closer look at the nature of this phenomenon and pose this problem in all its real magnitude....

The fact is that when industry operates, it acquires agricultural raw materials, semifinished goods, instruments of production, etc. In addition, it acquires labor, and absorbs, digests all these in the process of production. At the same time a distinctive kind of exchange occurs: industry, appearing on the raw materials market and on the labor market, pours its working capital into these markets. Through wages and purchases of raw materials, industry passes on its purchasing power to the workers and the peasants. As a result of the act of production there takes place a shift of purchasing resources from industry to the broad masses (and to other branches of industry producing semifinished goods and instruments of production required for the productive process). This shift means more than just a change in the topography of effective demand. The particular distribution of demand also determines the qualitative nature of that demand. To be concrete: industry has acquired raw materials and semifinished goods, equipment, and labor; the peasantry and the workers, to whom the financial means of industry have been transferred, at once emerge as purchasers of consumer goods. As a result of industry's emergence as a purchaser, a qualitative metamorphosis of demand occurs and effective demand is created for other commodities. Specifically, a demand is created for consumer goods, replacing the previous industrial demand for producers' goods.

"Ekonomicheskaia priroda nashego bestovar'ia," Ekonomicheskoe obozrenie, November, 1925, pp. 25-39.

What has happened during this time with respect to industrial supply? As a result of the productive process not only has there been a shift in demand, but a new industrial supply has been developed as well. At this point we must ask ourselves the following question: what will the result be if industry produces not consumer goods but instruments of production? In that case at the pole representing demand among the worker and peasant masses we shall see generated a growing demand for consumer goods, while at the pole representing industry we shall have a supply that will depend on which branches of industry we are giving priority in development. If it is heavy industry, industrial supply will consist predominantly of tools of production, girders, rails, building materials, etc., i.e., commodities which are out of line with the demand that industry itself has created in the process of its development. A disparity is possible here between the qualitative nature of demand, on the one hand, and of the supply which will be created by the given type of industrial development, on the other....

The illusion prevails in our country that all that has to be done to overcome the commodity-shortage crisis is to develop the industrial machine to the utmost. But we are forgetting that the supply which industry is creating is attended by the demand which it itself is creating. The disparity between the development of agriculture and the development of industry by no means signifies that our industry is not developing vigorously enough, for our industry is not parasitic upon agriculture; the disproportion lies on another plane and consists in the fact that industry's fixed capital is developing too fast and that the industrial branches which are developing are not those which could satisfy the consumer-goods demand that the development of industry is creating. This is the essence of the phenomenon currently observable in our country. If the capital which has been poured into industry and the enormous productive work it is doing had gone into lifting the branches of light industry—the textile industry, the footwear industry, the glass industry, the various branches of iron processing, the match industry, the food industry—if it were these particular industries in the main that were developing in our country, the satisfaction of peasant demand would have turned out more favorably. This would have meant, however, that where other branches of industry were concerned we should be relying not on domestic production but on imports.

This is precisely why we are pouring our main resources not into light but into heavy industry, and the result is the phenom-

enon of protracted commodity shortage the signs of which we observe at the present time. In the second volume of Capital, Marx wrote that the communist planned economy would have to be very wary of developing those branches of industry which immediately create a demand for consumer goods in the form of wages and raw materials purchases, but which do not turn out large quantities of consumer goods until they have passed through a number of later stages. We have already had occasion elsewhere to quote the passages relevant to this in the second volume of Capital. Marx wrote: "On the basis of socialized production the scale must be ascertained on which those operations—which withdraw manpower and means of production for a long time without yielding any product as a useful effect in the interim—can be carried out without prejudice to those branches of production which not only withdraw labor-power and means of production continually, or several times a year, but also supply means of subsistence and of production."[1]

The communist "society must calculate beforehand how much labor, means of production, and means of subsistence it can, without difficulty, invest in branches of production such as railroad building, for example, which for a long time, a year or more, furnish neither means of production nor means of subsistence and in general produce no useful effect, while they withdraw labor, means of production, and means of subsistence from the total annual production."[2]

Expressed here is the idea that there must be proportionate development of the branches of heavy industry. We cannot be said to have maintained strict proportionality in this respect! In 1925/26 we expect to invest in industry's capital stock around 900 million rubles, 575 million of this in heavy industry and a little over 300 million in light industry. It is contemplated, therefore, that almost twice as much capital will be invested in heavy industry as in light industry. In other words, only one-third of the total investment is expected to be directed into light industry, which produces consumer goods.

The usual reasoning of our management personnel is as follows: The textile industry needs textile machines for its development; consequently, we must set up the industry to produce them in our country. If there is a demand for, or shortage of, a particular item, then the industry to produce it must be set up in

1. Karl Marx, Capital, Vol. II, Chapter 18, p. 341, Russian edition.
2. Op. cit., Vol. II, Chapter 16, p. 296.

our country. According to this primitive reckoning, mass orders are put through for capital repairs and construction, channeled to particular branches of industry merely because there is a demand for their output.

And yet we must definitely realize that the heavy industries can be developed only on the basis of extensive preliminary development of light industry (or importation of consumers' goods), i.e., only provided light industry is in a position to make available the very considerable supplies of commodities needed for satisfying the consumers' goods demand created by the development of heavy industry. Should our light industry get so far ahead that it produces output in excess of the demand which presently exists, and inventories of consumers' goods, first a two-weeks' supply, then a month's, than a two-months', etc., start to mount up in our country, it would then be heavy industry's turn for development on a broader scale. Then the extensive development of heavy industry could be handled painlessly, for the demand created in the process of that development could be satisfied easily without any danger of inflation attributable to accumulated inventories of consumers' goods.

Not even countries like the United States and Germany developed all branches of industry simultaneously or at uniformly vigorous rates of advance. At the beginning only part of them developed, and where the rest were concerned the country lived on imports.

A number of industrializing countries began with light industry, imported semifinished industrial goods and the most advanced equipment purchased at low prices from the better developed countries, and in that way pushed the development of their light industry on a less costly basis. Not until these branches had accumulated considerable inventories of goods, which could be quickly directed into nurturing the branches of industry next in order, did these countries proceed to the development of the latter. Only after extended industrial grounding in the sphere of consumer goods production did they proceed to the development of the basic branches of heavy industry. Only as and when light industry developed on such a scale that it began to turn out surplus products which went into inventories essential for the satisfaction of consumer demand (engendered by the growth of heavy industry) did the country proceed to the development of heavy industry.

In our country this essential proportion has thus far not been maintained. We did not have to maintain it initially, because thus

far, without notable outlays, we have been activating capital stock already available. Since the equipment was available, all that was required to start up enterprises in heavy and light industry alike was working capital, and in general the production results were attained equally fast in heavy industry and in light. But now that we are moving on from the recovery process to the building of new plants or the restoration of old ones in need of extensive repair and renovation, any new investment for heavy industry requires a considerably greater capital outlay than for the construction of light industry, while the production results in the former will not begin to be obtained until much later. This is why we must now reconsider the tactics of industrial construction and be especially wary of developing industries which do not directly manufacture consumer goods. Actually, under the influence of the crisis that we are undergoing—the crisis of commodity shortage—we are already partially embarking on this course. If we take the credit plan for the first quarter, we see that it is based on the following directives: industry must be supported, but specifically the industry which directly and with the shortest possible delay makes consumer goods; but we should be doubly wary of everything that calls for investment of funds for a more extended period, in order to avoid a time gap between the appearance of demand and the possibility of its being satisfied.

However, at this point a new problem arises to confront us in all its magnitude: How shall we be able to develop light industry unless we supply it with sufficient equipment, semimanufactured goods, and industrial raw materials out of domestic production? The answer lies in the importation of these groups of commodities for the appropriate industries in our country. But is this solution feasible? Is it not thwarted by the acute shortage of foreign exchange resources in the country?

There is nothing unfeasible in this solution. The only thing is that such a rearrangement does presuppose a number of broad measures for the development of the export branches of our economy.

We must:

(1) Develop more intensively, and in the first instance, those branches of agriculture which produce large masses of goods for export, and those branches of industry with whose development our industrial export capability is linked. Development of consumer goods production and of our economy's export branches is our central object.

(2) Simultaneously, utilizing these export resources for im-

port purposes, we must adopt a course of initially slower and more cautious development of heavy industry. With the proceeds from exports we must systematically import equipment, processed metals, etc., so that substantial outlays on their production do not have to be made at the present time. Funds made available (as a result of having rejected the forced-draft development of heavy industry) we must pour into light industry and the export branches of the economy.

Our economic strategy should involve, first, export of agricultural commodities, and second, investment of capital in the branches which serve that export. Relying on our agricultural basis, we must build grain elevators, refrigeration plants, and bacon factories, the investments required for these undertakings being infinitely small when compared with the expenditures which would be required by the immediate full-scale development of heavy industry.

At the same time we must do our utmost to speed the development of industries processing farm produce. We must strive to develop the sugar industry, so that we can export sugar. The textile industry must, in its advance, reach the point where it can make its appearance on the Near East market. We must speed the development of other industries producing manufactured goods for export. These are the ways in which we shall secure the foreign exchange we need. The export program set for 1925/26 at 800 million to one billion rubles must next year be brought up to a figure of 1.3 billion to 1.5 billion rubles. It should be this year's central task to lay the groundwork for this. Every branch of the national economy which can be utilized in the export field should undertake a proper portion of this program.

The economic administrators must at once be asked to decide what is required for bringing the export program up to the scale indicated above. It must be ascertained how many grain elevators, refrigeration plants, and corn driers to build, how to get operations at sugar refineries, sawmills, etc., fully under way, and so forth. Vigorous use must be made of the current year to lay the groundwork for exports in 1926/27.

Foreign exchange earned as a result of pushing exports should be used for so developing imports as to spare us the necessity of expanding all branches of industry simultaneously. We shall be justified in moving on to the full-scale development of industry only gradually, as we build up the inventories enabling us to do so without inflation; only on the basis of such inventories shall we be able to say that in such and such year, such and such

funds can be poured into the development not only of light industry, but of heavy industry.

This should be recognized as the basic principle of our economic policy in the period immediately ahead. It is the only approach that guarantees painless emergence from the commodity shortage crisis which we are undergoing....

L. Shanin

QUESTIONS OF THE ECONOMIC COURSE

... The fundamental criterion determining the volume of admissible expansion of fixed capital and indicating the maximum limit of investment is the existence of commodity reserves created by prior economic activity (or imported on the basis of credit). If normal productive operations require as working commodity capital, let us say, a month's reserve of commodities (inventory) and if actual reserves do not exceed this one-month norm, then expansion of fixed capital cannot take place. Only to the extent that, let us say, a six-weeks' or two-months' reserve is formed, can investment in fixed capital attain a volume corresponding to the excess of commodity reserves over the above indicated one-month norm of working reserves.

Hence a precondition for crisis-free expansion of fixed capital is a certain prior saturation of the market with both agricultural and industrial goods. That is the only basis on which appropriations made for industry, transport, and agriculture, the intensified extension of bank credit, and the arrangement of an economic reconstruction loan will be able to create not only effective demand but also real (commodity) possibilities for investment in fixed capital. That is the only basis on which investment can actually be effected, without a crisis. For only under these circumstances will the reserves be available that will make possible painless immobilization of commodity masses in fixed capital.

Initially, investment in fixed capital curtails the supply of goods put on the market. However, not every curtailment of the supply of goods creates a goods famine. It will not occur if the commodity reserves on hand are greater than the reduction of these reserves that will result from the expansion of fixed capital.

In due course capital put into industry begins to function and to yield growing industrial output. The difficulty is to be able to wait for that moment to arrive, and wait in such a way that the curtailment of the commodity supply does not create a goods

"Voprosy economicheskogo kursa," Bol'shevik, No. 2, January 30, 1926, pp. 65-87.

famine.[1] This is possible only when commodity reserves are so considerable that when they are temporarily reduced somewhat, this cannot at once create a goods famine. The course being proposed should establish these conditions by saturating the market with agricultural and manufactured goods.

The essential difference between us and the West on this point becomes clear. Intensive investment in fixed capital in the West usually creates a crisis of industrial overproduction; in our case it has created an acute goods famine. What is the reason for this striking difference? It is that the wealthier Western states do their investing on the basis of commodity reserves accumulated in considerable quantities beforehand. These reserves enable them to effect investment in such a way that the diminution of the commodity mass does not create a goods famine and remains unnoticeable throughout the period of immobilization. It makes it possible, consequently, to wait calmly, without a commodity shortage crisis, for the development of industry to yield results. But when industry begins yielding its increased output, the countries which were able (thanks to the considerable volume of their commodity reserves) to survive the period of curtailment without crisis, plunge for the very same reason into a crisis of overproduction. When there is a deficiency of commodity reserves, however, investment in fixed capital initially becomes, on the contrary, the source of an acute commodity shortage crisis, and only later can it bring some relief. This explains the aforementioned difference between us and the West.

If, therefore, by holding off on investment and intensifying foreign trade we form some commodity reserves, conditions will thereby have been created for expanding fixed capital under less crisis-ridden circumstances, and more energetically, later on. The ultimate result of the economic program envisaged will be precisely that.

1. The problem is more complicated if a country's agriculture grows faster than its industry over an extended period and if an attempt is made to eliminate this disparity in rates of growth by expanding the fixed capital of industry. In that case industry later pays back what was invested and, it is true, somewhat more, but since at this later date agriculture is still growing faster, leveling is not achieved even then. But the point is that, generally speaking, this leveling is not at all imperative.

THE OUTLINES OF OUR DEVELOPMENT FROM THE STANDPOINT OF PURE ECONOMICS

But the development of agriculture may still be balked by the limited capacity of the world market. Agriculture will be unable to continue developing without the simultaneous development of those industries which, though they do not export, expand the domestic market for agriculture by using agricultural raw materials in their operations and consequently provide an opportunity for the further investment of capital in agriculture. The development of the said industries is a necessary and decisive prerequisite for the further development of agriculture and hence of the economy as a whole.

The same significance may later attach also to those industries which, even though they do not use agricultural raw materials in their operations, create a domestic market for agricultural foodstuffs (grains and animal products).

With the transition to these later stages, the cost of our economic progress will rise considerably. Even at that point agriculture per se will require relatively less investment of capital, but since at that stage the advancement of agriculture will no longer be possible without the simultaneous advancement of industry (the latter requiring considerably larger investments of capital), in the aggregate the cost of developing the national economy will become much greater than before. That cost will then presuppose considerably greater preliminary accumulation of capital than at preceding stages.

Under present circumstances, as long as the capacity of the world market to absorb agricultural products has not been exhausted, we can advance the economy (specifically agriculture) without advancing industry to the same extent, whereas at the new stage the only way development can proceed will be in this more costly fashion. Whereas now we have a choice, by that time the choice will no longer exist and the forced-draft development of industry will become a necessity from the purely economic point of view.

The following pattern thus emerges. To the extent that the world market for agricultural products in their original form becomes exhausted, a world market must be opened up by way of the industrial processing of agricultural raw materials. After grain and animal husbandry have had their turn, sugar, alcohol, textiles, leather products, etc., must have theirs. To the extent that these possibilities, too, exhaust themselves, development must proceed thanks mainly to the industry which, though operating for the domestic market, uses agricultural raw materials or just agricultural foodstuffs. But at the same time we should

also develop those industries which, though they do not operate on agricultural raw materials, are nevertheless highly important in the export field (petroleum, manganese, platinum, etc., and the rubber, match, and lumber industries). With respect to the development of the other industries (which neither operate on agricultural raw materials nor produce for export), decisive significance attaches to prices of domestic output as compared with world prices.[2] The extent and the sequence of the development of these branches are determined, furthermore, by the amount of capital investments which they require.[3]

The course proposed involves a reduction of the aggregate fixed capital to be invested. In addition, it means an allocation of the invested capital among the individual branches of the economy and in particular of industry different from the present allocation. Is it to be expected, in this connection, that still greater difficul-

2. The high cost of a product of domestic origin as compared with the cost of the imported product does not always indicate that that branch of industry is impractical in our circumstances. There may be cases where this high cost is determined not by the uneconomical set-up in the given industry, but by the high cost of the raw materials and semifinished goods that it uses. Under such circumstances, rather than forgo developing the particular industry, it would be more advisable to switch to importing those of its production components (raw materials and semifinished goods) that determine the abnormally high cost of the end product. But even in those cases where the fundamental causes of the high cost lie in the industry itself, one still may not unconditionally forgo its development. Frequently the high cost is merely a resultant of the initial period of production: there is every reason to expect an appreciable drop in costs as time goes on. In that case a certain tutelary protectionism is unquestionably rational. But protectionism is in no wise warranted when the industry or enterprise, owing to its technological conditions, has no prospect of being able to meet the world price. Putting fixed capital into industries which under no circumstances give promise of being able to effect the necessary price reductions is inadmissible. Only in the interests of defense is some modification possible in this case.

3. The author has been reproached with completely losing sight of industry. In this connection I consider it helpful to point out that the portion of this chapter which has been cited reproduces almost verbatim one of the theses in that same report to the Central Committee of the All-Union Communist Party (Bolsheviks), part of which was once published in Ekonomicheskaya zhizn [Economic life] and Finansovaya gazeta [Financial gazette].

ties will be created with respect to the supply of industrial commodities? Such apprehensions are unfounded. As a matter of fact, what will occur is not a diminution but an increase in the supply. A certain inhibition of the rate of industrial development is precisely what should give rise to more abundant industrial supply. This may appear to be paradoxical, but it is nevertheless so.

Curtailed investment in industry means curtailment of domestic consumption by industry and released resources for export. On the basis of expanded exports imports will develop on a considerably broader scale than at present. These same resources will be advanced (for export) that were to have been invested in domestic production, and on that basis imports will yield a considerably larger supply of goods. This result is due to the fact that one and the same unit of export goods buys considerably less within the country than abroad. In addition, the proceeds from exports, amplified by foreign credits (both export and import credits), yield an additional increase in the mass of commodities forthcoming, thus heightening supply. To these factors should be added the lessened immobilization of goods in fixed capital, greatly depressing the demand for manufactured goods. One can plainly see, therefore, the degree to which forgoing the forced-draft expansion of industry's fixed capital should initially increase, and not diminish, the supply offered by industry.

But what does this type of development bode, not in the way of over-all growth in the supply of manufactures (albeit accounted for by imports) but in the way of our own industry's development? Does it imply forgoing the extensive development of our industry?

Such an interpretation would be the greatest mistake. For only this type of development opens up the maximum industrial prospects. Only this (leaving aside an influx of foreign capital) can ensure the maximum industrial development within our capability.

But why is this so? What prompts this assertion? How explain so paradoxical a result of the policy of not developing industry under forced draft?

Our industry's growth in the period immediately ahead will have two sources: (1) its own accumulation and (2) the diversion of resources from other spheres of the economy (from agriculture).[4] But inasmuch as development will proceed in these two

4. Some of my critics have maintained that I deny the need to divert resources from other spheres of the economy to industry. This is a

ways, we shall encounter a complex interweaving of influences. Let us analyze this process.

The development of industry—this year, let us say—proceeds on the strength of last year's accumulation within industry and of resources diverted to it from other spheres. But after this diversion process has been completed and these resources have been absorbed by industry, they—equally with other resources—enter into industry's productive operations and become a source of what is then intra-industrial accumulation (in ensuing years). Whereas prior to the diversion phase resources drawn in from the outside are external resources, once they have been invested in industry, they figure as a source of ulterior intra-industrial accumulation.

Curtailment of the diversion of resources from agriculture must therefore initially result in a two-fold deceleration of industrial development: in the first instance directly and immediately, owing to the diminished influx of resources from the outside, and in the second instance indirectly, owing to the diminution of subsequent intra-industrial accumulation (as a result of the diminished diversion of resources). For the retardation of industrial development (based on the slowed diversion of resources from other spheres) constricts the base of operations in industry and thereby also the proportions of intra-industrial accumulation in it. The more slowly industry absorbs resources from the outside, the narrower will be the base for its internal accumulation in each subsequent year and the more slowly will its development proceed, owing to that accumulation.

Clearly revealed here, consequently, is the adverse effect of the slowed diversion of resources. How, in that case, can that diversion become a factor in the expanded development of industry? This seems to be a perfectly legitimate question.

The effect is possible by virtue of the fact that concurrently with the above process another process of opposite significance

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patent error. What I was saying, merely, was that in the third phase of our development, when the relative weight of our industry will be greater than that of agriculture and when our industry will be growing more rapidly than agriculture, industry will develop on the strength of its own accumulation and not of what is diverted to it. This all referred specifically to the third phase of our development, when "agriculture's rate of development will gradually decline as compared with industry's, while the prospects for industrial development will be improving all the time;" it did not refer to the present phase.

will be under way in the national economy, the latter process outweighing the former. What is this process?

In our circumstances, investment of capital in agriculture is more profitable than investment in industry. The organic structure of capital is considerably smaller in agriculture, and labor requirements are considerably greater. One and the same unit of capital brings into play masses of labor eight times as great in agriculture as in industry; and with the same rate of labor utilization the same unit of capital yields a much larger accumulation in agriculture than in industry. Moreover, the level of consumption in agriculture is lower than in industry and this further enhances the accumulative effect of capital invested in agriculture.

If in industry average accumulation is estimated at, say, 6 per cent per annum, in agriculture it can be reckoned at a considerably larger figure, say, 15 per cent. What conclusion follows from this? Clearly, if some 100 units of resources were diverted this year from agriculture to industry, the following year they would total 106 additional units in industry, the third year 112.3, and the fourth year 119.1. But if the original 100 units were left in agriculture, the following year they would there yield 115.0 units of additional resources, the third year 132.2, and the fourth year 152.0. If the diversion of these means from agriculture to industry were carried out in the first year, the resources of industry would increase by the beginning of the fifth year to 119.1 units. But if this diversion were to take place not in the first year but towards the beginning of the fifth year, the resources of industry, on those same 100 units, would grow to 152.0 units. It is clear that by taking the resources intended for diversion to industry and passing them first through agriculture, we enable them to advance industrial development more tellingly than if we pour them immediately and directly into industry.

What conclusion may be drawn from this? It is clear that by cutting the relative share of the surplus product of agriculture to be diverted at this time from agriculture to industry, in the early years we also reduce the absolute magnitude of what we pour into industry. But later, thanks to the considerably greater fruitfulness of investment in agriculture, the reduction of the relative share of the transfusions can yield in absolute figures a greater mass for injection into industry. Thanks to the greater productivity of capital investments in agriculture, the ability of these resources to bear fruit is greater in agriculture than in industry. As a result, the relatively reduced share of the surplus product of agriculture being diverted to industry will begin

to amount in absolute terms to greater masses of commodities as the years go by.

Thus, holding back somewhat in the diversion of resources to industry will as time goes on not only make up for the original slowdown (both in the diversion of resources and in intra-industrial accumulation) but will result in the positive effects considerably outweighing the negative. What we lose in the rate of industrial development in the initial years will be made up with interest in the succeeding ones. For ultimately the absolute growth of industry will be greater than with the type of development that is based on immediate diversion of resources under maximum forced draft.

True, with the alternative we suggest, the relative growth of industry (as compared with the growth of agriculture) will be smaller. This will not be, however, because industry will develop more slowly than with the other pattern (on the contrary, it will develop faster), but because with our alternative agriculture will develop faster still.

The disproportion between industry and agriculture will be more noticeable with this pattern of development than with the other one. For though both (industry and agriculture) will be growing more rapidly than with the first pattern, agriculture will in this case be growing faster than industry.

Both stand to gain with this scheme of development. The general level of the economy will rise markedly. This includes industry, which will be growing faster than with the other pattern. It will grow faster because with our alternative the reservoir of agricultural resources will expand more rapidly and industry will be able to dip into this reservoir for greater masses of resources.

This is why it can be maintained that not only will the economy develop more fully and agriculture experience more luxuriant growth with the scheme that we have outlined, but that this is the only pattern of development that gives fullest expression to the policy of industrialization proclaimed by the Fourteenth Congress of the Party....

V. Bazarov

PRINCIPLES OF LONG-RANGE PLANNING

...The problem of smoothly absorbing the surplus population into industry, given our cultural backwardness and the limited material resources which we can earmark for reconstruction purposes, makes it imperative that in carrying out industrialization we follow a strict system with respect both to the types of new enterprises to be set up and to the priority to be awarded them. Unfortunately, there has thus far been no settled system in the theory and practice of our industrial development (except for electrification). Guiding ideas deriving from specific Soviet conditions have not been formulated with due clarity, and often thinking inherited from the prerevolutionary past has enjoyed undeserved popularity.

The USSR is a country very rich in latent potentialities, but very poor in tangible accumulations. Even with substantial foreign credits, we shall for a long time remain short of the means needed for capital outlays on the reconstruction of the economy. Where the development of productive forces assumes a considerable increase in fixed capital, we are unable to handle reconstruction work fast enough. The guiding principle of our industrialization must therefore be the attainment of maximum efficiency—in regard to physical volume of output, labor productivity, and involvement of new manpower in production—while a minimum is spent on capital construction. Modern technology opens up two possibilities in this respect which, if exploited skillfully and systematically, would enable us to give the industrialization process a remarkably wide scope, far exceeding the rates of growth in capitalist countries at corresponding stages of their development. These possibilities are first, rationalization, and second, electrification.

Let us dwell first on the factor of "rationalization" of industrial enterprises, meaning by this eliminating unnecessary labor processes (scientific organization of labor) and speeding up the working of machinery, with specialization and automation of complex operations. In this latter and most effective form, rationalization is realizable only with mass production on a gigan-

"Printsipy postroeniia perspektivnogo plana," Planovoe khoziaistvo, No. 2, 1928, pp. 38-63.

tic scale. Mass production must therefore be the basic criterion determining the order of priority in our reconstruction undertakings. First to be reconstructed must be the industries producing consumers' goods and those kinds of producers' goods for which something like mass demand already exists. In all other industries, so long as they have not acquired a broad enough base within the USSR, it would be preferable to purchase essential products abroad or grant concessions to foreign capitalists.

The usual argument against this guiding principle is that it presumes long-term consolidation of commercial relations with foreign countries, whereas the unfavorable and ever worsening international situation obliges us to seek the earliest possible elimination of the slightest economic dependence on the outside world. This argument is based on an obvious misconception. Our present dependence on other countries is due not to any "natural" causes but to the exceptionally low level of our material development, i.e., to the underindustrialization of our country, which, in terms both of its climatic conditions and the abundance of its natural resources, has all that is required for the people inhabiting it to form an almost self-sufficient economic organism (of the type represented by the United States of North America). In other words, emancipation from capitalist encirclement is, under our conditions, above all a function of industrialization. The faster our industrialization proceeds, the faster shall we achieve that emancipation. If, therefore, we can prove that the scheme outlined above ensures the fastest possible rate of industrialization, we shall thereby have proved that it is also the most rational when it comes to relieving the USSR of its economic dependence on outside countries. Let us assume that in bringing about industrialization we fail to observe a rational order of priority enabling us, at any given moment, to concentrate our construction efforts in the areas in which we are best prepared to do so and in which we can straightaway avail ourselves of the most powerful types of modern equipment. Instead, we hasten to build our own enterprises to produce all products of which we are in need. Because of our organizational and technological unpreparedness and the inefficient scattering of resources inevitable with such superficial industrial expansion, these new enterprises, having absorbed a huge aggregate of capital outlays, would drag out a sickly existence, suffering endless "infantile disorders" and putting on the market an insignificant quantity of goods of very low quality produced at very high cost. These hastily contrived domestic substitutes would

not, of course, emancipate us from outside countries, while they would retard cancellation of the lags in our economic forms, undermine the strength of the national economy as a whole, and spoil the whole outlook for general reconstruction.

It must moreover be emphasized that hasty capital construction in industries that had not yet won for themselves a sufficiently broad base in the USSR would not only slow down the growth of productive forces in the immediate future, but fetter it for many, many years to come. When production is on a limited scale, its specialization is not practicable. Consequently, by building new enterprises in industries that are not mass-producing, we should be forced to put large sums into obsolete production facilities—facilities whose efficiency would be much below that of their West European or American competitors. Thus, when the prerequisites for mass production materialize, we shall in a great many instances be faced with the following alternative: either to work to death, to the limits of physical deterioration, enterprises that had been rendered obsolete even before coming into existence, and accept the fact that each new year they were operated would confirm and aggravate our technological backwardness vis-à-vis the capitalist world, or to nullify in their underutilized state the millions of "man-days" embodied in irrational construction—an operation least of all consistent with planning.

Needless to say, the principle of a rational order of priority cannot be implemented in its pure form, without any compromises. To strengthen our defensive capacity we are compelled to build and develop enterprises which do not accord with this principle. But exceptions of this type must be confined to special-purpose output, to a group of cadre enterprises. As for industrialization of all those spheres that in peacetime are called upon to supply, so to speak, "civilian" needs, here the interests of national defense and of the national economy as a whole coincide: to strengthen and enhance the economic power of the USSR is to strengthen its defensive capacity at the same time.

Let us move on to examine the second factor in modern technology, its new "power base." Electrification opens up very broad horizons in the mechanization of artisan trades without their transformation into factory production, obviating, that is, huge capital outlays on the construction of buildings for production and housing. In the history of capitalism, mechanizing any branch of labor was tantamount to turning it into factory-and-plant production. But not nearly always was this dictated by the

actual technology of the product's manufacture. The main reason was that the steam-power base of those days permitted neither the fractioning of power nor its transmission over a distance.

The shift to electric power, which can at will be fractioned and transmitted over long distances, spells a profound change in the technology and organization of many industries. This change is still nowhere near having been completely assimilated by the capitalist countries, saddled as they are with the gigantic legacy of the old century's technology and public services. There is every reason to believe that the barrack-like factory style in industry and its fitting social complement—skyscraper buildings—will find their place in the museums of the future socialist society as the most glaring manifestations of the cultural barbarity produced by the crude technology of the age of classical capitalism.

We can and must pioneer in this respect, set out with our very first steps in industrialization to create a new type of enterprise fully in keeping with the possibilities of the new power source. We must make a most painstaking inquiry into the possibilities of industrializing artisan trades while having them retain their "domestic" character. In all those cases—and they are more than a few—where cheap current and the cheap automatic lathe make it possible to raise the level of the artisans' labor productivity to that of workers in modern enterprises, we must renounce the stereotype for industrialization in the form of urban plants and factories. In every such instance, what represents the last word in modern technology—not only in mechanization, but in specialization and standardization as well—can be, and therefore should be, infused into domestic industry. The added expenses that would inevitably be incurred in the transportation of manufactures would be more than offset by the enormous savings on capital construction, not to mention the tremendous social and cultural significance of introducing industrialization in its most refined forms into the peasant or semi-peasant environment. Needless to say, in bringing electrification and mechanization to artisan trades we must see to it that the industrial workers thus created—industrial workers of a new type—deal not with the capitalist middleman between them and the "free" market, but with the state. The state must, on the one hand, act as the "customer" and the supplier of raw materials and on the other, promote the organization of cooperative production among the technologically renovated crafts.

But even when the technology of a particular type of industry

necessitates setting it up in plants or factories, it is by no means obligatory that the new enterprises be built in cities, the workers for them being concentrated there, too. Particularly is this undesirable where it is a matter of processing agricultural raw materials.

It would be desirable if production of raw materials and all the stages in their processing were consolidated, not only organizationally but territorially, in unitary combines. Besides the possible savings on capital construction (e.g., housing construction), we must here again keep in mind the more important fact that combines of this nature could represent powerful centers of industrial culture in the very heart of the countryside (this is precisely what Karl Marx had in mind when he spoke of the fusion of city and country).

The shortage of certain types of raw materials needed for the mass production of consumer goods and the impossibility of accelerating the output of these raw materials sufficiently in the USSR oblige us to consider expanding our trade with other countries in every way possible, and, in particular, preparing new mass-export items. However, steadily growing dependence on the foreign market for basic raw materials used in great quantity would appear to be undesirable even granted stability in our commerical relations with the outside world. Such dependence becomes a direct threat in the presence of international complications. Germany, cut off from the foreign market during the Great War, undertook to substitute products of domestic origin for imported raw materials and in the space of two or three years accomplished this task for a whole series of industries. Many of these "substitution industries" proved so successful that they were able to hold their own after the war. The USSR is not Germany. But for all our technological backwardness it would not be utopian to assign our engineers the task of setting up two or three (not a great many, as in Germany) "substitution industries" over a span of five to seven years (not two or three, as in Germany). It would in any event appear to be vital in the extreme that such an assignment be set at least in the case of cotton and rubber.

Among the branches of industry, power and transportation hold a special place. Whereas the scale on which to develop enterprises producing tools of production is determined by the real need actually manifested, the development of power and transportation facilities must be governed not by present but by potential demand. Thus an elaborate network of dirt access

roads and rail spurs is a prerequisite for the elimination of subsistence and semisubsistence farming in the countryside. When we set out to build such a network in some region, the flow of goods for which it is intended does not yet exist. But the material and human elements of production are already there; in the absence of good roads they would be doomed to remain in their dissociated, paralyzed state; but after a road has been built they should combine in the process of productive labor, filling the newly constructed transportation arteries with the products of that labor.

This general criterion also holds for present installations which serve economic needs that may be expected to increase greatly. Here, too, construction priorities must be determined by which of these potential labor fields being newly brought into existence will have the maximum effect on production with the minimum capital outlay. For example, in bringing the electrification plan to fruition, we must first build the electric power stations needed for supplying existing industrial and mining centers as well as thickly populated agricultural districts, and be especially circumspect in starting on power plants whose capacity can be fully utilized only after new industries that take large investments of capital and a long time to build shall have been set up in the area that these power plants will be serving.

The existence of considerable obvious and hidden unemployment makes the concept of labor absorption one of the basic criteria of expediency in reconstruction undertakings. What goes into this criterion? It is often formulated as follows: "All other things being equal, reconstruction must be directed toward enterprises characterized by the greatest labor absorption." This formulation is ambiguous because, with varying outlays of labor, it is inconceivable that all other things could be equal. Out of the vast number of possible combinations in the way of "other things," it is essential that we examine two that are antipodal.

First combination: "Capital outlays being equal, the enterprise with greater labor absorption will show a growth in the physical volume of its output proportional to or even greater than the growth in the number of workers employed" (i.e., higher labor absorption is accompanied by higher labor productivity). Thus understood, the criterion of labor absorption is indisputably sound and, under our conditions, is tremendously important as the regulative principle in the choice of methods and patterns for the reconstruction of the national economy. This is the criterion by which we were guided earlier when we emphasized the

rationalization of mass-production industries, the electrification and mechanization of artisan trades without turning them into factory enterprises, the formation of industrial-agricultural combines in the countryside instead of concentrating the industrial part of these combines in the cities, and so on.

The second combination: "Capital outlays being equal, the enterprise with greater labor absorption yields less output per worker employed in it than the enterprise with less labor absorption" (i.e., higher labor absorption is accompanied by lower labor productivity). If the concept of labor absorption is taken as the criterion in this second combination, one can defend the expediency of investing large amounts of capital in the repair and renovation of technologically backward enterprises, as opposed to building modern plants, which are said to threaten the proletariat with increased unemployment by unduly heightening the productivity of labor. We cannot for one moment accept this formulation of the problem. To maintain obsolete equipment, by dint of considerable outlays on its reproduction, in an unchanged or almost unchanged state over a period of many years is outright negation of planned reconstruction, the plainest testimonium paupertatis of the planning principle. As we have already noted, under the Soviet system, the expansion of the physical volume of output to the same extent as the growth in labor productivity cannot run up against the limitation of the internal market. Hence an increase in unemployment as the effect of technological progress is by no means an economic inevitability in our country, and if it is all the same observable, this only attests our organizational inexpertness, which hardly merits perpetuation in our general plan.

Thus the criterion of labor absorption cannot overshadow the main criterion of reconstruction: the rise of the level of productive forces. Only if it enjoys equality with this primary index does the index of labor absorption take on its regulative significance.

Special mention should be made of the case where the technological improvement of operations in production, even though it raises the productivity of labor, is from the capitalist point of view unprofitable, since it requires more highly paid labor. The criterion of private enterprise profitability is surely not binding for us. The watchword of our reconstruction is: high intensity and productivity of labor, with high wages and a short working day. However, we can conceive of a situation where not only from the private enterprise viewpoint but from that of the

national economy as well "profitability" takes on decisive importance in the choice between types of reconstruction projects. This happens when, by tapping reservoirs of low-paid labor, we can with insignificant capital outlays launch full-scale reconstruction projects of the kind which are an indispensable prerequisite for raising the level of productive forces in a whole district or in an important branch of the national economy. The classical example is the earthwork that goes with roadbuilding or with the building of hydroelectric power installations. If this work is done manually by the surplus manpower of the villages, and at the rate of pay prevailing on the "free" peasant market, it will cost very little and can be organized on quite a broad footing. If, however, workers were paid at the rates of the construction workers' union, the wages (including all the extras) would be three or four times as high as for "free-market" labor. This would so increase the cost of the work that it would pay instead to order power shovels from abroad and put them to work. The possibilities of acquiring them, however, are highly circumscribed by the meagerness of our foreign currency resources. Thus, if labor is highly paid and mechanized, the kind of projects (for example, local road building) that absolutely must be accomplished on a broad scale if the most elementary prerequisites are to be created for the normal development of extensive and thickly populated areas, will have to be pared down to a minimum. In this case, from the standpoint not of an entrepreneur, but first and foremost of the given district's working masses, who figure simultaneously as manpower and as users of the product, projects of the former type are incomparably more "profitable" than projects of the latter type.

The whole preceding argument is pervaded with the idea that the reconstruction plan must be based on the economic districting of the USSR economy. The fundamental task of the plan with respect to the framework of production is to achieve a carefully worked out system for the social division of labor, in terms both of rational differentiation of the Soviet economy by industries and of rational distribution of these industries over the country's territory. The tendency being shown by some district officials to interpret "industrialization of the districts" as meaning that the greatest possible number of industries should be established in each district, must be fundamentally repudiated. So universal a program would lead not to the vigorous growth but to the paralysis and decay of the productive forces in the economy of the USSR in general and of each district in particular. Real

industrialization of the Soviet Union is possible only on condition that all the efforts of local management personnel and of the local population are centered on developing that special function in the social division of labor which falls to the given district by virtue of its geographic, geophysical, demographic, and other qualifications. This basic function makes the district an indispensable and irreplaceable organ of the national economic organism, and all trades and enterprises of local importance should be rationally combined around this function. This is the only thing the idea of "district combines," which is popular with us, can possibly mean.

Even the above schematic description of a rational procedure for reconstruction work makes it clear that a long-range plan can be framed with some degree of soundness only if we have for each branch of the national economy not merely general assumptions on the extent of financing needed for the reconstruction and on the coefficients of productivity growth, prime-cost reduction, etc., which the "experts" say can be anticipated from that financing, but also an amply concrete and detailed plan for the reconstruction and construction processes in the performance, so to speak. We must know just what will be built, just where, and just how. We are not, of course, concerned here with blueprints but with data on the sizes and types of the new installations. It is equally essential to know within what periods of time the existing enterprises will be scrapped or reshaped on a new technological base (for example, our technologically backward all-purpose metallurgical plants, to be transformed into specialized modern enterprises turning out standardized products). Only on the basis of such concrete data can we critically gauge the probable rate at which labor efficiency will grow, the manpower that will be required for production, improvements that will be needed in the workers' skills, and many other elements without which long-range planning is void of any material substance. Naturally, the planning agencies alone cannot cope with this problem. The cooperation of government departments must be enlisted. We wish to point out that this necessity has long been recognized. Thus far, however, despite repeated inquiries from the Gosplan and the Council of Labor and Defense, we possess no departmental information that is at all explicit about the scope, the type, and the efficiency of construction, not only construction that is still in the planning stage, but construction that has already been accomplished over the past few years....

E. A. Preobrazhenskii

ON PRIMARY SOCIALIST ACCUMULATION

...In order that capitalist accumulation might begin, the following preconditions were essential: (1) the preliminary amassment in particular hands of sufficient capital for a more advanced technique or higher stage of the division of labor to be adopted with the same equipment; (2) the existence of a contingent of trained hired workers; (3) adequate development in general of a market economy system as the base for capitalist commodity production and for accumulation.

Respecting the first of these requisites, Marx says: "By reason of commodity production, production on a large scale can develop only in the capitalist form. A certain accumulation of capital in the hands of individual commodity producers is therefore a prerequisite for modern industry, for that combination of technique and social relations which we call a special, capitalist type of production or specifically the capitalist mode of production. We must thus posit the existence of such accumulation when the transition is made from handicraft to capitalist production. It may be termed primary accumulation, because it is not the historic result but the historic basis of what is specifically capitalist production. Here there is as yet no need for us to explore the way in which it itself originates. Suffice it that it forms the point of departure."[1]

The question arises as to how matters stand in this regard where primary socialist accumulation is concerned. Does socialism have its prehistory? If so, when does it start?

As we have already seen, primary capitalist accumulation could occur on the basis of feudalism, whereas primary socialist accumulation cannot occur on the basis of capitalism. Accordingly, if socialism has its prehistory, that prehistory can commence only after the conquest of power by the proletariat. Nationalization of large-scale industry actually constitutes the first act of

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Novaia ekonomika: Opyt teoreticheskogo analiza sovetskogo khoziaistva (New economics: Attempt at a theoretical analysis of the Soviet economy). Vol. I, Part I. Moscow, Komakadizdat, 1926. Excerpts from pp. 89-94, 98-102, 105-109, 110-125, 133-137, 162.

1. Capital, translation by Stepanov, Vol. I, Part I, p. 640.

socialist accumulation. It is this act which centers in the state's hands the minimal resources necessary for organizing the socialist control of industry. But here we instantly run up against another side of the question. By the mere act of socializing large-scale production, the proletarian state from the outset changes the system of ownership of the tools of production, gearing that system to its future moves in the socialist revamping of the economy as a whole. In other words, the working class acquires through revolution only what capitalism had in the institution of private ownership without any revolutions, even on the basis of feudalism.[2] Primary socialist accumulation, as the period in which the material preconditions are created for socialist production proper, does not begin until the seizure of power and nationalization.

Here is the picture. Capitalist accumulation is accumulation on the basis of a mode of production which differs, economically and technically, from handicraft. The capitalist manufactory was able to demonstrate its advantage over handicraft only to the extent to which it proved economically superior, since the large-scale, as opposed to small-scale, production made possible the fabrication of a unit of output with smaller outlays than in handicraft. But the organization of the manufactory, the construction of the building, the stocks of raw materials, and the expenditure of working capital over the span of the circulation process—all these things, in the absence of the modern system for providing industry with financial credit, necessitated the availability of substantial resources, created not in manufacturing but prior to manufacturing, in small-scale production, and looted from small-scale production by commercial capital. Capital which has been accumulated in advance is even more essential for large-scale machine industry to begin operations. Consequently, for capitalist production to have been able to show its advantage, in the technical and economic sense, over handicraft production, a period of prolonged depredation of small-scale production was necessary.

Similarly, socialist accumulation too, in the authentic meaning of the term—accumulation on the technological and economic basis of a socialist economy which is already displaying all the hallmarks proper to it and the advantages proper to it alone—can

2. I ignore here the curbs on the institution of private ownership in the period of feudalism. Basically private ownership did exist at the time, despite these infringements.

begin only after the Soviet economy shall have traversed the stage of primary accumulation. Just as it takes a certain minimum wherewithal saved up in advance in the form of natural elements of production for the functioning of manufactories, let alone factories with machine technology, so a certain minimum is essential for the complex of the state economy to be able to exploit all its economic advantages and establish a new technical base as its underpinning.

Here we promptly come across another momentous fundamental structural distinction between capitalism and socialism, to which we shall later return when analyzing the circumstances under which the socialist and capitalist forms of economy compete. For manufacturing to be able to prove its advantage over handicraft, it is quite unnecessary that a tremendous number of manufactories be organized at once. Just one or two, or five, of them can show its advantage over handicraft and trounce it in the competitive race. Consequently, the amount of primary capital accumulated, too, in comparison with the scale of the entire national economy taken en bloc, could be very small. A few enterprises which made up the advanced shock group on the economic front and represented the new economic system could begin pushing forward without waiting for the entire transition to be of a mass and simultaneous character. And though concretely, historically, primary accumulation had made such headway during the period when commercial capital was developing that by the time the manufactories were organized there was no acute shortage of free capital, the whole movement nevertheless bore an unorganized and spontaneous character. Later on, this method of propelling the new form forward also made practicable the export of capital. Capitalist enterprises were able to come into being in petty bourgeois countries where neither the technical nor the economic prerequisites existed for the new mode of production, or where all this existed in potential and a push was required from the outside, from progressive foreign capital.[3]

Conversely, no partial socialist accumulation of insignificant dimensions is capable of solving the basic problem of organizing

3. We shall see below that whereas the export of capital is made possible by the very structure of capitalism and the method whereby small-scale production is rendered subservient to capitalism, the socialist pattern can spread only through the export of proletarian revolutions.

a socialist economy. Specifically, insofar as the economy of the Soviet Union is in question, needed here are: (1) accumulation which enables the state economy to attain to the contemporary level of capitalist technology in areas where the gradual transition to a new technological base is impossible; (2) accumulation which makes it possible to change the technological base of the state economy, to organize labor scientifically, and to administer the whole complex of the state economy in planned fashion, which is impossible without large emergency stocks and planned reserves; (3) accumulation which ensures progression for the entire complex and not just for its separate parts, because the chainlike dependence in the movement of the entire complex altogether precludes uncoordinated forward movement after the method of capitalist planlessness, individual initiative, and competition. We thus establish that not only is the period of primary socialist accumulation not completed by the nationalization of what was accumulated by capitalism but that, on the contrary, it can get into full swing only after the conquest of power by the proletariat and after the first act of accumulation—the socialization of the most important branches of the economy. But if this is the case, can one speak at all of primary socialist accumulation? Is it correct to speak of it at all?[4] Is there any analogy with primary capitalist accumulation? After all, the latter began before capitalist production. Is the former to occur at the same time that the transition to socialist production is initiated and simultaneously with accumulation in the socialist complex itself? We think this term may be kept in a relative sense, because, although primary socialist accumulation is chronologically intertwined with socialist production and partly with socialist accumulation on the basis of production, the economic essence of this process in relation to socialist production is nevertheless the same as that of primary capitalist accumulation in relation to capitalist production.[5] And even if this term were to be judged inapt, it would have to be replaced forthwith by another, because

4. The term "primary socialist accumulation" comes from one of our most eminent economists, Comrade V. M. Smirnov. We do not especially insist on the term. It may be supplanted by the term "preliminary socialist accumulation," which we sometimes employ to mean the same thing.

5. Nor should it be forgotten that though primary capitalist accumulation on the basis of commercial capitalism precedes capitalist production, the primary-accumulation period as a whole does, however, take in the initial period in the development of capitalist industry.

the material substance of what it denotes does not cease to exist. On the contrary, the differentiation of primary socialist accumulation from socialist accumulation proper is of vast and fundamental significance. We shall see below that this differentiation has enormous importance for our economic policy, and to confuse these two processes entails the most egregious mistakes in the practical direction of the economy.

We call socialist accumulation the addition to the functioning means of production of the surplus products which are created within the established socialist economy and which do not go for supplementary distribution among the instrumentalities of socialist production or of the socialist state but serve for expanded reproduction. Conversely, we call primary socialist accumulation the accumulation of material resources in the hands of the state—primarily, or at the same time, from sources lying outside the complex of the state economy. In a backward peasant country this accumulation is due to play a prodigiously important role, enormously accelerating the advent of the day when the technical and scientific reshaping of the state economy begins and when that economy at long last gains the purely economic ascendancy over capitalism. True, in this period the state economy also accumulates capital on the basis of its own production. In the first place, however, this accumulation too bears the character of preliminary accumulation of means for a genuinely socialist economy and is subservient to that end, and in the second place, accumulation by the first method, i.e., at the expense of the nonstate sector, on the basis of nonequivalent exchange with it, is patently overriding in this period. We should therefore call this entire stage the period of primary or preliminary socialist accumulation. The basic law of our Soviet economy, which is passing through this stage at the present moment, happens to be this law of primary or preliminary socialist accumulation. All the main processes of economic life within the compass of the state economy are subject to this law. On the other hand, this law alters and in part vitiates the law of value and all the laws of a commodity and commodity-capitalist economy, insofar as they manifest themselves and may yet manifest themselves in our system of economy. Consequently, not only may we speak of primary socialist accumulation, but we shall be unable to grasp anything of the essence of the Soviet economy unless we are alive to the pivotal role played in that economy by the law of primary socialist accumulation, which, in the struggle with the law of value, determines the distribution

of means of production in the economy, the distribution of manpower, and the extent to which the country's surplus products are alienated for expanded socialist reproduction.

...In the period of primary socialist accumulation the state economy cannot get along without alienating part of the surplus products of the countryside and of handicraft, without, in short, deductions from capitalist accumulation for the benefit of socialist accumulation. We do not know in what state of devastation other countries in which the dictatorship of the proletariat triumphs will find themselves when they emerge from civil war. But a country such as the USSR, with its ravaged and, in general, retarded economy, will have to pass through a period of primary accumulation, drawing very liberally upon presocialist forms of enterprise as sources. It must not be forgotten that when the civil war is over the period of primary socialist accumulation is the most critical period in the life of the socialist state. In this period the socialist system is not yet in a position to develop all its organically inherent advantages, but at the same time it is bound to nullify a number of the economic advantages inherent in a well-developed capitalist system. It is a matter of life and death for the socialist state to traverse this period as quickly as possible, and as soon as possible arrive at the point where the socialist system unfolds all of its natural advantages over capitalism. At least this is now the issue for the USSR and will perhaps for a time confront a number of European countries in which the proletariat will have been victorious. In these circumstances to bank solely on accumulation within the socialist domain is to gamble with the socialist economy's very existence, or interminably prolong the period of primary accumulation, and that, moreover, does not depend upon the pleasure of the proletariat. In the part of this work which is devoted to concrete matters, to the industry and agriculture of the USSR, we shall cite some numerical estimates of how long we should be obliged to wait for our industry to be restored even to prewar proportions if we relied in this matter only on the surplus products of industry itself. At all events the notion that the socialist economy can develop on its own, without touching the resources of the petty bourgeois, including the peasant, economy, is assuredly reactionary petty bourgeois utopianism. This is a case where it behooves the socialist state to take more, not less, from the small-scale producers than capitalism took—from the even greater income which will be assured the small producer by the

rationalization of the country's entire economy, including small-scale enterprise, on the basis of industrialization and of the intensification of agriculture.

Taxation on private capitalist profit, i.e., systematic deductions from capitalist accumulation, may be another source of socialist accumulation. Resources of this sort may vary in nature, but it goes without saying that in the final analysis what is involved here too is accumulation which comes out of the labor of the workers, on the one hand, and of the peasants on the other. When the state collects big taxes from private capitalist enterprises, it puts back into the socialist accumulation fund part of the surplus value which would have accrued to the state as surplus products if, all other things being equal, it were the state itself which were running the given enterprises. Here the capitalists perform the same role vis-à-vis the socialist state as was performed by the feudal landowners vis-à-vis the knights of primary accumulation. By the same token taxation of the class of village kulaks employing hired labor means in the final count accumulation which comes out of the labor of hired farm hands. Conversely, to the extent that the socialist state taxes tradesmen, buyers-for-resale, capitalists, and kulaks, who also derive part of their income from the peasantry engaged in independent farming, here too we shall have accumulation at the expense of the peasant household; the aforementioned personages will represent vehicles of capitalist accumulation on the one hand, and on the other an intermediate stage at one of the poles of socialist accumulation.[6]

The role of state loans, which have served as a most important channel for primary capitalist accumulation, is different in the period of socialist accumulation. Here a distinction must be drawn between two fundamentally different systems of loans. Our semicompulsory loans, such as the first and second lottery loans, must be considered part of the system of accumulation out of tax sources, i.e., accumulation using methods of extra-economic pressure. Credit operations of the normal loan type, which are the practice in the bourgeois system, are an altogether different proposition. Such loans, say a 30-year loan at 7 per cent from British capitalists, cannot be regarded as one of the direct sources of socialist accumulation, because the Soviet state will be paying interest on the loan out of its income

6. As the context makes clear, for brevity's sake I refer from here on to socialist accumulation, instead of primary socialist accumulation.

and will thus itself be an intermediate stage of capitalist accumulation and an intermediary in the capitalist exploitation of the toiling masses of the Soviet Union by the foreign bourgeoisie. But these loans may on the other hand serve as a most potent stimulus to socialist accumulation, resulting in greater interest accruing to the socialist accumulation fund than to the capitalist. We shall touch upon loans of this type in another context, when we come to analyze the economic significance of foreign loans and concessions under a socialist commodity economy.

Before we move on to the forms taken by primary accumulation on an economic basis, we have yet to mention a source of state income, and ipso facto a source of primary accumulation under the Soviet system, which should more properly be reckoned among taxes but which outwardly, formally, has not normally been considered such in the theoretical literature of economics. I refer to the emission of banknotes. In my pamphlets "Paper Money in the Era of the Proletarian Dictatorship" and "Reasons for the Drop in the Exchange Value of Our Ruble" I showed that under a system where the rate of exchange is dropping, emissions are a form of taxes. At this point I want merely to state that emissions are also a method of primary accumulation. In the corresponding period in the history of the bourgeois economic system, emission did not play the role of an ancillary factor of primary accumulation. The debasement of the coinage, in which the feudal princes and our tsars engaged, and the issuance of paper money in the ensuing period constituted state taxes on the entire populace, which, in a measure, meant taxes on the monetary capital of the bourgeoisie as well. But when the state is at once the agency of national administration and the proprietor of a mammoth economic complex, emission serves plainly and simply as a channel for socialist accumulation. This accumulation comes either out of the income of petty bourgeois and capitalist elements, or out of a reduction in the emoluments of industrial, office, and professional workers.

...The difference between the period of preliminary socialist accumulation and the period of primary capitalist accumulation is, first of all, that socialist accumulation must come not merely out of the surplus products of small-scale production, but also out of the surplus value of capitalist forms of enterprise. In the second place, the difference derives from the fact that the state economy of the proletariat comes in historically on monopoly

capitalism's back and consequently has at its command means of regulating the total economy, and economic ways of redistributing the national income, such as were inaccessible to capitalism in its infancy.

Let us start with railroad tariffs. This mighty lever of economic regulation, wholly in the hands of the Soviet state, has been employed precious little in the interest of such regulation and not at all as a tool of primary socialist accumulation. The system of reduced tariffs for certain freight (coal, oil, salt) is for the time being rather a means of redistributing state resources than an indirect assessment on the nonsocialist preserve of the economy. Similarly, those few privileges enjoyed by state and cooperative, as compared with private, shippers are for the time being of negligible importance. The use of this lever of primary accumulation is still wholly a thing of the future. Only when transport has ceased to operate at a loss and become profitable will it be possible, by structuring railroad tariffs appropriately on the basis of the differentiation of state from private freight, to levy a systematic assessment on private producers and merchants and from that end dock part of private capital's profit. It should be plain to see, furthermore, that all this will constitute one of those blows at the law of value which make the economic system of the period of socialist accumulation a time of gradual alteration, limitation, and to some extent nullification of that law.[7]

The second mighty lever of primary accumulation is the monopoly of the banking system. In the period of primary capitalist accumulation usury is a device for redistributing national income from the hands of the feudal lords to those of a bourgeoisie on the rise and gaining strength. Credit, as a tool for mobilizing society's uncommitted funds and distributing them through the channels of expanded reproduction, was either lacking in this period, or existed only in the germinal state. Conversely, in the period of preliminary socialist accumulation which the economy of the USSR is going through—at its first stages, that is—

7. Here, as in the entire exposition to come, I refer to the law of value as the spontaneous regulator under the commodity and commodity-capitalist system of production, and not to regulation of the economy proceeding from labor expenditures irrespective of the historically transient form of that regulation in an exchange society. Such regulation will obtain under a planned society too, but will be exercised otherwise, i.e., on the basis of the direct calculation of working time.

the state's credit system has greater effect in the redistribution of the country's uncommitted funds than in the redistribution of national income. This may seem untrue, since the interest exacted by the bank on loans (apart from the period of rapid decline in the rate of exchange) is tremendous when compared with normal capitalist rates, while depositing is rather negligible. But at the same time we must not for a single moment forget the real economic source which makes practicable the emission of ruble notes and the bank's loan operations with that emission as their source. If the bank issues 60 million in ten-ruble notes without causing the rate of exchange to fluctuate, the economic implication is that national commodity assets worth that amount have, through certain channels and at various times, become available to the State Bank. If one considers that this "loan from circulation" is apportioned between the state sector and the private sector proportionally, say, to the extent to which each of them participates in the country's commodity circulation in money terms, whereas the money from this loan goes to finance state and cooperative industry and trade almost exclusively, then we have here the process of socialist accumulation proceeding with great rapidity....

As for the redistribution of the national income through the medium of the credit system, the main developments are yet to come. If the State Bank takes a high interest from state enterprises obtaining long- or short-term loans, what we are seeing is not the process of accumulation in the state sector but primarily the process whereby funds are routed within it. Redistribution from the private economy to the socialist sector can take place directly only when the funds belonging to the private economy and accumulated by the banking system through the intake of deposits are distributed within that same private economy on the basis of loans bearing a higher interest, and the difference between the sum total of what the bank pays out on deposits and what it takes in as loan interest and other forms of remuneration for its services accrues to the socialist accumulation fund. We shall have the same situation if state moneys are loaned on interest through the extension of credit to the private economy. However, given the general deficiency of capital in the country and above all in the state sector, this last operation, while continuing in a formal sense to be a source of accumulation, is at present plainly disadvantageous because at the present stage it turns into an obvious tool for capitalist accumulation out of state credit. This operation can take place only if provision is

made for it through the more profitable transaction of extending credit to state enterprises, because this last process guarantees not only banking interest but the accumulation of capital in the state enterprises on the basis of production. Under these circumstances, to extend credit to private trade and industry, thus yielding the bank, say, 10 per cent interest annually, is less advantageous than to provide credit to state industry, which may pay the bank, say, 8 per cent for the loaned capital, but on the basis of production is itself the recipient of 15 per cent on the loaned capital. In this case for the State Bank as such it is more rewarding to provide credit for private industry and trade, whereas from the standpoint of the state complex as a whole and of socialist accumulation throughout that complex, and not just in its State Bank precinct, such an operation is plainly unprofitable. This explains why the State Bank is presently extending next to no credit to private trade and industry notwithstanding their readiness to pay more than the state enterprises, and is extending credit almost exclusively to the latter. From the point of view of the tasks involved in socialist accumulation, this is the only correct policy.

But in the future the situation in this area is due to change, and there may come a time when the provision of credit to the private economy will become one of the paramount tools for redistributing the national income in the interest of the state economy and one of the key devices for rendering it economically subservient to the regulating centers of the state economy. The credit system of the USSR can play an especially large role in this respect, granted the development of long-term agricultural credit—specifically, if we can manage to negotiate large loans abroad and the State Bank acts as the distributor of these loans in pouring foreign funds into the economic organism of the USSR.

From what has been said we see, therefore, that our whole credit policy is at the present time ancillary to the law of primary socialist accumulation, and cannot be otherwise.

...Here we must distinguish: (1) exchange within the purview of the state economy itself; (2) exchange within the private economy; (3) exchange between the state and the private sectors of the economy.

Where the first category is concerned, needless to say, there can be no positive tasks here for socialist accumulation. The economics of exchange resolves itself here into the economics

which prevail under a system of exchange, into the trimming of costs in the distribution process. These costs represent an outright deduction from the surplus product of the state economy, and in the event that private middlemen are involved in the exchange between state enterprises, the net effect is not only a deduction from the socialist accumulation fund but an addition to the fund of "secondary" capitalist accumulation. As the gods of Epicurus nestled in the pores of the universe, so private middlemen sought, in the initial period of the state trusts' emergence into the free market, to accommodate themselves not only in the channels of private trade but in the pores and interstices separating one state enterprise from another, and there they collected the "costs of distribution." The rationalization of state trade spells the systematic ousting of these leeches of capitalist accumulation from the socialist sector and not only leads to reduced costs for the state economy in the process of distribution but to the organization of distribution itself through the state economy's own powers.

Insofar as the second category is concerned, i.e., exchange within the private economy, here socialist accumulation is, on the contrary, practicable. We have already referred to the extra-economic method of accumulation from this source, i.e., taxes on trade in the output of the private sector. Accumulation of another description, i.e., on the basis of commercial exchange, is not only possible but is even now in a measure occurring and will doubtless grow.[8] As an example of such accumulation one may take the purchase from the peasants of grain and of foodstuffs in general by the All-Union Company for Trade in Grain and Farm Produce and their sale to private consumers in the city markets. The commercial profit thus derived is to all intents and purposes a deduction from the income of producers selling their commodities to the state agency for disposal. When the state trading agencies and the cooperatives sell to private consumers the output not only of peasants, but of handicraftsmen, artisans, and private entrepreneurs, and in the process derive a profit, this part of the profit of state trading and of the cooperatives constitutes the source of socialist accumulation which we are considering. From the standpoint of socialist accumulation the contest waged in this sector of exchange by cooperatives and state trade against private trade has positive, not negative,

8. The increase in rail tariffs on the loadings of private capital which are disposed of within the private sector falls into the category of accumulation from this source.

purposes. What is taking place here (thus far in small measure, unfortunately) is accumulation out of the fund of one system of economy for the benefit of the other. All other things being equal, what is wrested from private trade will to some extent or other be gained for the fund of the state economy. I say "all other things being equal," because it is conceivable to have a trade policy which would further not socialist accumulation but the interests of the petty bourgeois producers, aiming at the trimming of deductions from their proceeds. Whether or not such a policy is expedient hinges on which, at the moment, is more important for the state economy—to lower the prices of goods on the market and edge out private capital or to accumulate capital in the sphere of distribution. Economically such a policy can, under certain conditions, unquestionably mean a reduction in the socialist accumulation fund and a boon to private production—a boon which is the harder on the state economy the poorer that economy is in capital and the less advantageous it is for it to tie up in trade part of the capital of which there is a deficiency in production itself, instead of intensifying the mobilization of the small producers' own funds for the development of cooperative turnover. At the present stage of its development, though, state trade manages its affairs less well than private trade and for the time being its most pressing problem is to cut costs, at least to the level of private trade. But it is important for us here that we formulate the entire problem in correct theoretical terms because we are concerned not with the policy of the moment but with understanding fundamental processes throughout the whole span of socialist development. Further on we shall see what enormous difficulties stand in the way of state trade in its efforts to compete with private capital and how these difficulties turn on the basic problems of socialist development in general. Here we should only observe that on account of the country's dire poverty in capital and with commodity circulation developing at a pretty rapid pace, commercial profit is attaining vast proportions, proportions reminiscent of the situation in the period of primary capitalist accumulation. In these circumstances this sector of accumulation is assuming towering importance: here the gains of private capital constitute a very powerful drag on the influx into the socialist accumulation fund of funds from the petty bourgeois milieu and are eating up part of the surplus product of the state economy itself.

The third category, i.e., exchange between the state economy and the private, represents a point where socialist accumulation

faces purely negative tasks, as in the case of exchange within the state economy's own purview, as well as positive tasks, i.e., to nurture the state economy at the expense of the nonsocialist milieu. Looking at it this way, we should deal with the disposal of state industry's output outside the socialist sector separately from the disposal of the private economy's output inside the state sector.

Let us start with the first process, i.e., the movement of the mass of state industry's commodities into the nonsocialist environment. From the standpoint of socialist accumulation the objectives here are negative both where the state economy is bent on cutting the distribution costs of its own agencies, i.e., simply engaging in trade with the very least outlays on the machinery of trade, and where it is a matter of forcing private trade off the road followed by the commodities of the trusts as they move from the factory to the ultimate link, i.e., the consumer.

As for the first of these objectives, the point here is to improve organization within the set-up of the state economy itself. The second objective is far more important, because it is tied in with the struggle between the two inimical systems for the surplus product of the state economy. Here we come close to finding the enemy in our own house. It is essential to note here the fundamental difference which exists between the interrelations of commercial and industrial capital in the period of primary capitalist accumulation, on the one hand, and the interrelations of private commercial capital and state industry in the period of primary socialist accumulation on the other. If, in the era of capitalist accumulation, commercial capital appropriates from private industrial capital more of the surplus value created in industry, this is simply a matter of a different distribution of surplus value within one and the same economic system. What commercial capital has today accumulated in excess from the surplus value of industry is tomorrow returned to industry; the process whereby the redundant capital of commerce passes to industry is a continuous one, occurring from the very inception of capitalist production. It is quite a different story when the bulk of industry is in one system while the machinery of trade belongs to another system which is hostile, as in the case under scrutiny. Then the accumulation of private commercial capital is an outright and irrecoverable deduction from the surplus product created by the workers in state industry. If we assume that the total worth of the new commodity assets created in state industry

in a year, and being turned over in trade, comes to one billion when sold by the trusts wholesale, while this mass of commodities is sold at retail for 1.5 billion, then 500 million is an outright deduction from industry's surplus product for the benefit of the machinery of trade. If four-fifths, or 400 million is appropriated by the private machinery of trade, then that machinery becomes a most perilous breach at the very source of socialist accumulation, and not just of accumulation but even of simple reproduction in the system of state economy. What is happening here is the expropriation by private capital not of the surplus product of small-scale production, on the basis of which capitalism develops historically and which it never thereafter ceases to exploit, but the expropriation of the surplus product of socialist industry—a phenomenon new to economic history. The struggle with private capital in this area is for the state economy a battle against the plundering of assets which it has itself created. It is perfectly proper that the contest with private capital be shifted to this very area, just as it is perfectly proper to be eager to move on from accomplishment of easier tasks to harder ones, i.e., to start by first of all gaining control of wholesale and wholesale-retail trade in the products of state industry.

In the matter, therefore, of gaining mastery over the process through which its own products are exchanged, the state economy seeks to accomplish for itself a task of a negative character, i.e., to keep from private capital what essentially belongs to the socialist sector itself—in its own fund, created on its own productive basis.

An altogether different picture obtains with respect to the process whereby assets move from the private economy into the sphere of the state economy. Here the contest between the state trading agencies and private capital is in large part a struggle for the surplus products of the private economy. When, for example, it is private capital that effects the procurement of raw materials for industry on the peasant market and the entire route from the raw material producer to the trust is sectioned off to private middlemen, the difference between the price at which the materials are purchased from the peasant and the price at which they are sold to the trust represents in the main a deduction from the earnings of the peasant household. If, on the other hand, we assume that the state agencies do their own raw material procurement, then everything deducted from the income of the peasantry accrues to the state sector of the

economy. At this stage of primary socialist accumulation it is both technically more difficult and of less importance to combat private capital than it is to combat the plundering of the state economy's own surplus products by private capital. On the other hand, if this latter struggle were successful, i.e., if private capital were driven out of trade in the output of state industry, this would doubtless lend impetus to the shift of private capital into private industry—a process which, given the rapid growth of the state economy, is by and large economically advantageous, and is not dangerous.

...Let us move on now to foreign trade and the system of socialist protectionism (Comrade Trotsky's term). The foreign trade monopoly is an institution of surpassing importance in the whole socialist economic system. First of all it is itself one of the instrumentalities of socialist accumulation. In the second place, it is one of the most important agencies for safeguarding the accumulation process itself, in all its guises and forms, and by virtue thereof is one of the most important leverages with which to combat the law of value of the world capitalist economy. Thirdly, this institution is one of the most important tools for regulating the entire economy of the Soviet Union.

We shall in this instance dwell on the foreign trade monopoly only as a tool of socialist accumulation.

As agriculture's marketable yield increases and as commercial ties develop between the economy of the USSR and the world economy, exports grow in extent. In the sum total of exports the output of our industry figured less importantly before the war than did farm products, and with the recovery of agriculture one should expect a very considerable expansion in the export of farm products as compared with what it is now, if not the restoration of the old proportions in the breakdown of exported commodities. All of this means augmented possibilities for socialist accumulation out of the peasant household's income. The more products the countryside exports, the greater its economic dependence upon the agency which links the peasant's farm with the external market. The foreign trade monopoly not only makes small-scale production dependent upon the state for the disposal of surpluses, but is an important instrument for deriving additional profit on the external market. There are spheres of world trade in which the state economy of the USSR is well-nigh a monopolist. Suffice it to mention trade in platinum and furs, to some extent flax, etc. True, the state monopoly over

commerce in exported goods still does not by any means signify that the full difference between the internal and external market prices ends up in the hands of the People's Commissariat of Foreign Trade. The State Forestry Trust of the Northern White Sea District may, for instance, by disposing of timber without middlemen, end up in possession of its total surplus product, but not nearly always does the state move export goods through all the stages as they are forwarded to the foreign market. If, for example, grain is purchased directly from the peasants by The All-Union Company for Trade in Grain and Farm Produce and sold abroad by the People's Commissariat of Foreign Trade, the full difference between the purchase price and the selling price passes through the state's hands. Conversely, where procurements are made through representatives of private capital and particularly when the state trading agencies buy up goods for export from private wholesalers, the state's commercial profit is very heavily pared down in favor of private capital. On the other hand, even when the export products are procured and moved by the state trading agencies themselves, it by no means signifies that the People's Commissariat of Foreign Trade is in the given instance the recipient of the maximum profit. With our utterly wretched and costly mechanism of exchange, the total difference (which percentagewise is often tremendous) between the purchase prices and the sales prices in the foreign market in almost every case goes entirely into overhead costs, the net profit equaling zero. But not nearly always does socialist accumulation, especially in the initial phase of that accumulation, mean an increase in industry's production capital. The establishment of a network of agencies for the trade we have been discussing as well as the construction of all the facilities required as a minimum for catering to the needs of the state economy and ensuring that private capital is forced out of the key positions in the economic struggle—this, too, is in itself socialist accumulation, only in a different form. As we shall see below, the narrowly commercial view of all the processes within the state economy, a view induced by observation of the ways of private capital, militates most powerfully against an understanding of the very essence of the socialist form of economy at its initial stages and, in practical terms, often leads one totally astray. Because of the imperfection of this or that mechanism people frequently fail to perceive the tremendous importance of that mechanism in the system of state economy as a whole. In this particular case the

extremely unprofitable nature—from the commercial standpoint—of a number of our state trading agencies argues the need to rationalize this operation, not to replace these agencies with "more profitable" private ones. They are more profitable if the disadvantages of socialism at the opening stage are viewed from the standpoint of capitalism, instead of the "advantages" of capitalism (among which depressions, wars, etc. must needs be listed) being appraised from the socialist standpoint even when, in a particular area, the capitalist form has the edge.[9]

In the preceding analysis we took as our starting point the assumption that the prices on the products of state industry represent a given magnitude. Now we must take up the extremely important question of the role which price policy plays in socialist accumulation. We shall here survey, first, the policy of prices on exported goods, i.e., the principles of our customs policy and its results, and second, the price policy of our trusts and state agencies in general.

Let us begin with the customs policy. We refer here to customs duties on imported goods, because the assessment on commodities exported by state agencies and by the Commissariat of Foreign Trade represents not a new source of accumulation but merely another way of distributing aggregate trade profit or trade-turnover proceeds among the various state agencies (between the People's Commissariat of Finance, for instance, and the Supreme Economic Council with its trusts).[10] The USSR's customs policy, with its well-nigh prohibitive rates on the products of foreign light industry and its high duties on products of the machine-building industry, represents a stout barrier

9. Annotation to the 2nd edition [of Preobrazhenskii's book]. I am not referring, in this connection, to another most important aspect of the matter, namely, that commercially unprofitable exports may be highly profitable from the standpoint of the state economy as a whole if the foreign exchange acquired with these exports goes for the importation of machines for industry, machines which for the time being are much more costly to manufacture in our country than abroad.

10. We have already pointed out above that the trading apparatus' income and its profit are entirely different things. Income is calculated from the standpoint of the whole national economy, while profit is gross income minus the expenses of the trading apparatus. The apparatus should enjoy an income, i.e., make deductions from the national income, irrespective of whether it shows a profit or a loss.

guarding the country's domestic trade turnover from the workings of the world law of value and keeping our socialist industry, puny when it comes to capital and retarded when it comes to technology, from going down under the buffeting of foreign competition. We shall consider this role played by Soviet protectionism, as well as the role of the foreign trade monopoly, when we come to analyze the clash between the law of socialist accumulation and the laws of value. In this instance, we merely refer to the customs policy as a source of socialist accumulation.

The USSR's customs receipts break down into two distinct categories which are of differing significance from the standpoint of accumulation. The customs receipts from the assessment on the means and tools of production imported for equipping state industry are in no wise an instrument of accumulation. Indeed not. If, say, the textile syndicate makes purchases in Britain of new machines worth 30 million rubles for textile factories and pays 10 million in duties, we are confronted merely with a simple redistribution between the textile industry and the People's Commissariat of Finance of what are still state funds. If there were no duties whatsoever on textile machinery, or if they were turned back to the textile syndicate, the sum total of the state's funds would not change by a single kopeck. The objection may be heard, it is true, that if the cost of equipment for the textile industry increases this will cause the trusts to raise their depreciation rates and, accordingly, boost the sales prices on their articles. But this demurrer is spurious, because in the given instance the textile syndicate is merely a pump of the People's Commissariat of Finance, sucking the sum of 10 million rubles from the consumers, and for the substance of the case it is a matter of complete indifference whether the syndicate extracts this sum by boosting sales prices to meet additional costs of wear and tear or simply raises these prices so that it may pass them on to the People's Commissariat of Finance as profit from state enterprises, and imports 30 million rubles' worth of equipment duty free. Which is technically more convenient is another matter, and that is just what the question boils down to. With the prices given and all other things being equal, the accumulation fund of the textile industry, as that of any other, is a constant magnitude. If customs duties fall on part of that industry's fund and are not shifted to the consumers, this constitutes redistribution of one and the same fund within the state bailiwick. If a price increase occurs, a fund increase occurs too, but does so in consequence of the price increase

and not of customs policy. The possible extent of that increase is determined by a number of concomitant economic circumstances and not by the magnitude of the customs assessment rates. And whether it is a good idea altogether to tax the consumers of a given industry under the pressure of the assessment imported for that industry, or whether it would be a better idea if the price policy and the terms for deducting the profit of state enterprises for the till of the People's Commissariat of Finance were correctly framed, is a matter of technique of accumulation and does not affect the origin of the income itself.

The taxation of tools of production imported for state industry, therefore, constitutes the transposal of assets from one state pocket to another, from the capital equipment stock of state industry to the till of the People's Commissariat of Finance. The assessment on raw materials for industry is of quite the same nature. Here too, with a given price level, it all comes down to the redistribution of state means within that same state bailiwick, even though this taxation may be expedient for other reasons as well.

The situation is entirely different as regards the assessment of tools of production imported for private industry, and the importation of consumption products. Here the assessment in its entirety constitutes a deduction from the income of the mass of consumers or from private industry's capital equipment stock. In point of fact, if the Commissariat of Foreign Trade imports sugar, footwear, etc., from abroad, the output of domestic productive facilities being inadequate, the difference between the prices on the internal market and the purchasing prices abroad will be paid by the consumer and accrue to the state trading agencies. Even though it may be the worker who pays this difference we shall have an increase in the state's income and its accumulation, albeit accounted for by a shrinkage of the real consumption budget of the working class.

This is the picture if the imported consumption products merely make up the shortage of domestic output and are sold at home-market prices. This import operation does not in the least inhibit the process of accumulation and reproduction at other points in the state economy. The case is somewhat different when the goods imported, taken in conjunction with domestically produced products, are more than the market is in a position to absorb and when these goods are sold cheaper than the domestic. In that event accumulation in the sphere of trade and through the instrumentality of customs assessment is purchased at the

price of a partial cutback in home production, i.e., at the price of cessation, in one sector, not only of accumulation on the basis of production, but even of simple reproduction. If the quantity of products imported is not beyond what the market requires, but they are sold cheaper than domestically produced products, the gain at one pole will be attended by a loss at the other. Such a policy may be advantageous if the losses are offset by the gain, and the fall in prices results in the enlargement of demand and is in the final count beneficial for industry. The practical decision one way or another will be determined in this case by the results of a simple numerical calculation.

...Let us move on now to the policy on the products of industry. This policy is of enormous consequence not only for socialist accumulation but for the normal course of production in general, even in its unaugmented dimensions; it has immense importance for the peasant household; finally, it affects the political relations of the proletariat and the peasantry. For the moment we shall touch on this policy only from the viewpoint of primary socialist accumulation.

The fundamental theoretical question which needs to be settled here at the very outset is whether equivalent exchange between the state economy and the nonsocialist element is possible. Here one can envision three cases:

(1) When the values received by the state economy from the nonsocialist element are of lesser magnitude. We shall in that event be dealing with the persistent disintegration of large-scale socialist production and the gradual disposal of its output at prices below cost. This disintegration may take the form of the disposal of industry's not-fully-renewed capital stock at prices below cost while wages remain constant, or of the sale for next to nothing of the industrial proletariat's manpower, or, finally, of both together. At the opening phase of the NEP we had a number of cases where industrial output was priced this way, which meant that both capital stock and the proletariat's labor power were disposed of for a song.[11] Were such a price policy to become the rule, it would unquestionably spell the progressive fractionalization of large-scale industry and the triumph of small-scale production over large. The reader will find concrete

11. A striking example of the same thing, this time from capitalist experience, was German industry's price policy after the World War, in the period of depreciating currency.

examples in the section on the economics of industry. This case must on no account be confused with another, where, with prices competing, supplementary provision is made for the depreciation of capital stock but the renewal of capital stock does not in fact occur, because the respective sums cleared go either for raising wages or into reserves of raw materials, i.e., go to swell circulating capital. Such temporary borrowing from the capital equipment stock for more pressing needs has figured heavily in the life of Soviet industry. This process was inevitable, given state industry's dire poverty in working capital, and frequently occurred even when prices were fairly high—not lower than reconstruction prices.

(2) The second case. Prices on the products of state industry are so calculated that the exchange of that industry's output for the products of the private sector means the exchange of equivalents, i.e., neither of the two economic systems exploits the other. Such a situation is by and large possible only as an episode of the briefest duration. To regard such a state as normal is to suppose that the socialist system and the system of private commodity production, comprised by the one system of national economy, can exist alongside one another on the basis of absolute equilibrium between them. Such an equilibrium cannot long endure, for one system must dispossess the other. Either degradation or development is possible here; standing still is not. Speaking in this context of capital as a process of movement, Marx wrote: "The conception of capital as a spontaneously growing value takes in not only the idea of class relations and of a distinct character to society deriving from the fact that labor exists in the hired form. Capital is by the same token movement, the process of a cycle, a process which traverses various stages and itself in turn comprises three different forms of the cycle process. Capital, therefore, is conceivable only as movement and not as something quiescent." [12] If capital in its circulation in some individual enterprise and, inasmuch as we are taking the capitalist system as a whole, in its relationship to the precapitalist environment, represents movement, then just how can the socialist form, in its relationship to the presocialist environment, be "something quiescent?" And what does movement mean in this case? It means one of two things: either the capitalist form is rapidly eating away the monolith of the state economy, which was formed during the

12. Capital, translation by Stepanov, Vol. II, p. 81.

October Revolution and the Civil War, or the socialist form is developing both on what it itself is accumulating and at the expense of the nonsocialist milieu, nurturing itself on the latter's juices, too. If capitalism is movement, socialism is still faster movement. And for the speed lost in the period of primary accumulation in that, thanks to its dire poverty in capital, it is developing its technical and economic base, it is forced to compensate by intensifying accumulation at the expense of the nonsocialist element. One of the paramount devices for that accumulation, aside from those described above and the method to which reference will be made below, is the nonequivalent exchange of values with the nonsocialist milieu. The only way this exchange can occur so that the socialist mode has a favorable balance is through an appropriate policy of prices on the products of state industry.

(3) We come, therefore, to the third case, which is not only possible but inevitable in our circumstances, i.e., to a price policy deliberately calculated to alienate a definite part of the surplus product of private enterprise in all its varieties. This policy is possible because the proletariat's state economy comes in historically on the foundation of monopoly capitalism. The latter, in consequence of the elimination of free competition, brings about the establishment of home-market monopoly prices on the products of its own industry, secures surplus profit by dint of exploiting small-scale production, and thereby paves the way for the price policy in the period of primary socialist accumulation. But the concentration of all the country's large-scale industry in the hands of a single trust, i.e., in the hands of the workers' state, adds enormously to the possibility of following a monopoly-based price policy which will be merely another form of taxation on the private economy. The obstacles which the state economy encounters on this path consist not in its lack of economic strength with which to pursue this policy, but primarily in the necessity of coupling this policy with a policy of trimming prices, something which is feasible only if costs are brought down at an even faster pace. And this in turn assumes the need to re-equip industry as soon as the rationalization of production with the old plant stock has reached its limit. Another difficulty derives from the fact that the state is not a monopolist in all industries. The price policy must accordingly be planned in such a way that state accumulation does not automatically entail private capitalist accumulation. Finally, I make no mention here of difficulties of a political character,

which stem from the interrelations of the working class and the peasantry and necessitate frequent allusion to equivalent exchange, though with the socialization of large-scale industry in an economically backward country equivalent exchange is even more utopian than under the hegemony of monopoly capitalism.

Accumulation through the intermediary of an appropriate price policy has its advantages over other types of direct and indirect taxation of small-scale economic activity. Paramount among these advantages is the extreme convenience of collection, which requires not a single kopek for special tax machinery.

The objection that taxation on the basis of a definite price policy will impinge upon the wages of the workers and the village poor is altogether picayune. (I deliberately avoid saying "on the basis of rising prices" because taxation is not only possible with falling prices but, in our country, will take place when prices are indeed falling or, at times, when they are stationary. This is possible because with prime product costs being reduced the price cuts will affect less than the sum total of the reduction, the balance going into the socialist accumulation fund and to raise wages.) The village poor are not the prime purchasers of our industry's products. What they lose in the process they may recover from the state in the form of credit, in the form of enforced accumulation of capital stock for their economic activity, etc. As for the workers, this objection is quite as flimsy as is the objection to indirect taxes. The burden of such taxes may be shifted entirely off wages. Here is a statistical example. If, owing to a particular price policy, the working class, in company with the rest of the population, pays out 50 million rubles to the state, the state can easily return that sum by raising wages, whereas the amount obtained from the bourgeois and petty bourgeois consumers will not be returned to them but will go to increase the socialist accumulation fund. In the chapter on the economics of industry we shall revert to this problem and, armed with the figures, treat it in greater detail.

...Thus, when socialist accumulation is just getting under way the state engages in production even though it is unprofitable and aspires merely to minimize the loss in the economy as a whole and not nearly always the loss entailed in the choice of enterprises to be brought into operation (otherwise the first thing it would have to do would be to bring transport to a halt).

From this basic factor distinguishing socialist from capitalist accumulation flow a number of differences of a derivative character. But even when the zero mark in the area of accumulation has been passed and the state economy as a whole is outwardly carrying on the same policy of accumulation as the individual capitalist enterprise, we observe a vast difference between primary capitalist and primary socialist accumulation.

This difference lies not only in the fact that the principles of accumulation in the separate state enterprise and principles of accumulation in the complex en bloc are two different things, which is a matter of extreme importance for the economic policy of the particular trusts. Another difference is that capitalist enterprises were from the very start technically superior to, and economically stronger than, the individual enterprises of the mode of production which they were to dispossess and reduce to subservience, i.e., small-scale production; but socialist production has to pass through a period in which it is accumulating material resources, during which a particular enterprise of the state economy will inevitably be technically inferior, not superior, to and economically weaker, not stronger, than a contemporary capitalist enterprise in an advanced bourgeois country. The whole of the state economy will in this period be entirely and unavoidably geared to the task, on the one hand, of the speediest possible accumulation of resources adequate for revamping the technical base of industry on the basis of electrification, and of its economically practical territorial distribution, and, on the other hand, of protecting this new economy from the still strong capitalist economy.

In this sense the period of primary socialist economy with the laws peculiar to it will be inevitable not only for retarded peasant countries such as the USSR, but partly, the chances are, for the socialist economy of Europe too, inasmuch as the present European economy (even without the devastation in store for it in civil war) is economically and technically weaker than the economy of capitalist North America. Only in the more advanced industrial countries will primary socialist accumulation be based to a far greater extent on the surplus product of the workers than on resources obtained from presocialist forms of production in Europe and the colonies.

But capitalism was not confronted with these two tasks in the era of primary accumulation. Some moves were indeed made against handicrafts, but this was a product of intemperance and capitalist zeal rather than an economic necessity for capitalism,

since under circumstances of complete equality it was in any case trouncing small-scale production. On the other hand, in countries with feebly developed industry even a protective customs policy aimed at protecting a given industry from the competition of a capitalistically more advanced country bears no more than an outward resemblance to socialist protectionism. There it was a matter of defending one industry against another when both belonged to the same economic system. Here, however, we see one mode of production in its feeble infancy being protected against another economic system which is its mortal enemy and which, even in the period of its senile decrepitude, is bound for a time to be economically and technically stronger than the new economy.

Only if one is blithely indifferent to theory can one see a complete analogy between socialist and capitalist protectionism. There would be point to the comparison only if one socialist country with its own industry feebly developed were to introduce duties to protect that industry from the socialist industry of a more advanced country, instead of behaving like a part of the unitary socialist economic organism of all countries in which the proletariat had triumphed. We should then have customs duties within the same system of economy, as we do under capitalism. But such an absurd situation is unlikely ever to exist. We might incidentally note that even this example, as is true of all instances where the capitalist economy is compared with the socialist, lays bare a fundamental difference between the two, to wit, that capitalism expands on the basis of the competition and mutual repulsion of its parts, while the method of socialist expansion in the economic sphere (as well as the political) is the mutual attraction of parts, mutual assistance, and a drift toward a single economic complex. This is linked up not only with military but with economic necessity.

...Primary socialist accumulation is a fundamental law which constitutes the mainspring of the whole Soviet state economic system. But this law is probably of universal application, except possibly with respect to the countries which are last to make the transition to the socialist form of economy. Taking what has been said above as our starting point, we may formulate the part of this law that concerns redistribution of the material resources of production, as follows: The more economically backward is a particular country which is going over to the socialist organization of production, the greater the extent to which it has a

petty bourgeois, peasant economy, and the smaller the legacy which the given country's proletariat receives for its socialist accumulation fund at the time of the social revolution—the more, relatively, will socialist accumulation be compelled to depend on the alienation of part of the surplus product of the presocialist forms of economy and the smaller will be the proportion of accumulation based on its own production, i.e., the less will it be fed by the surplus products of the workers in socialist industry. Conversely, the more economically and industrially developed is a particular country in which the social revolution triumphs, the larger the material legacy in the form of a highly developed industry and an agriculture organized on capitalist lines received by that country's proletariat from the bourgeoisie after nationalization, the smaller the proportion of precapitalist forms of production in the given country, and the more essential it is for the proletariat of the country to reduce the nonequivalent exchange of its products for those of former colonies—the more will the center of gravity for socialist accumulation shift to the basis of what is produced by the socialist forms, i.e., rest on the surplus product of its own industry and its own agriculture.[13]

...We say that the law of primary socialist accumulation is the aggregate of the state economy's deliberate and semispontaneous tendencies to expand and consolidate the collective organization of labor in the Soviet economy, which dictate to the Soviet state as a matter of necessity: (1) definite proportions which shape up in the battle with the law of value within and outside the country and the objective purpose of which is to achieve optimal expanded socialist reproduction in the given circumstances and maximal capability of defending the entire system in the battle with capitalist commodity production, and (2) definite proportions in the accumulation of material resources for the expansion of reproduction, especially at the expense of the private economy, inasmuch as the need that such accumulation be of definite dimensions is dicated to the Soviet state with compelling force on pain of economic disproportion, the growth of private capital, the weakening of the state economy's nexus with peasant production, the disruption of the

13. Needless to say, this law must undergo certain modifications when means of production are transferred from a socialist country which is advanced to a backward one.

requisite proportions of expanded socialist reproduction for years to come, and the weakening of the whole system in its battle with capitalist commodity production within the country and beyond its boundaries.

Inevitably subject to the law of primary socialist accumulation are: the extent of alienation of the private economy's surplus product; the wage level in the state economy; the price policy; the regulation of foreign and domestic trade; the customs system; credit policy; the structure of the budget; the framing of import plans; etc....

N. I. Bukharin

NOTES OF AN ECONOMIST AT THE BEGINNING OF A NEW ECONOMIC YEAR

...The transition to the period of reconstruction does not signify a radical change of economic policy as was, without doubt, the case in 1921. However, it has a much greater significance, so to speak, in another dimension. For there exists a great difference between, let us say, a simple repair of a bridge and its construction: the latter requires knowledge of both higher mathematics and the resistance of materials and a thousand other wisdoms. The same is true on the scale of the economy as a whole. The period of reconstruction has raised a number of very complex technical tasks (projecting of new enterprises, new technology, new branches of industry), a number of very complex organizational and economic tasks (a new system of organization of labor in enterprises, question of location of industry, regionalization, the forms of the entire economic administration, etc.), a number of very difficult tasks of general economic leadership (the combination of the basic elements of the economy under the new conditions, the question of socialist accumulation, economic questions in connection with questions of the class struggle, again under the new conditions of the struggle, etc.), and finally, a number of problems concerning the human material (the drawing of masses into the process of rationalization on the one hand, the problem of skilled personnel on the other). The major technological achievements of the capitalist world (particularly in Germany and in the United States) and the growth of world production put our internal problems into an extremely sharp focus. And yet we have not undertaken the necessary regrouping of our forces, or more correctly, we have not undertaken it to that extent and at the rate and with that energy, which the objective march of events required....

Zametki ekonomista k nachalu novogo khoziaistvennogo goda, Moscow-Leningrad, Gosizdat, 1928, 56 pp.

II

The reconstruction period requires from economic leadership the most thorough thinking through of the problems of current policy. In this connection there appears again, above all, that "cursed" question of the relationship between the city and the village, and the old prescriptions which are supposed to save us from all evil and misfortune are being warmed up once more: the Trotskyite ventriloquists, those gardeners who are pulling the plant by the top to make it grow more rapidly, and the petty bourgeois who mourn and whimper about the "forced attack on the kulaks," all of them have swarmed against the background of the difficulties associated with grain deliveries; they have revived, they have renewed the production of their panaceas, they have come up—for how many a time!—with their desires, their demands, their warnings, and their threats. We too should once again examine this "problem of problems," critically reviewing our course.

We have made the historical break between the capitalist world and the world of the proletarian dictatorship, but it is useful for us to make use of the historical experience of capitalism. It is useful for us to make use of this experience also from the point of view of the problem which interests us, the more so since we all recall the proposition of Marx: various types of relationships between the city and the village mark entire historical eras.

Within the limits and the framework of capitalism it is not difficult to distinguish three basic types of relationship. The first type, semifeudal agriculture, is the most backward; the peasant is a pauper, there are starvation leases, ruthless exploitation of the peasant, the capacity of the domestic market is weak. (Example: prerevolutionary Russia.) The second type contains much smaller remnants of feudalism; the feudal landlord is already to a considerable degree a capitalist, the peasantry is more well-to-do, the capacity of the peasant market is greater, etc. The third type is the "American" type: there is almost complete absence of feudal relationships, "free" land, initially there is absence of absolute rent, there are prosperous farmers, the domestic market for industry is tremendous. And what of that? It is not difficult to see that the power and force of industrial development, the power and force of the productive forces were at their maximum precisely in the United States.

The Trotskyites, by raising the problem of a maximum trans-

fer (to take everything that is "technologically attainable;" to take more than the tsarist regime, etc.), want to place the USSR in this historical sequence "behind" old Russia, at the same time that it should be placed "behind" the United States of America. For if the United States is realizing the most rapid development of agriculture and progress of productive forces in general with the limits of capitalism, then we—on the basis of socialism, on the basis of decisive struggle with all capitalist elements—must proceed even more rapidly in close association with the decisive masses of the peasantry. In their naïveté, the ideologists of Trotskyism believe that a maximum annual transfer from peasant agriculture into industry secures the maximum rate of development of industry in general. But this is clearly incorrect. The maximum continued rate of growth will be experienced with such a combination when industry will advance on the basis of rapidly growing agriculture. It is precisely then that industry will experience record achievements of its development. But this assumes the possibility of rapid real accumulation in agriculture, hence by no means the Trotskyite policy. The period of transition unveils a new era in the relationship between the city and the village, an era which marks the end of the systematic lag of the village, the "idiocy of village life," which lays the foundation of the course aimed at the abolition of the polarity between the city and the village, which turns industry itself "face to the village" and which industrializes agriculture, leading it out of the historical wings onto the stage of economic history. Consequently, the Trotskyites do not understand the fact that the development of industry depends on the development of agriculture....

Thanks to the initiative of E. A. Preobrazhenskii, the ideologists of Trotskyism imagine that the law of socialist accumulation is bound more and more to violate the law of value, which is the law of equilibrium of commodity production. This is not the place to analyze in detail the whole absurdity of this proposition. We shall show here that the very contraposition of the law of value as the law of commodity of production and the law of socialist accumulation as the substitute and successor of the law of value is already absurd, for the simple reason that even under capitalism there was a law of accumulation which functioned on the basis of the law of value: for this reason the law of value may be transformed under our conditions into whatever you please except into a law of accumulation. The law of accumulation itself assumes the existence of another law on whose basis it functions. What it is—whether the law of labor outlays or some-

thing else—makes no difference to us under the given conditions. One thing is clear: if any branch of production systematically fails to receive back the expenses of production plus a certain additional amount corresponding to a part of surplus labor and capable of serving as a source of expanded reproduction, then it either stagnates or regresses. This law is also appropriate for grain production. If the neighboring branches of production in agriculture find themselves in a better position, there takes place a process of reallocation of productive forces. If this does not take place, there will occur under our conditions a general process of movement toward subsistence farming. To think that the growth of a planned economy means the possibility (on that dear old basis of withering away of the law of value) of acting any way one pleases amounts to failure to understand the ABC of economic science. These considerations are a sufficient basis to determine the bounds of the "transfers." The opponents of industrialization object to any withdrawals, even of a part of the surplus product, i.e., to any "transfer." But in that case the rate of growth of industrialization is slowed down. The Trotskyites determine the magnitude of the transfer within the limits of what is "technically attainable" (i.e., going actually beyond the limits of the surplus product). It is clear that in such a case there can be no question of development of agriculture or of its grain-producing branch, which is necessary for the development of industry. Here the truth lies in the middle.

But the development (expanded reproduction) of agriculture in general (including the production of raw materials and of grain production) is also necessary from the point of view of exports and imports. We have to pay for our imports of equipment. The same is true for the imports of raw materials. It would be a wild thing indeed if we should, after the decline of grain exports brought about by the grain crisis, reorient ourselves altogether in such a way as to consider those exports lost forever. It is enough that we should be temporarily dependent on foreign countries with respect to the imports of equipment. To depend on them simultaneously with respect to equipment and with respect to raw materials and grain is inconceivable. What we must do is, relying on our agricultural base and utilizing its output, to pay for the imported equipment with the "agricultural currency" (which, of course, does not exclude the necessity of strengthening industrial exports as well), and developing our heavy industry, emancipate ourselves gradually from dependence with respect also to equipment, and come to stand in this way more

and more on our own feet (which, of course, does not exclude the necessity of further utilization of international economic relations)....

Our economic organs have not yet understood the absolutely urgent necessity of a thorough and thoughtful study of the structure of demand[1] for industrial products, even though its significance from the viewpoint of the analysis of reproduction is completely exceptional. According to exceedingly rough and only approximate calculations undertaken upon my urging by some comrades and presenting an idea not so much about precise proportions as about the order of the magnitudes in which we are interested, matters stand as follows:

	Percentage of total demand for industrial products
1. Demand of industry itself (for requirements of current production and for capital construction)	37-39
2. Demand of the other branches of the socialized sector	15-16
Total demand of the socialized sector	52-55
3. Demand of wage earners	15-16
4. Demand of the rest of the urban population . . . . . about	5
5. Demand of peasantry	23-25
6. Demand of exports	2-2.5

In this connection the demand created by the socialized capital construction (including the wages of construction workers) enters into the aggregate demand for industrial products in the dimension probably of 16 to 17 per cent.

Thus these approximate calculations, which are concerned with the structure of the demand for industrial products in the coming year 1928/29, indicate that village demand, even when taken as a whole, amounts to only one-fifth or one-fourth of the aggregate demand for industrial products.

As regards the other portions of demand (i.e., three-fourths or even four-fifths of the whole), then, you see, here is the same

1. By "demand" in this case we understand not only monetary demand but also "demand" satisfied, let us say, by a given production unit via its own production (for example, the demand of the fabricating enterprises of Iugostal for pig iron produced by Iugostal itself, etc.).

"lagging"! In particular, even industry itself, which is developing furiously at record rates of growth, also has a furious demand for industrial products, but it cannot satisfy it. Trotsky states that industry lags behind the growth of village demand, behind the growth of agriculture; but this argument may appear satisfactory only at first sight. But here, with a careful analysis, it turns out that industry "lags" behind itself! How should this formula be interpreted? It means that industry in its development is running into the limits of that development. There you have the conclusion that is avoided by the superindustrialist Trotsky and is being slurred over by discourses about village demand for industrial goods, viewed in isolation from the aggregate demand for industrial products.

But to be running into the limits indicates the following: (1) Clearly we have selected insufficiently correct relationships between the branches of industry itself (for instance, the clear lag of metallurgy). (2) It is clear that we have chosen insufficiently correct relationships between the growth of capital construction (both in industry and in the socialized sector as a whole). If there are no bricks and if they cannot be produced in a given season (for technical reasons) beyond a certain amount, then one cannot draw up programs of construction which exceed that limit and create thereby a demand which cannot be satisfied, since no matter how much you may force construction, you cannot make factory buildings and residences from thin air (we shall return once again to this question in connection with the discussion of the problem of capital outlays). (3) It is also clear that the limits of development are given by the output of raw materials: cotton, hides, wool, flax, etc., cannot be obtained from thin air either. But as everyone knows, these objects are the products of agricultural production, and their shortage is a cause of the insufficient development of the gross output of industry, which cannot, in its turn, fully satisfy either the demand of the city population or the demand of the village population. Consequently, if there is a shortage of raw materials plus a shortage of grain (and this means, among other things, also a shortage of exports and a shortage of imported products), plus a shortage of construction materials, then one must truly be a clever person to demand still a "superindustrialist" program.

To sum up in general, one must state: (1) With respect to fixed capital, gross output, and marketed output, the rate of development of industry exceeds extraordinarily the rate of development of agriculture. (2) Grain production, which is put in an

extremely unfavorable situation, lags dangerously even behind the minimum necessary rate of growth. (3) One-half of the demand of the village population is not agricultural demand, and it is itself created to a considerable degree by the development of large-scale industry, of the socialized sector. (4) Further increases of the rate of development of industry are limited, to a large extent, by limits of agriculture, of raw materials, and of exports. (5) It is clear, furthermore, that in allocating resources within industry (and with respect to capital construction, within the whole socialized sector) one must attain an all-round account of all factors which determine "a more or less crisis-free development" (from the resolution of the Fifteenth Congress), a more correct combination of the branches of industry and the branches of the socialized sector.

Of the whole complex of problems which follow from here, of first importance are the problems of capital construction and of grain production. As regards the last question, the party in its decisions—especially in its recent decisions—has underscored its tremendous significance: hence the correction in respect to price policy, hence the formulation of the question of the state and collective farms, hence the necessity of extremely vast practical efforts in the given sphere. Of course, if there were no dangerous lag of grain production, if there were no parcelization in it, if there were no decline of its marketed output, etc., then it would be more expedient, if you please, to invest the funds allocated to the state farms, let us say, in production of ferrous metals, which is a bottleneck of our industry. However, even the superindustrialists do not dare to attack the state farms. Why? Because it is precisely the lag of grain production which is obvious. The "purely productive" point of view, i.e., the point of view of "increasing output" (Lenin) coincides in this case with the point of view of "class substitution," the gradual elimination of the capitalist elements of agriculture by the growing collectivization of individual poor peasants' and middle-sized peasants' farms, by the strengthening and socialization of agricultural production.

This tremendous new problem, which by no means assumes an attitude of disregard for the individual labor farm but which must, on the contrary, be solved on the basis of progress of individual farms (it is precisely in this way that the problem was formulated by Lenin), requires special attention and special efforts, precisely because of its novelty. It is to a certain extent major capital formation in agriculture, which requires also new

technology (tractorization, mechanization, the application of chemistry, etc.) and a skilled labor force. The progress of individual peasant production, in particular grain production, the limitation of kulak production, the building up of state and collective farms, along with a correct price policy, along with cooperation of the masses of the peasants, etc., should correct the major economic disproportion which finds its expression in the stagnation or even regression of grain crops and in the weak development of agriculture in general. On the whole and in general, in the drawing up of our plans, one must recall the directive of the Fifteenth Congress: "It is incorrect to start from the requirement of a maximum transfer of resources from the sphere of peasant agriculture into the sphere of industry, since this demand means not only a political break with the peasantry but also the undermining of the raw material base of industry itself, the undermining of its domestic market, the undermining of exports, and the disruption of equilibrium of the economic system as a whole. On the other hand, it would be incorrect to give up using the resources of the village in the construction of industry: this would amount at the present time to a slowing down of the rate of development and a disturbance of equilibrium to the detriment of the industrialization of the country.[2] ...

2. Resolution of the Fifteenth Congress "About Directives" of the Drawing Up of the Five-Year Plan of the National Economy.

J. Stalin

INDUSTRIALIZATION OF THE COUNTRY AND THE RIGHT DEVIATION

Our theses proceed from the premise that a fast rate of development of industry in general, and of the production of the means of production in particular, is the underlying principle of and the key to the industrialization of the country, the underlying principle of and the key to the transformation of our entire national economy along the lines of socialist development.

But what does a fast rate of development of industry involve? It involves the maximum capital investment in industry. And that leads to a state of tension in all our plans, budgetary and nonbudgetary. And, indeed, the characteristic feature of our control figures in the past three years, in the period of reconstruction, is that they have been compiled and carried out at a high tension. Take our own control figures, examine our budget estimates, talk with our party comrades—both those who work in the party organizations and those who direct our Soviet, economic, and cooperative affairs—and you will invariably find this one characteristic feature everywhere, namely, the state of tension in our plans.

The question arises: is this state of tension really necessary for us? Cannot we do without it? Is it not possible to conduct the work at a slower pace, in a more "restful" atmosphere? Is not the fast rate of industrial development that we have adopted due to the restless character of the members of the Political Bureau and the Council of People's Commissars?

Of course not! The members of the Political Bureau and the Council of People's Commissars are calm and sober people. Abstractly speaking, that is, if we disregarded the external and internal situation, we could, of course, conduct the work at a slower speed. But the point is that first, we cannot disregard the external and internal situation, and second, if we take the sur-

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Pravda, No. 273, November 24, 1928, reprinted in Works, Vol. 11, Foreign Languages Publishing House, Moscow, 1954, pp. 255 - 302. Speech delivered at the Plenum of the Central Committee, November 19, 1928.

rounding situation as our starting point, it has to be admitted that it is precisely this situation that dictates a fast rate of development of our industry.

Permit me to pass to an examination of this situation, of these conditions of an external and internal order that dictate a fast rate of industrial development.

External conditions. We have assumed power in a country whose technical equipment is terribly backward. Along with a few big industrial units more or less based upon modern technology, we have hundreds and thousands of mills and factories in which the technical equipment is beneath all criticism from the point of view of modern achievements. At the same time we have around us a number of capitalist countries whose industrial technique is far more developed and up-to-date than that of our country. Look at the capitalist countries and you will see that their technology is not only advancing, but advancing by leaps and bounds, outstripping the old forms of industrial technique. And so we find that, on the one hand, we in our country have the most advanced system, the Soviet system, and the most advanced type of state power in the world, Soviet power, while, on the other hand, our industry, which should be the basis of socialism and of Soviet power, is extremely backward technically. Do you think that we can achieve the final victory of socialism in our country so long as this contradiction exists?

What has to be done to end this contradiction? To end it, we must overtake and outstrip the advanced technology of the developed capitalist countries. We have overtaken and outstripped the advanced capitalist countries in the sense of establishing a new political system, the Soviet system. That is good. But it is not enough. In order to secure the final victory of socialism in our country, we must also overtake and outstrip these countries technically and economically. Either we do this, or we shall be forced to the wall.

This applies not only to the building of socialism. It applies also to upholding the independence of our country in the circumstances of the capitalist encirclement. The independence of our country cannot be upheld unless we have an adequate industrial basis for defense. And such an industrial basis cannot be created if our industry is not more highly developed technically.

That is why a fast rate of development of our industry is necessary and imperative.

The technical and economic backwardness of our country was not invented by us. This backwardness is age-old and was be-

queathed to us by the whole history of our country. This backwardness was felt to be an evil both earlier, before the revolution, and later, after the revolution. When Peter the Great, having to deal with the more highly developed countries of the West, feverishly built mills and factories to supply the army and strengthen the country's defenses, that was in its way an attempt to break out of the grip of this backwardness. It is quite understandable, however, that none of the old classes, neither the feudal aristocracy nor the bourgeoisie, could solve the problem of putting an end to the backwardness of our country. More than that, not only were these classes unable to solve this problem, they were not even able to formulate the task in any satisfactory way. The age-old backwardness of our country can be ended only on the lines of successful socialist construction. And it can be ended only by the proletariat, which has established its dictatorship and has charge of the direction of the country.

It would be foolish to console ourselves with the thought that, since the backwardness of our country was not invented by us and was bequeathed to us by the whole history of our country, we cannot be, and do not have to be, responsible for it. That is not true, comrades. Since we have come to power and taken upon ourselves the task of transforming the country on the basis of socialism, we are responsible, and have to be responsible, for everything, the bad as well as the good. And just because we are responsible for everything, we must put an end to our technical and economic backwardness. We must do so without fail if we really want to overtake and outstrip the advanced capitalist countries. And only we Bolsheviks can do it. But in order to accomplish this task, we must systematically achieve a fast rate of development of our industry. And that we are already achieving a fast rate of industrial development is now clear to everyone.

The question of overtaking and outstripping the advanced capitalist countries technically and economically is for us Bolsheviks neither new nor unexpected. It was raised in our country as early as in 1917, before the October Revolution. It was raised by Lenin as early as in September 1917, on the eve of the October Revolution, during the imperialist war, in his pamphlet "The Impending Catastrophe and How to Combat It."

Here is what Lenin said on this score: "The result of the revolution has been that the political system of Russia has in a few months caught up with that of the advanced countries. But that is not enough. The war is inexorable; it puts the alternative with ruthless severity: either perish, or overtake and outstrip

the advanced countries economically as well....Perish or drive full steam ahead. That is the alternative with which history has confronted us." (Vol. XXI, p. 191.)

You see how bluntly Lenin put the question of ending our technical and economic backwardness.

Lenin wrote all this on the eve of the October Revolution, in the period before the proletariat had taken power, when the Bolsheviks had as yet neither state power, nor a socialized industry, nor a widely ramified cooperative network embracing millions of peasants, nor collective farms, nor state farms. Today, when we already have something substantial with which to end completely our technical backwardness, we might paraphrase Lenin's words roughly as follows:

"We have overtaken and outstripped the advanced capitalist countries politically by establishing the dictatorship of the proletariat. But that is not enough. We must utilize the dictatorship of the proletariat, our socialized industry, transport, credit system, etc., the cooperatives, collective farms, state farms, etc., in order to overtake and outstrip the advanced capitalist countries economically as well."

The question of a fast rate of development of industry would not face us so acutely as it does now if we had such a highly developed industry and such a highly developed technology as Germany, say, and if the relative importance of industry in the entire national economy were as high in our country as it is in Germany, for example. If that were the case, we could develop our industry at a slower rate without fearing to fall behind the capitalist countries and knowing that we could outstrip them at one stroke. But then we should not be so seriously backward technically and economically as we are now. The whole point is that we are behind Germany in this respect and are still far from having overtaken her.

The question of a fast rate of development of industry would not face us so acutely if we were not the only country but one of the countries of the dictatorship of the proletariat, if there were a proletarian dictatorship not only in our country but in other, more advanced countries as well—Germany and France, say.

If that were the case, the capitalist encirclement could not be so serious a danger as it is now, the question of the economic independence of our country would naturally recede into the background, we could integrate ourselves into the system of more developed proletarian states, we could receive from them

machines for making our industry and agriculture more productive, supplying them in turn with raw materials and foodstuffs, and we could, consequently, expand our industry at a slower rate. But you know very well that that is not yet the case and that we are still the only country of the proletarian dictatorship and are surrounded by capitalist countries, many of which are far in advance of us technically and economically.

That is why Lenin raised the question of overtaking and outstripping the economically advanced countries as one of life and death for our development.

Such are the external conditions dictating a fast rate of development of our industry.

Internal conditions. But besides the external conditions, there are also internal conditions which dictate a fast rate of development of our industry as the main foundation of our entire national economy. I am referring to the extreme backwardness of our agriculture, of its technical and cultural level. I am referring to the existence in our country of an overwhelming preponderance of small commodity producers, with their scattered and utterly backward production, compared with which our large-scale socialist industry is like an island in the midst of the sea, an island whose base is expanding daily, but which is nevertheless an island.

We are in the habit of saying that industry is the main foundation of our entire national economy, including agriculture, that it is the key to the reconstruction of our backward and scattered system of agriculture on a collectivist basis. That is perfectly true. From that position we must not retreat for a single moment. But it must also be remembered that, while industry is the main foundation, agriculture constitutes the basis for industrial development, both as a market which absorbs the products of industry and as a supplier of raw materials and foodstuffs, as well as a source of the export reserves essential in order to import machinery for the needs of our national economy. Can we advance industry while leaving agriculture in a state of complete technical backwardness, without providing an agricultural base for industry, without reconstructing agriculture and bringing it up to the level of industry? No, we cannot.

Hence the task of supplying agriculture with the maximum amount of instruments and means of production essential in order to accelerate and promote its reconstruction on a new technical basis. But for the accomplishment of this task a fast rate of development of our industry is necessary. Of course, the

reconstruction of a disunited and scattered agriculture is an incomparably more difficult matter than the reconstruction of a united and centralized socialist industry. But that is the task that confronts us, and we must accomplish it. And it cannot be accomplished except by a fast rate of industrial development.

We cannot go on indefinitely, that is, for too long a period, basing the Soviet regime and socialist construction on two different foundations, the foundation of the most large-scale and united socialist industry and the foundation of the most scattered and backward small commodity economy of the peasants. We must gradually, but systematically and persistently, place our agriculture on a new technical basis, the basis of large-scale production, and bring it up to the level of socialist industry. Either we accomplish this task—in which case the final victory of socialism in our country will be assured—or we turn away from it and do not accomplish it—in which case a return to capitalism may become inevitable.

Here is what Lenin says on this score: "As long as we live in a small-peasant country, there is a surer economic basis for capitalism in Russia than for communism. This must be borne in mind. Anyone who has carefully observed life in the countryside, as compared with life in towns, knows that we have not torn out the roots of capitalism and have not undermined the foundation, the basis of the internal enemy. The latter depends on small-scale production, and there is only one way of undermining it, namely, to place the economy of the country, including agriculture, on a new technical basis, the technical basis of modern large-scale production. And it is only electricity that is such a basis. Communism is Soviet power plus the electrification of the whole country." (Vol. XXVI, p. 46.)

As you see, when Lenin speaks of the electrification of the country he means not the isolated construction of individual power stations, but the gradual "placing of the economy of the country, including agriculture, on a new technical basis, the technical basis of modern large-scale production," which in one way or another, directly or indirectly, is connected with electrification.

Lenin delivered this speech at the Eighth Congress of Soviets in December 1920, on the very eve of the introduction of NEP, when he was substantiating the so-called plan of electrification, that is, the GOELRO plan. Some comrades argue on these grounds that the views expressed in this quotation have become inapplicable under present conditions. Why, we ask?

Because, they say, much water has flowed under the bridges since then. It is, of course, true that much water has flowed under the bridges. We now have a developed socialist industry, we have collective farms on a mass scale, we have old and new state farms, we have a wide network of well-developed cooperative organizations, we have machine-hiring stations at the service of the peasant farms, we now practice the contract system as a new form of the bond, and we can put into operation all these and a number of other levers for gradually placing agriculture on a new technical basis. All this is true. But it is also true that, in spite of all this, we are still a small-peasant country where small-scale production predominates. And that is the fundamental thing. And as long as it continues to be the fundamental thing, Lenin's thesis remains valid that "as long as we live in a small-peasant country, there is a surer economic base for capitalism in Russia than for communism," and that, consequently, the danger of the restoration of capitalism is not an empty phrase.

Lenin says the same thing, but in a sharper form, in the plan of his pamphlet, "The Tax in Kind," which was written after the introduction of NEP (March-April 1921): "If we have electrification in 10 to 20 years, then the individualism of the small tiller, and freedom for him to trade locally, are not a whit terrible. If we do not have electrification, a return to capitalism will be inevitable anyhow."

And further on he says: "Ten or twenty years of correct relations with the peasantry, and victory on a world scale is assured (even if the proletarian revolutions, which are growing, are delayed); otherwise, 20 to 40 years of the torments of white guard terrorism." (Vol. XXVI, p. 343.)

You see how bluntly Lenin puts the question: either electrification, that is, the "placing of the economy of the country, including agriculture, on a new technical basis of modern large-scale production," or a return to capitalism.

That is how Lenin understood the question of "correct relations with the peasantry."

It is not a matter of coddling the peasant and regarding this as establishing correct relations with him, for coddling will not carry you very far. It is a matter of helping the peasant to place his husbandry "on a new technical basis, the technical basis of modern large-scale production;" for that is the principal way to rid the peasant of his poverty.

And it is impossible to place the economy of the country on

a new technical basis unless our industry and, in the first place, the production of means of production, are developed at a fast rate.

Such are the internal conditions dictating a fast rate of development of our industry.

It is these external and internal conditions which cause the control figures of our national economy to be under such tension.

That explains, too, why our economic plans, both budgetary and nonbudgetary, are marked by a state of tension, by substantial investments in capital development, the object of which is to maintain a fast rate of industrial development.

It may be asked where this is said in the theses, in what passage of the theses. (A voice: "Yes, where is it said?") Evidence of this in the theses is the sum total of capital investment in industry for 1928/29. After all, our theses are called theses on the control figures. That is so, is it not, comrades? (A voice: "Yes.") Well, the theses say that in 1928/29 we shall be investing 1,650 million rubles in capital construction in industry. In other words, this year we shall be investing in industry 330 million rubles more than last year.

It follows, therefore, that we are not only maintaining the rate of industrial development, but are going a step farther by investing more in industry than last year, that is, by expanding capital construction in industry both absolutely and relatively.

That is the crux of the theses on the control figures of the national economy. Yet certain comrades failed to observe this obvious fact. They criticized the theses on the control figures right and left as regards petty details, but the most important thing they failed to observe.

THE GRAIN PROBLEM

I have spoken so far of the first main question in the theses, the rate of development of industry. Now let us consider the second main question, the grain problem. A characteristic feature of the theses is that they lay stress on the problem of the development of agriculture in general, and of grain farming in particular. Are the theses right in doing so? I think they are. Already at the July plenum it was said that the weakest spot in the development of our economy is excessive backwardness of agriculture in general, and of grain farming in particular.

When people complain of our agriculture lagging behind our industry, they are, of course, not talking seriously. Agriculture always has lagged and always will lag behind industry. That is particularly true in our conditions, where industry is concentrated to a maximum degree, while agriculture is scattered to a maximum degree. Naturally, a united industry will develop faster than a scattered agriculture. That, incidentally, gives rise to the leading position of industry in relation to agriculture. Consequently, the customary lag of agriculture behind industry does not give sufficient grounds for raising the grain problem.

The problem of agriculture, and of grain farming in particular, makes its appearance only when the customary lag of agriculture behind industry turns into an excessive lag in the rate of its development. The characteristic feature of the present state of our national economy is that we are faced by the fact of an excessive lag in the rate of development of grain farming behind the rate of development of industry, while at the same time the demand for marketable grain on the part of the growing towns and industrial areas is increasing by leaps and bounds. The task then is not to lower the rate of development of industry to the level of the development of grain farming (which would upset everything and reverse the course of development), but to bring the rate of development of grain farming into line with the rate of development of industry and to raise the rate of development of grain farming to a level that will guarantee rapid progress of the entire national economy, both industry and agriculture.

Either we accomplish this task, and thereby solve the grain problem, or we do not accomplish it, and then a rupture between the socialist towns and the small-peasant countryside will be inevitable.

That is how the matter stands, comrades. That is the essence of the grain problem.

Does this not mean that what we have now is "stagnation" in the development of agriculture or even its "retrogression"? That is what Frumkin actually asserts in his second letter, which at his request we distributed today to the members of the Central Committee and of the Control Commission. He says explicitly in this letter that there is "stagnation" in our agriculture. "We cannot and must not," he says, "talk in the press about retrogression, but within the party we ought not to hide the fact that this lag is equivalent to retrogression."

Is this assertion of Frumkin's correct? It is, of course, incorrect! We, the members of the Political Bureau, absolutely

disagree with this assertion, and the Political Bureau theses are totally at variance with such an opinion of the state of grain farming.

In point of fact, what is retrogression, and how would it manifest itself in agriculture? It would obviously be bound to manifest itself in a backward, downward movement of agriculture, a movement away from the new forms of farming to the old, medieval forms. It would be bound to manifest itself by the peasants abandoning, for instance, the three-field system for the long-fallow system, the steel plough and machines for the wooden plough, clean and selected seed for unsifted and low-grade seed, modern methods of farming for inferior methods, and so on and so forth. But do we observe anything of the kind? Does not everyone know that tens and hundreds of thousands of peasant farms are annually abandoning the three-field for the four-field and multi-field system, low-grade seed for selected seed, the wooden plough for the steel plough and machines, inferior methods of farming for superior methods? Is this retrogression?

Frumkin has a habit of hanging on to the coattails of some member or other of the Political Bureau in order to substantiate his own point of view. It is quite likely that in this instance, too, he will get hold of Bukharin's coattails in order to show that Bukharin in his article, "Notes of an Economist," says "the same thing." But what Bukharin says is very far from "the same thing." Bukharin in his article raised the abstract, theoretical question of the possibility or danger of retrogression. In the abstract, such a formulation of the question is quite possible and legitimate. But what does Frumkin do? He turns the abstract question of the possibility of the retrogression of agriculture into a fact. And this he calls an analysis of the state of grain farming! Is it not ludicrous, comrades?...

What ways and means are necessary to accelerate the rate of development of agriculture in general, and of grain farming in particular?

There are three such ways, or channels: (a) by increasing crop yields and enlarging the area sown by the individual poor and middle peasants; (b) by further development of collective farms; (c) by enlarging the old and establishing new state farms....

What is required in order that our work should proceed along all these three channels, in order that the rate of development of agriculture, and primarily of grain farming, should be raised in practice?

It is necessary, first of all, to direct the attention of our party

cadres to agriculture and focus it on concrete aspects of the grain problem. We must put aside abstract phrases and talking about agriculture in general and get down, at last, to working out practical measures for the furtherance of grain farming adapted to the diverse conditions in the different areas. It is time to pass from words to deeds and to tackle at last the concrete question of how to raise crop yields and to enlarge the crop areas of the individual poor and middle peasant farms, how to improve and develop further the collective farms and state farms, how to organize the rendering of assistance by the collective farms and state farms to the peasant by way of supplying them with better seed and better breeds of cattle, how to organize assistance for the peasants in the shape of machines and other implements through machine-hiring stations, how to extend and improve the contract system and agricultural cooperation in general, and so on and so forth. (A voice: "That is empiricism.") Such empiricism is absolutely essential, for otherwise we run the risk of drowning the very serious matter of solving the grain problem in empty talk about agriculture in general....

It is necessary, in the second place, to ensure that our party workers in the countryside make a strict distinction in their practical work between the middle peasant and the kulak, do not lump them together, and do not hit the middle peasant when it is the kulak that has to be struck at....

It is necessary, next, to give further incentives to individual poor and middle peasant farming. Undoubtedly, the increase in grain prices already introduced, practical enforcement of revolutionary law, practical assistance to the poor and middle peasant farms in the shape of the contract system, and so on, will considerably increase the peasant's economic incentive. Frumkin thinks that we have killed or nearly killed the peasants' incentive by robbing him of economic prospects. That, of course, is nonsense. If it were true, it would be incomprehensible what the bond, the alliance between the working class and the main mass of the peasantry, actually rests on. It cannot be thought, surely, that this alliance rests on sentiment. It must be realized, after all, that the alliance is on a business basis, an alliance of the interests of two classes, a class alliance of the workers and the main mass of the peasantry aiming at mutual advantage. It is obvious that if we had killed or nearly killed the peasant's economic incentive by depriving him of economic prospects, there would be no bond, no alliance between the working class and the

peasantry. Clearly, what is at issue here is not the "creation" or "release" of the economic incentive of the poor and middle peasant masses, but the strengthening and further development of this incentive, to the mutual advantage of the working class and the main mass of the peasantry. And that is precisely what the theses on the control figures of the national economy indicate.

It is necessary, lastly, to increase the supply of goods to the countryside. I have in mind both consumer goods and, especially, production goods (machines, fertilizers, etc.) capable of increasing the output of agricultural produce. It cannot be said that everything in this respect is as it should be. You know that symptoms of a goods shortage are still far from having been eliminated and will probably not be eliminated so soon. The illusion exists in certain party circles that we can put an end to the goods shortage at once. That, unfortunately, is not true. It should be borne in mind that the symptoms of a goods shortage are connected, first, with the growing prosperity of the workers and peasants and the gigantic increase of effective demand for goods, production of which is growing year by year but which are not enough to satisfy the whole demand, and, second, with the present period of the reconstruction of industry.

The reconstruction of industry involves the transfer of funds from the sphere of producing means of consumption to the sphere of producing means of production. Without this there can be no serious reconstruction of industry, especially in our Soviet conditions. But what does this mean? It means that money is being invested in the building of new plants, and that the number of towns and new consumers is growing, while the new plants can put out additional commodities in quantity only after three or four years. It is easy to realize that this is not conducive to putting an end to the goods shortage.

Doesn't this mean that we must fold our arms and acknowledge that we are impotent to cope with the symptoms of a goods shortage? No, it does not. The fact is that we can and should adopt concrete measures to mitigate, to moderate the goods shortage. That is something we can and should do at once. For this, we must speed up the expansion of those branches of industry which directly contribute to the promotion of agricultural production (the Stalingrad Tractor Works, the Rostov Agricultural Machinery Works, the Voronezh Seed Sorter Factory, etc., etc.). For this, further, we must as far as possible expand those branches of industry which contribute to an increase in output of goods in

short supply (cloth, glass, nails, etc.). And so on and so forth....

I should like to draw your attention to the collective farms, and especially to the state farms, as levers which facilitate the reconstruction of agriculture on a new technical basis, causing a revolution in the minds of the peasants and helping them to shake off conservatism, routine. The appearance of tractors, large agricultural machines, and tractor columns in our grain regions cannot but have its effect on the surrounding peasant farms. Assistance rendered the surrounding peasants in the way of seed, machines, and tractors will undoubtedly be appreciated by the peasants and taken as a sign of the power and strength of the Soviet state, which is trying to lead them on to the high road of a substantial improvement of agriculture. We have not taken this circumstance into account until now and, perhaps, still do not sufficiently do so. But I think that this is the chief thing that the collective farms and state farms are contributing and could contribute at the present moment toward solving the grain problem and strengthening the bond in its new forms....

Part II B

Economic Growth:

Pace and Efficiency

INTRODUCTORY NOTE

What could be done to accelerate the pace of growth of a limited number of key industrial branches might be ascertained with the help of surveys of resources on hand, statistical projections, and engineering-construction blueprints. But surveys, projections, and blueprints alone will not help to assess either the specific results which a variation in some growth rates will provoke in the growth rates of other branches and sectors, or all the impacts which the choice of a goal in one branch will have on the pace of growth of the economy as a whole.

The question of the impact of a variation in the pace of growth of one sector on the pace of growth of other sectors and of the economy as a whole was, of course, at the heart of the Soviet discussions on macro-economic models, on strategies of development, and on the "perspectives" of the economy as it completed the phase of recovery and approached the threshold of "economic reconstruction," i.e., the creation of a complex of entirely new industrial branches.

While some of the party planners—Krzhizhanovskii and Strumilin, for instance—affirmed that the plan could be based on "intuition" in setting up the main goals and on an isolated balancing of resources and allocation for each of the present or scheduled outputs of the main developing branches, other economists—notably Bazarov and Fel'dman—rejected as totally unsatisfactory the "intuitive" approach. Bazarov pointed out that the over-all pace of development was bound to slow down as the economy shifted from recovery to "reconstruction," i.e., as it exhausted some of the advantages arising from the rapid return into production of recommissioned plants. Fel'dman stressed, in a rather sophisticated paper, the interdependence between the rates of growth of the capital stock and their utilization in his sectors p (consumers' goods) and u (producers' goods). After examining theoretically the impacts of variations in the pattern of allocation of investments as between his two sectors, and after indicating the variant which would result in the quickest increase in the rate of growth of p, Fel'dman drew the attention of the Soviet policy makers to the immediate importance of increasing the effectiveness of capital utilization until the ratio of the capital stocks of the two sectors (Ku/Kp) could be raised, i.e., "until a much higher degree of industrialization has been attained."

The question of the effectiveness of capital utilization—or the "profitability" of capital investments—has plagued Soviet economics for many years: on the one hand because in Marxian theory capital, unlike labor, is "unproductive"; and on the other hand because, notwithstanding doctrinaire restraints, scarcity of capital and the possibility of using it in different directions forced planners and policy makers alike to consider its "effectiveness" in alternative uses. The two studies which are included in this section, by Gol'dberg and Rozentul, both show great awareness of Western literature on this subject and interesting ingenuity in an attempt to adapt some Western techniques to the Soviet environment. These papers, along with the Fel'dman studies, show clearly that the question of effectiveness of capital utilization appeared early on the agenda of Soviet planners. While, as we already know, the planners resorted in practice to all kinds of eclectic solutions in this field, the problem of finding some sort of theoretical solution to the question of effectiveness has refused to dissipate itself, notwithstanding numerous doctrinaire incantations.

V. Bazarov

ON "RECOVERY PROCESSES" IN GENERAL

The term "recovery process" was naturalized in our contemporary economic literature at the happy suggestion of V. G. Groman. He performed an unquestionable service in this matter, for without a clear conception of the nature of the recovery processes one can understand nothing of our present-day economy. Unfortunately, the nature of the recovery process as such, its inner pattern and logic, is precisely what most people discoursing and writing on this subject have thus far poorly grasped. On the strength of the gigantic coefficients of our present economic growth, some of them have been indulging in the most fantastic optimism while others, failing to perceive any solid base behind this growth, are becoming thoroughly ironical about the very idea of a recovery process, and go to the length of perversely denying wholly obvious facts.

Since it is not very useful to engage in polemics on these two lines determined by intuitive feelings, we trust the reader will forgive us if, with a certain pedantry, we force him to take a close look at the concept of the recovery process in its—so to speak—pure form, before turning to the concrete phenomena of concrete reality.

What, then, is the recovery process?

Any system of relations having a definite organizational structure, if some external forces have caused the deformation of that system, seeks to regain the state of equilibrium (static or dynamic), provided the deformation is not of such significant extent as to make the system fall apart.

What is the mechanism of processes of this sort?

Since the greater the deviation from equilibrium, the more strained are the inner powers of cohesion seeking to restore the deformed system to a state of equilibrium, it is obvious that the rate of speed of the "recovery process" must slacken[1] in pro-

"O 'vostanovitel'nykh protsessakh' voobshche i ob 'emissionnykh vozmozhnostiakh' v chastnosti." Ekonomicheskoe obozrenie, No. 1, 1925, pp. 11-29. [The full title of the article is "On 'Recovery Processes' in General and on the Possibilities of Currency Emission in Particular." Bazarov's discussion of currency emission has been omitted. —Ed.]

1. "Rate of speed" here signifies acceleration; with acceleration diminishing, speed itself may actually increase, provided the resistance of the environment is not great.

portion as the difference diminishes between the given state of the system and the state of its stable equilibrium. We re-emphasize, furthermore, that stable equilibrium can be not only static but dynamic, the characteristic of the latter as it applies to biotic and, specifically, societal processes being definite quantitative relationships between the parts of a normally functioning whole.

The principle just formulated is applicable to any system—mechanical, biological, or social—of organized relations. For example, a pendulum which has received a push oscillates, gradually shortening the span of its swings as it is affected by friction, until finally it comes to rest in a position of stable equilibrium. Subject to this same law of "fading oscillation" are the movements of a sounding string, the discharge of an electric battery, waves spreading out as the effect of a stone thrown into the water, "conjunctural" fluctuations of market supply and demand, and even the succession of political forms in transitional periods....

Actually, phenomena of the type which interests us still appear to be far more common than is usually believed. As the statistical method has scored greater and greater gains in the exact sciences, the stringent laws of the old physics, chemistry, and mechanics have been proving to be no more than statistical averages, i.e., combinations which are not absolutely necessary but merely most likely, oscillating around and gravitating toward what are all manner of real processes which, in their quirky concrete diversity, can be accommodated in no hard-and-fast laws.

However, even though fading periodic oscillations are widespread in societal life, they relate in this sphere primarily to phenomena of a so-called "conjunctural," and on the whole transitory, character. Nevertheless, the effects of conjunctural, seasonal, and other periodic or in general undulating oscillations are precisely what must be eliminated if the recovery processes which constitute the object of our investigation are to be brought out in their pure form. They themselves are not undulatory in character, are not among the periodic phenomena, and represent a particular instance of fading oscillation where the process gradually dies down, approaching a state of equilibrium, and in no case goes beyond the equilibrium line.

For a more graphic explanation of the matter, let us first analyze a fictitious example. Let us suppose that a certain country which manufactures a particular mass-consumption

article (cotton fabrics, for example) from imported raw material and is unable, owing to climatic conditions, to develop domestic production of that raw material, has been subjected by its neighbors to a protracted blockade involving the particular raw material that it needs. Obviously, while the blockade is on, our hypothetical country will be compelled to replace the output which new circumstances make impossible by manufacturing some surrogate of domestic derivation. Let us assume that when a number of years have gone by the blockade is in an instant terminated and the country reverts from the surrogate to the original product. At what rate, it may be asked, will the output of this product develop if the country's productive capabilities are unlimited?

First of all, it is clear that this transition cannot be instantaneous. However poor and unprofitable may have been the surrogate employed during the blockade, its long-time use has created certain habits which, despite the obvious preferability of the genuine product, take a certain time, albeit very brief, to disappear, clearing the way for the new contrivances. Thus at no finite distance from the level of equilibrium can the rate of the recovery process be infinitely great; however abruptly the line which graphically delineates the recovery process may ascend to the level of equilibrium, it must have a smooth appearance. It may not have acute angles, discontinuities, points of reversion, or isolated points. Nor may it have points of flection, i.e., there cannot be moments when, before it has attained equilibrium, the recovery process of its own accord, without in any way being affected by outside forces,[2] temporarily pauses and then resumes with great intensity. Thus in our example demand for the resumed output will obviously grow at its maximum rate at the very beginning; then this rate will taper off, for two reasons: first, because as a larger and larger part of the public needing the new product has its need satisfied, the unsatisfied part of the consumers will diminish quantitatively; second, because the first to gratify their wants will be those consumers who are most alert and quickest to find their bearings in the new setting, while the people who emerge as customers from then on will be those who are slower to change their habits. In other words, the growth of the process is attended by falling quality as well as numbers of

2. The reader must not forget that we are exploring the recovery process in its pure form, i.e., are abstracting ourselves from all changes in the external environment.

the elements which it has not yet embraced. Not only are there fewer and fewer people remaining who have not been turned to account, but each person left contributes with less and less intensity to the development of the process. Because of this fact, the further the point the recovery process has reached is from the level of equilibrium, the speedier that process is, whereas as it draws nearer that level its rate steadily declines, becoming infinitely slow at an infinitely short distance from the equilibrium level. When an insignificantly small number of unsatisfied customers remains, the recovery process as such is practically over. After that the development of production is attributable to the rise in population and to its well-being, or to the lowering of prices on output, resulting in fuller gratification of needs. These are all processes of normal organic development and have nothing to do with recovery processes, which are subject to altogether different laws and, by their rate, determine the level of dynamic equilibrium sought by the recovery processes in particular elements of the societal whole, elements which are for some reason retarded in their growth and have therefore proved to be at their minimum.

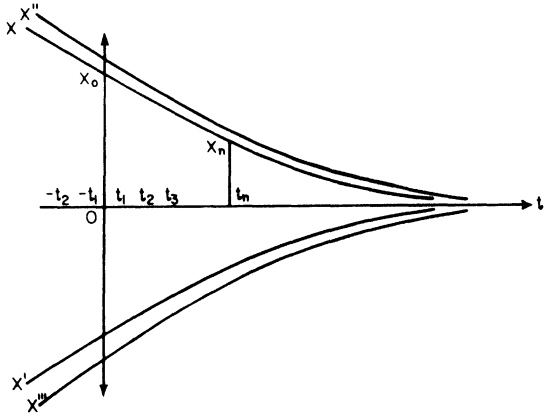
Needless to say, the only way to tell whether we are confronted with a recovery process in the precise meaning of the term or a phenomenon of a different order is through a concrete analysis of available empirical data. Before the formula of the recovery process is actually applied and any practical conclusions drawn on the strength of it, it must be proved that in each given instance all the essential prerequisites for this are on hand.

But as long as we describe the recovery process solely in terms of qualitative features, the practical results of applying this concept will be rather slim. Admittedly, we shall be able to orient ourselves better in the available material on our socialized economy, gain better insight into the structure of its separate sectors or elements, clear up some seeming paradoxes, and remove some misunderstandings and prejudices. This is by no means a trifle, but it is still not enough for the practical man, and not sufficient for the theorist either. The main task of practice, and accordingly of theory as its primary tool, is not classification and qualitative description of what exists but prevision of the future, quantitative appreciation of developmental trends. To transform quality into quantity, logic into mathematics (and this is, in the final analysis, the problem of so-called exact cognition), there is no necessity in our case for recourse to any

arbitrary hypotheses. It is enough to employ mathematical symbols to designate the elementary characteristics which we have just searched out in the pattern of the recovery process. Comparison of the mathematical designations thus obtained will yield the formula that expresses the general law of the recovery process, making it possible to proceed from qualitative description to quantitative analysis.

For convenience of inquiry, we shall operate not with the absolute proportions attained through the recovery process by a given moment in time, but with the distance it still has to travel before arriving at the level of equilibrium.

Having, on a horizontal axis (see figure) moving to the right from any point arbitrarily taken as the start of the process, marked off segments proportional to the time which has elapsed in the period of observation (the letters t_1, t_2, t_3...t designate the number of days, weeks, months, or any other units of time), we shall on ordinates drawn at each such point mark off segments proportional to the distance which at the moment of observation separates the process under study from the equilibrium level for which it is aiming. The level of equilibrium thus coincides on our drawing with axis t. The distances we shall designate by the



letters X_0, X_1, X_2...X , depending on the moments in time to which they refer. The course of the restoration process is represented by curve X. The characteristics of the restoration process, with which we are already familiar, are expressed geomet-

rically in the fact that curve X descends smoothly to the level of equilibrium, has no points of flection, acute angles, or discontinuities, and its convexity is directed steadily downward, i.e., as it approaches the level the intensity of its fall diminishes; for an infinitely long time it approaches axis t at an infinitely short distance without, however, ever intersecting it. In other words, axis t is an asymptote of the curve.

In reality every recovery process starts at a definite moment in time, at a finite distance from the level of equilibrium. But theoretically there is nothing to prevent us from assuming that line X, symbolizing a process, extends infinitely far to the left, while retaining all the characteristics enumerated above. Since at a finite distance from the level of equilibrium the speed of the recovery process is inevitably finite, the ordinate of X can attain an infinitely great magnitude only at an infinitely great distance from point 0, and that means that curve X has no second asymptote perpendicular to axis t.

If, to continue, at various moments in time we measure not the actual distances separating the process from equilibrium, but the rate or speed at which these distances change, we shall find that the curve of the rate possesses the same characteristics as the curve of the process itself with one exception: if we take the distance from the level of equilibrium as a positive magnitude, then the rate of its change is a negative magnitude, for we have in this case the rate at which the distances diminish, not grow, with the passage of time. The graphic expression of this will be that the rate curve, which we shall designate with the letter X', will have to be traced not above but below line t. For the rest, the rate curve must be characterized by all the features identified above for the curve of distances, for deviation from even one of them would with logical inevitability cause the description which we have established for curve X to be in one way or another distorted. Thus, for example, if curve X' had a point of flection, i.e., straightened out for an instant in order thereafter to have its convexity turned in the other direction, it would mean that at a certain moment the distance begins to diminish not at a slackening but at a constant speed, in defiance of the basic pattern of the recovery process; if X' did not have axis t as its asymptote, process X would not draw to an end either as it approached line t, but would seek to go beyond it, and line t would not be the level of equilibrium; if curve X' had a second asymptote, perpendicular to axis t, at a finite distance from point 0, the speed of the recovery process would take on infinitely great magnitude at a finite distance from equilibrium, etc.

Since curve X' possesses all the characteristics of the recovery process and is distinguished from curve X only by its location below axis t, if we invert the sketch we can rightfully take line X' as our basic curve. From this it follows in turn that a curve X'' should exist, depicting the speed with which X' changes, the rate of the change of rate, so to speak, and having exactly the same relationship to X' as X' has to X; it is opposite curve X' in its sign (i.e., as does X it lies above line t), but is in all other respects analogous to X and X'. Deriving in exactly the same way from the existence of curve X'', clearly, is the existence of a curve X''', expressing the rate at which X'' changes, and so on ad infinitum.

Mathematicians term the rate of a process, measured at a given moment in time, its first time derivative, the rate of the change of rate the second derivative, etc. Our symbols X', X'', and X''' consequently signify the first t derivative of X, the second derivative of X, and so forth.

The patterns deduced above may be briefly expressed as follows. X, the curve of distances, has at all points a numberless series of derivatives of consecutively higher order; the first derivate of X, all the way from $t = -\infty$ to $t = +\infty$. is negative, the second X'' is positive, the third X''' negative, etc.; finally, if $t = -\infty$, the $X = -X' = +X'' = -X'''... = +\infty$; if $t = +\infty$, then $X = -X' = +X'' = -X''' = \ldots (X^n) = 0$.

By what law, then, can the magnitude of X change, if all the conditions named above must be met?

...We shall not here adduce the proofs[3] but shall simply point out that functions of one type and one type only meet all the requirements we have set; these are model functions which have the following form: $X = ca^{-kt}$, or $x = c/a^{kt}$, where a, c, and k are some constants and X and t variables (in our case distance and time).

Indeed, if the relationship between X and t is expressed by the equation just written down, then if t equals negative infinity, X equals positive infinity; if t equals positive infinity, X equals zero; all through this the curve descends smoothly to axis t, its convexity being turned toward it all along; the function has a countless number of derivatives which exactly duplicate it and differ from it only in the constant coefficient, the equivalent ratios X'/X, X''/X', etc., furthermore, having a minus sign. Neither algebraic nor trigonometric functions meet all the conditions of our problem, nor do model functions of any other type.

3. See appendix at the end of the article.

There thus derives from the very pattern of the recovery process, from the combination of the most general features qualitatively distinguishing processes of this sort from all others, the law which quantitatively defines the course of these processes.

This law states: $X = ca^{-kt}$ or, employing symbols more convenient for computation purposes, $X = X_0e^{-kt}$. In this last formula X_0 is the distance of the process, measured directly, from the level of equilibrium at the moment which we agreed to take as the start (the zero point on the drawing) for measuring off our observations; e is the base of the natural logarithm; k the coefficient, different for the various processes and describing their intensity; X the distance from the level of equilibrium at the moment of observation; and, finally, t the time which has elapsed from the start to the moment of observation.

As a specimen of a recovery process we cited above the example of a country which revives a branch of production after it has been blighted by an extended blockade. The vast majority of present-day recovery processes in Soviet Russia bear the same general character but are, needless to say, immeasurably more involved and complex than our systematically oversimplified examples.

We have assumed that the productive capabilities in the given field were limitless and that the potential demand to be completely satisfied (the level of equilibrium) was precisely known in advance. Actually, rather narrow limits, defined by the productivity of this or that branch when the available means of production have the maximum possible work load, have been set for our productive capabilities within the bounds of a pure recovery process. Given the present state of information on the capital stock of our industry, this limit, which determines the level of equilibrium from the technical side, may be indicated—to be more accurate, guessed—only very roughly. On the other hand, the potential extent of demand backed by ability to pay in this or that field (the second element determining the level of equilibrium), after the profound socio-political upheaval through which the country has passed, appears highly speculative. Finally, we are not dealing with a temporary retardation of the economic process in one field, but with a severe deformation of the whole of the national economy, a deformation which has grossly disrupted all the relationships of the parts. And if, furthermore, the elements which have proved to be at their minimum go through the recovery process under a "double strain," so to speak, pulling them-

selves up to the general level of equilibrium and at the same time experiencing special acceleration by virtue of their lag behind the recovery process as a whole, on the other hand—and perhaps to an even greater degree—the presence of the particular "minimums," which appear one moment here and the next there, hampers the general course of the recovery of our national economy. The picture is rather complicated and involved and calls for close and detailed analysis....

APPENDIX

The following considerations lead to the conclusion that the characteristics of the recovery process can be expressed only by an equation of the type: $X = X_0 e^{-kt}$.

(1) The ratios X'/X, X''/X', etc., should have finite value all through the recovery process from $X = \infty$ to $X = 0$, including the limits themselves. Indeed, if X'/X turned into infinity with X equalling 0 it would mean that X' retains finite dimensions while X becomes smaller than any given magnitude, i.e., that the axis of abscissas is not an asymptote for X'—and this conflicts with the conception of the recovery process. Likewise the ratio X'/X cannot turn into infinity with X equalling ∞, for that assumes that as X grows, X' attains infinitely great values, while X itself (and consequently t as well) still retains finite dimensions, i.e., that besides the asymptote $X = 0$, curve X' has still another asymptote, namely the ordinate, the equation of which is $t = -a$, where a is a finite magnitude; this once again conflicts with our definition of the concept of the recovery process.

(2) It follows directly from point (1) that if $X = 0$ the ratios X'/X, X''/X', etc. gravitate toward one and the same finite limit C, and if $X = \infty$, to the limits C_1, C_2, C_3, etc. (C_1, C_2, C_3...also being finite magnitudes).

Let the looked-for equation of the recovery process be $F(X, t) = 0$. Having solved it in terms of t and substituted the corresponding magnitudes in the expressions X'/X, X''/X', X'''/X'', etc., we can express these last in a function of X. Let us assume that $X'/X = f(X)$. Then $X''/X' = f'(X)X + f(X)$ or $X''/X' = f'(X)X + X'/X$. If $X = 0$ (taking into account that X''/X' and X'/X are finite), we obtain $X''/X' = X'/X$. In exactly the same way we discover that $X'''/X'' = X''/X'$. And so, if $X = 0$, then $X'/X = X''/X' = \ldots = f(0) = C$. On the other hand $X''/X' - X'/X = f'(X)X$, or $f'(X) = 1/X[(X''/X') - (X'/X)]$. Hence, if $X = \infty$, then $f'(X) = 0$,

and consequently $f(X) = C_1$. Likewise if $X = \infty$, $X''/X' = C_2$, etc.

(3) Thus, the function $X'/X = C$ if $t = +\infty$ ($X = o$) and $X'/X = C_1$ if $t = -\infty (X = +\infty)$.

Let us first assume that X'/X is not a linear function of t (from the foregoing it follows that X'/X is a continuous function having a derivative at every point).

This being the case two hypotheses are in turn possible:

(1) Within the limits of a finite interval the function X'/X has several maximums and minimums, i.e., has an undulatory character. But as has already been indicated in the text, the recovery process is an essentially nonperiodic phenomenon alien to undulatory fluctuations. We still do not know whether or not the ratio X'/X can change, but we do already know that if it does change, this change, having once begun, must under the influence solely of the inner forces of the recovery process swell or diminish smoothly. In no case must it pulsate, passing through a number of maximums and minimums and points of flection separating them. And even if, when engaging in a detailed factual study of this or that concrete recovery process, one should discover closely associated with the inner pattern of that process forces which give rise to undulatory fluctuations, even then it would be necessary at the first stage of the formal analysis to isolate them as conventional and conjunctural from the "secular" smooth level of the curve of the recovery process.

(2) The only assumptions which remain, therefore, are that curve X'/X has between points C and C_1 (a) one maximum, (b) one minimum, or (c) neither. But in view of the fact that $C - C_1$ is a finite magnitude, and the distance between C and C_1 along axis t is infinitely great, the curve in these three cases will at every point have an infinitely small curvature, i.e. will be expressed by a linear equation.

Thus the only hypothesis compatible with the concept of the recovery process is that $X'/X = at - k$ (a minus sign with k because X'/X, as we know, is negative). In particular, $C = a(+\infty) - k$ and $C_1 = a(-\infty) - k$, i.e. $a = o$. The straight line X'/X is parallel to the axis of abscissas (the coefficient k remaining indeterminate: any straight line parallel to axis t satisfied the condition).

The looked-for equation of the recovery process, consequently, has the appearance: $X'/X = -k$; integrating it, we get: $\lg (X/X_o) = -kt$ or $X = X_o e^{-kt}$.

Thus a more precise definition of the recovery process is that the speed of its X' at every given moment of time is proportional to the distance from the level of equilibrium, i.e. to the magnitude

of X (and not to any function of X). Deriving from this, with logical necessity, are all the qualitative attributes of the recovery process which have been enumerated in the text, as well as the logarithmic law of its course.

ON THE THEORY OF THE DIMINISHING GROWTH RATES OF THE SOVIET ECONOMY

...We economists have a duty not only to point out the results and to refute on theoretical grounds the conclusions of the "learned" saboteurs, but also to expose the way these conclusions were reached, in order to preclude the repetition of such occurrences in better camouflaged forms.

That is why we must dwell here on Bazarov et al. If we were simply trying to refute his main conclusion about the diminishing growth rates of our economy, we should not have to bother to go to these lengths. This conclusion has long since been disproved by our very development and it is being disproved every day by the tremendous growth we are experiencing.

Thus the task of the economist is to point out the falseness of the premises adopted by Bazarov to arrive at his conclusions. This will equip us better and make us more vigilant in case we ever have to face such theoretical sabotage again....

In the literature Bazarov (as a planner) is mostly known for his theory on slackening growth rates. Bu his theoretical sabotage goes well beyond this. A closer look at his work reveals the total absence of differentiation in his approach to our economy under capitalism and under the Soviet system. It is a repetition of Groman's theory about the constant proportion between agriculture and industry and the view, common to all the wreckers, that the prewar level is the limit to which the Bolsheviks can raise the country and beyond which they can never go. This proposition appears in Groman in the form of the constant proportion between agriculture and industry and it is found in Bazarov in a somewhat different form.

To prove his views, Bazarov introduces several curves. Unlike the others, he tries to explain the curves he uses to approximate the actual figures of our economic growth. Kondratiev and the others unabashedly use parabolas of "corresponding order." Bazarov makes a serious attempt to justify the curve he uses. This attempt can be roughly represented as follows.

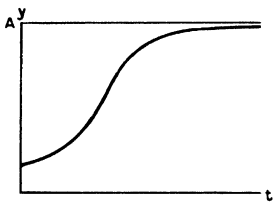
"O teorii zatukhaiushchego tempa razvitiia sovetskogo khoziaistva," Planovoe khoziaistvo, 1930, No. 10-11, pp. 158-163.

Economic development is the process of the growth of production. This process manifests itself in the fact that the production figures grow. Therefore, if we present this production figure as a function of time, we shall be able to judge how our economy develops. Now, what sort of function is this? Bazarov constructs its differential equation. The rate of production growth, or the derivative of our function, in the first place is in proportion to the magnitude of this function itself because the more production grows, the better is the organization of labor, the acquired skill of the workers, etc. (as to the material base for the further growth of production, Bazarov never mentions it); in the second place, there is a certain level A which is above the attained size of production, and the growth of production is in proportion to the distance that still remains to this level.

Thus:

$$\frac{dy}{dt} - Ky = (A - y)$$

where t is the time; y, the size of production; A, the level of 1913. When solved, this differential equation gives the following S-type curve:



The curve not only grows at a diminishing rate, it never even reaches the limit A, i.e. the level of 1913, which it approaches asymptotically. That is why, besides the slackening rate of growth, Bazarov also has the unattainable ideal of 1913.

Now let us see on what his differential equation is based. Imagine that under capitalist conditions an amount of some product for which there is certain demand, expressed by the value A, is put into the market. Let us see now how this amount is marketed. It is obvious that the greater the unsatisfied demand (i.e. the larger [A - y]), the faster the product will sell. Moreover, each unit of this commodity that is purchased publicizes it, if its quality is adequate. Both these facts lead to the

differential equation given above. But at this point Bazarov performs a spectacular about-face. Having written the equation for the marketing of the amount of the product put into the capitalist market, he simply decides that it applies equally under Soviet conditions.

From what precedes, it is easy to see that for the application of this ill-fated differential equation to be valid, one should first prove that the rate of increase in production is in proportion to (1) the size it has reached and (2) the difference between the latter and a certain constant level A. In the chapters dealing with the Soviet economy, Bazarov states that the differential equation is valid and strengthens this assertion by references to the organization of labor, etc. But all this refers to the first part of the proof. To this (the proportionality of the rate of increase of production to the size it has reached), we do not even have any special objections. All we have to do is to eliminate the references—strongly reminiscent of Bogdanov—to organization, etc., and simply point out that the increase in production is not taking place in a vacuum but on a material base, whose width and strength are determined by the level already attained. The second part (the proportionality of the rate of increase of production to the lag in the level of production, i.e., A – y) is precisely the part which causes the slackening and sets the 1913 level as unattainable limit to total growth. This has been expanded in detail in Bazarov's book but does not apply at all to the growth of the Soviet economy. True, in the opening pages of his book, Capitalist Cycles and the Recovery Process of the Soviet Economy, Bazarov declares that our plans are based on the demands of a free market. However, our plan is not to attempt to adapt ourselves to the free market, but to have an active influence on it and to drive it out of existence; our plan is the expression of the deliberate direction of our whole national economy toward the most rapid realization of socialism, a leap from the domain of necessity into the domain of liberty. All this the members of the Kondrat'ev-Bazarov-Groman group of saboteurs cannot, or rather refuse to, understand. The conclusion based on the above-mentioned differential equation is without any justification and is dictated by the refusal to see the difference between our economy and a capitalist economy. Bazarov has used it to help him find the answers he wanted and not as an instrument for a scientific investigation of what really happens.

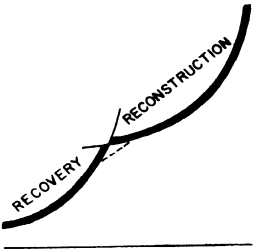
Now, we ought to say a few words about the use of differential equations in general. Generally speaking, if we have in mind a

process of variation and if we wish to find the pattern of this variation, the use of differential equations is no doubt very useful. It is not for nothing that Engels said that with the variable, mathematics has entered the domain of dialectics. And the decisive role of the variable in mathematics is in differential and integral calculus. The essence of differential and integral calculus lies precisely in differential equations. Therefore, wherever we deal with the variation of quantity, it can best be studied by the means of differential equations. But this equation, unlike Bazarov's, must be based on qualitative analysis.

We also ought to say a few words about the figures used by Bazarov to establish his S-type curve. How is it possible that he failed to see a sharp discrepancy between the series of figures and the theoretical S-type curve? The actual explanation is quite simple. Since the recovery period is followed by the reconstruction period, we may not draw one single smooth curve through both periods. Comrade Khotimsky dwelt on this subject when he criticized the Leibnitz aphorism that nature abhors leaps. If one period is followed by another that differs from it qualitatively and if a curve suits one period, then the curve for the next period must be quite different. What happens then at the point of juncture of the two periods? There are here two distinct curves, and therefore a leap must of necessity take place. If we take the recovery period and the reconstruction period, we find that each of them has its own curve of the rate of growth. During the transition from recovery to reconstruction, these two curves meet and a leap occurs. But it is not always possible to see this leap in figures, and for a very simple reason. The leap, i.e. the change-over from the recovery period to the reconstruction period, does not occur simultaneously everywhere. At one enterprise it can happen earlier, at another, later, and these differences may be substantial if we take not simply a few enterprises of the same industry but rather the national economy as a whole. What, then, is the result? A mass of leaps occurring at different times are superimposed on one another and thus soften the sensation of the leap and create the illusion of a smooth curve running over the two periods (see diagram).

Seeing this softening effect shown by the dotted line on the graph, Bazarov mistook it for a falling growth rate, for the natural continuation of the curve of the recovery period, and rushed to generalize his blindness in his theory of falling growth rates. Mach's philosophy hid from him the true process of development and his political hostility toward

our regime prompted him to make hasty, far-reaching conclusions.



I believe that the continuation of the ideological struggle against those who have been arrested by the GPU does not in the least free us from continuing the fight against our enemies still at large. Therefore after having dealt with Bazarov, I want to touch upon some alleged corrections to his theory made by Podtiagin (see my articles in Ekonomicheskaia zhizn, January 4 and February 1, 1929). Podtiagin's corrections consisted in the following: he denies the necessity for basing the curve on anything except the figures from which it is plotted. Following many other economic vulgarizers, he simply uses a straight line and then tries to prove that if our planners produce directives with growth rates that exceed those of his straight line, then this proves that the plan violates the actual facts and must inevitably fail. And we all know that a straight line is a line with a diminution in the growth rate.

Thus, the outright Machism—with its formula "apply a straight line to whatever comes into your hands"—and the more subtle variety of Machism, involving differential equations and other refinements, easily come to an agreement on the role of planning as well as on rates of growth....

M. Ragol'skii

ON THE GROMAN-BAZAROV SUBVERSIVE THEORY OF PLANNING

... After having proclaimed in 1924 his thesis on the primacy of spontaneity, Bazarov continued to advocate it, only adding to it in 1926 his theory of "the falling rates of growth."

In a Planovoe khoziaistvo article (1926, No. 7), Bazarov declared: "Long-range planning must combine genetic and teleological methods to find the optimal way of development."

The solution Bazarov suggests is a very simple one: teleology is to be applied to state enterprises, and genetics to agriculture.

In this same article he writes: "Agriculture, split as it is into more than 20 million small independent units and relying mostly on export in its market production, is an area in which the genetic method plays the dominating role." Thus the old familiar song is heard again in 1926.

As to the plan being optimal, Bazarov brings in three factors: (1) "The movements of the national economy must be smooth, without any bottlenecks...." (2) "At any transition point, the national economy must be a harmonious organic unit, a system of mobile equilibrium with maximum stability. This requires the balancing and internal coordination of various elements of the recovery process." And, finally, (3) "the optimum plan assumes that, provided conditions (1) and (2) are fulfilled, the way chosen by the plan to achieve its target should be the shortest possible.... At this point, therefore, the problem of the rate of growth arises.... The advantages, in this respect, of a planned economy over a capitalist one are obvious and consist in the more efficient use of the share of national income spent on recovery. However, this share in our planned economy at its present stage of development is not larger—in fact if anything it is smaller—than the equivalent share in a capitalist economy at the same stage of development. Try as we may to reduce the demand of the masses for consumer goods during the difficult period of transition, we will not be able to attain, in this re-

"O vreditel'skoi teorii planirovania 'Gromana-Bazarova," Planovoe khoziaistvo, No. 10-11, October-November, 1930, pp. 59-97.

spect, the norms of a capitalist society. On the other hand, our planning machinery is costly. This is due partly to our inexperience but also, to a certain extent, to the low level of production forces. Under capitalism there is no complex planning apparatus, and therefore there are no expenses connected with it. We could achieve a comparable economy by streamlining the functioning of the planning apparatus and limiting it considerably at the present low level of our economic development."

Since in this country wages tend to grow, since the welfare of the peasants is greater, and finally since the planning system and the state machine "require relatively high expenditures," Bazarov concludes that our sources of growth are smaller than those of a capitalist economy. But the fact that the workers in this country are working for themselves, that the socialist reorganization of small-scale enterprises opens up tremendous vistas for increasing the productive forces of agriculture, that our system eliminates the tremendous wastefulness of capitalism, all these advantages Bazarov calls handicaps.

According to Bazarov, not only are we incapable of reaching rapid rates of growth, but we are even doomed to falling rates.

"We are about to reach the end of the recovery process without sufficient preparation for the forthcoming period of reconstruction. Therefore, in the next years, we shall inevitably witness falling rates of economic growth. Indeed, we must spend on reconstruction considerable sums, the effect of which will not be felt for several years, that is, until the newly built enterprises begin operating one after another. The greater the resources for the construction of new enterprises at the expense of the renewal and repair of enterprises already in operation, the greater will be this fall in growth rates. From the viewpoint of efficient principles of reconstruction, obsolete enterprises must only complete their term of operation and are not worth important capital outlays, since the latter would amount to overpaying for a small increase in output and an even smaller increase in productive efficiency. But it seems that we shall not be able to avoid such 'irrational' expenditures. In effect, if we decided to make only capital outlays that we considered 'rational' in the light of the general plan, then we should have to invest all our savings in the construction of new enterprises, thereby limiting expenditure on enterprises now in operation to what is known as 'current repairs.' As a result, during the period when the new enterprises are still under construction, we should find not only a fall in the growth rate, but also a complete stabiliza-

tion of the physical volume of output and a drop in general labor productivity, combined with a sharp increase in the wage fund at the expense of the proletariat engaged in construction" (ibid.).

And so Bazarov draws this practical conclusion: "Such a policy would obviously violate the condition of the 'commensurability of the parts' of the national economy taken as a whole and lead us to a sharp crisis and a catastrophic failure to meet our planned targets. Thus, to soften the hardships of the transition period, we must, along with new construction conducted strictly according to the plan of general reconstruction, spend considerable sums on obviously inefficient enterprises in order to obtain an immediate, even if insignificant, improvement in their efficiency" (ibid.).

Thus Bazarov tries to found his theory of diminishing rates of growth on two premises: first, denial of the advantages our system has over the capitalist one; and second, insistence that the transition from the recovery period to the reconstruction period will involve colossal expenditures of capital and labor on enterprises that will not show any results for five or six years. If we insist on building new factories, we are threatened by an arrest in the development of our production, and along with it a crisis, a catastrophe, etc. So the fewer new enterprises we construct and the more we expand the old ones, the slower will be the rate of diminution. Such is Bazarov's conclusion.

There is so much confusion in Bazarov's theory that it is not too easy to disentangle the mess. First of all, Bazarov is wrong in saying that expanded capital construction would inevitably result in a stationary volume of physical output or a falling growth rate. The scope of capital construction is linked, to a great extent, to the size of the increment in the surplus social product (although the construction of new enterprises can be financed by the part of gross production that covers the amortization of old enterprises that are winding up their operations). The growth of capital outlays requires the growth of the surplus product, i.e. of production as a whole. Construction of new enterprises requires huge amounts of producer goods for building and consumer goods for the builders. It is impossible to build such plants as the Dneprostroi or Magnitogorsk without a tremendous increase in the output of metal, cement, etc.

Increasing capital construction means that every year a great bulk of metal, cement, and bricks is sent to the building sites of new enterprises. These materials are "participating" in the output of products in the given year. That is true. In this respect,

there is a difference between construction materials and equipment which, as soon as it is received in the new enterprise, is used in the production process. However, we can imagine a rapidly increasing annual amount of surplus product and an increasing amount of means for construction. And if the share of the accumulated part of the surplus product increases—and there is no doubt it will—then this becomes more and more possible.

Since the means of production come from the market, as well as the means of consumption for the construction of new enterprises which will start producing only after the completion of their construction, a strain may occur in supply and demand, although it does not necessarily follow that a crisis is imminent. Just like any other difficulties in our building of socialism, they contain within themselves the means for us to overcome them. The growth of labor productivity, socialist competition, the self-sacrificing efforts of the workers—all these lead to growth of the social product, to the speeding up of construction which will enable us to construct and to produce more.

In his theory of diminishing growth rates, Bazarov attributes great importance to the dynamics of labor productivity. He says it will inevitably drop if, in order to avoid the total arrest of the rate of growth, we begin to expand old enterprises. Now, if we give priority to means of production for the construction of new enterprises, we shall again have "a drop in average labor productivity." In brief, it will drop whatever we do. But a simple "unsophisticated" brain cannot grasp why the construction of new enterprises must result in a drop in labor productivity. Neither is it clear why the expansion of old enterprises must lead to the same result. And Bazarov choses to remain silent about the tremendous reserves that have remained unused, often intentionally unused, by saboteurs.

Now, if the restoration of old enterprises or the construction of new ones is not carried out by saboteurs, the result will be an increase in labor productivity. And an increase in labor productivity is an important way of speeding up the rate of economic growth: it increases the surplus product while simultaneously increasing wages, it increases the volume of goods and the means of labor, it expands the area of labor, etc.

The theory of diminishing growth rates is wrong since it is derived by equating our economy with a capitalist economy, thus ignoring our advantages over capitalism, which become more and more obvious as we approach socialism.

The theory disregards the facts that the socialist revolution

has opened up tremendous vistas for increasing the productive forces; that it has broken down the barriers by which capitalism prevented the use of machines, the application of scientific methods in agriculture, electrification; that it has swept away the parasitic class of consumers such as the landlords and the rentiers; that, as we approach socialism, outlays on distribution are reduced; and that new incentives to work have been created. This theory conceals the fact that a very large share of the surplus product in our country is used to expand the means of production, just as it conceals the important fact pointed out by Comrade Stalin at the 16th Congress: that the socialization process of our economy is in itself a source for the increase of our growth rates. All this must be taken into consideration. As we socialize our economy, we bring the full advantages of socialism to our entire economic complex, and thus, instead of a falling rate, we shall find an increase in the growth rates of capital outlays and output....

The theory of diminishing growth rates was very important for the united counterrevolutionary front—it suited the purposes of the wreckers, which was to delay at all costs the successful and rapid development of our economy. According to Bazarov, during the recovery period our growth followed a "smooth S curve," and thus we must base our plans on the mathematical analysis of this curve which is a falling rates curve. But to the mathematical logic of the S-curve, the proletariat has opposed the dialectical logic of socialist growth. And contrary to Bazarov's predictions, the reconstruction period showed no slackening in the rate of growth....

G. A. Fel'dman

ON THE THEORY OF

GROWTH RATES OF NATIONAL INCOME, II

4. THE INTERDEPENDENCE OF THE RATES OF GROWTH OF THE QUANTITIES ND_p, ND_u, S_p, S_u, K_p, K_u IN THE GENERAL CASE

...Use of differential calculus introduces new mathematical content into the concepts of national income, increments of capital, and rates of growth, especially by use of the concept of an infinitely small change or shift in a quantity during an infinitely small time interval. In what follows, we are no longer concerned with national income produced in a year, but with the "rate" of production of national income at any given instant, with an infinitely small increment of crystallized human labor as a function of an infinitely small increment of time.

The velocity of this production at any given instant can be measured by the magnitude of the national income which would be obtained if it were produced at a given constant rate all year. This, however, gives only the velocity of production—the volume of output divided by time—at any given instant.

The same is true of the growth of capital: the formulas give only the velocity of the growth. The rate of growth is defined as the ratio of the acceleration per unit of time to the velocity at a given instant.

It will be assumed for the present that there is no amortization due to obsolescence. The limiting conditions (see section 3) of the equations

$$\alpha_p \cdot S_p \cdot K_p = (1 - \alpha_u) \cdot S_u \cdot K_u$$

and

$$G_{\alpha p} + G_{sp} + G_{kp} = G_{(1-\alpha_u)} + G_{su} + G_{ku}$$

This is the second part of the article "K teorii tempov narodnogo dokhoda," Planovoe khoziaistvo, No. 12, December, 1928, included in our section Macro-economic Models. For the list of symbols see page 175.

Certain typographical errors in mathematical symbols in the Russian text of this article have been corrected.—Ed.

will also be discarded, and it will be assumed that the rates of growth G_{ku} and G_{kp} can be maintained by increasing S_p and α_p, i.e. by increasing the effectiveness of capital and the portion of output channeled into accumulation....

Four basic equations in differential form will represent the basis for the ensuing analysis.

$$T_p = \frac{dND_p}{dt} \cdot \frac{1}{ND_p} \tag{1}$$

$$ND_p = S_p \cdot K_p \tag{2}$$

$$ND_u = S_u \cdot K_u \tag{3}$$

$$ND_u = \frac{dK_p}{dt} + \frac{dK_u}{dt}, \text{ with } A_m = 0 \tag{4}$$

The following have also been defined:

$$T_u = \frac{dND_u}{dt} \cdot \frac{1}{ND_u} \qquad G_{sp} = \frac{dS_p}{dt} \cdot \frac{1}{S_p}$$

$$G_{su} = \frac{dS_u}{dt} \cdot \frac{1}{S_u} \qquad G_{kp} = \frac{dK_p}{dt} \cdot \frac{1}{K_p}$$

$$G_{ku} = \frac{dK_u}{dt} \cdot \frac{1}{K_u} .$$

The following are also known from the first part:

$$T_p = G_{sp} + G_{kp}, \quad T_u = G_{su} + G_{ku}, \quad T = G_s + G_k .$$

These equations hold whether the rates of growth are positive or negative.

These formulas raise the paradoxical possibility that an increase in productive capital may result in a lowering of the rate of growth of income as the effectiveness of capital utilization decreases. From this it is clear that an increase in labor productivity can increase the rate of growth of income only if it results ultimately in an increase in the effectiveness of capital utilization. Yet such a connection is far from compulsory, since frequently an increase in labor productivity is purchased at too high a price. We shall return to this question again in what follows.

The interdependence of the rates of growth of capital in sectors p and u is expressed as follows:

$$ND_u = \frac{dK_p}{dt} + \frac{dK_u}{dt}$$

and

$$S_u \cdot K_u = K_p \cdot G_{kp} + K_u \cdot G_{ku}$$

or

$$G_{ku} = S_u - \frac{K_p}{K_u} \cdot G_{kp}$$

or

$$\frac{K_u}{K_p} = \frac{G_{kp}}{S_u - G_{ku}} \quad .$$

The first conclusion that must be drawn from this formula is that if the rates of growth are to be increased, with S_u constant, the ratio $K_u/K_p = I_k$ (see section 3) must also be increased. The following relationship between the rates of growth of output ND_p and ND_u is also deduced from this formula:

$$(T_u - G_{su}) = S_u - \frac{K_p}{K_u} (T_p - G_{sp}).$$

No special limiting conditions have been placed on the size or behavior over time of the rates of growth G_{ku} and G_{kp} and the functional relationships will therefore be analyzed for arbitrary G_{ku}, G_{kp}, and S_u.

To this end, differentiate the equation:

$$G_{ku} = S_u - \frac{K_p}{K_u} G_{kp} \; .$$

Thus:

$$\frac{dG_{ku}}{dt} = \frac{dS_u}{dt} - G_{kp} \cdot \left[\frac{\frac{K_u dK_p}{dt} - \frac{K_p dK_u}{dt}}{K_u^2} \right] - \frac{K_p}{K_u} \cdot \frac{dG_{kp}}{dt}$$

$$\frac{K_u}{K_p} \cdot \frac{dG_{ku}}{dt} = \frac{K_u}{K_p} \cdot \frac{dS_u}{dt} - G_{kp} \cdot (G_{kp} - G_{ku}) - \frac{dG_{kp}}{dt}$$

$$\frac{K_u}{K_p} \cdot \frac{G_{ku}}{G_{kp}} G'_{ku} = \frac{K_u}{K_p} \cdot \frac{S_u}{G_{kp}} \cdot G_{su} - G_{kp} + G_{ku} - G'_{kp} \; ,$$

where

$$G' = \frac{dG}{dt} \cdot \frac{1}{G} \quad ,$$

or:

$$G_{ku} + \left(\frac{K_u}{K_p} \cdot \frac{S_u}{G_{kp}} \cdot G_{su}\right) - \frac{K_u}{K_p} \cdot \frac{G_{ku}}{G_{kp}} \cdot G'_{ku} = G_{kp} + G'_{kp} \qquad (1)$$

With no amortization due to obsolescence, this is the most general formula expressing the interdependence of the rates of growth and their changes for all variables of interest.

That G_{kp} and G_{ku} determine the rate of growth of total consumption follows from the equation $T_p = G_{kp} + G_{sp}$ and the differential equation

$$T_p \cdot T'_p = G_{kp} \cdot G'_{kp} + G_{sp} \cdot G'_{sp} ,$$

or

$$T'_p = G'_{kp} \cdot \frac{G_{kp}}{T_p} + G_{sp} \cdot \frac{G'_{sp}}{T_p} .$$

Substituting for T_p from the first equation gives

$$T'_p = \frac{G_{kp} \cdot G'_{kp} + G_{sp} \cdot G'_{sp}}{G_{kp} + G_{sp}} .$$

T_p is thus a function of the variables G_{kp} and G_{sp} and their rates of growth.

If G_{sp} is constant, the formula becomes

$$T'_p = \frac{G_{kp} \cdot G'_{kp}}{G_{kp} + G_{sp}} = \frac{G'_{kp}}{1 + \frac{G_{sp}}{G_{kp}}} .$$

If $G_{sp} = 0$, then $T'_p = G'_{kp}$ and $T_p = G_{kp}$.

Thus we have shown an extremely close dependence (even equality, with S_p constant) of T_p and T'_p on G_{kp} and G'_{kp}.

The fact that the right-hand side of the equation of growth rates (1) consists of the sum of G_{kp} and G'_{kp} determines the character of the dependence. If $G'_{kp} > 0$, then G_{kp} increases, but remains less than the left-hand side of the equation. However, if the left-hand side of the equation increases at the same rate as G_{kp}, then G'_{kp} also increases the same rate.

If the left-hand side of the equation increases faster than G_{kp}, then G'_{kp} must also increase faster than G_{kp}. Only in the case when the left-hand side of the equation increases more slowly than G_{kp} does G'_{kp} decrease to zero; having attained a maximum, G_{kp} stops increasing.

Consider first the case when the sum of the second and third terms of the left-hand side of the equation is zero.

There is nothing impossible in the existence of the equality:

$$\frac{K_u}{K_p} \cdot \frac{1}{G_{kp}} \cdot S_u \cdot G_{su} = \frac{K_u}{K_p} \cdot \frac{1}{G_{kp}} \cdot G_{ku} \cdot G'_{ku}$$

or

$$S_u \cdot G_{su} = G_{ku} \cdot G'_{ku} .$$

The experience of recent decades in the United States has indicated that the variables G_{su} and G_{ku} have negative values. But it is not impossible for these variables to take on positive values under certain conditions. It is entirely possible to establish a constant rate of growth, G_{ku}, and in that case G'_{ku} will be zero. The same is also true of S_u and G_{su}.

When $S_u \cdot G_{su} = G_{ku} \cdot G'_{ku}$, the general formula for the rates of growth is transformed into $G_{ku} = G_{kp} + G'_{kp}$. G_{kp} can increase, and hence G'_{kp} can be positive only as long as $G_{ku} > G_{kp}$. At the same time, if $G'_{ku} > 0$, G_{ku} may also be growing.

What are the limits of the general increase of the capital of sectors p and u and of the rate of this increase?

In order to clarify this question, the equation

$$(1)\quad G_{ku} + \left(\frac{K_u}{K_p} \cdot \frac{S_u}{G_{kp}} \cdot G_{su}\right) - \frac{K_u}{K_p} \cdot \frac{G_{ku}}{G_{kp}} \cdot G'_{ku} = G_{kp} + G'_{kp}$$

is transformed into

$$(2)\quad S_u - (G_{ku} + G'_{ku}) + \frac{S_u \cdot G_{su}}{G_{ku}} = \frac{K_p \cdot G_{kp}}{K_u \cdot G_{ku}} (G_{kp} + G'_{kp})$$

with the aid of

$$G_{ku} = S_u - \frac{K_p}{K_u} G_{kp} .$$

Consider these equations when $G_{su} = 0$. Then

$$S_u - (G_{ku} + G'_{ku}) = \frac{K_p \cdot G_{kp}}{K_u \cdot G_{ku}} (G_{kp} + G'_{kp}) .$$

If G_{ku} increases, $S_u - (G_{ku} + G'_{ku})$ diminishes gradually and most ultimately become zero. Now, on the right-hand side of the equation, K_p and G_{kp} increase gradually, while G_{kp} remains constant in the extreme case. The numerator must therefore generally be positive. In the denominator, G_{ku} can be no greater than S_u. Thus, when the left-hand side becomes zero, the equality can be preserved only if K_u goes to infinity.

This is clearly a limiting case and one that is of only theo-

retical interest, but it clarifies the nature of the given function. As G_{ku} increases and approaches S_u in magnitude, G'_{ku} diminishes, and it becomes zero, in the limiting case, when $G_{ku} = S_u$.

Thus the rate of growth of capital K_u is limited by the effectiveness of the utilization of this capital. The growth of S_u and G_{su} can increase this limit.

$G_{ku} = G_{kp} + G'_{kp}$. So, if $G_{su} = 0$ and $G'_{ku} = 0$, then at the limit $G_{ku} = S_u = G_{kp} + G'_{kp}$.

$G_{ku} = S_u$ is also the limit of G_{kp}, and when $G_{sp} = 0$, the limit of T_p is zero. These limits are attained as K_u increases to infinity. However, S_u is the limit for G_{ku} and G_{kp} not only when $K_u = \infty$. It may be noted from the equation

$$G_{ku} = S_u - \frac{K_p}{K_u} G_{kp}$$

that when $G_{ku} = S_u$, and K_p and K_u approach their limits, $G_{kp} = 0$. This indicates that, even when the entire production of sector u is used to increase K_u, the rate of growth of K_u cannot exceed S_u. This is also apparent from the equation $ND_u = S_u \cdot K_u$, or

$$S_u = \frac{ND_u}{K_u} .$$

These considerations indicate that there are various possible ways of raising the rate of growth of the capital of sector p.

(1) A fixed, constant rate of growth can be established for the capital of sector u. With a given initial ratio K_u/K_p and a fixed value of S_u, the initial rate of growth G_{kp} is determined by the equation

$$G_{kp} = S_u - \frac{K_u}{K_p} \cdot G_{ku} \text{ [properly, } G_{kp} = \frac{K_u}{K_p} (S_u - G_{ku}) \text{—Ed.].}$$

G_{kp} will increase until it equals G_{ku}. Until then G_{ku} is always greater than G_{kp} and the ratio $I_k = (K_u/K_p)$ increases gradually to the limit

$$I_k = \frac{G_{ku}}{S_u - G_{ku}} .$$

(2) Given an initial value for G_{ku} (which must be greater than G_{kp}), its later values can be predetermined. Thus it may be arbitrarily determined how and when G_{ku} shall attain a desired magnitude, and when it shall become zero. In case (2) the initial magnitude of G_{ku} might be larger than in case (1), but the projected magnitude of G_{kp} can be attained over an extended period

of time. The policy maker must determine the rate of growth G_{kp}, and consequently also T_p, which is acceptable and desirable, and the final magnitudes these rates are to attain. Technicians and statisticians must provide indications as to the coefficients of effectiveness which are attainable, and in what periods of time. Then the social planner can formulate a plan of development for the economy.

The calculations so far have not taken the labor force into account. But the limited growth of the labor force with insufficient growth of labor productivity will serve as a limiting condition, though a distant one. This question will be examined in the next section.

So far G'_{kp} has remained positive in all cases, approaching a limit of zero in the process of development. Thus the rate of growth of the capital of sector p was taken to be increasing, but approaching stability in the process of development. With constant S_p, total consumption must vary as K_p.

$T_p = G_{sp} + G_{kp}$. So, with constant G_{sp}, T_p = constant + G_{kp}. But $G'_{kp} > 0$ implies that, if S_u is constant and $G'_{ku} > 0$, then $G_{ku} > G_{kp}$ [equation (1)] up to the limit, i.e. that a relatively larger proportion of productive accumulation is directed to sector u than to sector p.

We have thus an increased industrial ("rate of growth") structure of the productive apparatus, leading at the limit to a stable growth of the industrial ("rate of growth") structure.

With constant S_u this would indicate [equation (1)] that

$$0 > G_{ku} - G_{kp} \text{ and } 0 > G'_{kp} + \frac{K_u}{K_p} \cdot \frac{G_{kp}}{G_{kp}} \cdot G'_{ku}$$

is possible under the following conditions:

(1) If $G'_{kp} < 0$ and $G'_{ku} < 0$, i.e. if the rates of growth of capital of both sectors u and p diminish. Depending on whether the rate of decline of G_{kp} is greater or less than that of G_{ku}, either G_{kp} will approach G_{ku} and the deterioration of the industrial structure will cease when $G_{kp} = G_{ku}$, or such a state of equilibrium will recede. In the latter case the deterioration of the productive apparatus will continue indefinitely. This would indicate that the rate of growth selected for K_p is beyond the capacity of the economy to sustain.

(2) If $G'_{kp} > 0$ and $G'_{ku} < 0$, then

$$0 > G'_{kp} + \frac{K_u}{K_p} \cdot \frac{G_{ku}}{G_{kp}} \cdot G'_{ku}$$

only if

$$\left| \frac{K_u}{K_p} \cdot \frac{G_{ku}}{G_{kp}} \cdot G'_{ku} \right| > |G'_{kp}|,$$

or

$$|K_u \cdot G_{ku} \cdot G'_{ku}| > |K_p \cdot G_{kp} \cdot G'_{kp}|.$$

Whereas under our conditions, and very likely also in other countries, K_u is less than K_p, G_{ku} is, by hypothesis, less than G_{kp}. Now $|G'_{ku}|$ must be many times greater than $|G'_{kp}|$, and this leads to a rapid lowering of the rate of growth of K_u, until G'_{ku} becomes negative and any further growth of K_p is possible only at the cost of decreasing K_u. This is the case of rapid deterioration of the industrial structure of the productive apparatus of the country, and of its being brought to a condition in which $G_{kp} = 0$ and $K_u = 0$.

(3) If $G'_{kp} < 0$ and $G'_{ku} > 0$, then

$$0 > G'_{kp} + \frac{K_u}{K_p} \cdot \frac{G_{ku}}{G_{kp}} \cdot G'_{ku}$$

if

$$K_u \cdot G_{ku} \cdot G'_{ku} < K_p \cdot G_{kp} \cdot - G'_{kp}$$

[or $|K_u \cdot G_{ku} \cdot G'_{ku}| < |K_p \cdot G_{kp} \cdot G'_{kp}|$—Ed.].

It is not difficult to prove that this is the case when the deterioration of the industrial structure of the apparatus comes to an end. G_{ku} increases, while G_{kp} decreases. At the limit, $G_{kp} = G_{ku}$ and equilibrium will be reestablished with a lower rate of growth G_{kp}, but with a stable industrial structure of the productive apparatus.

Changes in S_p and S_u may radically alter relationships in the development of the productive apparatus. This is apparent from the equality

$$I_k = \frac{S_p}{S_u} \cdot I_{nd}, \quad \text{or} \quad \frac{S_u}{S_p} \cdot I_k = I_{nd}.$$

With a given productive apparatus, the ratio between accumulation and consumption changes in favor of the former as S_u increases—and the index of the productive structure [I_{nd}] is increased. An increase in I_{nd} is possible even if I_k is decreased. On the other hand, if S_p is increased, the structure of produc-

tion can be preserved only if I_k or S_u is also increased. This does not mean that an increase in S_p leads to a decrease of ND_p; rather, if ND_p increases at the cost of the growth of S_u, any further increase of the rate of growth T_p, or even its maintenance at the new level, is impossible without an increase in S_u or I_k.

We may soon arrive at this point in our own development if T_p continues to be maintained at a high level by means of a rapid growth of S_p and S_u, unless we also concern ourselves with increasing I_k.

The economy in which

$$G_{kp} = G_{ku} = \frac{S_u}{1 + \frac{K_p}{K_u}} = \text{constant}$$

deserves particular attention. The preceding analysis indicates that all development of the economy leads to this at the limit. This situation is the only condition of dynamic equilibrium which can last indefinitely, leading neither to conflicts nor changes. It will therefore be called "the condition of stable and harmonious, or proportional, dynamic equilibrium of the economy" or, briefly, the condition of "harmonious development."

Under full utilization of capital K_p and K_u, at a given level of technology, S_u will have a maximum and constant value. Departure from a condition of harmonious development may result from technological discoveries, from an increase in S_u, or from an increase in G_{ku} at the expense of a decrease in G_{kp}.

The last is not feasible without decreasing, and even temporarily interrupting entirely, the growth of K_p and the increase in the supply of consumers' goods. Thus under full utilization of capital, and with both population and consumption increasing, it is rather difficult to get along without some straining of the market at a time of transition to a higher industrial level. Thus the task of increasing the effectiveness of utilization of capital, S, becomes more pressing....

5. CONDITIONS OF "HARMONIOUS DEVELOPMENT" ($G_{kp} = G_{ku}$, I_k = constant)

With constant S_u and $G_{kp} = G_{ku}$, equation (1) on page 308 gives

$$G_{ku} - G_{kp} = G'_{kp} + \frac{K_u}{K_p} \cdot \frac{G_{ku}}{G_{kp}} \cdot G'_{ku} = 0$$

and

$$G'_{kp} = -\frac{K_u}{K_p} \cdot \frac{G_{ku}}{G_{kp}} \cdot G'_{ku} = -\frac{K_u}{K_p} \cdot G'_{ku} .$$

Since both K_u and K_p are by nature positive, this condition shows that G_{kp} and G_{ku} cannot both grow under conditions of harmonious development when S_u is constant. This is also apparent from the basic equation relating G_{ku} and G_{kp},

$$G_{ku} = S_u - \frac{K_p}{K_u} \cdot G_{kp} .$$

Simultaneous growth of G_{kp} and G_{ku} is not feasible if S_u and K_p/K_u are constant. With constant K_p/K_u, G_{ku} and G_{kp} may grow simultaneously if S_u increases correspondingly.

If $G_{ku} = G_{kp}$ = constant and S_u = constant,

$$G_{ku} = G_{kp} = \frac{1}{1 + \frac{1}{I_k}}$$

These conditions were examined in section 3. Let the concept of harmonious development be extended to the case when I_k is constant and S_u varies.

Then $\frac{K_u}{K_p} = I_k$ = constant.

$$K_u = I_k \cdot K_p , \quad \frac{dK_u}{dt} = I_k \frac{dK_p}{dt}$$

$$K_u = G_{ku} = I_k \cdot K_p \cdot G_{kp} , \text{ and } G_{ku} = G_{kp} .$$

Similarly, it can be proved that $G'_{ku} = G'_{kp}$.

Then, if G_{ku} and G'_{ku} are replaced by G_{kp} and G'_{kp}, equation (2) (p. 308) takes the form

$$S_u - (G_{kp} + G'_{kp}) + \frac{S_u G_{su}}{G_{kp}} = \frac{1}{I_k} (G_{kp} + G'_{kp})$$

$$(G_{kp} + G'_{kp}) \cdot \left(1 + \frac{1}{I_k}\right) = S_u \left(1 + \frac{G_{su}}{G_{kp}}\right)$$

$$G_{kp} + G'_{kp} = \frac{S_u \left(1 + \frac{G_{su}}{G_{kp}}\right)}{1 + \frac{1}{I_k}} = G_{ku} + G'_{ku} .$$

At the initial moment, $G'_{kp} = G'_{ku} = G_{su} = 0$, and

$$G_{ku_0} = G_{kp_0} = \frac{S_{u_0}}{1 + \frac{1}{I_k}} .$$

6. DISHARMONIOUS DEVELOPMENT WITH CONSTANT RATES OF GROWTH

(G_{kp} = constant, G_{ku} = constant, $G_{kp} \neq G_{ku}$)

Consider again the fundamental equation:

$$G_{ku} = S_u - \frac{K_p}{K_u} \cdot G_{kp} \tag{1}$$

Using

$$\frac{dG_{kp}}{dt} = \frac{dG_{ku}}{dt} = 0,$$

and differentiating the fundamental equation with respect to t,

$$G_{kp} \cdot \left[\frac{K_u \cdot \frac{dK_p}{dt} - K_p \cdot \frac{dK_u}{dt}}{K_u^2} \right] = \frac{dS_u}{dt} .$$

Therefore

$$G_{ku} = G_{kp} - \frac{S_u \cdot G_{su}}{G_{kp}} \cdot \frac{K_u}{K_p} \tag{2}$$

By equations (1) and (2),

$$G_{kp} - \frac{S_u \cdot G_{su}}{G_{kp}} \cdot \frac{K_u}{K_p} = S_u - \frac{K_p}{K_u} \cdot G_{kp}$$

and, finally:

$$G_{kp}^2 \cdot \left(1 + \frac{1}{I_k}\right) - G_{kp} \cdot S_u - I_k \cdot G_{su} = 0 .$$

Therefore

$$G_{kp} = \frac{S_u + \sqrt{S_u^2 + 4\,(I_k + 1) \cdot S_u \cdot G_{su}}}{2\left(1 + \frac{1}{I_k}\right)} = T_p - G_{sp} \tag{3}$$

and, since

$$I_k = \left(\frac{S_p}{S_u}\right) \cdot I_{nd},$$

$$G_{kp} = \frac{S_u + \sqrt{S_u^2 + 4\left(\frac{S_p}{S_u} \cdot I_{nd} + 1\right) \cdot G_{su} \cdot S_u}}{2\left(1 + \frac{S_u}{S_p \cdot I_{nd}}\right)} = T_p - G_{sp} \tag{4}$$

Although derived under the restriction that all rates of growth are constant, these formulas disclose the process of expanded reproduction in all its complexity, since for short periods of time the rates of growth can be taken to be actually constant. These formulas again confirm that the quickest and most effective way to increase T_p is to increase first S_p and G_{sp}, then S_u and G_{su}, and finally I_k and I_{nd}. The last is possible even when G_{sp} and G_{su} are zero....

With constant T_p,

$$ND_p = ND_{p_0} \cdot \mathbf{E}^{T \cdot t} \tag{5}$$

where ND_{p_0} is initial total consumption. Together with equations (3) and (4), equation (5) gives the law of growth for total consumption when the ratio of growth of all the variables is constant.

It must be noted that when the rates of growth [G_{ku} and G_{kp}] are constant but unequal, I_k changes continuously.

In the case when $G'_{ku} = 0$, and S_u, I_k, and G_{su} are all variable, the following differential equation gives G_{kp} :

$$G_{kp}^2\left(1 + \frac{1}{I_k}\right) - S_u \cdot G_{kp} + \frac{dG_{kp}}{dt} - I_k \cdot S_u \cdot G_{su} = 0.$$

7. RATE OF GROWTH OF TOTAL CONSUMPTION. DISTRIBUTION OF INCOME AMONG DIFFERENT GROUPS. WAGES AND LABOR PRODUCTIVITY.

Up to this time the productive process has been considered without regard to the labor force, labor productivity, and the distribution of national income. Yet the necessity of allocating consumers' goods to persons not employed in productive labor, and at the same time of maintaining and increasing the wages of

the workers, creates additional conditions for the development of the reproductive process.

Denote the consumers' goods distributed among persons employed in productive labor by ND_{pv}, and the consumers' goods distributed among all the rest of the population by ND_{pm}. Then

$$ND_p = ND_{pv} + ND_{pm}$$

or

$$ND_{pv} = V_p \cdot ND_p \quad \text{and} \quad ND_p = \frac{ND_{pv}}{V_p} \tag{1}$$

where V_p is an arbitrary coefficient.

If the number of persons employed in productive labor is denoted by n, labor productivity by e, and the real wage by nd_{pv}, the following equalities hold:

$$n = \frac{ND_{pv}}{nd_{pv}} = \frac{S \cdot K}{e} \quad \text{and} \quad \frac{ND_{pv}}{S \cdot K} = \frac{nd_{pv}}{e} = V_e \tag{2}$$

where V_e is an arbitrary coefficient.

From equations (1) and (2) and from the preceding,

$$ND_p = \frac{V_e}{V_p} \cdot (S_p K_p + S_u K_u) = \frac{V_e}{V_p} \cdot (ND_p + ND_u),$$

whence

$$ND_p \cdot \left(1 - \frac{V_e}{V_p}\right) = \frac{V_e}{V_p} \cdot ND_u$$

$$\frac{ND_u}{ND_p} = \frac{V_p}{V_e} - 1$$

$$\frac{K_u}{K_p} = \frac{S_p}{S_u}\left(\frac{V_p}{V_e} - 1\right)$$

Consider now the dependence of the effectiveness of capital utilization S on labor productivity.

The total production is given by the expression $S \cdot K$. Since e denotes labor productivity, and n the number of workers,

$$S \cdot K = n \cdot e$$

and

$$S = \frac{n \cdot e}{K} .$$

In particular

$$S_p = \frac{n_u \cdot e_p}{K_p}$$

and

$$S_u = \frac{n_u \cdot e_u}{K_u}$$

or

$$S_u = \frac{e_u}{\frac{K_u}{n_u}} = \frac{e_u}{k_{nu}}$$

$$S_p = \frac{e_p}{\frac{K_p}{n_p}} = \frac{e_p}{k_{np}}$$

$$S = \frac{e}{\frac{K}{n}} = \frac{e}{k_n}$$

where k_n denotes capital per man employed in production.

Thus the effectiveness of capital utilization is determined also as the relations between labor productivity and capital per worker.

In the last analysis, the rate of growth $G_{kp} = T_p - G_{sp}$ as a function of the distribution of national income, of labor productivity, and of capital per worker, is determined by the following expressions:

$$T_p - G_{sp} = G_{kp} = \frac{S_u + \sqrt{S_u^2 + 4(I_k + 1) \cdot S_u \cdot G_{su}}}{2\left(1 + \frac{1}{I_k}\right)}$$

$$= \frac{\frac{e_u}{k_{nu}} + \sqrt{\left(\frac{e_u}{k_{nu}}\right)^2 + 4\left[\frac{S_p}{S_u}\left(\frac{V_p}{V_e} - 1\right) + 1\right] \cdot \frac{d\left(\frac{e_u}{k_{nu}}\right)}{dt}}}{2\left[1 + \frac{1}{\frac{S_p}{S_u}\left(\frac{V_p}{V_e} - 1\right)}\right]}$$

$$= \frac{\frac{e_u}{k_{nu}} + \sqrt{\left(\frac{e_u}{k_{nu}}\right)^2 + 4\left[\frac{S_p}{S_u}\left(\frac{ND}{ND_p} - 1\right) + 1\right] \cdot \frac{d\left(\frac{e_u}{k_{nu}}\right)}{dt}}}{2\left[1 + \frac{1}{\frac{S_p}{S_u}\left(\frac{ND}{ND_p} - 1\right)}\right]}$$

$$= \frac{\frac{e_u}{k_{nu}} + \sqrt{\left(\frac{e_u}{k_{nu}}\right)^2 + 4\left[\frac{S_p}{S_u}\left(\frac{ND_u}{ND_p} + 1\right)\right] \cdot \frac{d\left(\frac{e_u}{k_{nu}}\right)}{dt}}}{2\left[1 + \frac{1}{\frac{S_p}{S_u} \cdot \frac{ND_u}{ND_p}}\right]}$$

The following deductions can be made from these formulas: (1) increasing the rate of growth of total consumption is a function not only of an increase in the productivity of labor, but also of the ratio of labor productivity to capital per worker; (2) the rate of growth of total consumption varies inversely with the proportion of the national income represented by consumption, and directly with accumulation....

Note that the higher the ratio of wages to labor productivity (V_e), and the smaller the proportion (V_p) of total consumption going to the working masses, the smaller the rate of growth of income.

However, oversimplified deductions from these propositions should be avoided. The fact is that both labor productivity and the effectiveness of capital (S) depend to a very considerable degree on the scientific, educational, and regulative apparatus of the country, and a decrease in ND_{pm} may under our conditions create the most cruel conflict, due to the lack of skilled workers in our country and the weakness of the accounting, regulating, and planning apparatus of the government.

Only the study of the experience of industrial countries and of our experience can solve the question of the correct size of V_p. For obvious reasons, the necessary outlays for defense cannot be determined mathematically.

So far the analysis has been carried out under the assumption that a labor surplus exists, and this assumption will also hold in what follows. It is assumed that with significant unem-

ployment in the country and with continuous rural overpopulation, when for millions of workers in our country there is no other productive equipment than such things as work gloves and shovels, there is a shortage not of labor force but of tangible capital. Under such conditions, the rate of capital accumulation and effectiveness of capital utilization determine the rate of growth of national income.

Nor can the availability of skilled labor serve as the limiting condition, since present-day mass production is based on finer divisions of labor and makes possible the rapid adaptation to work of the peasant masses coming in from the villages. The training of skilled labor force is not a problem comparable with the availability of basic material investments.

Consider all the conditions under which the available labor force may prove insufficient.

In general,

$$ND = S \cdot K$$

$$ND = e \cdot n$$

Then

$$T = G_s + G_k \tag{1}$$

$$T = G_e + G_n \tag{2}$$

and if

$$G_e = G_n > G_s + G_k$$

then the growth of national income is determined by the equation

$$T = G_s + G_k \tag{1a}$$

If $G_e + G_n < G_s + G_k$, the growth of national income is determined by the equation

$$T = G_e + G_n \tag{2a}$$

In this last case, the system of fundamental equations determining the rates of growth remains the same, but two additional independent equations are obtained:

$$ND_p = e_p \cdot n_p$$

$$ND_u = e_u \cdot n_u \ .$$

To determine the growth of n_p and n_u is not very laborious; our economists have repeatedly predicted the growth of popula-

tion and its structure. The task is a more difficult one in the case of labor productivity. In going from a very backward technology to a highly technical organization such as that of industrial nations, by concrete reconstruction of the economy, it will be possible to determine both e and n for the coming years and, possibly, for a couple of decades. But when planned economy assumes the leadership in world technology and the labor force is utilized to the limit, then the prediction of technical improvements will be a pressing problem and the forecasting of technical reconstruction will be central to all planning.

The rate of growth of consumption, T_p, will be expressed as a function of the increase in consumption due to the increase of the number of workers, and of the increase in wages which will inevitably accompany expanding production if the unemployed masses are to receive a smaller share than the employed workers.

$$ND_{pv} = n \cdot nd_{pv}$$

where nd_{pv}, as before, is the average real income (excluding savings) per man employed in production.
Then

$$V_p = \frac{ND_{pv}}{ND_p} = \frac{n \cdot nd_{pv}}{ND_p} = \frac{n \cdot nd_{pv}}{ND_{pv} \cdot ND_{pm}}$$

and

$$V_e = \frac{nd_{pv}}{e} .$$

Then

$$\frac{V_p}{V_e} = \frac{n \cdot e}{ND_{pv} + ND_{pm}} = \frac{n \cdot e}{n \cdot nd_{pv} + ND_{pe}}$$

and

$$T_p - G_{sp} =$$

$$\frac{\frac{e_u}{k_{nu}} + \sqrt{\left(\frac{e_u}{k_{nu}}\right)^2 + 4\left[\frac{S_p}{S_u}\left(\frac{n \cdot e}{n \cdot nd_{pv} + ND_{pm}} - 1\right) + 1\right] \cdot \frac{d\left(\frac{e_u}{k_{nu}}\right)}{dt}}}{2\left[1 + \frac{S_p}{S_u}\frac{1}{\left(\frac{n \cdot e}{n \cdot nd_{pv} + ND_{pt}} - 1\right)}\right]}.$$

This formula expresses the dependence of T_p on labor productivity, wages, number employed in production, and the consumption of nonproducers.

8. AMORTIZATION DUE TO OBSOLESCENCE

In section 2 the relationships of the elements of the economy were expressed in terms of the replacement of equipment when the output of consumers' goods is constant.

The dependence of the rate of growth of consumption on amortization due to obsolescence will now be traced. The limiting condition will again be that the rates of growth and amortization due to obsolescence be constant.

Recall that $K_u + K_p = K$. If amortization due to obsolescence constitutes, per unit of time, a proportion a of K, then the production of sector u must, during that interval of time, provide $a \cdot K$ for the replacement of capital depreciated through obsolescence. Then

$$ND_u = S_u \cdot K_u = a \cdot K + \Delta K = a \cdot K + \frac{dK}{dt}$$

$$ND_u = \frac{dK_p}{dt} + \frac{dK_u}{dt} + a \cdot K = G_{kp} \cdot K_p + G_{ku} \cdot K_u + a \cdot$$

$$S_u \cdot K_u = G_{kp} \cdot K_p + G_{ku} \cdot K_u + a \cdot K$$

$$G_{ku} = S_u - \frac{a \cdot K}{K_u} - \frac{K_p}{K_u} \cdot G_{kp} .$$

Now, the first derivative of G_{ku} equals zero, so that

$$G_{kp} \cdot (K_p \cdot G_{kp} - K_p \cdot G_{ku}) + a(K \cdot G_k - K \cdot G_{ku}) = K_u \cdot S_u \cdot G_{su} .$$

Now, $K \cdot G_k = K_p \cdot G_{kp} + K_u \cdot G_{ku}$, so that

$$(G_{kp} + a)^2 \left(1 + \frac{1}{I_k}\right) - S_u (G_{kp} + a) - I_k \cdot S_u \cdot G_{su} = 0 .$$

Therefore

$$T_p = G_{sp} + \frac{S_u + \sqrt{S_u^2 + 4(I_k + 1) \cdot S_u \cdot G_{su}}}{2\left(1 + \frac{1}{I_k}\right)} - a.$$

Thus amortization due to obsolescence is immediately reflected in a decrease in the rate of growth of real income, unless there is a corresponding increase in G_{sp} and G_{su}.

The dependence of G_{sp} and G_{su} on the effectiveness of the utilization of the capital per man employed in production was demonstrated in the preceding section; it is necessary now to dwell on the question of the structure of the capital.

We observe that

$$S = \frac{e}{k_n}.$$

If S is to be increased, the growth of e must surpass the growth of k_n; k_n consists of productive equipment k_{nt} and of circulating capital k_{no}. It is reasonable that labor productivity e should grow proportionately to the value of productive equipment k_{nt}. Therefore e/k_n can increase if the circulation of the circulating capital, k_{no}, is accelerated, while its growth remains less than the growth of e and k_{nt}.

Acceleration of the rate of work can also be reflected in relative diminution of k_{nt} with the same output. A characteristic example of this appears to be the transition from a low-speed steam engine to a rapidly revolving steam turbine. The rise in the price of machinery, which is due to the greater complexity demanded by the increasing automatization of production, is an influence in the opposite direction.

Two opposite but equally erroneous views of this question exist. Some think that an increase in the effectiveness of capital utilization inevitably accompanies any technical improvement of production and increase in labor productivity. It has been shown above that this depends not on an increase in e, but in e/k_n, which is far from the same thing. In a capitalist economy, entrepreneurs are preoccupied not with increasing e/k_n, but with increasing profit. Profits can be increased because the value of labor per unit of output (with constant wages) decreases with the increase of labor productivity, even without a decline of the ratio of constant capital to the value of output. Surplus value increases as variable capital decreases. One must not forget that the effectiveness of capital utilization, with a given number of hours of utilization, a given degree of labor skill, and constant prices is a technical coefficient, and not a purely economic category, and is not purely a function of the structure of capital....

The second erroneous view involves the assumption that raising the organic composition of capital must inevitably lead to

lowering the effectiveness of capital utilization. This is true only when prices are falling, and then only if the technical factors operating to increase the effectiveness of capital utilization fail to resist the decrease in the value of labor and in surplus value per unit of production.

To repeat, the effectiveness of capital utilization is, in this treatment, which represents economic processes in constant prices, a technical coefficient whose growth is not controlled directly by the laws of capitalist development. Under our conditions it has a tremendous significance, and the socialist economy must cause its growth.

However, this causal relationship is not something so basic as to be taken for granted.

We have become accustomed to the absolute importance of profit, and all technical processes in the capitalist economy are determined by the law of maximum profit. By adopting the improved techniques of the leading countries without analysis, and without application of the criterion that has been developed, we would risk falling far short of doing all that could be done in approaching the problem correctly. In this connection, amortization due to obsolescence without a corresponding increase in the effectiveness of capital utilization represents a particular danger....

9. GROWTH RATES UNDER CONDITIONS OF FREE WORLD MARKET RELATIONS

...In a closed economy..., the structure of the entire productive apparatus K predetermines to a considerable extent the ratios

$$I_k = \frac{K_u}{K_p} \quad \text{and} \quad I_{nd} = \frac{ND_u}{ND_p} \quad .$$

The situation differs somewhat under free external relations. Any portion of ND_p can be exchanged in foreign markets for an equivalent quantity in terms of world prices, of the products in ND_u. (This is understood to be so unless prevented by the capacity of foreign markets and competitive conditions.)

Therefore, if it is considered only from the viewpoint of production, the value of K_u/K_p may be selected arbitrarily in any given case. The only limitation is the necessity for a definite

minimum satisfaction of the consumer wants of the population, and this predetermines the size of

$$ND_p = S_p \cdot K_p \quad .$$

The entire residual, $K - K_p$, can be utilized either for direct production of new physical capital, or for production of goods which may be exchanged abroad for goods to be used in increasing capital K_u and K_p.

Thus, having analyzed the various relationships mainly in terms of the ratio I_k in a closed economy, and being interested to a large extent in the rates of growth of capital G_{kp} and G_{ku}, then under free external relations we should turn our attention largely to the ratio

$$I_{nd} = \frac{ND_u}{ND_p} \quad .$$

The basis of the ensuing analysis will be the equation

$$T_u - G_{su} = S_u - \frac{1}{\frac{S_p}{S_u} I_{nd}} (T_p - G_{sp}) \qquad (1)$$

which is obtained from

$$G_{ku} = S_u - \frac{1}{I_k} \cdot G_{kp}$$

$$T_p = G_{kp} + G_{sp}$$

$$T_u = G_{ku} + G_{su}$$

$$ND_p = S_p \cdot K_p$$

$$ND_u = S_u \cdot K_u$$

Consider the meaning of equation (1) under increasingly complicated conditions, starting from simple cases.

(1) Let S_u = constant, S_p = constant, $S_u = S_p$, $G_{sp} = G_{su} = 0$ and $T_p = T_u$.

Then equation (1) becomes

$$T_p = T_u = \frac{S_u}{1 + \frac{1}{\frac{S_p}{S_u} I_{nd}}} \quad .$$

[Note that $\frac{S_p}{S_u} = 1$—Ed.]

T_p and T_u increase with S_u and are an inverse hyperbolic function of S_p/S_u and I_{nd} .

Under these conditions it is advantageous to export what is produced with maximum efficiency, and to import what is produced with minimum efficiency.

The following expressions are obtained from the equation:

$$T = T_p = T_u = \frac{S}{1 + \frac{1}{I_{nd}}} = \frac{S}{1 + \frac{ND_p}{ND_u}} = \frac{S \cdot ND_u}{ND_u + ND_p} = \frac{S \cdot ND_u}{ND} .$$

Thus with constant and proportional growth of the whole national income and of its parts, and with equal and constant effectiveness of capital utilization in sectors u and p, the rate of growth of national income is proportional to the portion of national income going into productive accumulation and to the effectiveness of capital utilization.

(2) Let $T_p = T_u$ and $G_{sp} = G_{su}$.

Then

$$T_p = T_u = G_{sp} + \frac{S_u}{1 + \frac{1}{\frac{S_p}{S_u} I_{nd}}} .$$

If $T_p = T_u$ and I_{nd} = constant, then $T_p = T_u$ increases with G_{sp}. The larger I_{nd} is, the larger is S_u .

(3) Let $T_p = T_u$.

Then

$$T_p = T_u = \frac{G_{su} + S_u + \frac{G_{sp}}{\frac{S_p}{S_u} I_{nd}}}{1 + \frac{1}{\frac{S_p}{S_u} I_{nd}}} .$$

Setting $\beta G_{sp} = G_{su}$, the equation takes on the following form

$$T_p = T_u = \frac{G_{sp}\left[1 + \frac{\beta}{\frac{S_p}{S_u} \cdot I_{nd}}\right]}{1 + \frac{1}{\frac{S_p}{S_u} \cdot I_{nd}}} + \frac{S_u}{1 + \frac{1}{\frac{S_p}{S_u} \cdot I_{nd}}}$$

[This equation is valid, with G_{su} in the first term instead of G_{sp}, only if the substitution made is $G_{sp} = \beta G_{su}$, instead of $G_{su} = \beta G_{sp}$ —Ed.]

This equation is of a more general form than the preceding one. For $\beta = 1$, the equations are identical. If $\beta > 1$, $T_p = T_u$ will be larger than before, while if $\beta < 1$, the reverse is true.

With free foreign trade, I_{nd} can be chosen arbitrarily. The larger I_{nd}, the higher the rates of growth, but the less the initial satisfaction of the wants of the population.

(4) Consider the case $G_{kp} = T_p - G_{sp}$ + constant and $G_{ku} = T_u - G_{su}$ = constant.

Equations (1) and (2) [p. 308] are now modified as follows. It is shown in section 6 [p. 315] that in this case

$$T_p = G_{sp} + \frac{S_u + \sqrt{S_u^2 + 4\left(\frac{S_p}{S_u} \cdot I_{nd} + 1\right) \cdot G_{su} \cdot S_u}}{2\left(1 + \frac{S_u}{S_p \cdot I_{nd}}\right)}$$

$$T_u - G_{su} = S_u - \frac{S_u}{S_p \cdot I_{nd}} \cdot \frac{S_u + \sqrt{S_u^2 + 4\left(\frac{S_p}{S_u} I_{nd} + 1\right) \cdot G_{su} \cdot S_u}}{2\left(1 + \frac{S_u}{S_p \cdot I_{nd}}\right)}$$

$$T_u = G_{su} + S_u - \frac{S_u + \sqrt{S_u^2 + 4\left(\frac{S_p}{S_u} I_{nd} + 1\right) S_u \cdot G_{su}}}{2\left(\frac{S_p}{S_u} \cdot I_{nd} + 1\right)}$$

(5) Finally, consider the relationships of the rates of growth under a single limitation—that the effectiveness of capital utilization be constant ($G_{sp} = G_{su} = 0$).

The argument will be based on equations (1) and (2), p. 308

$$G_{ku} - \frac{K_u}{K_p} \cdot \frac{G_{ku}}{G_{kp}} G'_{ku} = G_{kp} + G'_{kp} \qquad (1)$$

$$S_u - (G_{ku} + G'_{ku}) = \frac{K_p \cdot G_{kp}}{K_u \cdot G_{ku}} (G_{kp} + G'_{kp}) \qquad (2)$$

Now

$$G_{ku} = T_u \qquad G_{kp} = T_p$$

$$G'_{ku} = T'_u \qquad G'_{kp} = T'_p$$

$$\frac{K_u}{K_p} = \frac{S_p \cdot ND_u}{S_u \cdot ND_p},$$

and equations (1) and (2) are transformed into

$$T_u - \frac{S_p \cdot ND_u}{S_u \cdot ND_p} \cdot \frac{T_u}{T_p} \cdot T'_u = T_p + T'_p \tag{1a}$$

$$S_u - (T_u + T'_u) = \frac{S_u}{S_p} \cdot \frac{ND_p}{ND_u} \cdot \frac{T_p}{T_u} (T_p + T'_p) \tag{2a}$$

These expressions differ little in form from equations (1) and (2) [p. 308], and the discussion of those equations can be applied to these in its entirety.

It must be emphasized that the increase of the ratio S_u/S_p is of tremendous significance to the increase of the rates of growth. The greater the effectiveness of the capital used for the production of export goods, in comparison with that of the capital on which domestic consumption is based, the more significant the growth of consumption.

Under capitalist encirclement, we must make every effort to industrialize our country within the shortest possible time. Therefore our development must correspond to a large extent to the conditions of a closed economy.

However, what has been derived in the present section must be taken into account to some extent even under our conditions of development, in order to determine our viewpoint on the development of the export branches of our production.

A warning is necessary against possible errors in connection with the determination of the coefficient of the effectiveness of capital utilization. It must not be forgotten that effectiveness is determined by the ratio of the value of net output to the value of all capital. The error is often made in this connection of taking the ratio of total value of output to the value of a part of capital. Naturally, this leads to completely distorted results.

10. EXAMPLE OF A PROPOSED PARTIAL APPLICATION OF THE METHOD OF INVESTIGATING GROWTH RATES OF NATIONAL INCOME...

The experience of past years provides some foundations for planning for the future. This experience becomes more neces-

sary as we can depend less on some finished "theory of planning," on a worked-out, logically finished method. During past years definite rates of growth of the national income have been observed. It is now proposed to determine the extent to which these rates of growth resulted from the increase of capital and from improved utilization of that capital. The answer is of considerable interest since it will facilitate determining the extent to which national income can continue to be increased in the future by improved utilization of the available capital. The material for this investigation will consist of the Control Figures for 1927/28.

On the basis of the material now available, it is not possible to classify p and u in accordance with the preceding exposition, and we must therefore consider total production and total national income as a whole. As indicated in section 1 (Part I) of this article, this will give the work a conditional character. Nevertheless, if the fundamental results obtained from the following calculations sufficiently reflect reality, it will be impossible not to take them into account.

The ensuing calculations are based on the equation

$$ND = S \cdot K \tag{1}$$

and the difference equation that follows it:

$$\Delta ND = S \cdot \Delta K + \Delta S \cdot K + \Delta S \cdot \Delta K \tag{2}$$

Thus any increment of national income is divided into three basic parts. The first part, $S \cdot \Delta K$, is determined by the increment of productive capital. The second part, $\Delta S \cdot K$, is determined by the increase in the effectiveness of utilization of capital. The third part, $\Delta S \cdot \Delta K$, results from the increase of both S and K, and is the least significant. It is the interrelationships of these three parts that are of interest.

It is necessary to emphasize that the values of S and ΔS obtained by calculation are average statistical values and do not fully reflect true conditions.

More realistic would be the equation

$$\Delta ND = S_{st} \cdot \Delta K + \Delta S_{st} \cdot K + \Delta S_{nov} \cdot \Delta K ,$$

since the increment of the utilization of old capital, ΔS_{st}, need not equal the increment of utilization of new capital $[\Delta S_{nov}]$.

The error obtained is not great. In the first place, by performing the calculation uniformly for all years compared, an established trend will be revealed without regard to errors. In

the second place, from the experience of the United States it is known that as industry develops, S does not tend to grow, so that if it does grow under our conditions, it will do so mainly because of general causes, and for all capital as a whole, because of rationalization and an increase in the number of hours of utilization of all capital. Therefore the estimate of the relationships would yield a sufficiently true picture even by use of a statistical average....

[The total income in current prices of the USSR, net income of the socialized sector, and price indices are given in the Control Figures for 1927/28.] Table 6 has been compiled on the basis of these data.

The table of "Fixed Capital of the Economy," in the Control Figures for 1927/28, may be used to evaluate the behavior over time of national wealth. All capitals are valued in 1925/26 prices. (See Table 7.)...

[With S = ND/K, the following values can be obtained from data in the tables on p. 330—Ed.]

$S(1924/25) = 0.53140$ $\Delta S(1924/25) = 0.08502$
$S(1925/26) = 0.61642$ $\Delta S(1925/26) = 0.03390$
$S(1926/27) = 0.65032$ $\Delta S(1926/27) = 0.03834$
$S(1927/28) = 0.68866$

On the basis of these data, numerical coefficients can be inserted in the difference equation

$$ND = (S \cdot \Delta K) + (\Delta S \cdot K) + (\Delta S \cdot \Delta K)$$

For the three intervals (1) 1924/25-1925/26, (2) 1925/26 - 1926/27 and (3) 1926/27-1927/28:

$$(1924/25\text{-}1925/26)\ 3262 = 0.53140 \cdot 882 + 0.08502 \cdot 31972 + 882 \cdot 0.08502$$
$$(1925/26\text{-}1926/27)\ 2158 = 0.61642 \cdot 1606 + 0.03390 \cdot 32854 + 1606 \cdot 0.03390$$
$$(1926/27\text{-}1927/28)\ 2735 = 0.65032 \cdot 2053 + 0.03834 \cdot 34460 + 2053 \cdot 0.03834$$

Table 8, compiled from these equations, gives some idea of the rate of growth of national income, and of the extent to which growth was due to the increase of capital and to the increase of the effectiveness of capital utilization.

The calculations yielded rather interesting results. It will be noted that increasing the effectiveness of capital utilization remains extraordinarily significant, and in 1926/27 it still surpassed new capital formation in importance. Yet between 1924/25

Table 6

Years	National income (ND) in millions of chervonets rubles (1925/26)	Increment of national income in millions of rubles (1925/26)	Yearly increment of national income (per cent)
1924/25	16,990	—	—
1925/26	20,252	3,262	19.2
1926/27	22,410	2,158	10.7
1927/28	25,145	2,735	12.2

Table 7[a]

Years	Capital used in production (I) at the beginning of the year		Capital used in distribution (II) at the beginning of the year		Total capital (K) I + II at the beginning of the year	
	Capital in millions of rubles	Yearly increments in millions of rubles	Capital in millions of rubles	Yearly increments in millions of rubles	Capital in millions of rubles	Yearly increments in millions of rubles
1924/25	20,186	745	11,786	137	31,972	882
1925/26	20,931	1,309	11,923	297	32,854	1,606
1926/27	22,240	1,597	12,220	456	34,460	2,053
1927/28	23,837	2,011	12,676	641	36,513	2,652
1928/29	25,848		13,317		39,165	

a. The value of land is excluded from the estimate.... Capital used in distribution is added here to capital used in production, since in our economy distribution is considered as part of the overhead cost of transportation, and transportation is included in the category of production.

Table 8

Periods	Increment of national income ND in millions of rubles in 1925/26 prices	The same as a percentage of national income (ND)	Part of the increment due to the increase of capital (S · KD) as a percentage of ND	Part of increment due to the increase of utilization of capital as a percentage of ND		
				S · ΔK	ΔS · ΔK	SΔK + ΔS · ΔK
1924/25–1925/26	100% (3.262)	— 19.2	+14.4% (468.7)	+83.3% (2,718.3)	+2.3% (75)	+85.6% (2,793.3)
1925/26–1926/27	100% (2.158)	— 10.7	+46.0% (990)	+51.8% (1,113.8)	+2.5% (54.2)	+54.3% (1,168)
1926/27–1927/28	100% (2.735)	— 12.2	+48.8% (1,135.1)	+48.3% (1,321.2)	+2.9% (78.7)	+51.2% (1,399.9)

Figures in parentheses are absolute magnitudes in millions of rubles.

and 1927/28 S increased only from 0.53 to 0.69, or by 30 per cent. We believe that there remains ample room for further improvement, and we do not consider it impossible to raise S to 1.5.

This presents tremendous possibilities for maintaining the rate of growth of the country's income until the ratio K_u/K_p can be increased, i.e., until a much higher degree of industrialization has been attained. Apparently the main task of our planning organizations must consist specifically of regulating the growth of S_p, S_u, and K_u/K_p.

We believe that, with the aid of the models outlined in this article, the problem that confronts us could be successfully solved....

R. Gol'dberg

METHODS OF CALCULATING

THE EFFICIENCY OF CAPITAL INVESTMENTS

...If by efficiency we understand the ratio of results to outlay, we must first of all draw a clear line between national economic efficiency and efficiency from the viewpoint of a private enterprise. But since we are not concerned here with a capitalist national economy developing haphazardly, but with a planned socialist economy, we of course do not understand by private enterprise an enterprise pursuing some "private" goals, but an enterprise which, for certain organizational reasons, has been made into an independent economic unit with a defined assignment and supplied with a clearly limited part of the national economic capital. Such individual "private" enterprises cannot, of course, function effectively without giving an accounting of their activities—both of their achievements and of their outlays. The greater the achievement and the smaller the expenditure, the more favorable the results of the accounting are bound to be, however it is done, in monetary units or in man-hours or in any other system of measurement. Individual enterprises can be operated at a loss, but even then maximum achievement for minimum outlays will give the measure of the entrepreneurial efficiency of the capital invested in them....

But the principle of maximum achievement for minimum expenditure is the principle of profit; and thus it can be affirmed with certitude that whatever the system of measurement used, the concept of the entrepreneurial efficiency of capital is included in the concept of profitability provided, of course, that by profitability we are not so naive as to mean a drive for a maximum direct profit—a drive that would not allow for the prospects of long-range use of the capital, of possible changes in its form, and, in general, of all the positive and negative factors that could affect its further rational utilization....

A planned economy, by definition, cannot fail, during the preparation of the plan, to have a definite purpose which deter-

"O metodakh ischisleniia effektivnosti kapital'nykh vlozhenii," Put' industrializatsii, No. 11, 1929, pp. 10-24.

mines the evaluation of the various developmental factors and the application of qualitative weights to certain quantitative results. Hence, on the one hand, we have the absolute necessity of taking into consideration the qualitative comparison of the factors of the plan in accordance with the authoritatively established main lines of national economic development, i.e., the determination of what constitutes the concept of national economic efficiency, and, on the other hand, if we may put it thus, we have the historical approach, the realization that this concept is a conventional one that can change with a change in economic policy.

From this point of view, national economic efficiency can be determined by finding an indicator which would combine the positive and the negative elements that characterize the national economic process, in a certain proportion corresponding to the general direction of economic policy, and would thus indicate the extent to which the actual picture corresponds to the results and the expenditures foreseen in the plan.

Reasoning theoretically, we can imagine a triple solution of this problem: (1) a single and simple indicator of efficiency, (2) a series or a system of separate indicators, (3) a composed and complex indicator in the nature of a more or less complex formula.

A sample of a single, simple indicator of efficiency is the following, which is frequently used:

$$\frac{P - \text{gross value of output}}{C - \text{capital}}$$

or

$$\frac{\Delta P - \text{increment of gross value of output}}{\Delta C - \text{increment of capital.}}$$

It must be recognized that this indicator, which, by the way, was used in the Leningrad Province National Economic Five-Year Plan, is absolutely unsatisfactory. It is impossible to maintain from any viewpoint that gross value of output obtained per one ruble of capital would by itself measure the national economic efficiency of the capital investment. If we use this formula we find a proportional increase in efficiency simply because the price of the raw materials has increased. This formula would not help to detect a difference in efficiency if the output per worker dropped; it does not enable us to compare the efficiency of various enterprises operating with different compositions of prices, i.e., with different ratios of gross value of output to value added, or with a difference in the share of raw materials

in the price of the product. There is no doubt that this formula has been used as a result of confusion.

Of course, replacing the gross value of output by value added in the formula would improve it considerably, but this still would not make it theoretically and practically acceptable....

Thus we must seek a solution in a more or less compound indicator containing, in the form of a formula, the basic positive and negative factors of production which are decisive from the viewpoint of the entire structure of our economic system.

As we have said, the ratio of output to capital cannot by itself measure efficiency. But it cannot be denied that, other conditions being equal, the efficiency is greater, the greater the output per unit of capital. One cannot deny the validity of the equation $\eta_1 = a(P/C)$, where η_1 is a partial indicator of efficiency; P, the gross value of output; C, the initial capital; and a, the coefficient of proportionality, constant when P and C vary.

Along with this equation, we can write, with the same validity, a second equation which will give us a second partial indicator of efficiency, $\eta_2 = b(P/W)$, where b is the coefficient of proportionality remaining constant when P and W vary; W, the number of workers working a normal work day and producing output P. There is no doubt about this equation either since, from our viewpoint, the efficiency of the capital is so much the greater, the larger is one worker's daily output.

Multiplying these partial indicators η_1 and η_2, we obtain

$$\eta = \eta_1\eta_2 = \frac{a \cdot b \cdot P^2}{C \cdot W} = k \cdot \frac{P^2}{C \cdot W} .$$

This equation, despite its simplicity, reveals under closer scrutiny several peculiarities which we shall now study.

Since the coefficient a is assumed to be constant when all the other factors are constant except P and C, while coefficient b is assumed to be constant when all the other factors are constant except P and W, there is no ground to assert that a is constant when W varies and b is constant when C varies. Therefore it cannot be asserted that k is constant. In order to determine the nature of this coefficient and of the entire formula we shall now try to grasp its economic meaning.

We shall assume, to start with, that coefficient k is constant, and we shall try to discover how efficiency is determined from the formula under the simplest conditions: $\eta = P^2/CW$.

This equation conveys the information that the efficiency of the capital tends toward infinity when the capital and the number of workers are zero—which is logically correct but impossible in practice. Further, if the production doubles simultaneously with the doubling of the capital and of the number of workers, efficiency does not change. This is the situation when, alongside one plant, another similar one is opened having the same assignments and the same machines, with no technological or organizational improvements. In this case, the efficiency of the capital obviously does not change. But if output doubles when capital doubles but the number of workers remains unchanged or, vice versa, if the number of workers doubles while capital remains unchanged, the efficiency increases in proportion, which is also logical. Thus, introducing two work-shifts instead of one, we obtain theoretically a doubling of output with a double number of workers for the same capital, and the efficiency of capital doubles, too.

Let us now assume that despite an increase in capital, output remains the same because the capital increase is used on an auxiliary enterprise for the preparation of raw materials. In this case, the formula $P^2/C \cdot W$ ceases to be valid because it will show a decrease in efficiency which has not occurred. In such a case, for a capital increase of, say, 50 per cent and a 20 per cent increase in labor, we shall have at the initial period $\eta = 1$ and in the subsequent period

$$\eta = \frac{P^2}{CW} = \frac{1}{1.5 \times 1.2} = 0.55 \ .$$

We can see from this example that we can use the gross value of output figure, P, to determine efficiency only if the share of value added remains unchanged. If this share changes, then gross value of output should be replaced in the formula by value added, P_0.

This can be seen more clearly in the following example:

	A Initial situation	B New technological organization
Gross value of output	1,200,000 rubles	1,200,000 rubles
Costs of materials	350,000 rubles	200,000 rubles
Value added	850,000 rubles	1,000,000 rubles
Capital	600,000 rubles	700,000 rubles
Number of workers	400 men	475 men

Calculating on the basis of the gross value of output, we have

$$\eta_A = \frac{1200^2}{600 \cdot 400} = 6.0 \qquad \eta_B = \frac{1200^2}{700 \cdot 475} = 4.3 \ .$$

Calculating on the basis of value added, we obtain:

$$\eta_A = \frac{850^2}{600 \cdot 400} = \frac{722{,}500}{240{,}000} = 3.01 \qquad \eta_B = \frac{1{,}000^2}{332{,}500} = 3.01 \ .$$

...Thus the proposed formula passes a series of tests which, of course, are quite elementary. We are, however, immediately faced with a series of more complex questions:

(a) Since the size of the capital and the number of workers are not two independent variables and since, on the contrary, we know a priori that a change in capital determines a change in the number of workers one way or the other, we must find out how the proposed formula deals with this contingency.

(b) Since calculation of national economic efficiency must not be replaced by calculation of the same old profitability in disguise, and since it must make it possible to give to individual factors certain weights corresponding to our economic policy, we must find out whether this is possible using the proposed formula.

(c) Formula $P^2/(C \cdot W)$ or $P_0^2/(C \cdot W)$ ties together three factors: gross product P or net product P_0; capital C; and number of workers W. Is it possible, however, to maintain that the size of the product is determined by the size of the capital and by the number of workers to the same extent as the efficiency of the capital is determined by these two factors, and that no further factors need be included in the formula?

(a) An independent change of capital C and of the number of workers will occur only in special cases: on the one hand, if the number of man-hours or shifts decreases or increases and if purely organizational changes increasing or decreasing the output per worker per day are introduced without any increase in capital; and, on the other hand, if the old equipment is replaced by new, more expensive equipment, yielding the same output for a smaller number of workers. The efficiency of this type of independent change in C or W is fully allowed for in the proposed formula.

However, generally speaking, a change in capital much more often determines a change in the number of workers, and the ratio of capital to number of workers in concrete conditions varies according to a definite pattern: industrial development

is accompanied by an increase in capital per worker, when by worker is understood not the man but one normal work day.

According to the data of the American economists Cobb and Douglas,... during the period 1899-1922 fixed capital per worker has increased in the U.S. from $940 to $2,850, i.e. it has tripled. This increase was interrupted only in the years of crises when the number of workers was automatically reduced or, as production fell, working hours were cut. These figures take no account at all of the general reduction of working time (about 11 per cent) which took place in the period 1899-1922. If this fact had been elaborated upon and if instead of the workers we had been given the number of man-hours expended on production each year, then the increase of C/W would have been even greater.

Comparing the figures for capital per worker and gross production per worker, it is easy to see that, in the U.S., the growth of the latter lagged considerably behind the former....

The inversely proportional variation of capital and number of workers, according to the proposed formula, does not change the efficiency if output remains unchanged. Efficiency increases when the rate of growth of capital lags behind the rate of reduction in the number of workers, output remaining unchanged. Efficiency drops when the rate of growth of capital exceeds the rate of reduction in the number of workers.

The above-mentioned dependence can be best observed in a numerical example. Let us assume that in the initial year we have for output, capital, and number of workers, respectively, one million rubles, 500,000 rubles and 400 men. Then efficiency, according to the formula, will be

$$\frac{P^2}{C \cdot W} = \frac{1{,}000^2}{500 \cdot 400} = 5.0$$

We shall further assume that

(a) the capital has trebled and the number of workers been reduced to one half:

$$\frac{P^2}{C \cdot W} = \frac{1{,}000^2}{1{,}500 \cdot 200} = 3.3 \ ;$$

(b) the capital has doubled and the number of workers been reduced to one-third:

$$\frac{P^2}{C \cdot W} = \frac{1{,}000^2}{1{,}000 \cdot 133} = 7.5 \ .$$

Does this formula correctly determine the efficiency of capital in these cases? We cannot simply answer no to this question because we are dealing here not with a verification but with an evaluation. The fact that we have included in the denominator of the formula the product of the first degrees of the two values C and W certainly means that, independently of the functional dependence between these values, we evaluate their change equally, both of them being particular negative determinants of efficiency. If the expenditure of capital represents for us a greater sacrifice than bringing new workers into the work, we must weight these values correspondingly, i.e., not take them to the first power but to some other power which will not be the same for C and W.

Applying economic logic, it is impossible to object in principle to the rejection of the conclusion that the efficiency remains unchanged when C and W vary in inverse proportion and when production is constant.

(b) With respect to the second question, it must be noted that, as we have pointed out earlier, the proposed formula makes possible any weighting of all the values P, C, and W. It would be incorrect, however, to take the price-forming role of various factors as a basis for the weighting.

In the price of the product, capital accounts for 10 to 12 per cent while the number of workers, through wages, determines the greater part of the rest of the price after subtraction of the raw materials. An attempt to give appropriate weights to capital and to the number of workers would only produce a distorted picture of profitability and no picture at all of national economic efficiency.

Obviously, the weighting must correspond to an authoritative interpretation of national economic efficiency and to an authoritative, qualitative standardization of the relative values of capital and of the number of workers.

(c) The third question presents the greatest interest. Are the values included in the formula sufficient? Is it possible to determine national economic efficiency from the ratio of one positive and two negative factors without taking into account other factors such as profit, cost of production, working capitals, turnover, etc.?

This question can be answered as follows:

If a formula enables us to determine product P with sufficient accuracy, especially its rate of variation as a function of only two variables C and W—i.e., the capital and the number of

workers—then it is not necessary to include additional positive and negative factors in the formula. If, however, the national economic plan as a whole ascribes a considerable importance to some positive factors such as wages or negative factors such as expenditure on fixed capital, which may require expenditure of foreign currency, etc., then, of course, the formula must be correspondingly modified.

Extremely interesting studies on the extent to which the size of the output is determined by the size of the fixed capital and by the number of workers have been made by the American economists Cobb, Douglas, and Clark. Cobb and Douglas studied the indexes of the variations in physical output P, fixed capital C, and number of workers W and found that the size of the physical output P can, with a considerable degree of accuracy, be determined as a function of C and from the formula

$P_1 = 1.01 \cdot C^{1/4} \cdot W^{3/4} \cdot b$ (where b is a constant coefficient)....

It is, however, easy to see that product P can always be presented with adequate accuracy as a function of the capital and the number of workers. In fact, the product is nothing but the sum of prices, each of which by the very nature of the methods of calculation has the form

$$p = m + aC + bW$$

where m is the cost of the raw material, a value almost always constant for a given enterprise and industry under the capitalist conditions of the U.S. (From 1899 to 1914, m dropped from 42.3 per cent to 40.7 per cent, and in 1927 it rose to 44 per cent.) aC is the sum by which the capital is represented in the price of the product. In it, the coefficient a is also almost constant since it is determined by the amortization rate and by current repairs. bW is the sum of wages and extra expenses. The wages of one worker in fixed money terms change slowly, the extra expenses are determined in percentage of the wages, and this percentage also fluctuates within narrow limits for each individual product....

Analyzing the discrepancy between the actual figures for individual years and the figures obtained on the basis of the Cobb-Douglas formula, Clark pointed out many factors that could account for it, in particular the shortening of the work week between 1899 and 1922 and the low labor productivity during the war years due to the use of inexperienced workers. Clark proposed a modification of the Cobb-Douglas formula. He suggested it should be

$$W^{2/3} \cdot C^{1/3} \cdot [(W/W_n) \cdot 0.65]$$

where W is the actual number of workers, W_n the number of workers required if the utilization of capital were 100 per cent.

Both the work of Douglas and Cobb and the views of Clark and Shlicter would suggest that the merit of the Cobb-Douglas formula lies not so much in enabling us to determine the product from C and W but rather in defining the value of P under conditions sufficiently close to reality. Moreover, it must be assumed that as technology progresses and a greater and greater share of capital goes to equip one worker, C and W must, by their very nature, be variable rather than constant, and, with the increase in the technical efficiency of the capital, the index of C must grow while the index of W must diminish.

The basic economic meaning of the laws established by Cobb and Douglas has been expressed by Clark as follows. Assuming that, in an industry, 4 units of capital correspond to one unit of labor, then the result of the work of one labor unit and four capital units will be

$1 \times 3/4 + C \times 1/4 = 1\ 3/4$ units of product.

Under these conditions, five units of production would require

$\frac{5}{1\ 3/4}$, i.e. 2 6/7 units of labor and 11 3/7 units of capital.

The differentiation brings us to a formula of the type $C^{1/4} \times W^{3/4}$.

The above formulas enable us to determine the efficiency of capital investment in the Soviet Union through a comparison of the production obtained in our country with that which would have been obtained in the United States with the same W and C.

Indeed, if P is the size of the output (actual or planned) and we know the figures C and W for the capital and the number of workers, respectively, we can determine from the Cobb-Douglas formula product P_{am}, which, for the given C and W, would be obtained in the United States. By comparing our product P with the product P_{am} obtained through the formula $P_{am} = 1.01 \cdot W^{3/4} \cdot C^{1/4}$, we can find out the extent to which the efficiency of C and W is higher or lower in the USSR than in the U.S. It is necessary, of course, to translate P and C into the same currency, either rubles or dollars.

We can attain the same objective by using the formula we proposed earlier, $\eta = P^2/(W \times C)$, taking W and C with the exponents appropriate for our economic policy.

It is easy to see that there is no difference in principle in calculating efficiency by either of these formulas. In effect, the Cobb-Douglas formula has the form

$$P' = b \cdot 1 \cdot 01 \cdot C^{1/4} \cdot W^{3/4}$$

and, as has been shown, the efficiency is measured by the ratio of our actual product to product P', which the same C and W would have given under the American conditions prevailing between 1899 and 1922, i.e.,

$$(I)\ \eta_{am} = \frac{P}{P'} = q \cdot \frac{P}{C^{1/4} \cdot W^{3/4}},$$

where the coefficient of proportionality $q = 1/1.01$.

Now, using the formula proposed earlier, we have

$$(II)\ \tilde{\eta} = a\frac{P^2}{W_m C_n},$$ where m and n are equal to

one if we ignore the effect of the other factors.

Squaring both sides of the first formula we have

$$\eta^2_{am} = S \cdot \frac{P^2}{C^{1/2} \cdot W^{3/2}},$$

i.e., a formula that is at variance with ours only in the size of the constant coefficient and in the weightings of C and W. Thus our formula measures the phenomenon by the square of a determined ratio of values, while the Cobb-Douglas formula measures it by this ratio in the first degree.

Below, we illustrate this by some results of the application of the two formulas. We must note here that in these examples, because of the absence of data, we have had to base ourselves on the sizes of the gross rather than the net product. For this reason the comparison of the values of efficiency obtained for different cases will be incorrect theoretically, since the coefficients of net product are different everywhere.

The USSR Five-Year Plan's control figures for the final year put the growth of fixed capital at 239 per cent of the initial year and the increase in the labor force at 268 per cent.

According to the formula P^2/WC the increase in efficiency is

$$\eta = \frac{268^2}{135 \cdot 239} = 222 \text{ per cent of the initial value.}$$

According to the formula $1.01\ W^{3/4} \cdot C^{1/4}$, the efficiency for the final year is determined as

$$\eta_{am} = \frac{268}{1.01 \cdot 135^{3/4} \cdot 239^{1/4}} = 171 \text{ per cent of the initial value.}$$

In other words, under American conditions, the increase in the number of workers to 135 per cent and in the fixed capital to 239 per cent would have increased the product not to 268 per cent but only to 171 per cent = 268/157.

The five-year plan for the industry of Leningrad gives the following coefficients for the final year:

	For the whole industry (in per cents)	For producers' goods (group A) (in per cents)	For consumers'goods (group B) (in per cents)
Output	274	313	255
Fixed capital	189	206	168
Number of workers	146	161	137

From these figures, the increase in efficiency is determined by the following figures:

	From formula $\eta = \frac{P^2}{W \cdot C}$ (in per cents)	From formula $\eta_{am} = \frac{P}{1.01 \cdot W^{3/4} \cdot C^{1/4}}$ (in per cents)
For total industry	272	174
For group A	295	181
For group B	282	176

...Before we leave this interesting topic, which is important both from the point of view of theory and from that of practice, we must touch upon two additional matters.

(1) If we use the formula P^2/WC to determine the efficiency of American industry, we obtain the following figures:

	1899	1914	1927
Gross value of output (at 1899 prices)	$11,407,000	$19,278,000	$36,800,000
Number of workers	4,713,000	7,026,000	8,351,000
Fixed capital (at 1899 prices)	$ 4,449,000	$10,873,000	$24,000,000
	η 1899 = 6.27		
	η 1914 = 4.90		
	η 1927 = 6.77		

From these figures we obtain what would seem at first glance to be a rather paradoxical picture, namely, one of capital efficiency in the United States falling for the first decade and a half and rising a little in recent years. This conclusion is confirmed by a comparison of the figures of output per worker and of the amount of the fixed capital per worker, as well as by several studies by such American economists as Clark, Cobb, Douglas, and Thomas. But what then is the secret of American prosperity? The most plausible explanation seems to be that this prosperity is caused, above all, by the fact that American industry has not only been expanding production but, at the same time, has been paying wages which enable the workers to buy the output, i.e. has not only produced the goods but also increased the purchasing power of the consumers.

The wages changed as follows:

Years	Nominal wages (per year)	Real wages (per year)	Real wage index	Price index
1899	$ 426	$426	100	100
1914	579	442	104	131
1923	1,250	712	167	176
1927	1,300	747	175	174

In this connection the question arises whether it would not be appropriate, when evaluating efficiency from a broad national economic viewpoint, to include the indicator of the growth of wages as a major positive factor in the efficiency formula and to write the formula

$$\eta = \frac{P^2 \cdot L}{W \cdot C}$$

where L is the relative or the absolute value of one worker's wages.

If we do not include the growth of wages, then from 1921 on, the efficiency of American industry for the 1899 value of $\eta(1.00)$ varied as follows:

1899 — 1.00 1923 — 0.83
1921 — 0.54 1927 — 1.08

If we now introduce the indicator of the growth of yearly wages, the efficiency will vary as follows:

1899 — 1.00 1923 — 1.39
1921 — 0.80 1927 — 1.89

The question of the positive significance of wages as a factor in national economic efficiency warrants special study.

(2) The second question claiming at least brief consideration concerns the importance to the national economy of determining financial profitability in the light of what has been said here about efficiency in general.

In the introduction to this paper it has been shown that entrepreneurial efficiency of capital is determined by profits and that, whatever the system of accounting, the management that follows basic economic principles cannot do so without determining profitability. It is equally clear that when the national economy is conceived of as a system of interdependent but separate economic units, the algebraic sum of the entrepreneurial profitabilities is of first-rate importance to the national economy, since it is precisely this sum that determines the size of accumulations, i.e., of the funds out of which the resources for the expansion of productive capital are obtained.

Therefore, however we measure the national economic efficiency of capital outlays, we cannot reckon that this measure will render a careful watch over profitability unnecessary. Those who believe this to be so on theoretical grounds are not only naive in their theorizing but, in addition, will find themselves in complete disagreement with the facts, because every day and everywhere profits are being assessed, although perhaps by the most haphazard, antedeluvian, and home-made methods. The absence of an authoritative interpretation of the most elementary concepts leads to these haphazard computations of profitability, to the concealment of its true size, to excessive amounts of working capital, etc.

There is an especially popular theory which considers the determination of profitability impossible or unnecessary because of the special nature of our price policy and of the independence of these prices from supply and demand. This theory is surprising in a planned economy based on accounting, and if it were correct, it would have undermined not only the principle of profitability but the entire concept of a planned economy. Of course, the fact that money is an imperfect gauge of prices makes the determination of profitability more difficult, just as it makes planning and plan-fulfillment calculations and estimates more difficult. But certainly this does not mean that we may eliminate the concept of profitability from view and replace it by some more or less satisfactory indicator of national economic efficiency.

S. Rozentul

FORMULA OF EFFICIENCY OF CAPITAL INVESTMENT

WHAT IS MEANT BY "EFFICIENCY" OF CAPITAL INVESTMENT

Despite the fact that, with the intensification of the reconstruction of our national economy, the problem of the efficiency of capital investment has acquired major importance, we still do not possess a sufficiently elaborated formula for the quantitative determination of that efficiency, nor does the very concept "efficiency of capital investment" have a firmly established meaning. Thus some people consider it as a cost reduction achieved through investment outlays, others as an increase in profits, still others as labor-saving or as an increase in the volume of production, etc.

In order to produce an exhaustive definition of the concept of efficiency of capital investment, we must first establish the point from which we are studying it. From the viewpoint of a capitalist or of our enterprises operated on a commercial basis, efficiency is measured by the increase in the profitability of an enterprise's operations owing to an increase in invested capital. From the viewpoint of the labor force, efficiency is manifested in an increase of the wage fund and in the reduction of labor input per unit of production. Finally, from the viewpoint of other physical or legal persons who receive a part of the surplus value of the entrepreneur from the nonproductive expenses, the efficiency will obviously be determined by the size of the increase in these nonproductive expenses.

We shall dwell in more detail on the effects manifested (a) by an increase in profitability; (b) by benefits obtained by the labor forces; and (c) by an increase in income received from nonproductive expenses.

As to an increase in entrepreneurial profits, it can be determined by two factors: (1) a general, extensive increase in the value newly created in the production process without a change in the general conditions of production, i.e., with fixed capital,

"Formula effektivnosti kapital'nykh vlozhenii," Planovoe khoziaistvo, No. 6, 1929, pp. 99-116.

labor force, and the nonproductive expenses unchanged (interest on capital, rent, etc.); (2) an intensive improvement of the production process which makes it possible to reduce the input of labor and materials per unit of production.

Let us assume hereafter[1] that the cost of a physical unit of production, as well as the wage level, rent, etc., remains unchanged. In practice, this will happen when the reduction of production costs brought about by technological improvements in a given enterprise is of purely local significance and does not affect the general market value of the produce. In this case, the total effect of the reduction of the working cost goes to the capitalist in the form of an increase in his relative surplus value; whereas with an extensive increase in net production, his absolute surplus value increases proportionately. It is easy to see that, with our assumption, the exchange value of a product changes in proportion to its physical volume. Thus the wage fund of workers and employees changes in proportion to the expenditure of labor. We can therefore measure the changes in the physical volume of production and in the expenditure of labor by the changes in their cost.

Returning to the two factors on the basis of which the entrepreneurial profits of the capitalist increase, we note that in particular cases profits can increase on the basis of either one or both of these factors. We can also conceive of an instance when one of the factors would contribute to an increase in

1. Here is a list of symbols used in this article:

K = fixed and circulating capital (K_1 before investment effect, K_2 after)
C = constant capital (C_1 before investment effect, C_2 after)
F = outlays on labor (F_1 before investment effect, F_2 after)
I = C + F
D = net output
k = labor productivity = net output per worker
E_n = ($D_2 - D_1$) = increment in net output
E_e = economic effect
E_1 = (so-called extensive effect) = increase in D in proportion to growth of K
E_2 = (intensive effect) = increase in rate of growth of D faster than in rate of growth of K
E_3 = capital savings = decrease in cost of C per unit of output
E_4 = labor savings = decrease in cost of F per unit of output
E = $E_1 + E_2 + E_3 + E_4$ = efficiency of capital investment
N = number of workers—Ed.

entrepreneurial profits while the other would contribute to a reduction. In that case it is still to the entrepreneur's advantage to invest new capital if the total effect is positive. For instance, during business cycle expansions and when the demand exceeds the supply, it is definitely to the entrepreneur's advantage to expand the operations of his enterprise and increase his profits through an increase in absolute surplus value. Moreover, he may find it advantageous to spend his capital on obsolete equipment and less qualified labor, since, although this will reduce the relative surplus value, it will increase the absolute surplus value by more and hence have a positive total effect.

On the other hand, during business cycle contractions, when marketing goods is difficult, the capitalist is sometimes forced to reduce the volume of production. At the same time, however, he may still find it to his advantage to invest new capital in his enterprise if this is conducive to raising the labor productivity or reducing the input of raw materials, fuel, etc., per unit of production, because at the same time the production costs decrease and the relative surplus value increases.

If we consider the efficiency of capital investment from the viewpoint of labor, we can break it down into the following effects:

(1) The effect obtained from a general increase in the wage fund by an extensive increase in the volume of production (disregarding changes in labor productivity).

(2) The effect of wage increases due to changes in labor productivity. Since we assume the level of hourly wages to be constant, this effect will be negative if labor productivity increases, and vice versa.

(3) The effect obtained through labor-saving due to the fact that, as labor productivity increases, the number of man-hours spent on the production of the same physical volume of new value is reduced.

In the same way, we can calculate the increase, due to extensive and intensive increase in production, in the share of other physical and legal persons in the surplus value through an increase in nonproductive expenses.

Finally, an increase in production in one enterprise can lead to more productive and economical operations in other enterprises. This happens when the volume of output in one industry limits the output of other industries. Thus an increase in the production of fuel resulting from capital investment outlays in the fuel industry can cause an increase in the output of other

industries without additional investment outlays in these industries, if the obstacle to increased production was a lack of fuel rather than a lack of capital. Furthermore, since a greater utilization of the existing capacities of an enterprise usually reduces the input of fuel and labor per unit of output, we can say that capital investment in one industry can also increase the efficiency of the operations of other industries. This effect will also include increases in entrepreneurial profits in these industries, in wages, in labor-saving, and, finally, in the income of various persons connected with an increase in nonproductive expenses.

Adding up the individual shares of efficiency gained from capital investment outlays by the entrepreneurs, labor, and other beneficiaries of efficiency pointed out earlier, we find the total efficiency of the capital investment funds from the standpoint of the national economy as a whole. This efficiency can also be found by adding up the efficiencies of various industries corresponding to different variables brought about by capital investment.

These variables are:

(1) An extensive increase in the physical volume or in the quality of the net output, disregarding the effect caused by the reduction of input of materials and labor.

(2) A reduction of input of materials per unit of production.

(3) A reduction of input of labor per unit of production.

(4) An improvement of working conditions and safety measures for labor.

Of the enumerated variables, (4) has an independent social significance and must therefore be considered separately.

The economic efficiency is determined entirely by the first three variables. The first one consists of an increase in production, quantitative or qualitative; the second and third, in a reduction in the input of labor or materials per unit of newly created value. We call the first part of efficiency productivity, and the second part labor and material savings.

It is easy to see that, whatever the distribution of the increment of production and the saving of materials among entrepreneurial profits, the wage fund, and the incomes of various physical and legal persons from nonproductive expenses, in the true formula, the over-all economic efficiency is determined by the two main variables: the quantitative or qualitative increase in the volume of newly created value and a more economical expenditure of actual and materialized labor (labor force and fixed capital). We believe that the entire concept of efficiency is limited to these variables.

It is evident that when we speak of the efficiency of capital investment, we compare the absolute economic effect obtained through these investment outlays with the outlays themselves. Therefore it would be more correct to speak of the rate of efficiency of capital investment.

$$\text{Rate of efficiency of capital investment} = \frac{\text{economic effect}}{\text{sum of capital investment outlays}}.$$

Further we have:

$$\text{rate of efficiency} = \text{rate of productivity} + \text{rate of labor and material savings},$$

in which

$$\text{rate of productivity of capital investment} = \frac{\text{productivity effect}}{\text{sum of capital investment outlays}}$$

and

$$\text{rate of labor and material savings of capital investment} = \frac{\text{savings effect}}{\text{sum of capital investment outlays}}.$$

We distinguish the over-all economic efficiency from the social and political effectiveness that results from the fact that capital investment funds contribute to the industrialization of the country, to national defense, to a balanced supply and demand, to increased safety measures, etc.

Of course, an analysis of our policy of capital investment must take into account all these forms of social and political effectiveness. This, however, does not detract from the importance of determining the maximum efficiency of capital investment outlays in the aggregate economic sense, which is one guiding principle (although not the only one) that we should adopt in choosing the direction of capital investment.

FORMULA FOR THE EFFICIENCY OF CAPITAL INVESTMENT

We shall designate by E the absolute economic effect obtained in connection with the capital investment outlays; by K_1 the value of the stock of fixed and working capitals available before the investment; by K_2 their value (in fixed prices) after the investment. Thus the amount of these investment outlays

is $K_2 - K_1$ and the rate of efficiency of the capital investment outlays is

$$\frac{E}{K_2 - K_1} = \frac{E_n + E_e}{K_2 - K_1} \tag{1}$$

where E_n is the productivity effect and E_e the economic effect.

As for the productivity effect, it consists of the quantitative increment in net output (of the newly created value). We shall designate by D_1 net output for original capital K_1; and by D_2 net output for capital K_2 after the effect of the capital investment outlays is felt. Then $D_2 - D_1$ will represent the total productivity effect of the capital investment outlays on the national economy E_n, and the productivity rate will be

$$\frac{E_n}{K_2 - K_1} = \frac{D_2 - D_1}{K_2 - K_1} . \tag{2}$$

The labor and material savings of capital investments have a more complicated expression. As we have pointed out earlier, the economic effect consists of savings on fixed capital and labor. Let us assume that, if K_1 is the capital and D_1 the net output, C_1 is the outlay on materials and F_1 the outlay on labor. Let C_2 and F_2 designate outlays on materials and labor, respectively, after the effects of the capital investment outlays are felt. It is obvious that, without the economic effect, the expenditure of materialized and actual labor would have increased in direct proportion to the increase in net output, and would be

$$D_2 \frac{C_1}{D_1} \text{ and } D_2 \frac{F_1}{D_1}, \text{ respectively.} \tag{3}$$

Therefore, the absolute economic effect E_e will be

$$E_e = D_2 \frac{C_1}{D_1} - C_2 + D_2 \frac{F_1}{D_1} - F_2 = D_2 \left(\frac{C_1}{D_1} - \frac{C_2}{D_2} \right) + D_2 \left(\frac{F_1}{D_1} - \frac{F_2}{D_2} \right). \tag{4}$$

Hence, the rate of labor and material savings is:

$$\frac{E_e}{K_2 - K_1} = \frac{D_2 \left(\frac{C_1}{D_1} - \frac{C_2}{D_2} \right) + D_2 \left(\frac{F_1}{D_1} - \frac{F_2}{D_2} \right)}{K_2 - K_1} . \tag{5}$$

Let us assume that $I_1 = C_1 + F_1$ and that $I_2 = C_2 + F_2$. Then we have

$$\frac{E_e}{K_2 - K_1} = \frac{D_2\left(\frac{I_1}{D_1} - \frac{I_2}{D_2}\right)}{K_2 - K_1} \tag{6}$$

where I_1 and I_2 represent the total expenditure of materialized and actual labor for capital K_1 (before investment) and K_2 (after investment).

Combining the formulas for productivity and labor and material savings, we obtain a general formula for the efficiency of capital investment outlays:

$$\frac{E}{K_2 - K_1} = \frac{(D_2 - D_1) + D_2\left(\frac{C_1}{D_1} - \frac{C_2}{D_2}\right) + D_2\left(\frac{F_1}{D_1} - \frac{F_2}{D_2}\right)}{K_2 - K_1} =$$

$$\frac{(D_2 - D_1) + D_2\left(\frac{I_1}{K_1} - \frac{I_2}{K_2}\right)}{K_2 - K_1} . \tag{7}$$

This is the formula for the efficiency of capital investment outlays in the most general form.

The productivity effect of the capital investment outlays $(D_2 - D_1)$ can be broken down into extensive and intensive effects. The first represents the physical increase in the volume of output in proportion to the increase in capital; the second represents an increase in net production (or the equivalent qualitative improvement) at a rate exceeding that of the increase in capital.

The rate of productivity for capital K_1 was D_1. During the extensive growth of D_1, this rate does not change, and, therefore, if the capital increases from K_1 to K_2, we obtain the extensive productivity effect $D_1/K_1 = (K_2 - K_1)$.

If, however, D grows at a faster rate than K, we obtain the additional intensive effect

$$E_2 = D_2 - K_2\frac{D_1}{K_1} = K_2\left(\frac{D_2}{K_2} - \frac{D_1}{K_1}\right) . \tag{8}$$

The total productivity effect will be

$$E_n = \frac{D_1}{K_1}(K_2 - K_1) + K_2\left(\frac{D_2}{K_2} - \frac{D_1}{K_1}\right)$$

and

$$\frac{E_n}{K_2 - K_1} = \frac{\frac{D_2}{K_1}(K_2 - K_1) + K_2\left(\frac{D_2}{K_2} - \frac{D_1}{K_1}\right)}{K_2 - K_1} \tag{9}$$

Inserting this value into our formula for the efficiency of capital investment outlays, we obtain

$$\frac{E}{K_2 - K_1} =$$

$$\frac{\frac{D_2}{K_1}(K_2 - K_1) + K_2\left(\frac{D_2}{K_2} - \frac{D_1}{K_1}\right) + D_2\left(\frac{C_1}{D_1} - \frac{C_2}{D_2}\right) + D_2\left(\frac{F_1}{D_1} - \frac{F_2}{D_2}\right)}{K_2 - K_1}. \tag{10}$$

Thus the total effect of capital investment outlays is composed of the four individual effects

$$E = E_1 + E_2 + E_3 + E_4 \tag{11}$$

where $E_1 = (D_1/K_1)(K_2 - K_1)$ is the extensive increase in net output in proportion to growth of K; $E_2 = K_2 (D_2/K_2) - (D_1/K_1)$ is the intensive quantitative increase, or the equivalent qualitative gain, of net output at a rate exceeding that of the growth of K; $E_3 = D_2 (C_1/D_1) - (C_2/D_2)$ is the effect of a more economical expenditure of fixed capital per unit of output; $E_4 = D_2 (F_1/D_1) - (F_2/D_2)$ is the effect of a more economical expenditure of actual labor per unit of output.

Of course, in specific instances, one or several of these individual effects can be nil or even negative. We note that the effect $E_2 = K_2 (D_2/K_2) - (D_1/K_1)$, despite its considerable importance due to the shortage of capital in this country, will still be negative because of the change of the organic composition of capital (with an increase in fixed capital). In reality, the ratio D/K represents the relation between the quantity of actual labor D expended on a given production process and the quantity of material labor K that had gone into tools and materials. But, as labor is further mechanized, the ratio D/K will decrease and therefore tend to become negative, i.e.,

$$K_2\left(\frac{D_2}{K_2} - \frac{D_1}{K_1}\right) < 0. \tag{12}$$

The following example with figures will illustrate our formula.

Let us assume that the stocks of fixed and working capital of a given industry, say the textile industry, are 200 million rubles. Let us assume further that the annual value of output is 500

million rubles, of which 400 million represent materials, fuel, amortization, etc., and 100 million the net output. We have then $D_1 = 100$ million rubles; $C_1 = 400$ million rubles; $K_1 = 200$ million rubles. Finally, we shall assume that the labor expenditure is 100 million man-hours with a general productive capacity of $F_1 = 100$ million rubles.

If later we invest another 50 million rubles, the new capital stocks will be $K_2 = 250$ million rubles. Let us assume the corresponding net output $D_2 = 120$ million rubles, the expenditure of materials $C_2 = 440$ million rubles, and the expenditure of actual labor $F_2 = 100$ million man-hours with a productive capacity of 110 million rubles, its level remaining unchanged.

We have then the productivity effect $E_n = D_2 - D_1 = 120 - 100 = 20$ (million rubles).

Of these, the extensive effect will be

$$E_1 = \frac{D_1}{K_1}(K_2 - K_1) = \frac{100}{200}(250 - 200) = 25 \text{ million rubles} \quad (13)$$

and the intensive effect,

$$E_2 = K_2\left(\frac{D_2}{K_2} - \frac{D_1}{K_1}\right) = 250\left(\frac{120}{250} - \frac{100}{200}\right) = -5 \text{ million rubles} \quad (14)$$

Here the intensive effect is negative since production increased by 20 per cent while capital stocks increased by 25 per cent.

Further, we have the effect due to material savings

$$E_3 = D_2\left(\frac{C_1}{D_1} - \frac{C_2}{D_2}\right) = 120\left(\frac{400}{100} - \frac{440}{120}\right) = 40 \text{ million rubles} \quad (15)$$

and, finally, the actual labor-saving is

$$E_4 = D_2\left(\frac{F_1}{D_1} - \frac{F_2}{D_2}\right) = 120\left(\frac{100}{100} - \frac{110}{120}\right) = 10 \text{ million man-hours}$$

with a total productivity capacity of 10 million rubles.

Thus through the investment of 50 million rubles we have obtained:

(1) The effect due to the increase in productivity $E_n = 20$ million rubles consisting of (a) the extensive effect $E_1 = 25$ million rubles and (b) the intensive effect $E_2 = -5$ million rubles.

(2) Saving on fixed capital $E_3 = 40$ million rubles.

(3) Saving on labor $E_4 = 10$ million man-hours with a productive capacity of 10 million rubles.

Altogether 60 million rubles, plus 10 million man-hours.

Translating the labor-saving into the value it has created, we obtain a total of 70 million rubles. Hence the rate of efficiency of the capital investment outlays is 70/50 = 1.40.

REMARKS AND CONCLUSIONS

(1) We deliberately calculate the productivity and labor and material savings on the basis of value added rather than gross value of output. The reason is that capital investment outlays contribute to the increase created precisely in the given production process. If, on the other hand, this increase in the newly created value also makes it necessary to increase the production of the fixed capital stocks (raw materials, fuel, amortization, and other material expenditures), then additional capital funds must be spent on the industries that produce these fixed capital stocks. In the same way, savings on actual or materialized labor brought about by capital investment outlays in a given industry is achieved precisely in that particular industry, whereas the reproduced value is automatically transferred to the value of the final product and is not an active factor in saving. For example, if the manufacture of the final product requires 100 man-hours with 80 man-hours having been spent earlier on the preparation of materials and tools of production and 20 hours spent in that industry itself; and if, then, through capital investment outlays, labor productivity is doubled, then the expenditure on the product will be 80 + 10 = 90 man-hours and the saving of actual labor brought about by the capital investment outlays will be 10/20 = 50 per cent rather than 10/100 = 10 per cent....

A similar example of saving on fixed capital could also be given.

(2) The growth of productivity not accompanied by the savings effect causes an increase in the expenditure of actual and materialized labor in proportion to the growth of net output. Thus the quantity of the product per work unit does not increase and there is therefore no reason to raise individual wages unless redistribution of the national income occurs simultaneously, otherwise a wage increase for one group of workers would be gained at the expense of the income of other groups of workers or other citizens. However, such a growth of productivity causes a large influx of labor into the industry.[2]

2. Inasmuch as we estimate the value of actual labor on the basis of the productive capacity, the number of the new workers N, the length

On the contrary, the savings effect not accompanied by growth of production reduces the need for manpower while creating a basis for a wage increase or for a shorter work day, or else for an increase in accumulation.

If the productivity effect is combined with the savings effect, there will be both an increase in the number of workers and a reduction of labor input. This, as pointed out above, will result in either an accumulation, a wage increase, a reduction in the work day, or all of these.

(3) We can see that the savings effect can be obtained not only through an increase in labor productivity but also through more economical expenditure of fixed capital. A better boiler using less fuel per unit of steam or a device to utilize waste products or to reduce transportation yields the same results as an increase in labor productivity. And since the amount of materialized labor used in production exceeds as a rule the amount of actual labor, we gain more in saving 1 per cent of materialized labor than by increasing the productivity of the actual labor by 1 per cent. In our earlier example, when the fixed capital accounted for 80 per cent of the final product and the newly created value for 20 per cent, a saving of 1 per cent of materialized labor is tantamount to a 4 per cent increase in labor productivity. (The average ratio of the expenditure of actual to materialized labor in all branches of state industry is higher, about two-thirds, but in the building industry it is lower.)

It is interesting that our labor management officials consider an increase in labor productivity as the only way of achieving higher wages, shorter working hours, and accumulation, and seem to forget completely the possibility of saving on materialized labor which, in the U.S., for instance, has already had a spectacular effect....

(4) While the materialized labor (fixed capital) is estimated at its full value (disregarding here the possible deviations of prices from values), actual labor is evaluated in terms of wages, whereas the surplus value should also be taken into account. Based on such an estimate, the value of the savings on labor expenditure will be less than the true value based on the productive capacity of labor.

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of the work day remaining constant, can be expressed by the formula

$$N = \frac{E_n - E_e}{k}$$

where k is the value of net output per worker (labor productivity).

Thus if the saving reaches 100 million man-hours and the wages are 0.5 rubles per hour, we usually evaluate the savings effect due to the increase in labor productivity at 50 million rubles. It would, we submit, be more correct, under Soviet conditions, to evaluate the savings in man-hours not in terms of its market value but rather in terms of its productive capacity. Thus if a value of one ruble is produced in one man-hour, we would estimate a saving of 100 million man-hours as worth 100 million rubles. However, this matter requires some additional clarification....

Part III

Planning Theories and Methods

INTRODUCTORY NOTE

An economic plan is based both on targets determined by policy makers and on forecasts, which are estimated magnitudes (e.g., the size of the harvest) established by planners and statisticians.

The controversies of the 1920's on planning principles and methods raged around the following problems: (a) To what extent must the policy maker, in selecting his targets, take into account past economic trends and "regularities"? (b) To what extent must the planner aim at achieving consistency among all the targets set and all the forecasts? (c) To what extent must the planner build into the final plan provisions for emergencies, bottlenecks, and drawbacks?

The economists Groman and Bazarov emphasized the importance of certain constraints under which the policy maker necessarily operates when he makes his selections—namely, limitations of capacity, specific relationships between sectors of the economy, and existing commitments. The Communist planners—Strumilin for instance—stressed the importance of the time element in planning: in the long run, the planner may indeed be less and less limited by certain previous constraints, whether in respect to crucial capacities and outputs, sectoral relationships, or commitments. While Groman and Bazarov were drawing the attention of the policy maker to the importance of short-run or of medium-run relationships, Strumilin was pointing out the possibility of significantly reshuffling, in the long run, the economy's parameters. With almost mystical zeal, the Communist planners spread the illusion that indeed everything was possible "sometime in the future;" accordingly, the bureaucrats discarded the idea of any constraints, proceeded to formulate the most ambitious and often conflicting targets, and geared the efforts of the economy as a whole toward fulfilling at all cost the top heavy-industry priorities, the "levers" of future restructuring of the economy. The idea of consistency in planning was eliminated from Soviet planning literature. What was emphasized from then on was the necessity for sufficient elbow room for the planner—so-called "maneuverability"—and his capacity to insure the fulfillment of key targets and to solve the most pressing contingencies which might arise as the execution of the plan unfolded.

Deriding the glorification of arbitrariness in planning, Kondrat'ev, Fel'dman, and others suggested various solutions by means of which all the plan targets could be selected once the policy makers had expressed certain basic preferences, and by means of which targets and forecasts could be blended into a consistent plan. Applying this method (discussed in Parts One and Two above), Fel'dman pointed out how one can select optimally the rate of growth of the economy as a whole, given a set sectoral pattern. But Kondrat'ev's, Fel'dman's, and various other critiques were rejected, their proponents tracked down as pessimists and saboteurs, while official planning was launched, full steam ahead, on the course of intuition and "maneuverability."

Discarding the attempts of those who in the early phases of planning were already groping for a scientific solution, but stressing that key assignments must be "realistically" set, Strumilin—in "Answer to Our Critics"—expressed the official contempt for anyone who could not see that the whole "point of Soviet planning" was simply "to concentrate the will and efforts of the workers and the economists on certain selected objectives." As will be seen from the following excerpts concerning the methodology both of the Control Figures and of the first Five-Year Plan, no systematic method of bringing into agreement all the targets and forecasts was attempted in the planning procedure of the period. The selections give a detailed view both of the positions taken in the planning controversies and of the methods used in planning practice—assumptions and methods which have remained until today the basis of Soviet planning.

V. G. Groman

ON CERTAIN REGULARITIES EMPIRICALLY OBSERVABLE IN OUR ECONOMY

...Society represents an intricate complex of phenomena evolving in a certain direction, their elements being mutually connected by close ties. Any social system contains elements of contradiction which are resolved in one way or another when society is preserved. Class struggle shocks society in its very foundations, and as a result there occurs either a revolution and a transformation of society, or—through partial modification—society, while preserving its basic structure, attains an equilibrium. But such equilibrium is, to be sure, a moving one: today is not identical with yesterday but resembles it. Even revolutions, for example the greatest of all revolutions—the October [1917] revolution—cannot change economic forms over night by socialization of the processes of production and exchange. Nationalization could not cover all enterprises, and transition to planned distribution could not destroy the free market which continued to exist, even though illegally.

Following the era of war communism, which drastically changed—under the conditions of blockade—the forms of distribution of currently produced values as well as values that were accumulated earlier, we started on the road of organized application of methods elaborated by the highly monopolistic stage of capitalism (money, banks, credit), aiming to make use of such organizational forms as means of building a socialized economy. Why is that so? Objective conditions of the economy, given by its entire historical development, require certain economic forms, processes of production and exchange of goods, and distribution of national income. They cannot be arbitrarily decreed. "One cannot give orders to the economy," said V. I. Lenin. Only after having created the conditions for consciously influencing the development of society as a whole by establishing a proletarian

"O nekotorykh zakonomernostiakh empiricheski obnaruzhivaemykh v nashem narodonom khoziaistve," Planovoe khoziaistvo, January, 1925, pp. 88-101. (Editorial note of Planovoe khoziaistvo: by way of discussion.)

government can one begin and continue to proceed in the direction of socialist construction of the whole society. But this is again possible only on the condition—to use the words of N. I. Bukharin—"that one sees the whole at all times, that one understands the interrelationships and interdependence of its parts" (Bol'shevik, no. 14, p. 28). Comrade Bukharin correctly adds that one must constantly keep in mind the dynamics of the economy.

We have formulated the same idea differently in a memorandum to the Presidium of Gosplan dealing with the principles and methods of planning, in which we stated that the teleological and genetic viewpoints must be organically connected and that primacy belongs to the genetic.

Scientific socialism, as distinct from utopian socialism, developed the idea that genetic development of society must create the forces capable of securing both the power and the will to transform society in a certain direction. When political power is captured and one intends to start immediately the deliberate transformation of society, then the method and the forms of such transformation are dictated by the objective conditions of the society and the hidden objective tendencies of its development.

The method of learning the condition of a society and the objective tendencies of its development appears to be the formulation of empirical laws of the statics and dynamics of the economy, of laws established by statistics with the aid of theorems of political economy....

Clearly, a theoretically established tendency must find its statistical expression in the form of an "empirical law." By the latter we shall understand observable regularities of the existence and the sequence of phenomena, for instance the law of declining mortality associated with the growth of welfare, the growth or decline of yields associated with changes in cultivation, the relation between the value of industrial and agricultural output coming to the market, etc.

When we begin to search for empirical laws of economic statics and dynamics in the era of the reconstruction process, we run, of course, into a number of difficulties....

(1) The country is in the midst of the recovery process, whose essence lies in more and more intensive utilization of fixed capital in agriculture, industry, and transportation, more and more intensive drawing into active work of human labor, better and better organization of the process of production and exchange, as well as in perfecting the technical tools of exchange (monetary circulation and the credit system). The beginnings of planning are striking more and more roots in practice.

(2) The basic criterion of evaluating the dynamics of economic processes must be the principle of moving toward equilibrium, i.e., toward proportional development of different elements of the economy mutually determining each other. Any violation of this principle either from the side of objective conditions or as a result of incompatibility between planning measures and the principle of proportional development of individual sectors of the economy immediately affects in a most unfavorable way the over-all process of economic development.

(3) The third proposition may be formulated as follows: the relation between the development of material productive forces and the living standards of the working masses is of decisive significance for the general direction and rate of growth of economic development, its smoothness or, on the contrary, its violence, crises, and contradictions.

(4) The fourth proposition can be expressed as follows: the conflict between social economic forms ("state capitalism," private capitalism, independent small-scale production, cooperation) takes place both in conditions of progressive development and during a regressive process, and the subjectively desirable form is not always at a given moment the form which under the objective circumstances is economically most effective. This is inevitable. There is, of course, no predetermined harmony between social forms of production and the development of productive forces and at any given instant the optimum combination of social forms cannot be always recognized and realized.

We shall consider the following problems:

(1) The relative growth rate of development (recovery) of industry and agriculture.

(2) The relationship between the value of industrial and agricultural products entering the market and the resulting relationship between price levels of both types of products.

(3) The distribution of industrial and agricultural products between the city and the village.

(4) The relationship of the volume of money and the turnover of goods.

(5) The relationship between the state budget and production and the turnover of goods in the economy.

(6) The relationship between the productivity of labor, wages, and labor costs.

We shall investigate these problems by searching for static and dynamic regularities in the existence and consistency of phenomena.

Can such a search count on being successful? Yes. Even though economic life is complex, its elements changeable, its combinations whimsical, its development capricious, such regularities exist and can be discovered. Of course, the degree of their stability is not absolute; regularities once discovered will not subsequently reappear in identical form. However, subsequent events will closely resemble the regularities, and changes of established relationships in which the process of economic development is reflected can themselves be investigated and studied. As a result of these investigations we shall arrive at static and dynamic empirical laws of economic phenomena. We must thereby arrive at a system of empirical laws. In formulating empirical laws we start with the assumption that no single phenomenon can change without changes in the aggregate of other phenomena and of each of them separately. The method of searching for empirical laws involves complex as distinguished from isolating thinking. Suppose the investigator establishes that the price of bread has changed, then he already assumes that, if the country in question is an isolated one with a hard currency, this country has suffered a bad harvest or that a process of industrialization has taken place. Along with that he must also ask how real wages, production costs, the conditions of the market for industrial products, etc., must change when bread prices change, and how these phenomena are in turn reflected in the bread prices themselves.

The chain-like relationship between economic phenomena is the constant regulative idea of the investigator's work, and his work must lead to an elaboration of a system of static and dynamic laws of the economy, mutually determining each other, in which connection primacy must belong to the perceived developmental tendency of the economy as a whole....

V. Bazarov

ON THE METHODOLOGY FOR DRAFTING PERSPECTIVE PLANS

II. THE PRIMARY TASKS AND TECHNIQUES OF PERSPECTIVE PLANNING

...

1. ...In evaluating perspective plans it is usual to bear in mind one criterion—their correspondence with reality. This criterion might be considered exhaustive if applied to a scientific prognosis of economic development formulated strictly genetically, i.e., based solely on consideration of the objective regularities and trends of a spontaneous economic process. But the "Perspective Plan" is not only a prognosis but a directive, not only a genetic inquiry but a teleological construct, not only a stocktaking of objective capabilities but a system of measures needed for making the most of these capabilities. And if economic policy has not actually been directed along the lines contemplated in the plan, by no means does the plan's divergence from reality attest in and of itself to methodological errors or factual "miscalculations" on the part of those who drafted it. On the contrary, coincidence with reality would in this case be patent proof of a defect in the plan. On the other hand, hundred-per-cent accomplishment of the plan programs does not yet signify that these programs were projected with ideal accuracy, that the course outlined by them and actually traversed is really the optimum course.

2. The basic task of perspective planning, then, entails the need to combine the genetic and teleological methods in the search for the optimum course of development. Consequently, the chain of crucial methodological problems in perspective planning calls first of all for answers to two questions: (a) what should be the relationship between the genetic and the teleological; and (b) what is meant by the optimum course of development.

(a) The first question is in principle answered very simply. It stands to reason that the more fully a given branch of the

"O metodologii postroieniya perspektivnykh planov," Planovoe khoziaistvo, No. 7, 1926, pp. 7-21.

economy is encompassed by the direct operational influence of the state, the more markedly does the field for teleological constructs broaden at the expense of genetic prognosis.

Agriculture, parceled into more than 20 million small independent units and, in its commodity production, oriented in large part toward exports, is the sphere in which genetic inquiry plays the predominant role. We can exert a direct influence on peasant farming in the way of planning only to the extent to which there is definite demand for agricultural products from state industry. Indirectly, through the wage fund, the scope of operations of state enterprises and institutions determines the share of the marketable farm output consumed by factory and office workers. Thus, in this respect, the development of productive forces in agriculture is predetermined, in point of quantity and quality, by the requirements of the state sector, within which planning teleology finds its broadest application. For the rest, the program for agriculture should be based on objective study of historically manifested regularities of internal growth and trends in the world market. This does not mean, of course, that agriculture can be split into two independent pieces developing in different ways, independently of one another. No, we have here an organic whole the structure of which is determined, on the one hand, by the planned demand of the state and the complex of measures to stimulate the development of branches which are particularly important for the state and, on the other, by the spontaneous trends of domestic growth and the similarly spontaneous dynamics of demand from the outside capitalist world.

The state sector of the economy is a sphere of teleological constructs primarily. Genetic inquiry yields only a quantitative inventory of the resources which can be utilized by the state sector. Determining the lines that utilization shall take constitutes the chief task for the plan formulations, of which the highest criterion is expediency, the achievement of optimum results with the available manpower and resources.

(b) What meaning do we assign to the concept of "optimum" economic plans? There is no question that the concrete meaning of optimum will itself change to correspond with the distinct stages of economic development. However, there are several requirements which must be fulfilled under any circumstances. These basic "constitutive" characteristics of the optimum can be reduced to the following three propositions:

First, the progress of the national economy from its present state to the eventual point indicated by the General Plan must be

smooth, without interruptions, which in turn assumes the existence of definite economic reserves. This requirement is an especially difficult one to meet; particular attention should therefore be focused on it, specifically in the imminent initial period of the reconstruction process. This is why the idea of contingency and maneuvering reserves comes to the fore not only logically, but, if it can be put this way, chronologically as well, in the drafting of the General and Perspective Plans.

Second, the economy must be a harmonious, organic whole—a maximally stable system of mobile equilibrium—not only when the reconstruction mapped by the General Plan has been completed, but at any point in the transition. The emergence of temporary growth disproportions eventuating in crises is inevitable if the course of the reconstruction processes is spontaneous, but is not to be tolerated with planned reconstruction. This second requirement—the requirement of proportionality and internal consistency of the separate elements of the reconstruction process—excludes the possibility of movement on a straight line or any other line drawn in advance, and poses the problem of the intermediate stages of reconstruction as an independent planning problem. Hence the necessity of drawing up, along with the General Plan, a plan that is "perspective" in the narrow meaning of the word, i.e., a plan projecting the immediate stages of the general perspective in their chronological sequence and organic connection.

Finally, the third precondition of the optimum is that at the same time that the first and second preconditions are observed, the path chosen as leading to the goal projected by the General Plan be the shortest one. There arises at this point, consequently, the problem of the "growth rate," the colossal importance of which has been remarked upon repeatedly in our press. The inherent advantages of the planned economy over the capitalist in this respect are beyond dispute; they add up to the possibility of making more rational use of the share of national income which we spend on reconstruction. But the relative size of that share of our planned economy at the present stage of its development is by no means greater, but rather even smaller, than in a capitalist economy which is at the same level of development of its productive forces. No matter how hard we try to constrict the consumer demand of the masses in the difficult transitional period of the next few years, we shall in no case be able to achieve the norms of capitalist society in this respect. Until now it has been considered normal in our country for wages, which determine the

tent of consumer demand among factory and office workers, grow proportionately to labor productivity. In the period of construction, when advances in labor productivity will be ought about primarily by technological changes in production id not by more efficient planning of the working day, the rise wages may slow down somewhat as compared with produc- ity; but under our conditions wages should grow a little faster an the intensity of labor even during this period. Under cap- alism, meanwhile, wages always grow more slowly than the tensity of labor (piece-work with its corresponding drop in y rates, Taylorist "bonuses," etc.). The same thing must be id with regard to the peasantry. All other things being equal, e consumer demand of the peasantry will grow more rapidly the Soviet countryside than it would if landed proprietorship capitalist farming were in existence.

On the other hand, our machinery for the planned admin- tration of the economy requires relatively large outlays. In rt this is a reflection of our want of proficiency and our in- perience; but to a certain extent the relative costliness of this achinery is an inevitable consequence of the low level of pro- uctive forces and efficiency. Under capitalism this extremely mplex and widely ramified planning work is lacking, as also, erefore, are the corresponding expenses of administration; id at the present low level of our economic development the conomies that could be effected by concentrating and rationaliz- ig the functions of the planning machinery would be highly ircumscribed. For these reasons, achieving a faster rate of rowth in the reconstruction period than the rates that were bservable in the advanced countries of the capitalist world in ie years of their most intensive development represents a ather difficult task. In any event, the attainment of this goal s by no means guaranteed, as many think, by the mere fact iat a planned economy exists in our country, but calls for the tmost exertion, the greatest concentration of effort. And in- smuch as the problem of the "growth rate" is, for the years mmediately ahead, the cardinal problem, which will predeter- ine the very pattern of subsequent development, the postulate f the fastest possible expansion of productive forces must be ie supreme criterion of economic policy.

In particular, it is an especially urgent requirement for the oming period that there be a complex of measures making ossible the most effective use of private accumulation both ithin the country and abroad in the interest of accelerating ur economic growth.

The interconnection of the three elements of the postulate of "optimality" may be briefly outlined as follows: The requirement of "uninterrupted" progress identifies the shape of the prospective curve only in the broadest terms and from a negative standpoint at that; i.e., it tells us that the curve we seek should have as few points of inflection as possible and no acute angles or discontinuities at all. The requirement of "proportionality of parts" yields, so to speak, a system of equations interrelating the separate branches of the economy at every moment of its progress under the perspective plan; but these equations define only internal relationships and not the absolute dimensions of the economic process. The first and second requirements combined serve to trace not just one curve but an indeterminate set of possible curves, a whole "family" of curves, as the mathematicians say. It is the principle of the "shortest path" which suggests the ultimate criterion making it possible to select from the set of conceivable curves the only one which is optimum.

It must be pointed out in advance, however, that we are not in a position to plot the optimum curve of perspective development with complete accuracy and rigor, not only because we do not have sufficient factual data at our disposal but because of the very nature of the problem. To compute the shortest or optimum paths given definite, previously stipulated conditions is, as we know, one of the most difficult problems of the art of calculation. Modern mathematics offers methods of solving problems of this nature for only a few very simple cases, and even here the methods to be employed are highly sophisticated (the methods of the so-called "calculus of variations"). In our cases, meanwhile, not only is the problem itself infinitely complex, but the factual data are of necessity most incomplete and not always reliable. It is therefore understandable that no sufficiently detailed and accurate methodology of perspective planning should exist at the present time, and that evolving one at short notice should be impossible; it can only develop gradually, step by step, in the process of prolonged and intensive collective work. For the time being, however, in our search for the optimum we must fall back on rather rough estimates and feel our way to the sought-for goal using variant approximations.

III. THE FRAMING OF THE GENERAL PLAN

1. The disproportions and anomalies hindering the rapid development of the economy of the USSR have been created only in

part by the specific conditions of the war and revolutionary periods. An important role is played here by factors of a "secular" nature, so to speak, which are rooted, on the one hand, in the territorial distribution of the country's natural resources and, on the other, in the grievous economic legacy which has come down to us from prerevolutionary Russia. Thus, the GOELRO plan previously pointed out that our food and fuel resources were located in outlying areas and that our agriculture was enormously backward; this backwardness made the economic position of large agricultural areas ("the drought zone") very unstable and could be overcome only by protracted effort and major state measures for extensive land improvement. Both in the GOELRO work, therefore, and in the subsequent Gosplan works the General Plan is predicated on nation-wide quantitative and qualitative development of the power base. From this point of view, our main effort should be centered on building the power base and putting the economy's heat and power structure in order, and on all the factors that are preconditions for the adequate organization and efficiency of the entire army of human and animal labor in both industry and agriculture. In this conception the country's electrification and its economic regionalization are the chief guiding coordinates for all economic activity. It is clear from this that the framing of a general plan for reconstruction of the national economy essentially boils down to revision and modernization of the GOELRO plan.

2. The foregoing is a sketch of the cardinal lines of economic policy upon which the General Plan is being built. But the General Plan should provide not only a set of economic directives but also a perfectly concrete picture of the state at which the economy of the USSR will have arrived when these directives have been translated into reality. And since there is essentially no limit to the development of the national economy along the lines set by the over-all directives of the General Plan, the following question arises: what are the quantitatively and qualitatively determinate bounds within which the concrete formulations of the General Plan must be made to fit?

The state of society's productive forces is shown by two basic indices: (1) their level (the productivity of social labor), and (2) their volume (the quantitative dimensions of social output). Consequently, the level and volume of society's productive forces must be laid down in advance when the General Plan is drawn up.

3. The level, i.e., the limit of the qualitative improvements comprehended by the General Plan, is projected rather distinctly.

Actually, the goal of general reconstruction is the optimal utilization of available economic resources as regards both technology and regionalization. Hence the process of general reconstruction cannot be considered completed as long as we still have enterprises or branches of the economy in which labor productivity is lower than that of our foreign competitors in consequence of technological or organizational backwardness. The General Plan is first and foremost a plan for radically overcoming our backwardness. Naturally, despite the abundance of the USSR's natural resources, there may be and inevitably will be individual areas of production in which, owing to natural conditions, we shall be unable in the foreseeable future to bring the cost of production down sufficiently for the domestic product to cost us no more than the foreign product of the same quality. As a general rule output of this type should be left out of the General Plan. It is true that at present and for the immediate future, as a result of strained relations with the capitalist world surrounding us, we are obliged to stick to the idea of "autarky" for the USSR; but for the General Plan, which is laying the foundation for economic development over many decades, considerations of this sort cannot have decisive force. The international division of labor, the rational regionalization of social productive forces on a world scale, is an idea that is no less mandatory for the General Plan than the principle of rational regionalization of the USSR. Exceptions can be made (when deciding, for instance, on the routing of certain railroad lines) only in consideration of the perfectly obvious defense needs of the Union. We are assuming—and methodologically are forced to assume—that over the ten to fifteen years for which the General Plan is intended, the structure of the capitalist world and its relations with the USSR will remain roughly the same as they are now. Should this premise prove false, we shall be obliged to complete the General Plan under new circumstances for which long-range allowances cannot be made with any degree of accuracy. However, we cannot and must not assume that the secular development for which our general reconstruction is laying the foundation will proceed under conditions of national isolation and a scramble for the world's economic resources. In this longer perspective the presumption of transition from national economic individualization to a world-embracing economic plan is quite admissible, and for a socialist, mandatory.

Only as general reconstruction is brought up to the indicated qualitative mark shall we create a broad and solid foundation for

further economic construction and really eliminate all our present "disproportions."

The stability of our industry is at present guaranteed by the monopoly of foreign trade. In addition to this protective function, the foreign trade monopoly performs the function of planned commodity exchange with other countries, a function which, in one organizational form or another, is, of course, an inalienable feature of any planned economy. The General Plan can be realized only under the protection of the foreign trade monopoly, but the very process of its realization means gradually eliminating the need for the monopoly's protective function. And only when that need has been eliminated for good, will industry stand firmly on its own feet and, by the same token, will the "bond" with the peasantry become indestructibly solid; for under these circumstances even the well-to-do stratum of the village, the "commerce-and-industry" stratum, so to speak, will lose its prime incentive to fight the Soviet economic system as a matter of principle.

4. More difficult is the question of the magnitude of productive forces that should be adopted as the second, quantitative premise in laying the foundations of the General Plan. Depending on the pace of the reconstruction work, a predetermined level of productive forces can actually be attained with varying volumes of output, since the volume of output would grow even on the old technological base. Out of these many possibilities only one is optimal. But the problem of the pace of development, and of the course of development in general, a problem bound up with the search for that optimum, is a special task not of the General but of the Perspective Plan in the narrow sense of the term, and of the Control Figures drawn up annually. Thus the General Plan, which provides the over-all guide lines and the "goal" of progress, is the prerequisite without which it is impossible to set about exploring the intermediate stages along the way; and, on the other hand, as we have just seen, the most essential element of the goal itself depends, in turn, on the process of transition. We end up with one of those methodological vicious circles which inevitably develop when attempts are made to take the economic process, in which all dynamic and static relationships are linked inseparably by the unity of the organic whole, and break it down into sharply distinct spheres of investigation. There is only one way to break this vicious circle: the General Plan must aim, on the basis of tentative and, perforce, very rough ideas, at being a working hypothesis for the magnitude of productive forces. In

the perspective plans, when the problems of stages and growth rates on the path leading to the accomplishment of the General Plan are worked out, this hypothesis is little by little refined. This alone makes it obvious that the General Plan can in no case be viewed as a finished conceptual model which has but to be reproduced with literal exactness in the living reality of economic construction. As in any genuinely creative human activity, we shall thoroughly understand and concretize our task in reconstructing the national economy only in the process of effecting that reconstruction.

5. On the basis of the General Plan principles and framework outlined above, a prospective picture of the reconstructed national economy may be drawn, with any degree of detail desired, for the separate regions and branches of production. But this will still be merely the totality of illustrations for the specific directives of economic policy; it will not be the plan for the "national economy" until the elements of such a plan have been unified by means of balance estimates. The scheme of these estimates is roughly as follows:

Let us suppose, for example, that the level of productive forces adopted by the General Plan assumes that labor productivity will double in industry and rise 50 per cent in agriculture. Let the volume of output as an average for all branches of the national economy triple at the same time. The separate branches cannot, of course, grow uniformly. Specifically, since labor productivity is rising and production costs are therefore falling twice as fast in industry as in agriculture, the maintenance of "proportionality of parts" (as a condition of the dynamic equilibrium of the economy) calls for the relatively more rapid expansion of industry. But it certainly cannot be said a priori that industrial growth must be specifically twice as rapid as agricultural growth. The first balance problem for the General Plan is therefore posed as follows: In what proportions should the output of the separate branches of agriculture and industry increase, given the stated material and cost premises?

To answer this question we must look ahead and assess the capacity of the world market for our exports, and of the domestic market for both consumer goods and producer goods. Balance estimates drawn up with this purpose will enable us to gauge the future dynamics of the labor force in qualitative and quantitative terms. In industry the number of workers and employees should, generally speaking, grow proportionately to the value and not the physical volume of output. This determines the need for skilled

manpower and, consequently, also determines the expenditures required for the training and retraining of the manpower. The same factor will determine the redistribution of population between town and countryside in conformity with the General Plan. Finally, having ascertained the expected increase of the total urban population (it should be somewhat smaller than the increase in the number of industrial workers and employees), we shall get an idea of the volume of housing construction required by the General Plan. As a result of all these estimates we shall have not only a "financial statement" for the national economy in the shape it will assume when the General Plan has been completed, but also an over-all account of the expenditures required for the general reconstruction of the country's material and human productive forces. This essentially completes the task of the General Plan.

IV. THE FRAMING OF THE PERSPECTIVE PLAN

1. The purpose of the Perspective Plan is to concretize the stages immediately ahead in the accomplishment of the General Plan; the breakdown of the over-all plan perspective by years is unavoidably arbitrary and approximate, for the changes in the yearly rates of growth hinge not only on constant factors but on crop fluctuations and other conjunctural economic influences that cannot be foreseen. But there is no great misfortune in this. If certain naturally inconstant factors result in one yearly interval of the Perspective Plan being actually compressed into six months while another is stretched out into eighteen months, this sort of readjustment will not in the slightest impair the Perspective Plan's orientational significance. The only thing that is vitally important is to fulfill the requirement of "proportionality of parts" as painstakingly as possible for each arbitrary yearly segment of the Perspective Plan, i.e., to see to it that every stage in the accomplishment of the General Plan, every stage arbitrarily marked in the Perspective Plan with a particular calendar date, represents an organically connected economic whole and not a haphazard intertwining of separate lines of development.

2. Though the concrete calculation of yearly growth rates is neither possible nor especially important for the long-range Perspective Plan, this task being specifically essential for the annual Control Figures, the determination of the average growth rate over the entire long-range period is fundamental to the

Perspective Plan. And this problem becomes particularly acute within the framework of the coming five-year period. We are nearing completion of the recovery process without having adequately prepared for the approaching period of reconstruction, with the result that in the initial years of the reconstruction process we must inevitably experience a significant slowing down of the rate of economic growth. The fact is that we must immediately spend large sums on reconstruction while the results of that reconstruction will not affect the growth of productive forces until several years hence, when the newly built enterprises will one by one start coming into operation. The larger the share of productively expended accumulations we channel into new construction and the smaller the volume of the funds we are left with for renovating and partially re-equipping obsolete enterprises in being, the greater, obviously, will be the slowing down of the rate of growth. From the standpoint of rational principles of reconstruction, obsolete enterprises should merely live their days out; they do not merit sizable investments of capital, for the small increase in the volume of output and the even smaller rise in the level of productive forces are being purchased in this case at the high price of relatively great expenditures. But we shall obviously be unable to avoid "irrational" expenditures of this kind. Indeed, if we decided to make only such capital investments as appear rational in the light of the General Plan, we should have to steer all the accumulations to be invested in industry into new construction projects, limiting outlays on the maintenance of operating enterprises to so-called "current repairs." The result would be that for the period immediately ahead, while the new enterprises were still being built, we should have not merely a slackening of the growth rate, but a completely static physical volume of output and sagging average productivity of industrial labor, while the wage bill would rise sharply because of the involvement of proletarian manpower in construction. Obviously, such a policy would be fundamentally at variance with the requirement of "proportionality of parts" in the economic whole and would lead to an acute crisis and catastrophic disruption of all our plans. To mitigate the difficulties of the transition period it is essential, at the same time that new construction is expanded in strict accordance with the plan for general reconstruction, that very large sums be spent on enterprises known to be inferior, just so that an immediate, even if relatively modest, increase may be achieved in their productivity.

As we see, under the conditions that will obtain in the immediate future, the criterion of "proportionality of parts" and the criterion of "the shortest path" plainly conflict. By being compelled, out of a desire to satisfy the former requirement, to direct major resources into intensified production by obsolete methods, and to do so for the next three, four, or five years, we lose in the over-all rate of progress on the General Plan, postpone the date of its completion, and increase its costs.

A paramount task of the Perspective Plan, therefore, is to set proper limits to this policy of reconstruction outlays, which, though economically irrational, is vitally essential, easily implemented, and hence particularly tempting in the eyes of the practical economic manager. The share of productive accumulation which is expended irrationally will obviously be particularly large in the next few years; as the completely rebuilt enterprises come into operation it should dwindle, and we may hope that by the time reconstruction is completed the number of enterprises not covered by the General Plan can be reduced to zero.

3. The Perspective Plan should envisage procedure and methods for eliminating the disproportions of the present economic system in the process of its reconstruction. This refers first of all to the problem of overcoming the goods famine and accumulating stocks of commodities which will make it possible to regulate the domestic market by more effective, more flexible, and cheaper methods than at the present time. Under the Soviet economic system maneuverable stocks of commodities are at the same time the very best currency guaranty, since they provide the state with its most effective tool for regulating domestic market prices and, at the same time, the purchasing power of the paper ruble. The program of the Perspective Plan also calls for working out the problem of special reserve assets which will make it possible to carry on reconstruction work without interruption in spite of weather and seasonal fluctuations in the current state of the economy.

4. One of the most formidable tasks of the Perspective Plan is the projection of price relationships. This is an area in which substantial errors are inevitable. But the task is not to be avoided, in the first place because the balance estimates apply only to value and not at all to the magnitudes of output in kind; and in the second place because the prospective determination of prices constitutes not only a scientific prognosis but an economic policy directive. Without a definite line, representing a directive,

for the regulation of selling prices on industrial output, it will be impossible to find the optimum paths for reconstruction. The basic directive in this area, for the future as it has been in past years, should be that prices on manufactured goods are to be brought down commensurately with the reduction of their cost of production. In other words, the aim of state policy should be to have industry develop in a setting of healthy, moderate "animation," equally avoiding the oppressive atmosphere of an acute depression and the corrupting atmosphere of a "boom" (by "boom" we mean the violent upward spurt of the economy which marks the pre-crisis periods of the capitalist cycle, with their "credit inflation," enormous increase in profits, and their agiotage and other forms of speculation)....

S. Sharov

THE GOAL OF THE PLAN

AND THE TASKS OF OUR ECONOMY

1. WARNINGS IN THE GOSPLAN REPORT

The Report of the Gosplan of the USSR to the Council of Labor and Defense on the revision of the Control Figures broached the subject of the principles which should underlie the drafting of the economic plan. "Two basic elements must be considered," says the report, "in the drafting of the economic plan. First, the plan must take into consideration the objective trends of economic development. Second, it must ensure the maximum possible influence of the proletarian state on the course of economic developments in the country. Neglect of objective trends results in the plan being seen as the free play of arbitrary discretion. On the other hand, ignoring long-range prospects and the goal leads, inevitably, to opportunism and submission to elemental forces. Thanks to the fact that the country's vast productive forces have become the property of the state, the Soviet Union is in a far better position to influence the course of economic developments than are other countries. It is completely bound, however, by the laws of historic determinism."

The same ideas were developed in greater detail by Comrade Smilga in a report on our economic difficulties delivered in the Communist Academy, and in a speech on planning problems at the Congress of Presidiums of the Gosplans.

In the first of these addresses Comrade Smilga observed that "as the economy has grown in size and complexity, planning work has been confonted with problems of ever-increasing difficulty. The nature of the interaction of the state economy with the economy as a whole on the basis of the market, the features distinctive to the recovery process, the framing of tentative principles for the forthcoming reorganization of the economy—these are all

"Tsel' v plane i zadachi nashego khoziaistva," Planovoe khoziaistvo, no. 7, 1926, pp. 59-70. (Note by the editor of the journal: by way of discussion.)

extremely important and at the same time exceedingly difficult problems. We encounter quite a number of pitfalls in this work. On the one hand, understanding the objective trends of our economic development results in the economic plan being treated as arbitrary, and the state's opportunities for planning being overestimated. On the other hand, the absence of a long-range view and of goals leads to submission to elemental forces and to opportunism in practical policy."

In his second address Comrade Smilga used stronger terms to characterize the deviation which he called plan "maximalism," and thought it necessary to warn against it: "First comes the question of the relationship between the objective factor and the factor of the goal in planning work. Some plan maximalists hold that the goals are the most important thing in planning. These individuals nearly always interpret the plan as the free play of discretion. This hypertrophy of the plan cannot be regarded as proper. Such sharp emphasis on the goal aspect derives from the premise that in our economic system objective deterministic processes have largely died out or are dying out. Hence, a greater role is assigned to free discretion than really should be."

The observations in the Gosplan report and those made by Comrade Smilga, while perfectly correct in calling attention to the force of deterministic processes, do not exhaust the subject or dispel the misconceptions that enshroud it.

2. THE ESSENCE OF TELEOLOGICAL MAXIMALISM

The contention that sharp emphasis on the goal element results from underestimating objective factors, and leads to plan hypertrophy, is incorrect. Fixed, precise stress on specific goals, "plan maximalism," as Comrade Smilga calls it, or, to state it more accurately, "teleological maximalism in the plan," far from neglecting elemental forces in our economy, is reinforced by awareness of their colossal power.

Comrade Groman is absolutely correct in pointing out in his theses on the conceptual framework of the Control Figures that "the planning element conflicts with spontaneous processes not only in the private enterprises, but in the State enterprises as well,"[1] and that we are observing marked departmentalism.

1. Groman refers here to the state enterprises operating on the basis of economic accounting (khozraschet).—Ed.

It should be added that in the course of regionalization we have also been witnessing "territorialist competition" caused by "annexationist" ambitions.

Teleological maximalism, however, looks upon the Soviet state as an authority which is entitled, duty-bound, and in a position to regard itself as one of a number of equal forces contending for leadership of that economy and balancing on the waves of elemental forces.

It is the danger of being overwhelmed by these elemental forces and the impossibility, given the resources which the state has at its disposal, of subordinating all facets and corners of economic life to its discretion, that necessitates making a firm choice of our goals. The fact that the plan has a goal, far from leading to underestimation of objective factors, involves a warning against such underestimation.

The teleological "military" conception of the plan is this: there is a given situation, there are given objective factors; these objective factors are approached by a subjective will which seeks to alter them for subjective purposes. This subjective will takes the given objective factors as the point of departure and, with respect to their solution, projects goals which suit its purpose.

This is how the plan originates. Until a subject appears which has its own goals, i.e., seeks to alter objective factors, and has the will to alter them, there is no plan and there can be no talk of a plan. From this point of view, no examination of given objective factors, even the most painstaking, no elucidation of their historic trends in the past, even the most correct, no determination of the laws of their development, even the most exact, no forecast of their future deviations, even the most accurate, can constitute a plan. Control Figures, conjunctural economic prognoses, and hypothetical balances of the national economy are sometimes very useful for planning, but they are in no wise plans, and to circulate them as such, even under the designation of "genetic," is to offer not the genuine product but an imitation.

The existing situation, a subjective will bent on changing it, a general goal to go with that will—these are the preconditions of the plan. And it is precisely because the plan is born when the subjective will having subjective goals approaches objective factors, that the first stage in planning is to describe and assess these factors as they are in their initial state (i.e., at the plan's inception)—specifically in that state, and not as they have developed historically before that; information about that development—the minimum amount needed to comprehend the initial

state—should be drawn upon in planning work, but its collection is not the concern of planning work.

The objective factors to be taken into consideration should include the material resources already at the disposal of the subjective will drafting the plan—namely, natural environmental conditions, equipment, materials, funds, and human resources, i.e., the labor force, its size, technical training, general cultural level, etc.

The second stage in planning work is to compare the goal with the existing situation—with the favorable and unfavorable aspects of that situation—and with the resources available for influencing it and, on the basis of this comparison, to set the goal in the form of a hard and fast, concrete task formulated with complete precision and clarity. The economic task is to achieve a definite quantitative and qualitative result in a definite branch or indefinite branches of the economy and in a definite territory.

But the general goal cannot always be wholly encompassed by decisions possible in a given situation and in a given territory, nor can it always be reflected in the formulation of a concrete assignment. The concrete task which the acting will can firmly set itself is usually narrower and more immediate than the general goal. It usually represents narrower and more immediate aims than the general goal, which is the plan's premise; partial goals are advanced after an analysis of the initial situation.

Actually, there are several partial goals leading to the general goal that usually suggest themselves. Since the resources of any acting subject are always limited, setting a definite task necessitates a choice. This choice is, of course, a matter of discretion. But it is clear that if discretion is to be productive, it may not set just "any" tasks and in "any" number. The choice and formulation of the task is a decision entailing great responsibility.

Another such decision is the choice of ways of accomplishing the task; this is the third stage of planning. Here, too, there are always several ways that may be indicated, but only one must be selected. The selection of the one is, of course, also a matter of discretion.

The decisions on the setting of tasks and on ways of accomplishing them constitute the basic plan factor. Success here depends on the art of administration, which, like any art, rests on three pillars: scientific knowledge, talent, and experience.

Next comes the fourth stage of planning, which is to plan the fulfillment of decisions, i.e., to plan the mobilization of available human and material resources, the procurement of additional resources, the sequence in which and the points at which to bring forces to bear in the fulfillment of a task, and the date of its completion.

Once the plan has been drafted, the question of completion time may be inverted. The plan estimates how much time will be needed to accomplish a task; the way in which the matter might be put is: what part of the plan, what measures, will have been implemented, and what results achieved in a definite, given segment of time. But the question of time may be formulated differently: the very assignment can be stated as the achievement of a specific result within a given period of time. This formulation would naturally be reflected on the choice of ways of accomplishing the task and on the plans for the use of manpower and resources.

This kind of teleological conception of the plan, far from leading to plan hypertrophy, unquestionably tends to set limits to the plan, because to select one goal is to reject many others, to set one task is to defer another, and to choose one way of accomplishing the task is to dismiss another. What is more, the very fact that in this conception planning is work involving great responsibility runs counter to the tendency to draft plans for the mere sake of having as many plans as possible, and is quite sufficient to prevent the complications that arise when plans are not worked out thoroughly, as they should be, and not properly coordinated, but are drawn up in the very flimsy hope that "perhaps" they will be of some help, and in the often extremely ill-founded belief that "in any case" they will do no harm.

3. THE IMPORTANCE OF THE MACHINERY OF PLANNING FROM THE STANDPOINT OF THE GOAL

From the standpoint of the goal, the plan is neither a piece of research nor a forecast; it represents the preparatory work for and the rough draft of a decision. The actual drafting of the plan, therefore, is administrative work, not research.

The plan is the province of the administrator-manager.

If there is any special machinery for plan drafting, it consists in auxiliary spade work staffs attached to the administrative

agencies—office staffs, whose job it is to prepare materials for decision-making and to work out the technical problems of decision fulfillment.

According to the four-part plan formula, their primary function is describing the initial situation in a way that will make it easier for the decision-making agency to assess that situation properly, to formulate the tasks correctly, to plan the use of manpower and resources for accomplishing a task, and to estimate the time the task will take to complete. Naturally, however, an auxiliary staff which is familiar with all the administrator's goals, which prepares an evaluation of the situation for him, which enlightens him on the extent of technical resources at his disposal, including the size of the immediate operative staffs, cannot help forming and passing on to him opinions on advisable ways of formulating the tasks and on the shortest and most economical ways of accomplishing them.

The description of the initial situation must be "academic" in the completeness and accuracy of essential data and in the clarity and conciseness of their presentation but not, of course, as regards freedom in the choice of factors to be described, for only those things should be dealt with which must be dealt with for the correct assessment of the situation and for decision-making.

Since usually, in a complex economy and in a complex undertaking, the plan cannot be worked out in detail in one central place and its fulfillment is too big a matter for comprehensive orders from the chief administrator, and since he is sometimes forced to give his subordinates instructions of a relatively general nature, and to assign them only tasks which they are to accomplish at their own discretion, these executors are themselves turned into administrators and become the exponents of their own plans, the goal-premises of which are the tasks assigned to them; and if their plan drafting is complicated they may have their own staffs which assist them according to their instructions and for which they are responsible.

In any case, however, the plan of the top administrator is not drafted on the basis of the assumptions of the operative agencies under him. On the contrary, the plans of the operative agencies are an elaboration of the plan drafted by the top administrator.

4. THE TASK IN THE PLAN FOR OUR NATIONAL ECONOMY

In this conception of the plan, the general economic plan taken as a whole must aim at a definite structure and a definite level for the economy.

The ultimate economic goal of Soviet construction is to establish socialism, and to lift the national economy and the standard of living of the working people to a height unattainable by bourgeois states. But these things cannot be accomplished just by maintaining the proletarian regime in the country. Political ideas and slogans must be shaped into concrete economic tasks.

Socialism is a general objective which cannot yet be expressed in the form of a concrete economic task of this kind. But on our way to socialism we have an intermediate goal, and this can be formulated as an economic task. And we have a political idea which embraces this task and charts the paths to its accomplishment.

This is the idea of the New Economic Policy as the way to socialism. Translation of this idea into the language of economic goals; comparison of these goals with existing circumstances and with the resources available to the builder of the national economy—the proletarian state authority; fixing specific economic tasks; precise formulation of these tasks; selection of ways of accomplishing them; planning an advisable sequence and feasible deadlines for their accomplishment; and planning of the manpower and funds this will take, of the sources and procedure for their replenishment, of the procedure for putting them to work, and of the points and stages at which to employ them—this is what the over-all plan for the national economy, its general plan, should represent. This constitutes administrative and technical elaboration of the aims and intentions of the NEP.

The idea of the New Economic Policy, too, viewed not as the political policy of the proletariat at the initial stage of socialist reconstruction in a peasant country, but as a concrete economic undertaking, is: first, to give the country's economy a definite structure; and, second, to raise the economy to a definite level.

What kind of structure is this, and what is the level?

The structure is envisioned as follows: the state economy encompasses the focal points of the entire national economy, its commanding heights, but at the same time the small scale producers, the agriculturists, and the handicraftsmen retain complete legal, individual economic freedom, and big private capital continues to be active in both commerce and industry. The small scale producers, the agriculturalists, and the handicraftsmen are drawn into cooperatives and into the mechanism of the state

economy through mechanization of their production and the instituting of credit. Private capital submits to regulation, which makes possible clear and accurate stocktaking of its activities and ensures efficiency in its operations; and at the same time, through the instrumentality of state measures, it finds itself drawn into the channels of state capital in a subordinate and ancillary position.

As for the level to be aimed at for the national economy in keeping with the economic idea of the NEP, that level, in terms of the development and utilization of the productive forces of the country, in terms of electrification and of property status, health and cultural standard of the population, should accord with the advancement of the said structure and with the country's natural wealth. It is a level roughly corresponding to that of North America.

This should be set as the practical task in the General Plan for our national economy, a plan which should be unitary and at the same time complex.[2]

The General Plan is essentially a single plan, because it contemplates a single general task; the general lines to be followed in accomplishing this task can be dictated only by a single goal and a single will; all partial plans should constitute elaboration of this plan. It is complex because it solves problems of separate economic branches in their interconnection, and, in projecting their development, embraces them as an integral whole, not, of course, by coordinating autonomous departmental suggestions, but through the issuance of specific plans to the departments or specific directives for their plans.

What measures will be required for accomplishing this task; what forces are available to us for the task; what resources shall we have to and shall we be able to draw upon; where in the objective situation are the greatest obstacles to be surmounted; through what stages must the individual branches of the national economy be brought; what relationship should we establish among these branches at various stages of development; how many years will be needed to traverse these stages; and how many years—twenty, thirty?—to accomplish the entire task; these are the problems of the General Plan.

2. It was with this very interpretation, but with less detailed formulation, that I suggested the concept and term "general plan" in an article "On the Question of Provincial Economic Plans," published in Planovoe khoziaistvo, no. 1, 1925.

Should one bother answering the question of whether we need such a plan? If we look upon socialism as a system requiring intensive preliminary economic development, and upon the NEP not only as a political policy but as an economic program requiring planned implementation as quickly as possible, then the drafting of such a plan is not only a necessity, but must be the control task of our planning agencies.

Similarly, the drafting of such a plan must be the central task of our planning agencies if we wish to progress beyond prerevolutionary times in the sense of having a planned approach to the problems of our national economy. It is likewise essential for us to draft a plan of this kind if we want to avoid massive expenditure of unproductive labor on the drafting of disconnected, unfeasible, and superfluous plans, since such a plan is the criterion of the real need for other plans, and of their merit. It is the General Plan that will bring the other plans down to earth.

Is it possible to calculate this plan so accurately that it can be carried out completely on schedule and individual measures coordinated entirely as planned? Of course not. It will have to be amended in the process of implementation. This is the fate of all plans and in no wise negates their utility and necessity.

5. CONSIDERATION OF OBJECTIVE DATA IN THE GENERAL PLAN FOR OUR NATIONAL ECONOMY

Naturally, the General Plan for the national economy requires an enormous amount of work. But a great deal of material for it is already available. And its first part—a description and assessment of our initial stage, of the present objective situation, could be produced with comparative speed, especially since a number of very important suggestions for the scheme of this description and for this assessment may be drawn from Lenin.

If we assume that it will take two or three years to draft this first part in its complete form, then a conspectus, which would be rough but authoritative, and would contain the principal data and estimates, could be drawn up in several months.

As a matter of fact, even such a conspectus would be enormously useful for determining the desirable ingredients, composition, and orientation of our partial economic plans—long-range perspective plans and current annual plans, integrated plans and plans for individual branches—and for evaluating their quality, and (which is, of course, even more important) would

provide most valuable suggestions for the orientation and adjustment of the lines of our organizational economic activities.... A thorough and concise description of our geophysical resources by regions; of the potential and actual productivity of our soil, mineral deposits, and water; of the economic elements of our economy, the elements that are in a direct sense "material" (industry, agriculture, transportation, trade, capital, and credit) and the "spiritual" elements which, too, are in essence material; of the people's health and "physical worth;" then a characterization of their economic organization, juridical mores, legal consciousness, educational level, occupational breakdown, and technical skills; and a special sketch of the "social mechanism" at the immediate disposal of the Soviet regime's apparatus and immediate personnel—such a compact and sharply drawn description of the initial situation, with an evaluation thereof based not only on economic but on administrative and technical reasoning, an evaluation aimed at paving the way for economic decisions, a sober and bold evaluation, would be enormously important....

Such a description and evaluation of the initial situation would alone raise our economic creativity to a higher level than at present, that creativity consisting in the ability to set our goals decisively, to formulate precisely the tasks deriving from them, to choose boldly the ways of accomplishing these tasks, and to set out resolutely on these paths. A magazine article cannot possibly, of course, present even an outline, even a conspectus of such a description; it cannot possibly cover, even in outline form, all the conclusions on the substance of our plans and the composition and types of our planning which emerge when the plans are approached from the standpoint of a hard and fast goal. But several excursuses along these lines are possible.

6. ON SOME ASPECTS OF OUR PLANS

The five year "perspective" plans covering the development of one branch taken separately enjoy particular popularity with us.

Such plans include five-year construction and equipment programs which are based on the firm directives of administrative agencies and on the money and materials promised by them. There is no question as to the advisability of drafting five-year plans of this kind. But among these branch plans there are some that are based on shaky premises and do not and cannot set spe-

cific tasks, do not map specific measures for the accomplishment of such tasks.

For example, an assignment is given to draw up a five-year housing construction plan by provinces. Those who issue the assignment and those who are to carry it out know perfectly well that no expansion of housing construction is possible given the existing organization of housing; but the plans are nonetheless drawn up, and go so far as to estimate the number of nails that will be needed for the fifth year of the program, thus wasting the time of valuable personnel and filling the archives with documentation.

Or an assignment is given to draft a five- or three-year financial plan. If the matter were put in terms of estimating the total approximate annual increase in revenue and tentatively apportioning this increment among the disbursing branches—tentative annual totals being estimated for these branches and the uses of these increasing allocations being tentatively projected—it could not be denied that this relatively simple project was of some use. But when one is asked to compute the anticipated increase in tax revenues with the tax system changing all the time; when one is asked to indicate the exact annual growth of economic units with the cost of their maintenance fluctuating all the time as a result of the instability of all indices; and when the distribution of income and outgo among Union, republic, and local budgets has not been firmly established—then the project becomes an onerous intellectual gymnastic which is not only useless but downright harmful because it distracts from essential work on the budgets for the coming year, from that long-drawn-out planning work which we have not yet organized satisfactorily.

Among the five-year plans whose results fail to justify the labor expended on them are the agricultural development plans—the country-wide plan drawn up by the Agricultural Planning Committee and the provincial plans. With respect to the fundamental aspect of agricultural development—"land tenure"—they are based on regulations of the land code which have been abrogated by the most recent legislation, and abstain from that critical approach to those regulations which is imperative in the framing of a plan; they endeavor to confine the problems of agricultural development within the scope of the agricultural measures taken by the land agencies, whereas the roots of the plan for agricultural development lie to a far greater extent in the organization of land tenure, the expansion of the railroad network, the system of transportation rates, and the develop-

ment of industry; they shun broad formulation of the problems of agrarian overpopulation, an omission which Gosplan has called to the attention of the People's Commissariat of Agriculture, and of migration and colonization; and instead of setting clear ideals for the reconstruction of rural crafts, they set statistical goals for their future—for which reasons these agricultural plans are quite powerless to help us move up from the extreme rear of the agricultural countries to the front ranks.

This is where the "hypertrophy of planning" is to be found, and a fixed goal would have prevented it.

We see the same hypertrophy, stemming not from too much but from too little concern with the goal, in the demands that five-year plans be drawn up covering the development of the entire economy of a given region.

"A cry from the heart" prompted by this demand appeared in the Astrakhan magazine Nash krai [Our territory] (no. 5, 1925). On July 3 of this year the Lower Volga Province (Oblast) Planning Committee and the Presidium of the Astrakhan Province Planning Committee decreed that a five-year plan for the economy of the province be drafted by the first of October, accompanied by a comprehensive budget. After pointing out the absence of precise methodological instructions for the project, the need for extensive specialized research, and the enormous scope of the purely technical work, Comrade Ivanov, author of the article, ends by saying: "It should at long last be recognized that we are going to introduce plan in the economy only when we draw up the actual plans on the basis of factual data and with normal temperature and pulse, and not on a literary foundation or in a state of telegraph fever."

In January 1926 the Gosplan of the RSFSR demanded integrated five-year economic plans from the central black earth provinces, to which the agricultural recovery measures extend; the deadline for submitting these plans was originally to be March, but was later put off to the first of May.

This is an instance of that failure to consider performance capability which has time and again caused even the most useful undertakings to founder. It should further be borne in mind that these demands are being made of provinces where regionalization has not been completed and which are anticipating territorial changes, and at a period when the basic factors underlying the natural cycle are unexplored and the basic organizational features of the above-mentioned tax system and local budget system are unstable.

Although the problem of regionalization was given clear-cut

formulation a long time ago, the fact is still not clearly understood that unless economic administrative regions are firmly established, the sound drafting of long-range plans will be impossible.

It must be pointed out that a five-year plan drafted without a general plan idea does not essentially differ from an annual plan. It is another matter when a five-year plan is a segment of the General Plan.

The absence of a goal mars, if it does not ruin, the annual plans too. If we take what are so vaguely termed our "grain procurement operations," the mistakes in which have been noted so bluntly by both Soviet and party agencies, there can be no doubt that the reason for the economic difficulties created by these operations was that their objectives were unclear.

What did we want to accomplish in the grain market? We might answer that it was "to have the state grain-procurement people collect all the excess commodity grain." But if there were a plan goal, the question that would arise is: are we already aiming to monopolize the grain trade; do we have an adequate network of elevators, railroads, credit establishments and stores, and trained personnel in sufficient numbers to do this?

Given a negative reply, it would then be a question not of ousting the private dealer from the grain trade but of making use of him and bringing him under the influence of the state; what would then appear on the order of business is not petty competition with the private grain collector in the markets and an effort to put him out of pocket by tying up his transport, breaking off contractual relations with him, and other measures which result in higher bread prices for the consumer, but the question of drafting a plan to set up a grain monopoly, a matter which is highly complicated but imperative for us as one of the most fundamental problems of socialist construction; this problem can in no wise be solved, of course, by a primitive campaign against private grain collectors.

If there were a firm goal, a different approach would be needed in estimating the supply of commodity grain.

It is notorious, after all, that our statistics on sown areas, yields, livestock, and ration allowances are most inaccurate and only of relative and provisional significance.

And it would be wrong to propose, as Comrade Groman does in his theses on revision of the Control Figures, that "agricultural output should be reduced (i.e., considered less) by 230 million poods and the amount of commodity grain reduced by

that same amount; if the entire deficit is not to fall on exports, steps must be taken to increase them." This suggestion is unsound if only because 230 million poods is still only about 5 per cent of the figure that has all along been accepted for the harvest whereas the margin of possible inaccuracy in calculating the harvest is undoubtedly in excess of 10 per cent, and because irrespective of absolute errors in the concrete figures, it is today impossible to establish even a definite correlation—which is established under stable economic conditions—between the provisional figures for the grain harvest and the grain offerings on the market.

The fact that our grain market is obscure and has not been studied means that to conduct operations on it properly we must have proper "reconnaissance in force," must discover the marketable supplies and their responsiveness to demand through exploratory purchases and sales.

7. THE ELEMENT OF PLANNING

Without citing any other specific illustrations, we must point out that in general, under present circumstances, "planning" for us consists mainly in setting goals clearly, firmly adhering to them, giving precise formulation to the most urgent tasks, and in exercising self-restraint. As Comrade Smigla has put it, "planning is primarily 'qualitative.'"

Within the limits of precisely defined, firmly selected tasks, planning will also be quantitative. But planning understood as the intentional establishment of accurately calculated, quantitatively expressed connections between individual branches of the economy in a particular plan period, planning understood to mean the complete coordination of production with consumption, and of demand with supply—that kind of planning is still beyond us. Our annual plans for individual economic branches cannot as yet be so formulated that the output of one branch exactly meets the needs of another, without surpluses or shortages. We cannot effectuate a policy of this kind even in the state economy proper, much less in the broader and more complex sphere of the national economy as a whole.

We shall be afforded opportunities to move on to this kind of planning only if we work on a General Plan, and only if we implement the General Plan can this kind of planning be firmly established. Where the question of coordinating production and

consumption, demand and supply is concerned, our object at the present time must be to supply the needs of the most important nerves, the most vital needs, in full; in production directed toward this purpose, we must not fear overproduction and must guarantee any industry which is producing and risking overproduction against losses in consequence of that production. For example, for transportation we need fuel. A full supply must be ensured, plus a reserve. There is no reason, therefore, to fear overproduction of coal. We must act the same way with regard to other focal points.

In branches which are not of decisive importance for the national economy, we must count on instinct and common sense in business calculation, on adaptation to the market and on self-correction of errors.

Our advantage over bourgeois capitalist countries is not that we are already in a position to avoid disparities between production and demand—to avoid all "disproportions." We have not yet reached that stage, and attempts to avoid these disparities are useless and only lead to plan hypertrophy and disappointment. Our advantage is that we can prevent their turning into crises.

Gosplan

CONTROL FIGURES OF THE ECONOMY, 1925/26

Basic Conclusions of the Commission for the Drafting of Control Figures

STATEMENT OF THE PROBLEM

The Commission for the Drafting of Control Figures saw its task as being: to present, for the coming year, the basic contours of the most important elements of the national economy, to establish their interconnection, and to sketch the state of the economy as a whole which would in all probability be attained in the year to come, i.e., to draw up a tentative balance sheet for the economy a year and half in advance. The commission thought it necessary, simultaneously with the establishment of the Control Figures, to outline the system of economic measures needed to realize the tendencies and plan targets underlying the prospective national economic balance.

The system of Control Figures thus formulated and the system of economic measures organically connected with it constitute the plan for the national economy and contain the tasks which the state authority must set in the sphere of the national economy....

METHODOLOGICAL PART

For clarifying the basic lines of our economic development and the quantitative relationships that link the separate elements of the economy into a single organic whole, the Commission employed three chief methods: (1) the method of dynamic coefficients, these coefficients being obtained through analysis of the actual evolution of our economy in recent years; (2) the method of expert determination of advances economically and technically feasible in the separate branches of the economy in the coming

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Kontrol'nye tsifry narodnogo khoziaistva na 1925/1926 god. USSR Gosplan. Published by Planovoe khoziaistvo, Moscow, 1925, pp. 7-15.

year; (3) the method of control comparison of the results obtained with each other and with the corresponding prewar data.

I. The Method of Dynamic Coefficients

In extrapolating time series, in ascertaining trends of development and finding coefficients describing the dynamics of the present and near future, the Commission used as regulative principles for its formulations a number of regularities which have begun to emerge in our postrevolutionary economy. The most important of these regularities are the following:

(1) In the period of economic dislocation, the forms of economic activity that were hardest hit were those which were the most complex in their organization and had the highest technological level (metallurgy and metal working), while the organizationally and technologically primitive branches (agriculture and certain handicrafts) held their own best. On the other hand the least disorganized were the branches that serve primary needs (food, fuel, clothing), while the production of means of production was stricken with all but total paralysis.

(2) Accordingly, the more urgent the need gratified by a given branch, the sooner that branch is embraced by the recovery process, and, all other things being equal, the greater had been the disorganization in the period of economic dislocation, the faster recovery proceeds.

Thus agriculture, which had undergone the least deformation, is the first to take the path of rebirth and growth, but the rate of its growth is slower than the rate of industry's growth. The branches of the latter are drawn into the process of economic rebirth in the following sequence: food industry, clothing and footwear, fuel, and finally, last in turn, metallurgy and metal working. In 1922/1923 and in 1923/24 light industry producing articles of direct consumption was predominant in the over-all scheme of economic recovery, whereas in the current year, and in the coming year especially, the production of means of production is in the forefront, running well ahead of all other branches in the rate of its development. The era of War Communism made a shambles of the monetary system in particular. Credit was eliminated altogether. Naturally, in the era of the New Economic Policy the supply of money has been growing, and should continue to grow, considerably faster than the commodity turnover, and credit faster than the supply of money. There is nothing menacing in this sharp shift of the center of gravity, this ex-

tremely rapid change in rates of growth, or in their seeming disproportionality. On the contrary, an immanent regularity of the recovery process is manifesting itself here; the economy is passing through, and must get over, these temporary disproportions so that those relationships of its parts may be established which are essential for further normal development.

(3) However, even in the present phase of development, abnormal in its structure and the immensity of its scope, empirical investigation reveals a number of rather stable quantitative coefficients (e.g., the ratio between the value of the agricultural and industrial outputs fluctuates within narrow limits around 37:63)[1] which makes it possible to establish, not only for the present but for the immediate future as well, a dynamic system of equilibrium, i.e., the kind of quantitative ratio between the separate segments of the national economy as a whole that must be established if the coming development is to be accomplished as painlessly as possible and yield optimum results with the least expenditure of effort.

II. The Method of Expert Estimates

The results of studying dynamic curves, and their extrapolation on the basis of stable relationships and coefficients observed in the course of our economic development, have been compared with the expert estimates of specialists, who in formulating developmental prospects started from a concrete calculation of the economic and technical capabilities of a particular branch of the economy. In the vast majority of cases, both the preliminary calculations of the Commission and the estimates of the experts were in agreement that the rate of economic growth in the coming year would be determined, by and large, by whether there is hundred-per-cent utilization of all available material resources, and all the fixed capital inherited from prerevolutionary times is brought into use in the economy. However, in particular branches, the estimates of the experts have qualified this general requirement with some special restrictions, or, as the

1. This prewar ratio of the value of agricultural and industrial outputs, computed by Groman and alleged by him to "represent objectively a regulative norm of our current economic progress," constitutes one of the key "empirical regularities" on which he built his planning analyses of the mid-1920's. This alleged norm was soon discarded by the "teleologists" whose influence started to grow in the late 1920's.—Ed.

Chairman of the Supreme Council of the National Economy [SCNE] put it in his report, "limits." In the opinion of the SCNE rapporteur these limits may be rooted not only in the state of technological equipment, but in one of the following factors: (1) market capacity; (2) availability of domestic raw materials; (3) import possibilities; (4) financial possibilities.

He found the development of the salt and metal industries limited by the capacity of the market. Definite limits are placed on the development of the paper, starch-and-molasses, and agricultural machinery industries by the state of mechanical equipment. Domestic raw materials place a limit on the development of the tobacco and wool industries. The possibility of imports determines the limits to the development of the rubber industry and the tanning industry.

Representatives of the People's Commissariat of Labor have pointed to the shortage of skilled workers in certain categories as a limiting factor. The representatives of the People's Commissariat of Finance have cited still another: the availability of foreign exchange, which determines the degree of monetary coverage of the chervonets and hence of the whole supply of money, and determines the volume of credit. In agriculture the limit may be set by the availability of draft animals, which determines the possible extent of the cultivated areas, and by the possible output and import of mechanical prime movers to replace horses. Transport operations are limited by the availability of rolling stock and the condition of the roadways. In their grand totals, the experts' concrete estimates of the prospects for economic development were expressed in approximately the same figures as those which the Commission had arrived at by operating with the method of dynamic coefficients, though the Commission could not admit that particular limiting factors pointed out by the experts were of independent significance. Thus the capacity of the market for particular products is not a given entity, fixed, so to speak, in the natural order of things, i.e., in some absolute units of measurement, but in an enormous majority of instances is a function of price policy; and the possibilities in the sphere of price policy turn, in the final analysis, on the general level of the country's productive forces. The same must be said, mutatis mutandis, in regard to export and import possibilities. The condition of available equipment is a limiting factor only to the extent to which financial resources, i.e., the magnitude of national accumulation, exclude the possibility of re-equipment on a large scale. And

even the shortage of skilled workers, given the impossibility of training them domestically within a short period of time, is an insurmountable barrier to the expansion of production only insofar as it concerns large numbers of the proletariat: the few particular categories of indispensable specialists can be replenished by hiring workers of the respective skills from abroad.

In a word, the significance of the separate factors limiting the possible rate of the national economy's development can be gauged not through their isolated analysis but only in the general context of the economy's development taken as a whole. From this point of view, what must be regarded as the over-all limit to the possible rate of the national economy's development, a limit determining all the partial limiting factors, is the magnitude of national accumulation in its material form, i.e., the aggregate of all newly produced wealth which is left over after the needs of simple reproduction have been met, and thus constitutes the material basis for reproduction on an enlarged scale and for reconstruction.

Unfortunately, the resources for calculating the magnitude of national accumulation are especially scanty and unreliable. The modicum of direct data that does exist in this area, and the indirect indicators which have made possible the formulation of a more or less plausible hypothesis, have led the Commission to conclude that in the coming years capital projects to be managed out of accumulation can and must take on much broader scope than was the case in the preceding year, that the task that can and must be set in 1925/26 is to stop the squandering of fixed capital in all those branches of the economy in which this destructive process still continues. As for new construction, for the time being it is feasible only within very narrow limits: only where it is necessary for activating means of production in being or where low points that are beginning to appear in particular segments of the economy threaten to be a drag on the growth of the national production as a whole.

The level of world prices may be considered another "limit" having independent and general significance. As long as our economy, by virtue of the circumstances which arose in the early years of the revolution, represented the purest example of "autarky," the system of dynamic equilibrium of our internal economic relationships was not appreciably influenced by the world market. At present, with export-import operations intensively expanding and amounting to a respectable figure of the order of two billion rubles on the prospective balance sheet

for the coming year, the world market is far from being a matter of indifference to us and in our domestic price policy we must henceforth reckon most seriously with world price levels.

This consideration, in conjunction with domestic market sales conditions deriving from specific characteristics of the year ahead (large harvest, abatement of the goods famine given attainment of the expected rate of development for industry), has impelled the Commission to adopt a rather significantly lowered general index of commodity prices, in its tentative formulations.

III. The Method of Control Comparisons with Prewar Data

The prospective figures obtained through investigation of dynamic series and collated with the experts' calculations were subjected to comparison with prewar data—an operation which has played the role of the final control stage, as it were, in the Commission's work.

It is self-evident that the Commission did not in any way regard the prewar relationships as ideal norms which must at all costs be given embodiment by the contemporary process of economic recovery. The prewar figures as such, without any corrections, served as the control stage only in those particular instances where the actual mechanics of the Soviet Union's economic resurgence assures the re-establishment of the old proportions and relationships. Especially is this true where the economic resurgence amounts to the activation, to the involvement in the productive process, of hitherto unutilized fixed capital. Indeed, it is perfectly obvious that inasmuch as we are putting the old equipment to work and using the old mechanical methods to operate it, we are getting the old, or very close to the old, production results and their quantitative ratios. The Commission introduced an appropriate correction factor in its control comparisons of prospective with prewar figures wherever the deviations from the prerevolutionary economic structure could be given a more or less definite quantitative expression. Examples of this are the output of those few branches in which more or less substantial reconstruction has already been accomplished and, in particular, a good many phenomena in the sphere of commodity and monetary circulation, which at present has an organizational structure basically different from what it was in the tsarist empire. Finally, in some instances, the deviations from the prewar norms and patterns were such that there

was no possibility of expressing them in numerical coefficients. This was true, for example, of the contemporary relationships between the wage levels of skilled workers in various occupations. The aforementioned dynamic regularities of the recovery process manifest themselves here too, and no less distinctly than in other spheres of the economy, but we can already say confidently that the system of equilibrium toward which this dynamic is gravitating will have very little in common with the prewar wage differentiation: those categories of workers who by virtue of specific characteristics of the old regime came in for more than their share, so to speak, of enslaving exploitation, will never return, in the sphere of labor payment, to the position they occupied relative to other workers in the old days.

Thus the prewar relationships, as the Commission saw it, were not a norm, not a model for prospective thinking, but merely an arbitrary measuring scale which, for all its imperfections, could not be discarded and in very many cases performed indispensable services. For example, the Commission was able to determine the prospective growth of output and labor productivity using the method of dynamic coefficients and expert estimates only in the most important labor fields, which are under systematic observation. Mechanical application of coefficients from the fields in which they are being calculated to others in which they are not leads to implausibly exaggerated indices not only for these secondary industries for which calculations are not being made, but for industry as a whole. And yet without comparison with the prewar data, this implausibility might easily have escaped the Commission's notice just as it has thus far escaped the notice of quite a few analysts who have used the figures obtained through the unwarrantable extrapolation just mentioned. Comparison with prewar data not only uncovered this serious error but also provided the Commission with a yardstick—though a rough one to be sure—for making the necessary rectifications.

Besides the tremendous methodological value—the value of a control technique which makes it possible to establish the admissibility or inadmissibility of particular indirect calculations—comparison with prewar relationships is of great interest even in those cases where the concrete data being compared have been obtained by direct calculation and do not in themselves raise any doubts, for it is this sort of comparison that strikingly reveals the specific features and changes characterizing the structure of the economy at the level which it has today attained in its development. Guided by this consideration, the Commission has not

only employed comparison with the prewar period as a methodological technique of investigation but has also used the percentage relationship to prewar levels as one of its basic gauges in formulating the conclusions grouped in the summary table....

Gosplan

CONTROL FIGURES OF THE ECONOMY, 1926/27

METHODOLOGY

As was pointed out in the text appended to the Control Figures for 1925/26, three principal methods were used in drawing them up: (1) the method of static and dynamic coefficients (extrapolation into the future of the regularities observed in the country's economic development in past years), (2) the method of expert estimates (concrete evaluation by specialists of possible economic and technological advances in particular branches of the economy in the coming year), and (3) the method of control comparisons of the obtained results with prewar data.

Critical analysis of last year's experience as well as consideration of the specific characteristics of the new economic period which we are now entering compel us, in drawing up the Control Figures for 1926/27, to make a number of changes in the methodology. These changes are intended, on the one hand, to supplement, refine, and elaborate the techniques of analysis previously employed, and, on the other hand, to make use of several new approaches and criteria for solving problems in perspective planning.

On the whole 1925/26 was still a typical year in the so-called "recovery" period of the Soviet economy, with all the structural features and dynamic regularities characteristic of this period. In the coming year of 1926/27 we shall cross the dividing line between the recovery period and the new era of economic construction which we have named the period of "reconstruction."

True, even in the year ahead the growth of the physical volume of industrial production will be based mainly on activating idle or under-utilized equipment; however, such resources are now by no means available in all branches, and even where they do exist activating them calls for much greater funds and effort than in former years. To illustrate the change that has taken place, it is sufficient to point out that with outlays exceeding last year's and with an enlarged plan for imports, the year 1926/27 promises to

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Kontrol'nye tsifry narodnogo khoziaistva na 1926/1927 god. USSR Gosplan. Published by Planovoe khoziaistvo, Moscow, 1926, pp. 10-18.

yield merely a third of the increment of industrial output that we have had in the current year.

The exhaustion of resources for the recovery process necessitates, above all, higher standards of accuracy in the prospective calculation of the country's economic growth. The point is that as long as enterprises were operating at less than full capacity and rapid expansion of output was therefore possible, disproportions arising as a result of miscalculations in planning could be smoothed out with comparative ease as they came to light. For example, in the course of 1924/25 the programs for many branches of industry were revised upward three or four times; in industry the physical volume of output, which is regulated by the Supreme Council of the National Economy, grew at a rate more than double the rate assumed under the plan, and this gigantic rate of growth, by spontaneous leaps, caused no major interruptions and failed to disturb the smooth course of the economic process as a whole. At present this sort of dynamic is impossible. From now on any expansion of output will require heavy outlays and promptly organized preparatory work; any sudden decline of the rate of growth will mean a serious loss to the national economy, fruitlessly wasting part of society's productive forces. But an incorrect projection of the general curve of economic advance is not the only thing that bodes grievous consequences for the country's entire economy. A general disruption, constituting a crisis, can also occur as a result of partial errors in calculating certain of the principal elements on the balance sheet of the national economy. For example, despite ideally precise calculation of the share of national accumulation which must be mobilized by the state in order to expand industry, the production plan will founder if the export-import part of the general balance is out of line with what is actually feasible. The entire economic perspective becomes unrealistic if the particular balance between the town and countryside is not drawn in the proper proportions, and so forth.

The best way of safeguarding the Control Figures against possible distortions of the prospects for development of the national economy as a whole or of its separate parts would have been to work up an economic balance sheet for 1926/27 and for several preceding years. Unfortunately, however, because of the state of statistical data, it was not possible to accomplish this task in its entirety. Hence, in drawing up the present Control Figures, the State Planning Committee gave most of its attention to the most painstaking possible preparation of those partial

balance estimates which in broadest outline define the relationship of parts that will ensure uninterrupted development of the whole economy. These estimates cover: the grain and fodder balance, the fuel and power balance, the foreign trade balance, the tentative state budget, the transport balance, the construction balance, the balance of the money and credit system, and the analysis of production costs of manufactured items. In this chapter devoted to general description of the methodology used in drawing up the Control Figures for 1926/27 we cannot go into the particular methodological techniques that were employed in studying the economic perspective in terms of the balances just enumerated. The respective information will be given in special parts of the text. Here we shall merely note that all these balance comparisons were made in far more elaborate and detailed form than last year. Essentially new is the attempt to project the commodity turnover of the peasant sector, and to construct a balance sheet for consumption of and demand for manufactured goods and one for the incomes and outlays of the population. Here we are coming close to uncovering a whole series of major economic indicators, in particular indicators which define the market equilibrium between commodities of industrial and agricultural origin—a problem which is of decisive significance for any economic planning in our country.

As the regularities ascertained for the recovery period become less and less applicable to the new conditions of economic development, the elaboration and refinement of perspective economic plans by means of a system of balance estimates emerges more and more compellingly as our immediate task. Scientific statistical theory does not give us the formal right, from the mathematical standpoint, to extrapolate into the future the dynamic trends of the past. Any such extrapolation can be justified only by substantive economic analysis showing that the motive forces that gave rise to a current developmental trend will not cease to operate in the future. Exhaustion of the motive forces of the recovery process makes highly problematic prognoses that are based on dynamic coefficients characteristic of past years. But it is self-evident that those dynamic indicators which are functionally or correlatively tied to factors of which we have precise knowledge, and which lend themselves to quantitative calculation, retain their importance.

The static coefficients, i.e., constant quantitative relationships between variable elements of the economic whole, continue to be a more dependable tool for forecasting. In every branch of the

economy there is a whole series of relationships which maintain their stability for many years, despite the sharpest changes in the rate of over-all development. Without using those static coefficients (to fill in the gaps in the actual book-keeping with appropriate interpolations and extrapolations) one cannot conceivably draw up a single one of the above-mentioned balance estimates. Naturally, the balance formulations themselves take on a provisional, approximate character because of this, and to determine how accurate they are one needs in each particular case to know the degree of stability of the coefficient used. Even if this object is unattainable, however, the coefficient may, under certain circumstances, have orientational significance. Actually, since in spite of the transition to a new period of economic construction we do not anticipate, at any rate do not plan, changes of a crisis nature in the relationship of key segments of the economy as a whole, the static coefficients, which embrace a massive and structurally complex body of economic phenomena, should remain rather stable over short intervals.

Thus the nature of the problem of economic planning, as it relates to the particular characteristics of the period we are living through, obliges us to consider the system of balance estimates as the basic method for drawing up and justifying the Control Figures; as they are expanded and perfected, and provided the gaps in our statistical knowledge of reality are filled in, these estimates should eventually combine to form an integral balance of the economy of the USSR.

The static coefficients of whose stability there is no question are used both as a technical tool in the formulation of the balance estimates themselves and later on as a control. The dynamic series of the recovery period can no longer be relied upon as prospective guidelines unless their applicability under new conditions is specially proven for each particular case.

In the past year a major role in drafting the Control Figures was played by the method of expert estimates. Having made their prognosis of economic development on the basis of partial balances and consideration of the consistent dynamics of past years, the Gosplan workers verified individual elements of their projection by querying specialists—representatives of government departments—who, on the basis of all the information available to them, estimated the resources and the potentials of each branch of the economy.

This somewhat primitive way of operating was inevitable as

a first attempt at a time when not only the methodology and techniques for drawing up the Control Figures, but the very idea behind them, were not yet fully understood. In the current year the Gosplan of the USSR has taken a number of preparatory measures with the object of securing more orderly and productive collaboration among the planning personnel of the Union in the drafting of Control Figures. In March and May 1926 the Conference of Planning Workers, in which heads of republic and district planning commissions as well as representatives of government departments were active participants, thoroughly discussed the tasks entailed and the methods to be employed in drafting the Control Figures and worked out the form for a summary table. The intention was, furthermore, to plan subsequent work so that the Control Figures could be broken down by the major territorial divisions of the Soviet economy for the next year.

As it turned out, this aim was not fully attainable this year but the ground has now been adequately prepared for its achievement next year.

After having participated in the preliminary methodology conferences arranged by Gosplan, the central government departments have shown far more initiative and energy in the concrete drafting of the Control Figures for 1926/27 than they did last year. They have now presented Gosplan not with separate expert estimates, but with a harmonious, internally coordinated system of such estimates. This should be said in particular for the Supreme Council of the National Economy (SCNE), which submitted to Gosplan the results of an attempt to draft Control Figures that take in not only state industry but all other sections of the Soviet national economy, results which are exemplary in their detail and in the great care with which they were worked out....

The People's Commissariat of Trade presented a domestic and foreign trade balance worked out in detail. The People's Commissariat of Finance came up with a number of detailed reports in which it sought to prove in thoroughgoing fashion the impossibility of scientifically forecasting the dynamics of monetary and credit circulation for a year ahead, and the impossibility, therefore, of drafting a perspective plan for the national economy, for without a balance of the money and credit system such a plan is, of course, unthinkable. This is a negative conception, but no less consistent and coherent in its negativeness than the positive constructs of the other people's commissariats. Though guided by the whole body of these preparatory works, Gosplan used the control figures of the SCNE, as the most complete and best

thought out of all the positive conceptions submitted to it, for its basic material in framing the concrete plans for the year ahead. The critical verification of that projection consisted mainly of assessing the tangibility of the resources required for the rate of industrial expansion which SCNE had assumed. For the current period the point of greatest danger in this respect is the export-import plan. After the unfavorable trade balance last year and over a number of months this year, it has become imperative that a favorable balance of trade be planned for and achieved next year, in particular, a favorable balance of payments, which would permit replenishment of the foreign exchange reserves in the state treasury. Having subjected SCNE's export-import assumptions to detailed analysis from this standpoint, the Gosplan came to the conclusion that they did not guarantee the achievement of as large a favorable balance as is required for the stability of the economy's equilibrium in the coming year. As a result, the contemplated volume of imports was reduced somewhat, which in turn necessitated cutting down the rate of economic construction to a corresponding degree and tracing the effects of that reduction through the entire system of economic interrelationships expressed by the Control Figures.

In this revision, Gosplan was above all mindful of two weak spots that had already emerged, aggravation of which had to be avoided at all cost or the economy of the USSR would find itself in a most trying situation in the coming year or the one after that. In the first place, when the import quotas were cut, every effort was made to see to it that the textile industry, and other branches of light industry in which the rate of output growth could not be reduced without aggravating the goods famine, were supplied with adequate quantities of raw materials. In the second place the Commission on Control Figures tried as far as possible not to cut back those capital construction projects whose completion in the coming year is essential for production to proceed normally in the next few years.

We have managed to accomplish this double task only approximately. There is apparently no reason to expect a general aggravation of the goods famine under the scheduled program. But the possibility is not excluded that particular popular commodities that are in "short" supply at the present time will be in even shorter supply in 1926/27.

As for the rate of output growth in 1927/28, owing to the unavoidable contraction of capital construction projects in the metals industry, it must undoubtedly decline somewhat as

compared with what the situation would be if the SCNE's Control Figures were fully realized.

Given the limited extent of domestic accumulation and the absence of adequate foreign credits, the urgent need for large capital construction projects is inevitably leading to a substantial slowdown of the rate of growth in the output of direct consumption goods; even so, in the coming year of 1926/27, the increment of gross output in industry registered with SCNE will still reach a most impressive figure of over 15 per cent (as against the original SCNE projection of 18 per cent).

The task of halting the erosion of fixed capital in all the branches of the economy of the USSR—a task also set by previous Control Figures—will not be finally accomplished next year either. In railroad transportation big improvements have been made, but all the same so-called "neglect" (particularly in ties and rails) will come no closer to being ended in the year ahead, and is even likely to increase somewhat. As in the current year, housing construction will be held to a minimum. In the 1926/27 Control Figures, Gosplan sees no possibility of going beyond the maintenance of present housing per capita at a stationary level, while the average housing conditions of the working class still continue to worsen.

To the extent that the potentialities of the recovery process have not yet been exhausted, comparison with prewar data retains its orientational significance for the dynamics of economic phenomena.

With the exhaustion of these potentialities, the forces which have automatically been heading the dynamics of the economic process toward the restoration of prewar relationships are disappearing. In this sense, for the year 1926/27 the prewar data are no longer of particularly great importance as a control and check....

The entry of the Soviet economy into a new phase, the basic directive for which is "reconstruction," creates the necessity, on the one hand, of comparing the Control Figures for each year with the long-range perspective and general plans for economic construction, and on the other hand, of paying particular attention to our ties with the outside capitalist world, which take on especially great importance in this period. We were unable to make the first comparison this year, since the drafting of the perspective and general plans had not yet been completed; we are including the second comparison in the program of the Control Figures starting with the current year.

Gosplan

CONTROL FIGURES OF THE ECONOMY, 1927/28

METHODOLOGICAL OBSERVATIONS

....All the work of drafting the Control Figures was based, as in previous years, on the following categories of methodological techniques: (a) the method of balance estimates, (b) the method of static and dynamic coefficients, (c) expert estimates, and (d) comparison of the recovery elements in the economic development process with the prewar level, and of the reconstruction elements with the individual perspective plans and with the indices for the technological levels of the advanced capitalist countries. It is quite natural that these methodological techniques, which had also been employed in drafting the Control Figures of previous years, should have grown more complicated and been modernized in connection with the objective new situation and the specific tasks of economic policy for the coming year. The method of balances has been used somewhat more consistently in the current year than in past years. But in view of the fact that even this time we were forced to confine ourselves to partial balance estimates in setting up the Control Figures, these estimates were to a certain extent corrected by the construction of a system of static and dynamic coefficients that reveal the interconnection of parts of the economy as a whole, and their evolution in time.

Several remarks should be added to the summary description presented here of the methodological techniques that were employed in drafting the Control Figures. First of all, in studying market phenomena and with respect to the balance of supply and demand it proved possible, in making the 1927/28 projection, to go beyond merely comparing aggregate commodity supplies put on the market with the total disposable income of the urban and rural population combined. The experience of the period gone by has made it abundantly clear that a comparison of this kind necessitates operating with such large volumes that even with more dependable statistics than those available to us a "balance discrepancy" of 200 or 300 million can prove to be within the

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Kontrol'nye tsifry narodnogo khoziaistva SSSR na 1927/28 god. USSR Gosplan. Published by Planovoe khoziaistvo, Moscow, 1928, pp. 4-7.

accuracy limits of the computation. More extensive use has been made this year of selective indicators from budget surveys. These indicators enable us to study not only the volume of demand but also the demand structure characteristic of the various groups of the population. At the bidding of Gosplan, the Central Statistical Administration made a special study of the market turnover of nineteen major commodities. Finally, we were able to analyze the balance of market sales for the coming year using two entirely different methods. This enabled us to determine with greater reliability if not the absolute figures, at least the dynamics of the phenomena.

Calculating the effectiveness of capital investments turned out to be the most difficult task. The only method here capable of yielding indices close to reality—the method of expert estimates—proved defective in the extreme for the period in which the 1927/28 control figures were being drafted. The problem of checking on the effectiveness of capital investments and of insuring systematic and reliable indices in this sphere has been brought into the sharpest focus by the experience of working on the 1927/28 Control Figures.

Furthermore, there have been and still are exceptional difficulties standing in the way of our studying what happens in the private sector in general and in the differentiation of the countryside in particular. Everyone realizes the inadmissibility and defectiveness of data in which the capitalist and the small-scale producers, whom the socialist sector and its capitalist adversaries are competing to influence, are lumped together under the common designation of private sector. To this day, however, we are obliged to operate with undifferentiated magnitudes and indices of this kind.

Finally,...in the current year we have been able to make a certain amount of progress with respect to quarterly study of the dynamics of economic phenomena and to the feasibility of projecting these phenomena by comparing two years—the economic year (from October through October) and the agricultural (from July through July). This methodological technique is turning out to be very fruitful. One of the most essential tasks in working on the Control Figures hereafter should be to make sure that the dynamics of economic processes are studied and projected by quarters.

It must be re-emphasized that it would be wrong to think that what with the above-mentioned methodological difficulties in the drafting of the 1927/28 Control Figures, there has been

no improvement in the caliber of accounting data or of the methodological techniques with which the work was pursued. On the contrary, the years of work on the Control Figures, the extensive and now more firmly established system for observing economic conditions, and, finally, the accumulation of material for the drafting of perspective plans considerably strengthen the foundations of the Control Figures for 1927/28 as compared with their precursors. The growth of the people's commissariats of the Union and of republic and province planning agencies in turn gives this work more reliable underpinning. The difficulty, however, is that the complexity and responsibility of the work are growing at an extraordinary pace and confronting the country's planning agencies with more and more new tasks. This dictates special attention to studying the dynamics of the national economy in the past, to perspective planning, and to accumulating and elaborating the methodological techniques of planning in general.

S. G. Strumilin

PREFACE TO "PROSPECTIVE DEVELOPMENT OF THE NATIONAL ECONOMY OF THE USSR FROM 1926/27 TO 1930/31"

The material on the perspective Five-Year Plan for 1926/27-1930/31 submitted below represents the collective work of all sections of the Gosplan. Representatives of all the republic Gosplans and of the verification departments (Workers' and Peasants' Inspection and Central Statistical Administration) were asked to collaborate with the Central Commission for Perspective Planning which was set up under the Presidium of the Gosplan on April 10, 1926 to exercise general supervision over the work of the separate sections of the USSR Gosplan. Representatives of other interested departments were likewise invited on every occasion to participate in the work of the sections for the separate branches of the economy. Unfortunately, however, the republic and department planning agencies have thus far been unable, for a number of reasons, to take a sufficiently active part in our work. Hence with regard to region-by-region coverage, which is extremely important for us, and from several other points of view, our material awaits further analysis and refinement.

However—irrespective of the fact that the material is thus incomplete in some respects—we regard our work solely as guideline data for perspective planning, and not as a finished perspective plan that is subject to immediate confirmation and is to be undeviatingly fulfilled. This is because the great bulk of the data being published is subject to no confirmation whatever, being merely supplementary tentative estimates and ideas essential for validation and balanced verification of those basic Control Figures and directives for prospective development of

S. G. Strumilin, ed., Perspektivy razvertyvaniia narodnogo khoziaistva SSSR na 1926/27-1930/31. Materialy Tsentralnoi Komissii po Piatiletnemu Planu (Materials of the Central Commission on the Five-Year Plan), Moscow, 1927, pp. xiii-xiv.

the national economy that do need confirmation and really are to be executed. These include, we consider, only the figures and directives that outline the program of capital investment for several years ahead. None of the other estimates of rates of development is of independent significance in the Five Year Plan, and they can be projected and implemented with a far greater degree of precision through the annual Control Figures and plans.

With respect to the capital investment program, and to the data used to validate it, the Commission followed the method of successive approximations. Several variants in succession were submitted to the Commission for nearly every branch of the economy. But to save space and the reader's time we are publishing here only the variants which the Commission considered most probable and workable. This serves to indicate the significance of the material being published. The variant proposed here for the development of the economy seems to us the one most probable, but by no means the only one possible. It will be realistic and practical enough granted "average" harvests and a whole series of other equally hypothetical political and economic premises on which our estimates have been based. But should these conditions change, should, for instance, possibilities of foreign credit on a larger scale open up for us, the projected program of investments will have to be revised upward; or, on the other hand, should the country be overtaken by one or two severe crop failures, the investment program will have to be stretched out, and will take not five, but six or seven years to complete.

The Five-Year Plan being submitted represents Gosplan's second attempt at laying down five year prospective guide lines. The first such plan—for the period from 1925/26 to 1929/30—was reported on to the All-Union Congress of Planning Workers only a year ago. A year hence we shall undoubtedly have to draft a new Five-Year Plan—for the period from 1927/28 to 1931/32—and so on. We shall every year be obliged to move ahead the initiation and completion dates of the projected Five-Year Plans, making the necessary additions and refinements in them on the basis of the experience of the years that have passed.

After checking the first Five-Year Plan for 1925/26-1929/30 against the experience of the years 1925/26 and 1926/27, we must point out that as far as the scale of the construction program is concerned, the plan turned out to have been sufficiently

realistic and even somewhat understated in its estimate of the possible volume of accumulation. On the basis of past experience, the Five-Year Plan now being proposed offers a somewhat broader program of accumulation and investment, and what with the fund of "caution" that has been provided in it, we hope that in the subsequent variants of the tentative Five-Year Plans we shall similarly be called upon to make only revisions in the direction of expansion....

G. M. Krzhizhanovskii

INTRODUCTION TO "PROSPECTIVE DEVELOPMENT OF THE NATIONAL ECONOMY OF THE USSR FROM 1926/27 TO 1930/31"

1. The transition to the phase of reconstruction brings to the fore the obvious need for "reproduction on an enlarged scale" in our economic planning work. Control figures, operational annual economic plans, and conjunctural calculations are coming to be inadequate; the concerns of the moment are increasingly dominated by the long-range perspective, in which the five year cycle must inevitably attract our particular attention. There are several reasons for this. In the first place, a five-year period is inclusive enough for construction of large-scale economic works: large main regional supply channels, trunk-line railroads, irrigation projects, etc. In the second place, there is a definite cyclical pattern to be observed in our agriculture, making it possible to base perspective estimates on the average yield, and to do so specifically for a period of five years, for it is a rare case when good years extend beyond a three-year period. In the third place, finally, breaking the General Plan down into five-year cycles has its advantages in that it subdivides general economic tasks into major construction stages, enabling the planners to focus their thinking on the basic, the most important, aspects of economic construction as a whole.

One should not, however, overestimate the extent to which perspective five year plans of this kind can be of assistance, particularly during the next few years of transition from the phase of our economic recovery to projects for the thorough transformation of our entire economy. This period, as one in which the economic organism will be torn asunder, is unquestionably a particularly difficult period for any prognosis, since

S. G. Strumilin, ed., Perspektivy razvertyvaniia narodnogo khoziaistva SSSR na 1926/27-1930/31. Materialy Tsentralnoi Komissii po Piatiletnemu Planu (Materials of the Central Commission on the Five-Year Plan), Moscow, 1927, pp. xv-xxii.

the very nature of its transitional structure largely precludes extrapolation from the economic dynamics of the past, which in their further course are due to change the basic connections and relationships established earlier. And, on the other hand, to be able to contrast with the laws of the earlier economic structure those laws which we foresee in the fully developed phase of the new relations that are forming, five years is too short a period. The upshot is that the people working on the economic five-year plans that are being projected are at a singular disadvantage: they are sailing away from old shores, while the contours of the new shores ahead are visible to them only in very general and blurred outline. Hence the extremely provisional nature of the five-year prognosis and the particular danger—against which Vladimir Ilich was so careful to warn us in his time—of a bureaucratic attitude to five-year plan material. It is to be anticipated that, by and large, we shall follow the same path in this work as we have followed in putting together our Control Figures and in our work on the General Plan. We started with imperfect attempts; and, by preparing a whole series of variants and learning from our own mistakes, have year by year been feeling our way to superior working methods and selecting superior material as support points in our economic work. If in its individual sections our present Five-Year Plan represents a selection from many, many variants projected earlier, then obviously it is only by this method of gradual, successive approximations that we shall bring the Five-Year Plan as a whole to its typical form. In its initial draft it will inevitably suffer from an abundance of superfluous material and from imprecise dovetailing of its separate parts. Unperturbed by this circumstance, we must give the planning workers of the USSR and our large body of management personnel the fullest possible picture of the material on which the Five-Year Plan is based; we must take them into our laboratory, where the work is in the nature of a rough draft and will inevitably continue to be rough for a considerable period of time. It will be possible to move on from rough-draft material to compact and definitive material, to simple and concise formulations, only if a vast collective is engaged in this work. At the next congress of Gosplans and planning workers we shall only be starting on the first stages in processing the primary data, counting on collective work as the surest path to necessary improvements and refinements.

2. The provisional character of the economic prognosis in the perspective Five-Year Plan is aggravated by the fact that in

dealing with plan problems that encompass an artificially isolated calendar period we cannot and should not keep strictly within the limits of this period. The proper handling of our work would require that the drafting of the Five-Year Plan be preceded by a rounded analysis of the basic economic stages projected by the General Plan. Unfortunately, circumstances have so turned out in our work that revision of our first General Plan, the GOELRO Plan, has dragged out, and is lagging behind completion of our work on the Five-Year Plan. The reason for this is not only that the General Plan involves work on a far vaster scale, but that organizing the personnel drawn into General Plan work is a matter that requires eliminating a whole series of defects in the present structure of the planning agencies. And, as was noted at the First Congress of the Gosplans, a particular factor of a most negative character has been our tardiness in reforming the regional economic division of the Union.

While reckoning with this basic shortcoming, we must nevertheless take everything we possibly can from the extensive material of the General Plan, in order to safeguard our Five-Year Plan against future lack of coordination with the General Plan. However difficult a task this may be, we shall have to give it special attention, for this is the only way in which the Five-Year Plans framed by Gosplan can come to represent work of a higher order than that of the departments, as they must in conformity with the assignments that justify Gosplan's very existence.

Let us dwell on this matter. What we shall have to borrow from the General Plan first of all, and to treat as largely transcending the bounds of a five-year survey, is the material that constitutes the backbone of both the General Plan and the entire reconstruction program—the whole of the fuel and power problem. We shall be able to do this all the more easily in that we have been moving at a much faster pace in this particular field, and, as experience has shown, our prognosis for construction in the field of electric power and for fuel supply and consumption is every bit as accurate as desired. This circumstance, incidentally, enabled us to come up with assumptions regarding the five-year electrification plan without even waiting for the actual Five-Year Plan to be drafted. All the Five-Year Plan material does is once more confirm the soundness of the fundamental general conclusions reached in the GOELRO Plan. Comparing the key indices for the economic structure of the USSR, Germany, and the United States, the personnel of our sector of world economy come to the following general conclusions:

"(1) The development projected by the perspective plan unquestionably brings our economic structure closer to the structures of Germany and the United States.

(2) This is evidenced above all in the rapid reduction of the weight of the labor force (as motive power) and of the population (as consumer) relative to the dimensions of the national economy as a whole.

(3) The increasing relative weight of electric power production is especially conspicuous. Still, attention should be called to the fact that by 1930/31 we shall be producing considerably more power per worker than Germany in 1926, which indicates the fundamental and highly auspicious difference between our development and the way Germany and the United States have developed in the past.

(4) The fact that the increase in the (relative) weight of electric power production is occurring without an increase in the (relative) weight of coal consumption indicates that the increase in electric power output will come primarily from the utilization of hydraulic power and local fuels. At this stage in the reconstruction of our economy we are most expediently deviating from the ratios in Germany and the United States."

We have taken the liberty of quoting this rough-draft material from one of the sections of our Five-Year Plan because it superbly illustrates the soundness of our whole power-reconstruction policy, and because it represents an independent conclusion reached by the new group of Gosplan workers in the world economy sector which we recently established.

But there is more to the fuel and power sphere than energy resources that we take from inanimate nature. In the final analysis, all our accomplishments in this direction are merely contributory to the equipping of human labor. The fact that in all our economic thinking we are concerned with the building of a socialist society thrusts the factor of human labor even more dramatically to the forefront. Thus the gigantic problem of organizing human labor, the determination of proper socialist perspectives for organizing that labor, represents for us the commanding height in the fuel and power sphere, and it is here that we feel a special need for the respective landmarks of the General Plan. It should be noted that the general demographic data provided us by the all-Union population census that has just been taken can in this instance stand us in very good stead. Even in the partial form in which these data are usable at the present

time, they lay bare for us the basic factors in the present disproportions in this area, and enable us to map general policy with respect to crucial problems: unemployment, agrarian overpopulation, and housing; the problem of the ratios between extensive and intensive farming, between large- and small-scale production, between seasonal and public works, etc.

The second section postulated in the Five-Year Plan on the basis of the General Plan is the whole section devoted to major construction projects in industry, agriculture, and, in particular, transport. The fact alone that a five-year period seems to be the time normally required for building large installations and that bringing them into actual operation, into current economic use, falls outside a five-year span, is sufficient validation of this proposition.

A third section, extending beyond the scope of a five-year period in the play of its crucial factors, was to have been introduced from the part of the General Plan in which we establish the relationships of integral economic regions—their relative economic weights and their specific roles in the social division of labor. Here, unfortunately, we feel a particular lack of preparedness, for reasons noted earlier, and shall have to confine ourselves to fragmentary material. However, the existence of whole series of republic and province planning agencies will mean help for us, at least in the projection of preliminary guide lines.

3. In most of the Five-Year Plan drafts that have been prepared thus far, we observe a predominant tendency to base all the work on the method of extrapolation from the economic dynamics of the past. What largely accounts for this is that an extended-order, departmentalized front exists to this day in our planning work, the need for this kind of work flowing primarily from the conjunctural circumstances of the moment and from the requirements of actual economic operations.

The negative side to this arrangement of our work has been described above. But it has its strong point, too. Since in the General Plan we focus our attention on the main economic landmarks, on the broadest generalizations, on the ultimate goals of construction, we are obliged in the five-year economic plans to attend above all to the immediate economic needs dictated by economic experience. It should be added that there is an immense sphere of economic activity, namely, the entire sphere of our agriculture, in which our ability to set goals is most severely limited, and in which the law of large numbers and the

method of extrapolation win far greater rights for themselves. While we thus have far less freedom of action here, on the other hand we have in this particular area—given proper handling of economic statistics—a whole series of factors insuring us against a whole series of errors of the kind that are easy to make when there is a plan goal. Comrade Vishnevskii correctly notes that in our work in the fields of industry and transport we must necessarily take the position of prescribing—and have sound enough arguments for taking this position—whereas in agricultural planning we must for the most part limit ourselves to forecasting, which we can do to the extent that relevant scientific statistics are available. The inadequacy of such statistics will at once be reflected in a correspondingly defective prognosis, but this is defectiveness of quite a different sort and takes us into the realm of mistakes that really should be put in quotes, at least insofar as the actual working method on the whole retains the character of scientific analysis even in the face of these mistakes. An indisputable conclusion follows from this: the section of the perspective Five-Year Plan that deals with agriculture is of particularly vital interest to us not only because of the relative weight of agriculture in our economy as a whole, but because the sound drafting of this section can be a most essential safeguard for us against underestimation and overestimation in all goal-setting in our perspective economic plans.

4. We have tried above to show just how provisional our draft of the Five-Year Plan is, the reasons for this being, besides general circumstances in a period of economic transition, that the Plan is tied to the General Plan and that it entails economic forecasting in which the validity of the entire prognosis is limited by the fact that we have only a relatively scientific grasp of the developments being observed. But there is still another factor which in this case compels special caution in weighing the resources for Five-Year Plan prognosis. If reconstruction boils down to an effort to give our new economic structure a socialist character, then a special role will be played in our progress in this direction by the organizational forms which the working agencies of our economic and state organism assume in this next period. There is a good reason why the drive on bureaucracy and the quest for ways of reorganizing our most important economic departments and institutions should have acquired so spirited a character at this particular time. Cause and effect are changing place here in a most apparent manner. The basis for the stability of the Soviet economic and social organization—

which even in its present form can be sharply and favorably contrasted with the corresponding front of the capitalist encirclement—is, of course, the gains that have been registered over the whole of the recovery period in our whole broad material base. The time is now coming for a kind of exchange of services: determined organizational reshaping of this operative general Soviet line so as to take further advantage of the emphasis on the vast collective of working people may, in its turn, play an enormous role in bringing about a corresponding advance in the material base of production. Precisely this emphasis accounts for a whole series of improvements in the functioning of our state and economy. It will suffice here to cite the interesting statement by Professor M. I. Bogolepov contrasting the basic economic orientation of our budget with that of the state budget in tsarist times, when outlays on the same economic needs came to barely 18 per cent of the total for all items, and when even in the prewar years that were economically the most progressive the balance of annual investments in industry failed to exceed the meager figure of 80 million prewar rubles.

However, this appeal to the organizational factor makes unmistakably clear just how relative is the significance of illustrations in which we use figures. On the other hand, it can hardly be disputed that this particular emphasis on the work of a vast labor collective and on the huge economic complexes of the socialist economy can be assessed in terms of concrete Five-Year Plan figures only with the greatest relativity. Hence the compelling necessity for this Five-Year Plan to have invoked the strategy of social engineering, i.e, its appeal not only to science, but to art as well.

5. To prevent our Five-Year Plan from turning into a sort of legalized graveyard of figures, we must subject it to further simplifying, systematizing, and rationalizing analysis. First of all, we must clearly recognize the relative importance of the calendar division by years in this Five-Year Plan. Though the Plan is based on a number of assumptions involving concrete figures for separate economic years, this is nothing more than an auxiliary method of illustration, for actually we do not by any means claim that this calendar framework is rigid. Given certain definite conjunctural conditions in our economy and the world economy, it may happen that the cycle of economic events charted by our Five-Year Plan will be completed in a period of some three years, whereas given an opposite trend, our Five-Year Plan may take six or even more years to complete. We

must regard this Five-Year Plan not as a calendar program, not as a projection of the economic events of 1927/28-1928/29, etc., but as one of the variants in an economic series, [the variant] which assumes the existence of a so-called average economic trend. We know, however, that in the case of any scientific observation of a complex phenomenon which is a function of many variables, the generalized average curve is merely an abstraction from a reality that in fact deviates from—zigzags above and below—the smooth course of this ideal curve of average magnitudes. The practical applicability of an ideal average curve of this kind is always complicated, therefore, by the need to make allowance for a whole series of conjunctural features. This is why the notorious law of the chain linkage of economic factors is so relative when applied to practical administration of the economy, as we have had repeated occasion to mention.

In recommending our Five-Year Plan as a sort of economic series we are centering our attention on the possibilities as regards the tempo of our economic development, knowing beforehand that we shall progress in our searchings along these lines only by using the method which we have noted previously—the method of successive variant approximations. Thus with this Five-Year Plan draft we are merely opening a discussion of paramount economic problems, and the applicability of this Five-Year Plan and of the whole arsenal of its methods to actual economic operations should be treated only in this light.

Our previous work in the area of perspective planning clearly shows what difficulties are in store for us here. Examining the nature of the mistakes that we have made with perspective plans in the period of our economic recovery, we come to the conclusion that, by and large, the plans have suffered from substantial underestimation of our recovery capabilities. Appropriate adjustment of these plans has created among planning personnel a frame of mind in which with hindsight, so to speak, we are now palpably beginning to suffer from a kind of overestimation. Because we are nearing the end of the recovery period, we tend to believe that the perturbations which these underestimated potentialities of the recovery phase at one time caused in our plan drafting will be abruptly eliminated with our entry into the reconstruction phase. Hence the exaggerated pressure to reduce the pace being scheduled for our further economic development. I am very much afraid that the period of reconstruction is fraught with new surprises for us, of the same kind as those reflected in our underestimations during the recovery phase. It must not

be forgotten that this recovery activity in the various areas of our economy confronts us squarely with the functioning of a highly imperfect economic mechanism that still awaits the events of its own economic October. Elementary rationalization of our basic economic units may be attended by such an upsurge in our over-all economic growth rate as to make its correct projection at the present time extremely difficult, particularly since natural cautiousness inclines us to underestimate, rather than overestimate, our reconstruction possibilities. In consideration of these circumstances, we suggest that in the further elaboration of the Five-Year Plan we concentrate on projecting two new economic series—a minimum series and a maximum.[1] These series should rest on the basic material in the initial rough draft of the Five-Year Plan but should isolate from its multipartite organism the basic economic indices—as few of them as possible. Our world economy sector, for example, has its fifteen or sixteen basic indices to suggest, and we shall have to give due heed to this suggestion as well as take account of the limitations that will inevitably underlie the final summaries of our general Five-Year Plan. Correct isolation of these basic indices is the hardest part of the whole economic analysis underlying this project. We shall also have to consider here the fuel and power aspect of our economic construction and all the bottlenecks in our current economic operations, bottlenecks which find such striking reflection in the prescriptions of our governmental and directive agencies. The viability of our Five-Year Plan depends entirely on our progress in this analysis.[2]

The minimum five-year economic series will graphically outline for us the economic bounds whose transgression will at once entail some functional upset in our economic organism. Actually approaching the index figures of this minimum series will be a clear signal to us of dangers ahead and duly forewarn us in our economic maneuvering. Herein lies the enormous ancillary importance of this minimum economic series.

In projecting our maximum five-year economic series we must boldly count on a number of favorable economic factors. Here, by the way, we can allow for the possibility of foreign credit, and

1. To avoid misinterpretation, we stress that by "series" we mean a series in the mathematical sense, i.e., a series coordinated by an internal law. Such a series is the demonstration of a system of numbers.

2. The generalized articles by S. G. Strumilin are a superb beginning in this respect.

for such a coefficient of added growth within our entire organizational framework, such an upsurge of our over-all Soviet efficiency, as would naturally be rejected if we were considering medium capabilities. This work of drafting a maximum five-year economic plan has its difficulties: the exertion required to accomplish the plan must under no circumstances develop into overstrain which could in turn cause unhealthy developments in the economy. The index figures of this maximum economic series will serve as a useful scale for assessing our progress in socialist construction.

In drawing up our annual Control Figures we shall rely on precisely these two economic series, for they will constitute series of special control figures projected by the Five-Year Plan. With our planning work set up in this fashion, the drafting of Control Figures will by no means amount to merely copying relevant indices out of the draft Five-Year Plan, but will demand of us specific analysis of the concrete annual economic trends; this analysis will represent further normal refining of the planning assumptions which are of a more general character, the necessary refining that is prescribed when we move on to economic practice. Everything in its proper place.

6. As we go deeper in the field of our economic work, we multiply the number of front-line areas in which retreat would be synonymous with defeat. We started with the elementary notion that the technical equipment of our labor force should correspond in degree with that of labor in the capitalist countries. In accordance with the counsels of F. Engels and Comrade Lenin, we especially singled out projects in the field of electrification, which allow of accomplishing this re-equipment of labor with minimum outlays and maximum economic and social effect. A study of the postwar economic structure in the West and a stock-taking of the circumstances of our postwar crisis made it necessary for us to lay special stress on electrification as both motive element and crowning element in the reconstruction of the country's whole power base, and as the very best method of heightening the country's general efficiency.

A study of the disproportions in our economy compels us to endorse with particular insistence the emphasis on the economy's industrialization at maximum speed, without which we see no possibility of an upsurge in the whole power sphere.

We cannot accomplish this industrialization in our country by the usual imperialist method, i.e., through expropriation of the peasant masses and the plunder of colonial countries. Hence the

compelling necessity of planned economic development and of friendly alliance between the proletariat and the peasantry and between the Soviet republics and the colonial and semicolonial countries freeing themselves from imperialist coercion.

The unavoidable implacability of the whole capitalist encirclement toward us obliges us to give special attention to organizing our own internal market and building the kind of economic complex that will ensure both our defensive capability and further economic progress "on our own": hence the unavoidable emphasis on both heavy industry and the production of means of production as central to our general economic efficiency and defense capacity.

The very first attempts at setting up a smooth-running economic mechanism show us the difficulties in store for us on this path under these specific circumstances in which our economy is half isolated from the world consumer and capital markets.

Shortages in the supply of raw materials and shortages resulting from the underdevelopment of transport are making themselves felt more and more acutely. But at the same time, the projects getting under way in the power field already give clear promise of happily resolving those difficulties in our economy which, all during the past, have been linked with our fuel budget.

The raw material problem is once again bringing us face to face with the huge and complicated question of rationalizing the whole pattern of our agriculture, of dividing it into specific regions, while transport problems are confronting us point-blank with the whole question of our commodity circulation and of our inter-district ties as a whole.

Inquiry into the circulation of goods and into the general problem of our economic ties, along with the problems involved in the economic appraisal of the entire mechanism of growth, have posed for us highly acute questions relating to our domestic and foreign trade, and problems in the area of prices and currency. Side by side with very great accomplishments, there are both new difficulties developing and new stages unfolding in our economic work in this sphere, too.

The very first attempts made by our Central Commission for Perspective Planning, with Five-Year Plan data as its guide, to illustrate, concretize, detail, and summarize our requirements in these areas involving directives show us that the respective estimates for the variant series of this Five-Year Plan can be of vast practical importance. Comrade Strumilin's calculations

raise quite a number of new points for our economic discussion and provide rich illustrative material on the pre-eminent problem of further consolidating the union with the peasantry and further resolving the age-old contradictions between town and country. They indicate, incidentally, that the series of great capital construction projects that has been scheduled for the next few years by our directive agencies represents for us a kind of historic necessity for ensuring the most expedient utilization of our enormous resources of human and animal power. They face us with a whole series of specific difficulties in the phase of our economic reconstruction: there will be a particular concentration of these difficulties in the next five years....

S. G. Strumilin

PERSPECTIVE GUIDE LINES FOR

1926/27-1930/31

FIVE-YEAR PLAN DRAFTING; ITS TASKS AND METHODS

The task to be accomplished in drafting the perspective plan for the national economy of the USSR may at present be formulated, in the most general terms, as: the redistribution of society's available productive forces, including both the manpower and material resources of the country, in such a way as to ensure optimum, crisis-free expansion of these productive forces at the fastest possible pace, for the purpose of maximizing satisfaction of the current needs of the working masses and advancing them as rapidly as possible toward a society completely reconstructed on the foundations of socialism and communism.

Can a problem of this nature be solved with complete accuracy and certainty, as the most elementary problems are solved in geometry, algebra, mechanics, astronomy, and other exact sciences? We think not. Planning can be done well, in our opinion, only if we draw on the sum total of the technical and economic knowledge and methods evolved by science; we must accordingly do so. But still, planned construction, like the far more elementary art of building, should be viewed as a kind of engineering, not as science proper. A problem in the sphere of social engineering—which is called upon to reconstruct all the foundations of society—like a problem in any other engineering project, can be solved only on the basis of a whole set of calculations. But no one of its solutions is the only one possible, absolutely accurate, or unquestionably optimal. There may always be another engineer who comes along with a new design that offers an even tidier and more efficient solution to the same problem.

"Perspektivnaia orientirovka na 1926/27-1930/31," Report to the Second Congress of Planning Agencies of the USSR, March 25, 1927, in Strumilin, S. G., Ocherki sovetskoi ekonomiki. Resursy i perspektivy (Essays on Soviet economics. Resources and perspectives), Moscow-Leningrad, published by USSR Gosplan, 1928, pp. 422-439.

For that matter, not even the so-called exact sciences always possess methods adequate for the strictly scientific solution of some of their more difficult problems. We know, for example, that astronomy has to date failed to solve, even in general terms, the seemingly most elementary problem of the mutual influence of only three free bodies gravitating toward each other. The problems in planned construction, however, involve not three bodies but thousands of intercrossing forces and influences the laws of whose interaction are still a long way from having been fathomed, and, in any case, cannot be expressed in exact measurements and weights for every situation. However, while the enemies of socialism are prepared to conclude from this that the very problem of a planned economy, like, say, the problem of trisecting an angle or squaring a circle, is irrational, we are not a bit inclined to reach such a conclusion.

We know that in theory it is impossible, with a pair of compasses and a ruler, to divide an angle into exactly three equal parts. But it can be divided approximately enough for practical purposes into any number of parts. An experienced architect will often lay out an ornamental pattern without compasses altogether, simply by eye. The same can be said about the squaring of a circle and many analogous "difficulties." Theoretically they are insuperable, but practically they are overcome at every turn, and without any particularly great effort, even, simply because the accuracy to which strict science pretends is not at all necessary for practical purposes.

By no means does this imply, of course, that in practical construction or in a planned economy one should not aim for the greatest possible accuracy of calculation. Sooner or later every inaccuracy has to be paid for. And certainly a present-day architect, by drawing on the theory of strength of materials and a number of other sciences, will be able to erect a building at incomparably smaller cost and greater speed than could the builders of earlier ages, who possessed far less knowledge. Still, these old builders, without benefit of any Hütte manuals and though ignorant of the theory of strength of materials and a great deal else, did build the Acropolis of Athens, the Cathedral of St. Sophia in Constantinople, Notre Dame in Paris, St. Basil's in Moscow, and many other noble edifices. True, they were usually forced to allow a far larger factor of safety in their designing than the theory of strength of materials would have required of them. But even though at the cost of a certain overexpenditure of labor and materials, they did accomplish their purpose.

It is our belief that in the first attempts at perspective planning we, too, shall have to allow an overlarge "factor of safety." Our projections have no claim to the epithet optimal. We are convinced that only the method of successive approximation will enable us to approach optimal decisions in the perspective plan.

This idea of successive approximations holds probably the central place among the methodological ideas and techniques that have been thoroughly assimilated in our actual planning work.

As we know, there are three types of planning in progress: there is the general economic plan for a period of ten to fifteen years; there are the perspective five-year plans that refine the general plan; and, finally, there are the "control figures" for the national economy, which are still more concrete and are for only one year ahead. The idea of drafting economic plans through successive approximations to concrete decisions embodied in operative plans is dominant even in this most general of schemes. But this idea of successive approximations takes on still greater importance in the actual techniques used in all our plan-making. The fact is that when we get down to drafting the perspective economic plan for any period ahead, the difficulty we always run up against first is this: it is impossible to lay down rational perspective plans for development in any branch of the economy taken separately unless we know beforehand what the rates of development are going to be in allied areas and what over-all rate of development has been scheduled for the national economy as a whole. On the other hand, projecting over-all rates of development for the national economy as a whole is impossible unless we have a basis for it in estimates of possible rates of development in the economy's individual branches. Only the method of successive approximations can extricate us from this vicious circle.

In the first approximation, the perspective plans for individual branches of the economy were drafted by specialists in these branches on the strength of their realistic stocktaking of internal resources in the branches and of their very general expert assessments of the general economic situation in allied areas and in the country as a whole. But the very first compilation of these drafts also provided us with an over-all picture of the country's economic development. Profiting from this picture, we made the necessary adjustments in the initial plans for the separate branches of the economy and recompiled these partial plans into a general perspective plan, which thus represents a second

approximation to the integral and internally consistent solution of the problem; and so on. The respective sections of Gosplan, following this procedure of successive refinements, drafted and reworked at least three or four plan variants for almost every branch of the economy, and for several branches, even more. It must be pointed out, however, that these refinements have not thus far wrought any very basic changes in the over-all picture of our economic future.

Big difficulties in our work have stemmed from the fact that the general economic plan drawn up by GOELRO six whole years ago is now largely obsolete, while the new general plan is not yet finished.

We are setting for the General Plan the task of producing a pattern of the most general economic targets and thereby constructing a schematic structural model of our immediate future, a model which we can and must approach at the present stage of our economic development on the road to socialism. The General Plan provides our nearest landmark on that road. This landmark should be set far enough from the present moment to be firmly staked at a new and higher level of society's productive forces, but not too far, lest it be dissociated from the material base on which we already stand. Specifically, this plan is being drawn up for a period of ten to fifteen years, in which time we are tentatively intending to double our productive forces and capacity.

This General Plan is not yet finished. But its broad contours are already quite clear in terms both of scale and of the sequence of key reconstruction projects in the electrification of the country, the industrialization of the national economy, the establishment of trunk-line transportation routes, and in the area of other of the plan's basic goals. So that we were, after all, able to take the respective General Plan targets into consideration in drawing up the Five-Year Plan.

We regard the perspective Five-Year Plan as the first time-segment of the General Plan, representing the first refinement of the rates of development in the principal branches of the economy, and their coordination with each other as well as with the over-all rate of actual socialist accumulation within the given segment of time. Five years was viewed as the minimum period for the solid accomplishment of any serious reconstruction programs in electrification, industrial and railroad construction, the engineering of new arterial waterways, reclamation and irrigation, etc.

From what has been said it is now clear that the main function

of the Five-Year Plan is, in general, to indicate the possible scale of capital investment over the next five years and, in particular, to provide a concrete basis on which to frame operative programs for financing the long-range construction work scheduled for this five-year period. If our reconstruction program is to be accomplished without interruption, it must be assured financing on a calendar schedule for a number of years in advance. Only then can we render the program secure both with properly timed imports on orders for two or three years ahead and with future-delivery orders from domestic plants, these plants often requiring prolonged reconstruction before they can fill such orders. However, the task of framing operative programs for financing imports, domestic orders, etc., a task feasible only on the basis of a perspective Five-Year Plan, is, needless to say, the very special concern of the operational departments: it is outside the scope of this work.

Another vital purpose of the Five-Year Plan is to furnish a basis on which to draft Control Figures for the year-by-year development of the national economy.

Once the Five-Year Plan has been drawn up, Control Figures for the coming year will be planned as a one-year segment of the perspective Five-Year Plan, and will, of course, represent the plan's further refinement and concretization. At the same time they should, in our judgment, become the basis for the drafting of operative production programs, which will thus represent the final refinement and elaboration of the annual plan within the individual branches of the economy and departments.

Subsequent quarterly or even monthly adjustments of these programs, necessitated by the current conjuncture and by the economic situation of the moment, fall into the sphere of economic maneuvering within the framework of the General Plan targets. These targets are never intended as more than a general guide for the operational departments as to aims and methods in their economic activity and have no claim, therefore, to hundred-per-cent accomplishment; on the other hand they do not excuse the operational agencies from responsibility both for unsuccessful maneuvering and for failure to maneuver in cases where the economic situation warrants that.

The methods used to draft the General Plan, the Five-Year Plan, and the yearly Control Figures must of necessity differ in quite a number of points at each of these levels. Of the three, the annual plan is most circumscribed by objective circumstances not subject to our control through planning. The economic

activities of the coming year in the spheres of production, goods turnover, imports and exports, budget, credit, etc., are almost totally predetermined by the capital investments of preceding years and by the last harvest. Within a single year the possibilities for redistributing available productive forces to secure their more efficient arrangement are extremely limited. Over a span of five years these possibilities are far broader; and over ten to fifteen years, given substantial accumulation, they are enormous. Consequently, the opportunities for the free play of the social organizer's creative ideas on reconstruction are especially great in the drafting of the General Plan; they are less great in the case of the Five-Year Plan; and when it comes to the annual plans, they are altogether negligible. So that while every plan represents a certain combination of elements of prediction of what is objectively inevitable and projection of what is advisable from the standpoint of our subjective social and class aspirations, in the yearly plans it is prediction that has the paramount role, while in the long-term plans, it is prescription.

In view of this, it is easy to understand why, say, in the drafting of the control figures, such an important part is played by methods involving extrapolation on the basis of a study of the objective laws expressed in the empirically observed stability of a number of the so-called static and dynamic coefficients. It is perfectly obvious that when it comes to forecasting the action of elemental forces not subject to our control, the method of static and dynamic coefficients is quite in order and may yield highly satisfactory results. But where we deliberately set out to overcome the inertia of elemental economic forces and direct them into a different channel, it would be ridiculous to premise our forecasting on the immutability of the respective coefficients. Hence, in our general and perspective planning, we are in principle setting extremely narrow limits to the applicability of extrapolation methods. If we were merely to extrapolate from the past, we could at best extend that past, in a revised and enlarged version, by another five to fifteen years. But you won't build a new social order that way. Where it is a question of deliberately creating a new future, other methods are far more appropriate—methods involving the engineering of new social patterns on the basis of particular plan targets.

We thus deny that extrapolation methods are in any significant degree applicable in the realm of perspective planning, and do so not only because these methods are in general most unreliable for extending observed development curves several years into the

future, but because of another factor that is far more important for us. We are entering a new phase of development, with the creative will of the revolutionary proletariat irresistibly driving a wedge between our past and our future. In this period of the reconstruction of all social relationships, we can least afford to model our perspective plans on medieval horoscopes, to have our destiny foretold from the course of celestial bodies or even from the no less objective periodicity of terrestrial capitalist cycles. Our purpose in drafting plans is not to speculate idly and prophesy about what will happen in five or ten years, but first and foremost to frame a definite set of economic assignments in the sphere of socialist construction.

These assignments must, of course, be very specific, for which reason they are given in numerical coefficients; and they must be sufficiently realistic, which is why they have to be coordinated with each other, in all their parts—linked like a chain in their interdependence—and brought strictly into line with the country's available resources and the real potentials for its development. But all the same these are only targets, not forecasts. As construction proceeds we shall at any time be able, if need be, to alter tactics to meet the situation at the particular moment, and to change certain parts of the assignments. That is why in forecasting we by no means guarantee hundred-per-cent fulfillment of our perspective plans according to a set calendar schedule. And yet in spite of this, these plans are not a bit less realistic than other, less important, construction plans in which all the technical and financial calculations have been accurately performed and are adequately backed up with resources.

The drafting of the perspective plan is feasible only on the basis of prior elucidation of a number of the plan's premises and regulative ideas which in their aggregate constitute an integral pattern of economic policy. Gosplan's work is enormously simplified in this respect, in that a perfectly definite, integral pattern of economic policy has been provided us ready-made in the decrees of the country's directive agencies; all that remains for us to do is properly amplify and concretize these decrees

Identifying the ultimate aim of all our planning theories—the establishment of an economy consistently socialist in all its elements, and the incarnation of communism—would clearly not be enough for us. We must also determine, as accurately as possible, the far more concrete targets for the very next stage of our development. What should we aim at: the strengthening of economic ties with the outside world, or their restriction in the

name of autarky; the country's industrialization, or concentration on agricultural development; economic centralism, or separatism among the individual provinces and republics of the Union in the area of national electrification and other reconstruction undertakings; the organizational structuring of industry in accordance with the principle of all-embracing regional combines, or on the model of all-embracing regional combines, or on the model of all-Union trusts and syndicates integrating separate industries; and so forth. But of course no problems of this kind are settled with a one-syllable yes or no. The only clear and wholly concrete answer to them will be the magnitude of our imports and exports, of our capital outlays for industry and agriculture, etc., in the perspective plan.

As regards the technique of drafting the individual parts of the Five-Year Plan, two separate stages of the work must be distinguished: first, the drafting of special plans for individual branches of the economy on the basis of particular targets; and second, the coordination of these special plans, by means of balances, into the over-all plan for the national economy.

As for the methods used in drafting the special plans for the development of individual branches of the economy, they are in no basic respect different from the engineering methods employed in designing new factories, mines, plants, or other enterprises. The scale of the planned development is generally restricted by the scale of feasible investments, the anticipated capacity of the market, and a good many other "bottlenecks" and limits which, in the first approximation, are designated rather crudely on the basis of expert estimates and guesses. However, since the scale of development has been predetermined, we are for the rest dealing merely with a complex of technical and financial calculations that are within the capability of any engineer-designer and hold no methodological difficulties for him. The difference between the various designers in this field will now lie not in the volume and accuracy of their calculations, but in their varying capacities for creatively combining possible elements of the planned structure as simply, cheaply, handsomely, and efficiently as possible.

As to the coordination of the special plans for individual industries and branches of the economy by means of balances, the following should be noted. To make this coordination as easy as possible, in preparing the very first rough draft of the over-all plan we adopted a certain sequence for drawing up and reviewing the special plans, our intention being that succeeding plans should

rest upon the preceding ones. In view of the interdependent character of the over-all plan's individual elements, we decided that under our circumstances the following was the most rational sequence for drafting and reviewing the special plans for individual branches of the national economy: (1) industry, (2) agriculture, (3) transportation, (4) construction, (5) trade, (6) credit, (7) budget, and (8) manpower.

The electrification plan, deriving as it does from the goals of the General Plan, we consider preset for us on a definite scale; hence we had but to incorporate it into the general framework of the perspective Five-Year Plan as the first basic link.

In framing the Five-Year Plan it is easiest to start with industry, for the simple reason that it is industry—given our policy of industrializing the country—that is due to become the advanced, key link in our economy, the link whose movement will determine the dynamics of all the other links, which are connected with it.

The tempo of our industrial expansion in the coming five-year period is governed by a whole series of objectives and material factors. That tempo must be faster than the rate of our agricultural development, or we shall never eliminate the dangerous disproportion between our industry and agriculture. It must also surpass the rate of development in capitalist countries, for unless we were able to show the advantages of the collectivist over the capitalist economy in this respect, there would be no chance of victory for the socialist revolution on a world scale. But since the tempo of industrial expansion is at present determined almost entirely by the scale of capital investment, this financial factor represents for it still another limit, restricting it from above. We cannot aim at a rate of capital investment exceeding [what] our available resources [allow].

The perspective plan for industry as a whole constitutes, of course, a more or less coordinated compilation of the plans for individual industries and branches of industry. For this coordination to be feasible, it is logically imperative, in this case, too, that the plans be drafted in a certain order: first consumer goods industries and then producer goods industries—machine building, metals and other building materials, and the fuel industry; as far as possible it must be an order in which, by virtue of the internal chain linkage of these industries, the links that follow provide output for an ever greater number of preceding ones.

For the former industries the factor which—besides recovery needs—determines the rate of capital investment is, of course,

merely the expected increase in the capacity of the consumer market, whereas for the latter industries the market is primarily industry itself. But while the consumer market does lend itself under our conditions to a degree of current adjustment through regulation of the wage level, of tax policy, and other such measures, the estimated capacity of the market for the output of enterprises engaged in the reproduction of working capital and especially fixed capital must, in the interest of industry's crisis-free expansion, be given in advance, on the basis of rather accurate calculation, and must be fully consistent with the calculated resources for capital investment.

It will be more convenient to reserve to a special section a more detailed description of how we went about determining the capacity of the consumer market, basing ourselves on the coefficients of the anticipated population growth, the increase in the per capita income of the working classes, and the corresponding change in the structure of their consumption budget.

The very existence of a plan for industry in a measure predetermines the perspective plan for agriculture. Industry is the largest consumer of agricultural raw materials—cotton, flax, beets (for the sugar industry), potatoes (for the distillation of alcohol), etc. Consequently, once we have the plan for industry, we know how much the output of these crops—which require the biggest labor outlays—is going to increase. As far as the staple cereal crops and animal husbandry are concerned, owing to the extremely slow growth of the foreign and domestic consumer markets, and given extraordinarily backward farming techniques and a plowland area held within natural bounds, forecasting development in this area cannot be too difficult a matter. And as far as the effect of reconstruction measures is concerned, it will be wholly determined by the scale on which we earmark capital for this purpose.

For drafting the perspective transportation plan it is quite enough to know the expected annual increase in freight turnover, and that is a predetermined magnitude once we have the perspective plans for industry and agriculture.

The scale of the construction of production facilities in industry, agriculture, and transportation is determined by the extent of planned capital investment in these branches of the economy. As to the rate of city housing construction, and of all other municipal construction, insofar as that rate is not limited by the technical facilities for producing building materials and by financial resources, it is entirely determined by the anticipated growth of

the nonagricultural labor force in general and of the urban population in particular.

The scale of commodity output in industry and agriculture determines the perspective plan for domestic trade. As to foreign trade, its volume depends on: (1) the prospective export of grain and agricultural raw materials—which is set at the level at which expected domestic production exceeds domestic consumption under the plan for agriculture—and the industrial plan for oil and several other products—which sets the scale of exports for these products; (2) prospective imports, which are determined by the scale of planned investments in industry, transportation, and agriculture, and by the extent to which appropriate equipment for these investments cannot be produced inside the country. The foreign trade plan will have the independent task of bringing these imports into balance with our country's perspective export plan, its foreign exchange resources, and its credit prospects.

The rate of bank credit and emission operations is pretty much determined—objectively—by the scale of expansion in the turnover of goods, and is determined teleologically by the policy we set in the sphere of money circulation, accumulation of foreign exchange, discount rate, etc.

As regards the budget, the perspective income plan is wholly determined by the expansion projected for the national economy as a whole by all the plans enumerated above. As for the perspective expenditure plan, that is the concern of our budget policy, and that policy must find its commercial expression in the budget plan.

The perspective plan for manpower can be clarified only through correlation of all preceding plans including the budget (the scale of the budget determining the labor army employed in the civil service).

The sequence laid down for drafting the special plans facilitates their internal coordination and harmonization, but is certainly no guarantee as yet that the economic plan as a whole will be realistic and rational. If, for instance, we were to set too high a pace for the expansion of industry, this would be reflected, similarly in each of the other plans and, consequently, in their totality as well. A mistake of this kind can be avoided only through subsequent coordination of all the plans by means of balances.

Coordination by means of balances should in the first instance satisfy us that the grand total of the capital investments planned

does not exceed the actual resources accumulated in the country over the corresponding segment of time. But this coordinating should be done from many other standpoints, too. For example, the perspective labor balance will give us confidence that the scheduled program is not going to be wrecked by inadequacy of reserves of free manpower, both skilled and unskilled; the fuel balance will show us the amount of mechanical power that is assured for our program; the balance of trade and the balance of payments will show the amount of foreign exchange and, consequently, the imports of foreign equipment, that are assured for that same program; and so on.

The methodological conclusions and techniques set forth above by no means exhaust the subject of planning methodology. There are a great many more of them already being brought to bear in actual planning work than we have been able to enumerate here. But not even in their totality could they constitute a science of planning. Planning, by and large, will long continue at the stage of a practical art; still, a scientific approach to the solution of all the partial problems that already allow of such an approach is absolutely imperative for it.

N. D. Kondrat'ev

CRITICAL REMARKS ON THE PLAN FOR THE DEVELOPMENT OF THE NATIONAL ECONOMY

The third issue of Planovoe khoziaistvo for 1927 carried a number of articles presenting the basic data of the perspective Five-Year Plan for the development of the national economy of the USSR.[1] The perspective-plan materials that have been published are still far from complete, which prevents our properly assaying the full scope of the enormous job which Gosplan has done or all the methods and foundations underlying the conception being proposed. It is likely that Gosplan will in the very near future publish fuller material on the making of the plan, and it is to be assumed that several puzzling questions engendered by a reading of the published articles will then be cleared up.[2] Nevertheless, the basic theses of the perspective plan being put forward by Gosplan are already clear. And on the other hand the

"Kriticheskie zametki o plane razvitiia narodnogo khoziaistva," Planovoe khoziaistvo, no. 4, 1927, pp. 1-34. (By way of discussion—editorial note of Planovoe khoziaistvo.)

1. We have in mind these articles: G. M. Krzhizhanovskii, "On the Drafting of the Perspective Five-Year Plan", S. G. Strumilin, "Perspective Guide Lines for 1926/27-1930/31"; V. R. Chernyshev, "On the Question of Planning Methodology"; G. M. Krzhizhanovskii and A. A. Gorev, "The Perspective Electrification Plan for the Next Five Years"; I. A. Kalinnikov, "Basic Elements and Indices of Industrial Development for the Five Year Period of 1926/27-1930/31"; M. I. Bogolepov, "Perspective Financial Plan for the Five-Year Period of 1926/27-1930/31"; N. M. Vishnevskii, "On the Question of Agricultural Development in the USSR"; S. V. Bernshtein-Kogan and I. K. Libin, "Basic Theses of the Perspective Transportation Plan for 1926/27-1930/31."

2. When this article reached us, the printing of the volume of Central Commission materials (edited by S. G. Strumilin), which is devoted to the perspective plans for development of the economy of the USSR over the five-year period, was being completed. The volume has now appeared. (Editors of Planovoe khoziaistvo.)

matters involved in this conception are so vital that it seems advisable to dwell on them without waiting for the more detailed material to come out.

This article is therefore devoted to an analysis of Gosplan's constructs.[3] We do not intend, however, to enter into an exhaustive analysis of them here. It is hardly questionable that for the immediate future the principal problem in the development of our economy is the relationship of industry and agriculture, the relationship of town and countryside, and, accordingly, of the working class and peasantry. The fundamental and dominant importance of this problem was most explicitly underscored both in Gosplan Chairman G. M. Krzhizhanovskii's opening speech at the recent Congress of Presidiums of the Gosplans and in the extensive debate on the perspective plan at the Congress.

In view of this fact, we intend in this article to touch primarily—aside from some methodological questions—on those elements of Gosplan's conception that have an immediate bearing on the problem of the relationship of industry and agriculture. Since of all the published Gosplan material the most general article is the one by S. G. Strumilin, we shall hereafter refer chiefly to it, bringing in other material only to the extent necessary.[4]

I. To make the following critical comments as clear as possible, it would seem essential to dwell first on several methodological points of departure.

First of all, what is the essential nature of the perspective plan as understood by the plan's authors, and in particular by S. G. Strumilin? His opinion on this question cannot be said to be entirely clear. In any case it is equivocal. He actually says: "So that while every plan represents a certain combination of elements of prediction of what is objectively inevitable and projection of what is advisable from the standpoint of our subjective social and class aspirations, in the yearly plans it is prediction that has the paramount role, while in the long-term plans it is prescription."

Thus S. G. Strumilin maintains that our plans inevitably comprise elements of prediction on the one hand, and of the projection

3. Its author had a tremendous amount of assistance in writing it from Ya. P. Gerchuk, G. I. Mikhailov, and P. M. Antsiferov.

4. These other articles amplify the one by S. G. Strumilin. [This article is included in the present volume.—Ed.] It would therefore be natural to expect the calculations cited in them to be consistent with S. G. Strumilin's. Unfortunately, this requirement is not always observed, which makes critical analysis of the constructs more difficult.

of assignments or directives on the other. But why is either of these groups of elements inevitably inherent in the plan? To answer this calls for understanding the relationship in which the said elements stand to one another. S. G. Strumilin goes on to say: "These assignments must, of course, be ... sufficiently realistic, which is why they have to be coordinated with each other, in all their parts—linked like a chain in their interdependence—and brought strictly into line with the country's available resources and the real potentials for its development." It is clear, therefore, that in the author's opinion our assignments or directives may not be entirely arbitrary, that they must be fairly well meshed with one another and strictly correlated with the country's real resources and real potentials for development.

But what does it mean to correlate our assignments with the country's real resources and real potentials for development? S. G. Strumilin does not go into this question. But it can have only one answer. Our assignments relate to the future. They point out the direction in which our conscious efforts and measures are to proceed. These efforts and measures for the realization of targets can accomplish a great deal. All the same, however, they are not omnipotent. They will be proceeding in the concrete objective setting of the future, a setting in which purely spontaneous processes will have enormous significance. And their actual results will be determined by the coordination of our actions with the influence of the objective environment in which these efforts and measures will be proceeding. This being the case, our assignments will be realistic only if they specifically reflect the actual results which we may achieve through efforts proceeding in a concrete objective setting. Under what circumstances can we reflect these results in our plan assignments? Obviously, we can do so only if, in formulating the assignments, we not only remember our objectives but take into account as fully as possible: (1) the objective pattern of economic conditions; (2) the probable trends of their development; (3) our probable resources and opportunities for influencing the course of economic development; and finally, (4) the probable results of our influencing it. But what does it mean to take into account the probable trends of unchanging conditions, our probable resources and opportunities for influencing the course of economic development, and, finally, the probable result of influencing it? It means that we must not only have knowledge of the present in these areas; we must also have a certain amount of forecasting, for only if we do can we speak of the probable trends of our economic de-

velopment, of our probable opportunities for influencing it, and of the probable results of thus influencing it. This makes it plain that our plan assignments, if they are to be realistic (and that is the only kind of assignment worth talking about seriously), really are organically bound up with elements of prediction, and presuppose it.[5]

And if S. G. Strumilin really does think that our assignments should, as he says, be realistic, then he clearly has no grounds for objecting to the conclusions we have drawn.

Apparently this is not quite the case, however. The point is that this conception of his described above, in which the plan inevitably comprises elements both of prediction and of assignments or directives, is very soon crowded out by another, basically different, conception.

On very nearly the same pages of his article, and sometimes on the very same pages, S. G. Strumilin draws an analogy between planned construction and the ordinary art of building. Many of the problems in the art of building, he writes, though insoluble theoretically, are solved practically—solved approximately enough for real needs. Furthermore, any problem in the art of building can be solved in several ways: "There may always be another engineer who comes along with a new design that offers an even tidier and more efficient solution to the same problem." It depends on his creative gifts. S. G. Strumilin holds that in plan-making, or, as he puts it, social engineering, we have something analogous. A problem in planned economic construction can also have more than one solution. Here, too many problems appear, in strict theoretical terms, to be insoluble, but in practical terms are solved quite satisfactorily if we, like engineers, adopt methods for the "engineering of new social patterns...." In this same context S. G. Strumilin goes on to say: "Our purpose in drafting plans is not to speculate idly and prophesy about what will happen in five or ten years, but first and foremost to frame a definite set of economic assignments in the sphere of socialist construction" (ibid.). But these assignments of ours are "all the same...only targets, not forecasts" (ibid.). Thus, having acknowledged that any plan embodies not only the projection of a target but prediction as well, he is carried away by the analogies between the construction of plans and engineering and on literally the same pages draws a definite line

5. On this subject see our article "The Plan and Prediction," Puti sel'skogo khoziaistva (Paths of agriculture), no. 2, 1927.

between plan targets and prediction and squarely opposes them to each other. It is perfectly plain that this is quite a different way of interpreting the plan from the approach he himself had formulated earlier. What are the implications of this other way of interpreting the plan?

S. G. Strumilin is to a certain extent right in drawing an analogy between planned construction and construction engineering. But only to a certain extent. It is true that different engineers may solve the same construction problem differently. But no matter how they solve it, the difference between their solutions will in every case have to do merely with methods of combining the elements—building materials and funds—that will be needed for accomplishing the construction. Moreover, the engineer does not himself have to solve the problem of whether the building materials and monetary resources will be available, and if so in what volume: these magnitudes he takes as either given or predetermined. It is this that is missing in planned economic construction. In planned construction we must solve the problems not only of the very best way of combining the available economic elements but of the dimensions and forms in which we shall have or can ensure these elements at the present time and in the future (for example, accumulation, market capacity, etc.). We cannot take these elements in our framework as given or predetermined; nor do we have the right to do so. We have to determine them in the light of the total situation. But without an understanding of actual conditions and without prognosis we are not in a position to determine them. This is why, if we want our assignments or our designs for a new future to be really and truly realistic, we cannot dissociate them from forecasting.

And if S. G. Strumilin, carried away by the analogy with engineering, does proclaim this kind of breach, if he calls for "engineering methods" to be used in plan-making, it means that he is oversimplifying the plan-making problem; that he is prepared to regard as given or as predetermined elements which can in no wise be regarded as such and which have to be determined. It means that he is cutting the thread between his projections and reality. From this it is but a step, and a small one at that, to the framing of plans that are completely arbitrary.

The foregoing makes it clear that this other interpretation of the plan, which gives prominence only to the factor of targets in the plans, the factor of projection, and opposes it to prediction, can easily become a reason for flagging interest in the prac-

ticability, the feasibility, of these targets and projections. It is evident from the foregoing that S. G. Strumilin's thinking on the essential nature of the plan formulations does actually run along two different lines, as it were. But he is not satisfied with this, and shortly makes an effort to get back to a single line. Indeed, right after the statement cited above, i.e., that our assignments are "all the same...only targets, not forecasts," we find him saying: "As construction proceeds we shall at any time be able, if need be, to alter tactics to meet the situation at the particular moment, and to change certain parts of the assignments. That is why in forecasting we by no means guarantee hundred-per-cent fulfillment of our perspective plans according to a set calendar schedule." Thus, in this last statement the author is clearly referring to the targets simply as forecasts, i.e., is saying even more than is called for. Be that as it may, he here eliminates the breach between targets and forecasts and thereby reverts to his original position on the plan's essential nature. He is at the same time right, of course, that though we speak of forecasting in the plans, we cannot guarantee its hundred-per-cent accuracy.

On the one hand, then, it is seemingly clear that the plan is a system of targets, but that this system itself rests on a degree of prediction of what the course of developments will be, given our deliberate efforts to influence them.

On the other hand, it is no less clear that S. G. Strumilin is prepared to project the new socio-economic future purely on an engineering basis, to formulate a system of plan targets that have nothing to do with "speculation and prophecy about what will happen," i.e., when all is said and done, to sidestep the problem of substantiating the workability of his conceptions. Whereas within the scope of the author's introductory remarks in the article it is hard to decide which line dominates his thinking, and we are prepared to say that whereas his original, i.e. correct line prevails in the end, we must admit that later on, when he proceeds to the actual formulation of plan, it is the second, the "engineering," line that comes to be dominant in his understanding of the plan.

II. The question that now arises in this: What are the over-all tasks and over-all criteria that we must bear in mind in drawing up the perspective plans and formulating the system of targets whose nature we have just been clarifying? The author answers this question in the following manner: "The task to be accomplished in drafting the perspective plan for the national

economy of the USSR may at present be formulated, in the most general terms, as: the redistribution of society's available productive forces, including both the manpower and material resources of the country, in such a way as to ensure optimum, crisis-free expansion of these productive forces at the fastest possible pace, for the purpose of maximizing satisfaction of the current needs of the working masses and advancing them as rapidly as possible toward a society completely reconstructed on the foundations of socialism and communism."

In this statement the author has given us quite a precise formulation of the over-all task to be accomplished in drafting a perspective plan, thereby providing us with most explicit criteria that must be satisfied by perspective plans—including in the first instance, obviously, the plan that he himself has drawn up. According to the formula cited, this plan must ensure: first, crisis-free expansion of the economy's productive forces; second, their development at the quickest possible pace; third, maximum satisfaction of the current needs of the masses; and, fourth, the most rapid possible approach to a society reconstructed on the foundations of socialism and communism. To make our criticism immanently germane to the author's conceptions, we shall hereafter use these particular criteria in assessing the draft plan proposed by Gosplan.

Assuming that the over-all task to be accomplished in drafting the perspective plan is as just outlined, what sort of redistribution of productive forces does S. G. Strumilin regard as most expedient and feasible for the next five years? He considers that redistribution of productive forces to be most expedient which would assure the best prospect of industrializing the country in the near future. There can be no objection, of course, to the goal of industrialization as such. The industrialization of a country—and this is borne out historically—is the essential prerequisite for raising the productivity of the entire economy and the living standard of the masses. The undeniably progressive significance of industrialization should especially be emphasized in countries with agrarian overpopulation—with which the USSR may to some extent be classed—since the industrialization of countries like these is the primary means of remedying their agrarian overpopulation. In our case the significance of industrialization also derives from the peculiarities of our social system and of our situation in the world.

What counts in drafting the plan, however, is not proclaiming one or another goal but, as S. G. Strumilin himself rightly points out, giving it concrete expression....

III. ...All the perspective plans in the draft being proposed by Gosplan are given in exact figures. Figures are given showing not only output in five years' time, but accumulation, investments, market capacity, overpopulation, paper emissions, etc., many of them being not just five year totals but yearly figures as well.

There can be no objection in principle, of course, to numerical data for the perspective plans. But it stands to reason that such data have significance, are useful, and should be presented, only if they have definite economic implications, if they really are of adequate economic validity, and if the proper method has been used in their validation. In the absence of these conditions, an orderly series of figures remains but a series of figures, nothing more. And if, in the absence of these conditions, we attach any greater importance to figures, we run the risk of "statistical fetishism," which can prove very costly to the practical planning that in any way attempts to use the perspective-plan figures as a guide.

Approaching Gosplan's formulations from this point of view, we must definitely recognize that with few exceptions the published materials tell us almost nothing at all of the methods and reasoning by which the targets for the future were described with the specific figures cited in the plan, and not with some other figures. Thus, they give us no reason why industrial output is going to grow by 69.3 per cent and agricultural by 24.1 per cent, why accumulation will increase 93 per cent while the productivity of industrial labor rises by 49 per cent, etc. True, some of the derivative figures in the plan are easily understood from other, key figures. For instance, it is easy to understand why, given the rates assumed for the growth of output, national income, and population, per capita income will be precisely as shown in the plan, and not some other figure. The point is, however, that the key figures themselves, from which the derived calculations come, were calculated on bases that are not clear. The published material decrees these figures rather than substantiating them.

This may meet with the objection that the published materials do contain some statements indicating the method and reasoning employed in making up the plan. Thus we find in them statements repudiating the method of extrapolating on the basis of established static and dynamic coefficients. We also have the assertion that the method of successive approximation was used in the plan's formulation, and that the first approximations of the perspective plans for individual branches of the economy were

drafted on the basis of specialists' expert estimates of the potentials for the development of these branches. What we do not know from the materials, however, is the stages of successive approximation through which the plan passed in the making. We are given only one approximation, the one published, and no method of successive approximation is evident from it. Furthermore, it is in principle unclear and questionable why successive approximation in formulating the plan should here be elevated to the status of a special method. The fact that a variant of the plan is drafted, then refined, once again refined, etc., does not, after all, constitute a method; that lies in the techniques used to draft the first variant, in the techniques on the basis of which it is then refined, etc.—and the materials have not a word to say about these techniques.

This is just why we do not actually know the method of the plan's drafting or the techniques of its subsequent refinement. Nor do we know the principles by which the experts were guided in setting the perspective plans for development of the separate branches of the economy. Of course, the method of expert estimates gives considerable scope to those making them. Still, even experts are guided by certain principles in making their estimates. And of these principles there is no hint whatever in the materials.

As far as the separate branches of the economy are concerned, all that we find in the published materials that can be cited as an attempt to validate the proposed perspective plans essentially boils down to formal statements indicating the factors that were taken into account in formulating assignments for these branches. But statements of this kind are not enough.

S. G. Strumilin says, for instance, that the drafting of the [over-all] perspective plan was initiated with the setting of the perspective plan for industry: determination of the rate of growth for consumer goods production was made contingent on the volume of capital investment and that investment contingent on the increase in the capacity of the consumer market.

Thus we have been given a general formal statement indicating the factors with which the rate of growth for consumer goods production was ostensibly brought into line. According to this statement, to determine that rate of growth would call for data on the volume of investment in these branches (and, consequently, on the volume of accumulation necessary) and on the capacity of the market for consumer goods. The fact is that the published materials do contain figures on probable accumulation;

but on the other hand, we find no data whatever in them to substantiate the very possibility of this accumulation. As to the market capacity, an estimate for it is given but, again, quite without substantiation. Clearly, this capacity is determined, in its turn, by the growth of cities and of the urban population, by the rise in the living standards of the urban and rural population, and by the growth of its consumer demand for industrially produced articles. But the growth of cities, the rise in the living standards of the population, etc., are determined by the rate at which production expands, and industrial production in particular, as well as by other factors. If, therefore, in seeking substantiation of the growth rate for consumer goods production we follow these purely formal leads given us by the author, we either run into figures that are altogether unsubstantiated (viz.. accumulation), or find ourselves in a vicious circle, since we come to realize that the growth rate to be assumed for consumer goods production is at least partially determined by that growth rate itself.

An even clearer vicious circle of this sort emerges when we turn to the reasoning behind the rate assumed for the production of capital goods. We find the following statement on this question: "the estimated capacity of the market for the output of enterprises engaged in the reproduction of working capital and especially fixed capital must, in the interest of industry's crisis-free expansion, be given in advance, on the basis of rather accurate calculation, and must be fully consistent with the calculated resources for capital investment." In this case, then, it is the extent of capital investment and the estimated capacity of the market that are pointed to as the factors explaining the rate assumed. But as indicated above, the estimated volume of accumulation, and therefore of investment, is entirely unsubstantiated. Where the capacity of the market is concerned, it turns out that for the output of capital goods "the market is primarily industry itself." In other words, here the sought-for growth rate of industrial production is primarily determined by that sought-for rate itself.

As for the perspective plan for agricultural development, S. G. Strumilin has this to say about its formulation: "The very existence of a plan for industry in a measure predetermines the perspective plan for agriculture." In any case it is his opinion that "once we have the plan for industry, we know" what the prospects are for increased output of the technical crops, crops that take big labor outlays. The following should be said about

this. In the first place, since the factors determining the growth rate for industry itself had not previously been concretely elucidated, a growth rate for the output of technical crops that is determined by the growth rate for industry is obviously lacking in any validity. And in the second place, do we really know the rate at which the output of these crops will grow if we are given the rate of industry's growth? At least some of these crops provide products for export. What has happened to this export? Lost sight of, presumably? Nothing is said of it, at any rate, when the factors determining the growth of technical crop output are specified. How this attitude to the problem of exports has been reflected in the plan as a whole, we shall see below.

Finally, with regard to the staple cereal crops and animal husbandry, S. G. Strumilin has this to say: "owing to the extremely slow growth of the foreign and domestic consumer markets, and given extraordinarily backward farming techniques and a plowland area held within natural bounds, forecasting development in this area cannot be too difficult a matter." It thus appears that the framing of perspective plans for these branches of agriculture simply does not offer any special difficulty. This is all the substantiation we have of the growth rate assumed for grain farming and stock-raising. True, it is further pointed out that their development will be influenced by capital investment. But just how influenced—about that we are left in the dark. How simple a question the development of grain farming and stock-raising appears to the author is evident from the mere fact that the data on the growth of farm output is not even given separately for these key branches in any of the published material. True, at the Congress of Presidiums of the Gosplans a table was distributed describing both the development of field-crop cultivation by branches and the growth in the number of livestock. But how this table was computed, what principles were laid down for arriving at the growth rates assumed in it—no further light was shed on this question either by the table or by N. M. Vishnevskii's report on agriculture.

The propositions that we have examined essentially exhaust the parts of the Gosplan work where there are some remote and not very clear statements indicating the bases on which the published perspective plans were arrived at. The foregoing makes clear: first, that these statements are indeed formally declarative in character, containing as they do a formal inventory of the factors that were reckoned with in the shaping of perspective plans for the various sections of the national economy, while

totally lacking in substantive analysis of these factors; second, that an attempt to take a close look at these factors leads us either to [other] factors that were themselves assumed without sufficient validation, or to a vicious circle.

In sum, as regards the perspective plans for the separate branches of the economy, the thesis advanced above—that the perspective plans-in-the-making have been put forward without serious substantiation—must therefore be considered correct. One wonders why the center of gravity in the making of the plan should so hastily have been shifted directly to numerical calculations, and why elements of validation should at the same time have been all but totally excluded. One would think it should have been the other way round, that at the outset the focus in the making of the plan should have been on formulating and analyzing our basic problems of economic development and on substantiating particular perspective plans, for the figures ought only to represent final concretization of the conclusions from this analysis. We do not know whether Gosplan has any solid reasons for the formulations it has proposed, and if it has, just what they are. For the moment, therefore, we do not know whether we are dealing here with a plain passion for numerical computation or simply with a case of Gosplan's tardiness in publishing data to validate its draft....

We are well aware of the difficulty of substantiating the perspective plans for the economy's development. We are no less well aware that to substantiate them with absolute rigor may not be possible at all. But this does not mean that the effort to substantiate them is hopeless and should not be made at all. It is just because substantiating their formulations is so difficult, just because no serious, workable plan can possibly be drafted otherwise, that we would be right in urging that the plan's authors concentrate on that primarily.

We have already observed that the statements indicating the manner in which the plan was drawn up by branches lead to vicious circles. Though we reproached the plan-makers for these vicious circles, we are well aware that the reasons for them lie to some extent in economic reality itself, since all its elements are interlinked. This, however, does not relieve the plan-makers of the obligation to try to eliminate the vicious circles in their formulations. That is what makes drafting the economic plan so enormously difficult, but unless it is done a satisfactory plan cannot be drawn up at all, just as it cannot without a certain amount of forecasting.

This may meet with the objection that the plan-makers did try

to eliminate the vicious circles; that the preceding critical remarks are all unfounded precisely because they take no notice of this attempt; and that these remarks bear on the question of validating perspective plans for separate branches of the economy, while in view of the interconnection of these branches such validation is not even possible. The perspective plans adopted for the branches are validated by ultimately being correlated on the basis of the method of balances, they will say; balance coordination should be seen as the method of eliminating the vicious circles referred to above and of ultimately validating the perspective plans. In his article S. G. Strumilin definitely states that the perspective plans for the various branches of the economy were correlated by the method of balances.

Unfortunately, we do not share that absolute faith in balance coordination which marks many among us. In and of itself the method of balances, when applied to the perspective plans—and only if applied correctly—guarantees one thing only: namely, that the rates of development projected for the individual branches will be consistent with one another. But there is no guarantee whatever that the model of the future economy which is projected by means of the method of balances will be at all practicable and not arbitrary. Formally, arithmetically, a great many such models can be constructed. But the questions of which model may be realistic, and which of the realistic models is at the same time the very best one—these are questions that the method of balances cannot answer. To answer them calls, once again, for analyzing the reasons why a particular model of the economy is realizable, and not some other model.

We are not objecting to the fact that the proposed draft plan proclaims the need to employ the method of balances. But what we have just said makes it clear that this does not obviate the need we have commented on to analyze the bases on which the given model of the economy, and not some other model, was adopted as desirable and at the same time realistic. It is this substantiation that the published material fails to provide....

In the foregoing presentation we have not nearly exhausted the questions which the proposed draft plan raises. But even the examination of those that have been touched on, which seems to us the most important, allows us to draw some conclusions.

1. In the form in which the proposed plan has been presented, its constructs suffer from statistical formalism. Behind the numerical calculations, numerous and exceedingly bold and risky, no adequate economic substantiation is thus far to be seen.

2. But even taking the plan as such, and examining it "from within," so to speak, one finds that despite the proclaimed principle of balance and "coordination" of all its elements, such "coordination" is in fact nonexistent. The projected dynamics of production, consumption, accumulation, export, etc., lack the necessary congruity with one another. Because of this, the growth rate for some of the elements listed precludes the rate assumed for others.

3. A particularly serious deficiency in the internal meshing of the dynamics of the several branches of the economy is revealed with respect to the comparative rates of development of agriculture and the other branches, which is due to erroneous diagnosis of the place and importance of agriculture.

4. Under the circumstances, if we think back to the tasks which S. G. Strumilin said a good plan should accomplish, and to the criteria for evaluating the proposed plan that derive from these tasks, we must recognize that accomplishment of this plan, even were that possible, would not ensure the optimum, crisis-free path of development for the economy's productive forces or really maximum satisfaction of the current needs of the working masses, and hence would be unlikely to bring us notably closer to a basically reconstructed economy. On the contrary, accomplishment of the plan would inevitably result in greater economic difficulties.

5. The basic error committed in the drafting of the plan is that those who drew it up sought to accomplish the series of tasks indicated above (i.e., maximum, crisis-free expansion of productive forces, maximum satisfaction of current needs, etc.) simultaneously and in maximum degree without taking sufficient account of the fact that when these partial tasks are expressed in extreme terms they come into collision with one another. What had to be found was the very best combination of these tasks, which would at the same time be a perfectly realistic combination. Instead of a realistic combination of tasks we see in the plan a formal balancing of various estimates, which makes it, at first glance, outwardly well-proportioned. Internally, however, it is economically inconsistent.

ANSWER TO OUR CRITICS

Obviously the drafting of a long-range plan for a country like the USSR is very difficult. So I am not surprised that we have been criticized. But never until now did I imagine that criticism of planning was as easy as some of the speeches here would seem to indicate. I can compare planning to architectural designing. When we needed an opinion on the blueprints for the Dneprostroi, we had to address ourselves to the great specialist in that field, Cooper of the USA. He came over, studied the matter for several months, and only then gave his opinion. But our Five-Year Plan, which in scope of construction is equivalent to more than a hundred Dneprostrois, has found in this congress a good dozen Coopers who, without even studying the matter, have handed down their most definite views. How can this be accounted for? By the high qualifications of our home-bred Coopers, our own planning experts? Or because the science of planning is still in its infancy so that no special qualifications are required of a man in order to solve the most complex problems connected with planning in fifteen minutes although many hundreds of other learned specialists may have spent months working on them.

I am afraid that for many among us planning is not a science, not even an applied science, not even a sort of practical engineering which requires great experience and the corresponding feeling of responsibility for every expert pronouncement.

In planning, unfortunately, thus far the evaluation by "experts" has too often been without any scientific grounding. And therefore, in the criticism of planning we often come across "expert" pronouncements of the same value.

Nevertheless, I must say at this juncture that many of the objections raised at this conference we consider absolutely correct; we acknowledge their validity and shall guide ourselves by them in our future work.

Many have pointed out a grave defect in our work: the insuf-

"Otvet nashim kritikam," in Ocherki sovetskoi ekonomiki. Resursy i perspektivy (Essays in Soviet economics. Resources and perspectives) Moscow-Leningrad, published by the USSR Gosplan, 1928, pp. 476-498. The "Answer to Our Critics" was the concluding speech delivered by Strumilin at the Second Congress of Planning Agencies of the USSR.

ficiency, at times the complete absence, of long-range planning district by district for several economic sectors. Indeed, this is a great flaw in our planning. We fully recognize it. And because of this, we consider our work incomplete and offer here only the materials for a long-range plan and not a ready five year national economic plan. However, we do not feel too guilty in this respect because we could not possibly have prepared a long-range plan district by district without the participation of the districts. Had we taken this task upon ourselves, here in the center of a country extending over one-sixth of the world, we could have been justly accused of unprecedented bureaucratic conceit. Therefore, we immediately drew into the work all the agencies and planning bodies in various Union republics and through them the local district agencies.

Unfortunately, however, all the agencies and all the republics did not react too promptly to our appeal. I do not want to say that they were unwilling to help us in this matter. Possibly the contribution we had expected from them was beyond their means. But if they realize from their personal experience how difficult it is to prepare long-range plans even for individual economic sectors, even for individual districts and republics, they can surely imagine the complexity of producing such an all-engulfing long-range plan for the whole national economy as that prepared by the USSR Gosplan.

In any case, we are entitled to present countercharges against the planning agencies for individual branches and individual republics. Surely none of them can accuse us of having started our work without their knowledge and consent. At last year's conference of the planning agencies we all fully agreed that joint work was indispensable to produce a long-range plan; we agreed on the forms of collaboration and set to work. But almost from the second day it became evident that each planning agency was working according to its own methods.

The USSR Gosplan, following the resolution of the congress, set to work simultaneously on the general and the long-range plan. The Russian Republic Gosplan decided that the general plan had to be completed first and therefore did not even start working on the five-year plan. I do not know how far the Russian Republic Gosplan has gone with its general plan but I am aware that its subsidiary, the Agricultural Planning Commission of the Russian Republic, adopted a position that does not seem to promise a rapid drafting of a general plan even within the boundaries of the Russian Republic. The Agricultural Planning Commission decided

that a general plan was not needed, that it was impossible to foresee ten or fifteen years ahead and that the wisest thing was to limit oneself from the very outset to a five-year planning period. Now we ask: when, in view of this position of the Agricultural Planning Commission, shall we have a general plan for the Russian Republic and when would we have been able to start working on a five-year plan for the USSR had we waited for the district-by-district plans from the Russian Republic Gosplan? It is obviously impossible to speak of a planning independence of the planning agencies and of their refusal to adhere to mutually agreed upon decisions. And without such a discipline and without the active participation of the republics and ministries, an ambitious project like long-range planning for the whole economy of the Soviet Union can hardly be carried out in a very satisfactory fashion.

In view of this, whatever we have achieved in the district-by-district work can be viewed only as a preliminary working hypothesis requiring further study jointly with the local agencies.

On the other criticisms that I should like to answer, I shall first cope with the reproaches that our reports are incomplete. It is impossible to encompass the unencompassable. How could a mere two-hour report, in fact how could even an encyclopedia, answer all the questions posed by curious critics on all the prospects of our national economy five years ahead? Even without this, we have been accused of trying to foresee more than the present level of our knowledge makes possible. True, in this accusation we find an approach to planning with which we do not agree. We feel that our long-range plan must give not a sum of forecasts but rather a system for an economic policy, i.e., a system of economic tasks and directions expressed in figures. These tasks must be completely realistic in the sense that they must be realizable provided a sufficient will to realize them is exercised. However, these tasks will not be fulfilled or they may be fulfilled on a completely different scale if our regime chooses to follow a different economic policy. Thus if we end the monopoly of foreign trade, if we renounce the industrialization of the country and other such economic policies, what we would accomplish would be completely different from what is outlined in our five-year plan.

If all our planning consisted of foreseeing what is objectively inevitable, independently of anybody's will (which is the case with the spontaneous development of the capitalist countries), then we should really have been forced to base ourselves on purely

scientific forecasts. But in that case, it would have been impossible to talk about planning. It makes no sense to draw plans for the next solar eclipse or for the next capitalist crisis—they will occur without our planning! But under the Soviet regime, the point of planning is precisely to concentrate the will and efforts of the workers and the economists on certain selected objectives. That is why we disagree with our critics such as Kondrat'ev and consider that the main point in planning is not foresight but the selection of tasks and instruction on how to achieve them.

If our tasks and directives are included in the system of the Soviet economic policy, the path of economic development we indicated will be followed; if, on the other hand, our plan is rejected, we refuse to be responsible for any of the "prognostications" it may contain.

Our critics who base themselves totally on prognostication believe that those who draft plans must also be able to prognosticate whether their plans will be adopted or rejected.[1] Unfortunately, the author of this demand has yet to explain to us what methods he intends to use to obtain scientific forecasts of the probable resolutions of the Council of the People's Commissars or of the Politburo.

We, in any case, understand our task quite differently. In drafting economic plans, we are mostly guided by their suitability and how they fit in with our objectives. There is no need for us to try and guess whether we shall be able to convince the agencies whose approval we need to confirm these plans. The guessing game as to which plan would appear the best for this or that agency is no longer planning but something else. And that would entail the renunciation of new, creative ideas since no one can tell how such new ideas are liable to be received. To put it differently, this attitude would doom planning to a sort of hopeless "me-too-ism," not to use a stronger expression.

Each planner is a public servant and as such must defend his opinions whether or not they are shared by his superiors. Of course, it is possible that we are wrong but those who occupy other positions in the administration may also be wrong—no one is insured against error....

Now I shall examine the reservations made by V. A. Bazarov.

1. "If a given system of measures was adopted and later was not carried out, this indicates that its assumptions were unrealistic, i.e., the prognosis concerning the probable tendency of the measures was erroneous." This is the way Professor N. D. Kondrat'ev ends his piece "Planning and prognostication" in Puti sel'skogo khoziaistva, no. 2, 1927.

I find in them much that is correct. But it seems to me that this advocacy of the division of labor on an international scale is somewhat premature. If we are talking about small correctives, I do not believe that anyone will argue against them. But there is too much drama in the way he presents his question. There is nothing to indicate that we are facing the ghost of cold and starvation. We should not take too seriously this sort of prognostication. There are only two ways of solving fully the problem of the international division of labor: either by bringing world revolution closer or by capitulating to capitalist encirclement. Only the first method is acceptable to us. But, of course, if Comrade Bazarov knows how world revolution can be carried out within the next five years, let him tell us. However, according to Bazarov, even revolution would not satisfy his aspirations. In that case, we had better postpone all this talk.

Now for the criticism of Comrade Gukhman. I have not found any well-founded objections in what he said. All he seemed to do was to advise us to take into account all the pros and cons (Krzhizhanovskii: "For each pro he found a contra.")

We have tried to do this ourselves to the best of our ability. If he can navigate our planning ship better than we can between all these pros and cons, well, let him do it. In one thing, however, he is wrong. That is when he says that we do not describe the specific difficulties of the present Five-Year Plan. This shows that he has not read our report carefully. The passage he quoted referred to the problems of long-range planning in general and not to the period between 1926/27 and 1930/31. Had he read further, he would have found all those concrete difficulties and problems which apply to this five-year period.

I shall not bother to answer Comrade Essen, who expressed his delight here at not having gotten involved in the preparation of a long-range plan. I believe that this is a great mistake of the Russian Republic Gosplan officials and that they will feel it soon enough themselves. I would like to see their draft of the five-year plan that they must present in one month if they have not yet worked on it. (Essen: "It won't be any worse than yours.") If you believe that this work can be done in three days or so, I am sure it will be very good....

Now I shall deal with the criticism of Comrade Tumanov.

In some respects, he revealed his agrarian bias, which earned him a measure of Kondrat'ev's approval. I do not doubt that he will not agree with my appraisal of him. But then all the other representatives of this deviation protest when accused of it and

claim to be the most ardent partisans of industrialization. Even Comrade Shanin said that industrialization was necessary, but it should be started from the other—meaning the agrarian—end. Now if people like Shanin and Kondrat'ev wish to call themselves "industrialists" and us the "super-industrialists," that is their personal business. But we still prefer to call a cat a cat and a rabbit a rabbit. Comrade Tumanov tried to present the compilers of the Five-Year Plan as enemies of machines, people who do not understand that a plow is better than a hoe, that mechanized labor is better than manual labor, etc. This, of course, is not serious. We do not argue against the fact that in certain districts tractors are needed, and in others harvesters, and that in agriculture, as in anything else, an increase in labor productivity is desirable. No one would argue against that. But the problem was the following: having only a very limited amount of rubles for capital investments, we had to decide where these could be invested with the maximum effect to increase the general level of labor productivity.

And at this juncture we must explain why machines are so far in much more widespread use in industry than in agriculture. The crux of the matter is that agricultural machines such as plows, drills, threshers, etc., are not in use the whole year round but only between 11 and 17 days of the entire season. Now I am asking you: this being so, how is it possible to equate machines that double the production of a worker in industry and those in agriculture? You know the answer yourselves. And this is where the roots of our argument lie. That is why we are prepared to spend much more on the mechanization of industry than on that of agriculture. And, of course, if we are presented with good evidence that such and such a district needs, say, 100,000 tractors instead of 50,000 to cultivate so many hectares of virgin soil and that this is necessary for the harmonious development of our national economy as a whole, well, we shall not hesitate to allocate the funds. In that case, the discussion would be confined to the correctness of the estimate.

We shall content ourselves with answering briefly the criticism presented by Professor Makarov. He took us to pieces using the full weight of his high authority. Brandishing in front of us the pages of our theses, he categorically assured the congress that it was not permissible to produce such plans. But he did not feel he had to explain why it was not permissible. True, he expressed a few valuable, although no longer very new, planning rules. We have been popularizing them for a long time and

are very pleased that Professor Makarov seems to have grasped them. But why should these be used as arguments against our plans? He ought to have shown after all where we went wrong in applying our own method and to what specific errors this led us. But the professor had nothing specific to say on that subject except for an unfortunate reference to Kondrat'ev's fantastic computations about the four billion deficit in agriculture with which we have dealt earlier.

As to Makarov's ideological criticisms of our work, they boil down to the following four points. In the first place, they assert that our insistence on industrialization is primitive. But he does not explain why it is primitive. He says that we stand for "narrow industrialism" while he stands for "industrialization in the broad sense," an industrialization that requires considerable capital outlays for agriculture! But where are these funds to come from? Could it by chance be from the funds assigned to be invested into industry? Had he said this explicitly, everything would have become quite clear: a "broad approach to industrialization" presupposes the restriction of investments into industry. If that is the case, Makarov's is indeed a broad approach.

In the second place, Makarov reproaches us for our sins against Marxism. I shall be happy when Professors Makarov and Kondrat'ev begin giving us lessons in Marxism, assuming, of course, that they first become familiar with this doctrine. But, alas, they are still not familiar with it. Makarov brands our approach as a "consumer's approach" since it is from the standpoint of the consumer rather than from that of the producer. But he has failed to notice that, basing ourselves on the people, we calculate in terms of workers' hands rather than in terms of mouths and stomachs. We pose the problem of an optimum utilization of manpower. That is the approach of a producer.

Another observation about the problem of prices. Professor Makarov announces that the price relation we planned will not be accepted by the village. This is a very strong argument. The only thing I do not know is why such statements should come from Makarov rather than from the peasants. (Makarov from the audience: "You did not listen to the peasants very well.") The fact that the peasants supported the Soviet regime and not the parties that offered them different things proves that we have a common language and a mutual understanding. The price problem for the peasants is different from what many people imagine. What matters to a peasant is not the number of kopeks he can get

for a pood of grain but the number of yards of cotton material he can buy for one pood of grain he sells. From this viewpoint we intend not to stabilize farm prices but to raise them. It can be argued that the peasant would have preferred even a great increase in farm prices. But we refuse to take this into consideration where there is no realistic possibility for such an increase. This would no longer be the approach of an economist or of a socialist but that of a peasant lover....

Makarov's last criticism touches upon our foreign relations. He points out our isolation from the world market. If he has in mind the modest scope of our import-export trade, we should be very anxious to hear any suggestions as to how this could be improved. But even within the indicated limits our foreign trade should be adequate to realize our plan for capital investments and for the reconstruction of our economy. Now, if he means that we failed to schedule any large influxes of resources in the form of foreign loans, we wish to make it clear that this is in no way due to our refusal in principle to take advantage of such an opportunity when it presents itself. We prefer simply to keep such a possibility in mind so as not to delude ourselves.

In this respect the Five-Year Plan of the Supreme Council of the National Economy was much bolder than ours when it introduced into its balance such hypothetical items as foreign loans. But then, when assigning the resources by branches, the Supreme Council very generously assigned all the resources from foreign loans to transportation while reserving the national resources for industry. How the comrades of the Supreme Council regard our five-year plan is not too clear to me. From Comrade Ginzburg's speech, it may be inferred that our differences could be easily resolved. But when I listened to other representatives of the Supreme Council such as Comrade Sabsovich, it sounded to me as if neither our nor their five-year plans were any good. Now if that was the case, I do not see on what basis we could agree. To me, Sabsovich's pessimism seems exaggerated. He said he would have liked to see the past achievements taken into account more. So would we. But our Five-Year Plan, as is, is based on rates of development in agriculture and other branches that are unprecedented in the capitalist world, rates which our ideological friends from the People's Commissariat of Agriculture consider unrealistic. We do not agree with them. I am convinced that in our planning we have kept a sound safety margin. But wouldn't it be better to keep it that way?

Now for the principle of full priority in planning advocated

here by A. M. Ginzburg. I think it is a good principle when not abused. We have had quite a number of experiences of this sort. We have proclaimed: "all for transportation," "all for fuel," etc. But what often happened was that when we managed to pull the tail out, the nose sank in; when we pulled the nose out, the tail sank into the mud. And we are afraid that our flanks will sink into the mud when we give full priority to the center and vice versa. Whatever it may be, we have a chain between all our districts and branches of production and such priorities may break the chain and then it is bound to hit somebody on the head. And speaking about a system of priorities, we must never forget the principle of proportionality....

G. M. Krzhizhanovskii

INTRODUCTION TO THE CONTROL FIGURES FOR 1928/29

The discussion on the material of the Control Figures for 1928/29, which has already developed, clearly attests to the growing importance of the Control Figures as well as to the peculiarities of the year which we are entering.

The Control Figures are winning for themselves, to a greater and greater extent, the position of truly basic landmarks of an operational economic plan comprising both construction and "work in progress" in an annual period.

The circle of co-workers taking part in this responsible work is growing. The republics, districts, departments, and establishments rally more and more in the course of the work on the material included in the Control Figures and from year to year, under our eyes, the methodological aspects of this work are perfected more and more.

The scientific analysis that is indispensable for the elucidation of the economic dynamics of the past and setting planned tasks for the future is also becoming more profound. The role of the Gosplan groups working out basic problems in value terms—savings, prices, separate economic balances, efficiency of capital construction, etc.—is acquiring a greater and greater importance. The linking of the work on the Control Figures with the purposeful tasks of perspective plans is improving markedly. The analysis of social ties and social differentiation and the work on the transformation of technico-economical optimum into a social optimum is making notable steps forward with every year. Economics is becoming condensed politics; variants of the Control Figures—the Control Figures as a system of numbers—are becoming a more and more distinct illustration of the currents of political thought.

The problem of metals and the grain problem stand out in particular as critical questions for the entire future dynamics

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Kontrol'nye tsifry narodnogo khoziaistva na 1928/29 god. Gosplan SSSR, Introduction; published by Planovoe khoziaistvo, pp. 11-19, Moscow, 1929.

of our economy as a whole. To take full account of the acuteness of the situation in these "bottlenecks" of our economy means to predetermine the smoothest possible rise of our economy in its totality for the coming years.

The analysis of our current difficulties is richly illustrated with the materials of the present Control Figures; to what does it lead? Nothing has been obscured here. The appropriate figures and facts have been presented with perfect distinctness: difficulties of growth, temporary disproportions, inevitable defects accompanying the huge and complex job of transferring the economy as a whole to planned tracks, or organic defects such as miscalculations of planning leadership which can be explained only by the complexity of the basic tasks.

This is the question, and a reply to it—a direct and unequivocal one—is provided by the entire material of the present Control Figures. This reply is: the direction of our entire economic and political work is deep and historically true. The helm has been set correctly. The pilot is still the same, faithful and well-tried, the Bolshevik Party—Lenin's party.

But does this mean that an economic plan sketched at the present time will be fulfilled 100 per cent? Of course not. To maintain it means to be a fetishist of the plan, means to forget all that Comrade Lenin was saying about bureaucratization of planning.

The first stage of the period of reconstruction, which we are definitely entering at present, is inevitably accompanied by an extraordinary complication of the surrounding situation in all its aspects. At these initial stages, our hereditary historical economic disproportions are being mitigated and overcome at some individual poles, and are growing, developing, and deepening at other poles. The problems of culture and of organizational skill are acquiring a greater and greater weight, but we still do not have those stable "indexes" for these magnitudes with which we operate in our technico-economical analysis of the material constructs of the economic plan. What a wide range of jobs only barely begun! In prospect there is a transformation of the Gosplan into a most important scientific and research organism of the country.

The XVth Party Congress has already noted those particular difficulties which will stand along our way in connection with the backwardness of agriculture and of its production of grain in particular. This Congress has emphasized a number of basic disproportions left to us from the past: the "scissors" between

prices in industry and in agriculture, between wholesale and retail prices, and between world and domestic prices; the disproportion between demand for technical raw materials and their actual supply; and, finally, the disproportions in our country between the possibilities of quantitative growth of the industrial labor army and of the labor "reserve" army. The material of the present Control Figures attests to the fact that the first basic disproportion marked out with such distinctness by the XVth Party Congress—the "scissors" between the dynamics of the growth of industry and of agriculture—has not yet entered its zone of mitigation. On the contrary, a danger seems to be arising of some break of the leading dynamic indicators of industry from their agricultural bases. The most important task of the present Control Figures is to determine, with ample factual materials, all pertinent magnitudes, to provide a mathematically and economically correct diagnosis of the actual state of the matter, and to project an entire arsenal of measures, proximate as well as perspective, those having an immediate application to power supply in agriculture as well as those elucidating all potential possibilities present in our Soviet reserves. There is no doubt that here we are going beyond the narrow limits of an annual operational plan, but it would be pedantic to become embarrassed by this circumstance.

Which disproportions of a new order can be noted by us as resulting from the entrance of the economy into the phase of socialist reconstruction? It seems to us that the following should be referred to here:

(a) The general growth of domestic production is not accompanied by a corresponding quantitative growth of foreign trade, a fact which, in turn, depends not only on the lack of coordination between domestic outputs and the needs of the world market, but also on the policy of economic and financial isolation of the USSR due to continuing capitalist encirclement. A direct expression of this disproportion is represented by our needs in foreign currencies, by our overexpenditure of our currency means, and by shortage of currency savings as necessary reserves for defense purposes and as insurance against economic difficulties.

(b) The second growing disproportion of the new time is that which arises in conditions of a progressing technico-economical rationalization of our economy in regard to the labor force drawn into the economic organism. At the foundation of rationalization lies the inevitable law of the transfer of the center of gravity of the mechanism of production from living labor to a steel slave—

the machine. And our socialist construction requires a more and more definite realization of the basic right of Soviet citizens—the right to productive work. Only a huge growth of the scope of labor, only a gigantic quantitative increase in our entire productive activity can ease off this disproportion and shake off from the shoulders of the living generations the oppressing conditions of unemployment. Thus, on the one hand, maximal rates of growth of industrialization, not only industrialization in industry, but also industrialization of agriculture and development of new areas of activity necessary for the republic of the Soviets in the sphere of material as well as spiritual culture—this is what lies, first of all, on the positive side of the balance. As opposed to it, there are however a whole series of limits, characterized by the shortage of resources at our disposal for economic construction, and by the danger of disruptions in the normal processes of distribution, inevitable in conditions of a slovenly commitment of our resources to constructions which require prolonged building processes for their completion. In the last report, a correct solution can be found only during the drafting of long-term perspective plans, since the solution of the tasks to which we refer here obviously requires "serious and prolonged" work. One of the keys to a correct solution of the problem of unemployment must be a radical revision of all our previous positions regarding the problems of organization of labor, i.e., instillation of new themes connected with the socialist reconstruction also in this area. A definite transition to a seven-hour working day represents only the first sign in this direction. In perspective, the problem hinges on a more radical change in the relationships of time expenditures in the time budget of the workers of the republic....

(c) Finally, the third kind of disproportion of the economic period which we are experiencing is represented by the "scissors" between potentialities and the reality of our reconstructive work. There is here a whole complex of various magnitudes.

It would seem that the nationalization of industry secures for us a rapid mastering of the main key to cheap production and rapid economic turnover—a massed, typified, and standardized production.

In reality, however, it turns out that an actual nationalization of industry, i.e., its real economic mastering through a correctly organized and adequately qualified leadership, represents a process extended in time and meeting considerable resistance from numerous survivals of the past, and from the crossing of group and shop interests.

It would seem that along our way there is a comparative minimum of obstacles to the borrowing of the last word of technology from the countries which have outstripped us for the organization of our factories. But—not to speak of our limited resources for the appropriate capital investments—we are running here against special limits in the availability of adequate technical cadres and in the competition of cheap labor force. Technical optimum does not always coincide with economic optimum and the solution of the problems is becoming complicated.

It would seem that devices of planned economy secure for us a maximally correct distribution of material productive resources over the country, and the proper methods of work, and the allocation of needed human resources to needed places.

In reality, however, we have to take into account unplanned construction and various disruptions in planned policies and directives, and actual economic practice.

In particular, for example, we have to emphasize especially the contradictions between quantitative requirements presented to production and our progress toward its qualitative improvement.

A large growth of the population, a continuing cultural rise of the wide masses of workingmen, a further activation of outlying districts and backward nationalities—all this, in general, presents an ever growing demand on the goods market. The extreme wear, both technical wear and obsolescence, of our production apparatus requires from us a rapid transition to new and technically more perfect units of production, the transfer of the entire economic apparatus to a new technical basis. However, the necessity of considering the market equilibrium and the linking of new construction and of capital reconstruction with not only a considerable expenditure of material means but also with the inevitability of long calendar terms of new large-scale construction force us not only to keep in production technically worn and obsolete equipment but also to put into operation plants of low quality. Quantitative production needs are thus being put in obvious contradiction with qualitative ones. From here follows a certain dispersion of capital means over the entire production front, deviations from the straight lines of planned construction pursuing the aim of a decisive technical reconstruction of the economy, and a resulting considerable reduction of the general efficiency of capital investments.

Finally, there is a considerable distance between "what should be and what is" with regard to the tendency of our

organizational projects as well as with regard to the quality of the entire system of our plan. The difficulties of growth are also inevitable here. They are also inevitable results of all that objective environment in which our Soviet economy is developing.

A series of factors is thus acting in the same direction and results in a certain summary disproportion between the absolute growth of capital investments in the reconstruction of our economy and the rates of growth of its actual efficiency. These disproportions can be solved only in proportion to our successes in the actual, thoroughly thought out, and planned rationalization of our economy as a whole....

For the purpose of elucidating the planned ways of rationalization of industry, the Control Figures provide, this time, a more synthetic grasp of the lines of capital construction and of the work of industry in reducing production costs. Along with the division of industry into groups "A" and "B," i.e., into industries of means of production and of mass consumption goods, the task of dividing industry into a number of categories and sections described by definite indicators is increasingly becoming the next task (indicators of industrial exports, of industrial efficiency, of labor absorption, section "industry and agriculture," section "industry and transportation," etc.). Correct construction of these series could greatly contribute to formulation of the necessary methodology of the entire management of our economy in the area of industry, in other words, to a correct orientation in the realization of the most urgent tasks of industrialization. We could act here in the very same manner as mathematics operates in the analysis of magnitudes which are in complex functional dependence. Analyzing such complex functions, a mathematician easily reveals those inner regularities which characterize a given function in distinction from functions of a similar order. The data on industry disclose the critical bottlenecks of our economy; the series on the industrial branches working for export reveal our difficulties in the foreign trade area; the data on industries working on an autonomous business basis give us an idea on the correlation of magnitudes determining internal savings in industry. The series on labor absorption points to our needs concerning the training of cadres and the struggle against unemployment....

Next in order, and no less urgent, is the necessity of working out a special directory of our Control Figures. Into these directories we should enter the addresses and characteristics of

exemplary plants and factories, exemplary state and collective farms, and exemplary sections of railroads, all of which, in their totality, could be excellent pushers of rationalization.

While regarding self-criticism as a necessary and very useful tool of socialist construction, we should not lose sight of the fact that it represents only one of all the aspects of our work on the socialist reconstruction of our economy. Self-criticism is a kind of powerful plough of the community which is being socialized, which reveals the inner structure of the entire field of labor. A passage of this plough can remove a mass of weeds from the surface of this field, but this is only a necessary prerequisite and the first stage of the work. Its effectiveness depends entirely on what seeds will be cast upon the soil turned up by self-criticism, what tools of production will then be set in motion on the turned-up soil, and by what methods and by whom it will then be cultivated and harvested. Socialist rationalization as a whole is predetermined by a rationalization of individual parts of the process described by us. The problems of technical reconstruction, of economic expediency, and of securing the interests of workingmen, i.e., the problems of social expediency, are interwoven into one unbreakable whole.

The first and basic task of any economic plan—annual or long-term—consists in finding a proper optimum in the relationship of these critical points: technology and economic and social relations. However, a correct solution of this task, divided in its turn into a whole series of sub-tasks, is extremely difficult, not only by virtue of its extraordinary complexity but also by virtue of definite limits of planned economy and planning possibilities, existing objectively. We must dwell upon this problem once more here, both because the correct evaluation of our economic and planning accomplishments is impossible if we do not realize the changes which occur in planning possibilities, and because critics from the enemy camp incessantly search for "errors" and give a completely distorted picture of the mistakes arising from our attempts to bring the complex Soviet economy under a planning regime.

As a matter of fact, can one limit oneself to an elementary quantitative evaluation of our planning accomplishments only? Can one, for instance, be satisfied with a mechanical comparison of the system of indicators taken, for instance, from the Control Figures for 1927/28 with the indicators of the actual fulfillment of this economic plan? Such a position of our opponents simultaneously greatly honors and greatly dishonors us.

First of all, it should be said that in the Control Figures of the present year as well as in those of the next and the following years we still do not by any means have a 100 per cent complete system of solid numbers. The series of these numbers has a definitely conditional meaning as a result of their dependence on the success or failure of some economic maneuver. It is also necessary to note that the part of construction which is being realized during a year's period of our work constitutes a partial realization of the five-year program of our construction projects, and this program, in turn, constitutes a section of the General Plan of our economy. It is self-evident that the requirements of quantitative approximation are different when we have in mind an annual calendar term and when we consider the presuppositions inherent in a plan for a five- or ten-year period. A consideration of the possibilities of prognosis forces us, for instance, to proceed by way of not one but a series of numbers in the Five-Year Perspective Plan. It is very probable that both the calendar limits and the figures of the General Plan will have to be subjected to special reservations making them particularly conditional. Thus if our critics wish to see an ideal and stable system of solid numbers in our Control Figures, we have to correct them by pointing out that we must decline this honor since it is beyond our abilities. On the other hand, planning of the state sector of the economy, to which we have a sufficiently reliable approach, can be accompanied by coefficients of accuracy very different from those used in planning private and "intermediate" sectors representing a periphery, gigantic in its power. Critics who do not understand the relativeness of our solid numbers press upon us the position of bureaucrats of planning, and we do not deserve this dishonor.

Last year's Control Figures evoked wide interest not only within our country but also beyond its borders. We hope that the present work will represent a further stage, able to attract even wider attention. We welcome any businesslike criticism, but the criticism which reproaches us for the lack of realism in planning should first of all make sure that it is realistic itself, that it perceives reality as it is and not in a curved mirror. What does this living reality tell us? We are building socialism, but we have not by any means built it yet. In other words, we are building a planned economy, but we are in the process of its construction, and just as it would be strange to require from any large architectural structure that the proportion of its parts be obvious to anybody at the time when the structure is still

surrounded by woods and incomplete even in the rough, it would be equally strange to require a perfection in figures and in the quality of projects from our planning presuppositions....

We are convinced that one of the commanding heights of our economy—potentially the most important height—is represented by the planned development of the economy. However, we are realizing this planned development in one of the most technically backward countries, under frequently excruciating circumstances, during a stage of transition from private to collectivized economy. There are no completed theories of such a transition, nor can there be any. There are no analogous precedents even in history. For this reason, the socialist construction cannot at first avoid a considerable amount of groping. And where practical activity outstrips theory, an infallible creation is impossible....

Bureaucratism in planning and a scholastic attitude toward the so-called "laws of the market" would inevitably put us in a hopeless position: a collision between the market and the plan would in such a case be inevitable. This does not mean that we are completely insured against such collisions. Mistakes in plans and mistakes in economic maneuvers lie in wait for us, and there is no smooth road ahead of us by any means. However, a study of the dynamics of capitalist society shows us clearly that the servants of capital make extremely audacious attempts against the same "holy of holies"—the market—which they defend in their conflicts of principle with us. We know how large-scale financial capital operates its conspiracies against national and international markets, how it in fact treats the "sacred" laws of free competition, and how it deals with competitors who defend the rights of free initiative and "equality of conditions." ...

The Control Figures of every year concern current economic practice. If there is a certain discrepancy between a long-term plan and that section of the plan which is dealt with in the system of Control Figures, there is another discrepancy between the projects of the Control Figures and current economic practice. In other words, the system of Control Figures, if it is successful, presupposes a considerable scope, as was noted above, for an actual economic maneuver....

Our economic balance as a whole, and its practical realization, depend on a firm conviction that only if our economic mechanism works at high speed, only if all its parts put forth an intensive effort, only if there is far-sighted consideration

of the rearrangement of class forces that looms beyond the present economic plan, will it be possible to make ends meet with a minimum expenditure of our resources, and in such a way that the basic socialist orientation of our economy will not be distorted.

Gosplan

PREFACE TO THE FIRST FIVE-YEAR PLAN OF THE USSR

The Presidium of the Gosplan begins the publication of the Five-Year Economic Plan of the USSR for the period 1928/29-1932/33 after the plan has been subjected to a detailed discussion at the congress of planning organs and in the government and after the Five-Year Plan (in its optimal variant) has been approved, in principle, by the government as a program of the economic construction for the coming five-year period. The Presidium of the Gosplan considers it necessary to emphasize some most general conclusions reached during the course of the discussion on the Five-Year Plan.

First of all, a complete unity of the entire planning front of the country in the evaluation of the proposed project of the perspective plan should be noted. All basic problems of the Five-Year Plan (the problem of rates of growth and proportions of economic development, of the scale and structure of capital investments, of the character of the program of construction, of the socio-economic aspect of the plan, etc.) have, in principle, received unanimous approval. This unity in the evaluation of the Five-Year Plan could be reached only on the basis of a correct incorporation of the directive of the XVth Congress of the All-Union Communist Party and of the later plenums of the Central Committee concerning the rise in the productive forces along the way toward industrialization of the country, the socialist reconstruction of the village, and the overcoming of the capitalist and consequent strengthening of the socialist elements in the economy of the country. The Five-Year Economic Plan is being submitted for an examination by the XVIth Party Conference and the Vth All-Union Congress of Soviets as a plan of large projects and of an extended socialist attack.

The second thing stressed during the entire period of the discussion on the Five-Year Plan was the triumph of the concept

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Piatiletnyi Plan narodno-khoziaistvennogo stroitel'stva SSSR (Five-Year Plan of economic construction of the USSR), Moscow, USSR Gosplan, 3rd ed., 1929, pp. 6-8.

of massive development of electricity as a basis of planned reconstruction. The "energy" orientation of the plan met with a warm response and a full acknowledgment on the part of the workers on the economic front as well as on the part of wide circles of the Soviet public. This secures a continuity of the Five-Year Economic Plan with the GOELRO Plan of electrification which at one time was called by V. I. Lenin the second program of the Party.

The third very important peculiarity of the discussion on the Five-Year Economic Plan was the unity in the evaluation of the district division of labor in the USSR for the coming historical period. For the first time a five-year plan has been presented for discussion by the country in the form of a detailed analysis on the district level, with a thorough elucidation of inter-district problems of economic construction. Everybody knows how varied the economy of the Soviet Union is and what complex problems have to be solved in our economic construction with regard to raising backward economic districts and national republics oppressed under tsarism. A complete unity concerning this problem, achieved jointly with the representatives of all republics and economic districts, attests to the fact that the socialist plan of economic construction of the country has been compiled in correspondence with the nationality policy of the Soviet authorities and on the basis of a correct unification of the interests of the entire Soviet Union with the interests of the republics and regions composing it.

The interest in the Five-Year Plan shown by the scientific organizations and the workers of science should be particularly noted. A socialist plan should and can be a scientific plan. The formulation of a socialist plan of the economy relies on the work of an extensive system of scientific organizations and of a wide cadre of scientific workers. But, on the other hand, a plan of construction of a socialist economy opens up unlimited possibilities for the scientific thought and for the workers of science to realize all that is fruitful, advanced, and revolutionary in all the critical areas of knowledge.

Finally, the unity of the planning front of the country in the evaluation of the Five-Year Plan is extremely important from the point of view of the current conjuncture. The Five-Year Economic Plan has to be examined and approved in the conditions of considerable current difficulties. Under the influence of these current difficulties some people are inclined to doubt the expediency of approving a perspective plan at the present moment.

Our opponents are crying unceasingly about the notorious contradiction between the scope of construction and production tasks of the Five-Year Plan and the character of current difficulties. Let them recall how many cries there were at one time about the contradiction between the GOELRO Plan and the conditions of the productive forces and the economic situation of the country in 1920. However, an overcoming of current difficulties, which are those of a critical stage in the economic construction of the USSR, can be achieved only by means of an inexorable realization of the proposed plan of large projects and an extended socialist attack.

Gosplan

INTRODUCTION TO THE FIRST FIVE-YEAR ECONOMIC PLAN OF THE USSR

1. STARTING POSITIONS

The XVth Congress of the All-Union Communist Party provided exhaustive politico-economic directives for the formulation of the Five-Year Economic Plan, starting from a general course toward industrialization of the USSR, toward a socialist reconstruction of the village, and toward overcoming the capitalist and consequently strengthening the socialist elements in the economic system of the country. The later plenums of the Central Committee of the All-Union Communist Party, on the one hand, and a series of governmental acts, on the other (a decree of the Central Executive Committee of the USSR concerning crop yields) have additionally developed and concretized the instructions of the XVth Congress concerning the ways of raising the productive forces of the country and the problems of economic construction during the coming period. It was the duty of the Gosplan of the USSR and of the entire system of planning organs to translate these general politico-economic orientations and directives into the language of concrete economic and technico-economic calculations and to transform them into a plan of economic construction for the coming five-year period. The present report on the Five-Year Economic Plan represents an attempt at a solution of this task.

2. ORGANIZATIONAL AND METHODOLOGICAL REMARKS

The proposed Five-Year Plan considerably exceeds the calculation of all previous projects with respect to the scale of projected growth of material production, of capital investments,

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Piatiletnyi Plan narodno-khoziaistvennogo stroitel'stva SSSR (Five-Year Plan of economic construction of the USSR), Moscow, USSR Gosplan, 1929, pp. 9-12.

and of qualitative indicators. This is based, on the one hand, on the newly accumulated experience of the initial years of the period of reconstruction, which has shown possibilities underestimated before, and, on the other, on some changes in the character and order of the work on the Five-Year Plan. In accordance with the directives of the XVth Congress about lending to the work on the Five-Year Plan a wider public character, and also for the purpose of a more thorough scientific expertise with regard to the more important elements of the plan, Gosplan conducted during the course of the work on the Five-Year Plan special conferences with the participation of the most prominent representatives in the science and practice of metallurgy and machine building, reconstruction of agriculture, reconstruction of transportation, chemical, lumber, and textile industries, small-scale industry, cooperative construction, growth of skilled labor force, and local economy.

Relying on these conferences, and also on the extensive work of a number of People's Commissariats and, in particular, the Supreme Council of the National Economy and the People's Commissariat of Communication, it proved to be possible to construct a sufficiently concrete program (with designation of objects, districts, and time periods) of the new construction, and also a program of reconstruction and rationalization of the critical branches of the economy, on which all the projected rates of quantitative and qualitative growth are based. From the methodological point of view, this provided the possibility of breaking away from the method of extrapolation to which we had inevitably to resort in the previous stages of perspective planning, and which led to the underestimation of the possible rates of our development and construction.

Along with that, the Gosplan conducted special conferences with the workers of the more important economic districts of the country, during which the real resources and possibilities of every district were weighed thoroughly, with the participation of local people themselves, both from the point of view of All-Union tasks allocated to the area and from that of its specific peculiarities and needs. The work of these district conferences makes it possible for the first time to present the most important elements of the Five-Year Plan by districts, thus revealing the general lines of the redistribution of productive forces among districts and the special tasks regarding the raising of backward districts particularly noted in the decisions of the XVth Congress.

Finally, in the work on the Five-Year Plan during the recent

period we have succeeded in somewhat increasing the clarification of the series on national income, collectivization, energy balance of the country, etc.

The work on the Five-Year Plan has not been definitively completed at the present time and, therefore, a further exposition will require supplementary corrections. The main conclusions, however, will not undergo any essential changes as a result.

3. ON THE TWO VARIANTS OF THE PLAN

The Gosplan starts from the necessity of compiling the Five-Year Economic Plan in two variants. During an analysis of the problem of variants it is necessary to emphasize, very categorically, the unity of economic policy and economic program in both variants. The problems of industrialization and collectivization are determinative in both variants. The construction of the collectivized sector in agriculture has been projected on almost the same scale for both variants, with the greatest possible forcing of this matter in view of its particular importance. The distribution of national income of the population, in particular, in principle proceeds along the same lines in both variants. Finally, the program of the work on strengthening the defense capacity of the country is almost identical in both variants.

The difference between the initial and optimal variants—with unity of their economic policies—proceeds along the following lines. The starting variant takes into account:

(a) the possibility of partial crop failures during the five-year period;

(b) the present-day type of relations with the world economy, approximately (particularly in the sense of the growth of long-term credits—namely, a projected increase at the rate characteristic for recent years);

(c) a relatively less rapid progress in the realization of high qualitative objectives in economic construction in general and in agriculture in particular;

(d) under conditions of approximately the same defense program in both variants, a larger relative weight of the latter in the starting variant.

The optimal variant, on the contrary, postulates:

(a) the absence of any even moderately serious crop failure during the five-year period;

(b) a considerably greater scope of economic ties with the world economy by virtue of the presence of greater export resources in the country (complete realization of the decree of the Party's Executive Committee concerning crop yields) as well as by virtue of a considerably more rapid growth of long-term foreign credits in the initial year of the Five-Year Plan;

(c) a sharp shift in the qualitative indicators of economic construction during the next two years (production costs, crop yields, etc.);

(d) a lower specific weight of expenditures for defense within the general economic system.

Thus the progress of our economic construction during the coming five-year period in accordance with one of these variants can be conditioned by a number of independent factors (failure of crops, insufficient long-term credits) as well as by the degree of our successes in the very difficult matter of realization of high qualitative tasks (production costs, crop yields). In accordance with this, the starting variant can be looked upon as a kind of ironclad minimum within the optimal variant, with unity in their economic programs. The discrepancy between them is fixed at, approximately, 20 per cent (with identity of a number of indicators), i.e., at a one-year period of development. In other words, the program (optimal), which under some conditions we can realize in five years, under other less favorable conditions (characteristic of the starting variant) will be stretched over approximately six years. The formulation of the Five-Year Economic Plan in two variants, even considering the difficulty of this problem, should secure great maneuverability in annual economic plans and a high preparedness for overcoming those enormous difficulties which lie on the way toward the realization of the five-year program of economic construction.

G. A. Fel'dman

THE ANALYTICAL METHOD OF CONSTRUCTING PERSPECTIVE PLANS

1. ECONOMIC BASIS OF THE ANALYTICAL METHOD OF PLANNING

...The equations that follow from our schema were derived and discussed in our article published in Planovoe khoziaistvo, 11 and 12, 1928.[1]

For continuity with that article and for those who cannot make use of it, we shall present the equations, after some short explanations.[2] To simplify the system of symbols we shall denote the growth rate of a function [first derivative of a function] by a single prime sign, the growth rate of a growth rate [the second derivative of a function] by a double prime sign. Thus the rate of growth of D will be denoted by D', the rate of growth of D' by D''.

We define a growth rate as the ratio of the increment of any variable per unit of time to the growing variable itself. In mathematical language it is the ratio of the first derivative to the function; in other words, it is the derivative of the logarithm of the function. One may consider it a most interesting property of growth rates that in many respects they resemble logarithms. Thus, for example, the growth rate of the product of two functions is equal to the sum of the growth rates of the factors. On a semilogarithmic scale, a function that increases or decreases at a constant rate is represented by a straight line.

"Analiticheskii metod postroeniia perspectivnykh planov," Planovoe khoziaistvo, no. 12, 1929, pp. 95-127.

Certain errors in the mathematical formulas in the original text have been corrected.—Ed.

1. G. A. Fel'dman, "K teorii tempov narodnogo dokhoda," Planovoe khoziaistvo, nos. 11 and 12, 1928. The first part of this article is included in Part I of this book (Macro-economic Models); the second part is in Part II B (Economic Growth: Pace and Efficiency).

2. Here is a list of the symbols used in this article by Fel'dman. The symbols are not always identical with those used in "K teorii tempov narodnogo dokhoda."—Ed.

The level of national income and of each of its parts clearly depends upon the size of the corresponding capitals (D_p depends on K_p and D_u depends on K_u) and on the productivity of labor. We shall express this dependence by the following equations:

$$D = S \cdot K \qquad D_p = S_p \cdot K_p \qquad D_u = S_u \cdot K_u$$

$$D = e \cdot n \qquad D_p = e_p \cdot n_p \qquad D_u = e_u \cdot n_u$$

We define the coefficients S, S_p, and S_u as the coefficients of the effectiveness of utilization of the corresponding capital; e, e_p, and e_u as the productivity of labor (output per worker); n, n_p, and n_u as the corresponding number of workers.

The nature of the coefficients of the effectiveness of utilization of capital and of labor productivity are defined by the following expressions:

$$S = \frac{D}{K} = \frac{\text{subjective factor} \cdot \text{hours of work} \cdot \text{technical coefficients}}{\text{total capital}}$$

$$e = \frac{D}{n} = \frac{\text{subjective factor} \cdot \text{hours of work} \cdot \text{technical coefficients}}{\text{number of workers}}$$

To simplify the mathematical analysis we assume that the processes of production, consumption, and accumulation are continuous. The equation which describes the distribution of new capital will then have the following form:

u = producers' goods sector
p = consumers' goods sector
K = total capital (gross fixed assets and circulating capital)
D = net output
α_u, α_p = fractions of net output destined for accumulation
D_u = accumulation
D_{pv} = consumption of workers
D_{pm} = consumption of bourgeoisie
$D_p = D_{pv} + D_{pm}$ = total consumption
$D_m = D_{pm} + D_u$ = surplus product
$\frac{D_v}{n}$ = variable capital. D_v = wage bill per period
$\frac{D_m}{D_{pv}} = \frac{D_m}{D_v}$ = rate of surplus value
$\frac{D_m}{K}$ = rate of profit
e, e_p, e_u = output per man
n, n_p, n_u = number of workers
A_{mu}, A_{mp} = amortization due to obsolescence
OSK = organic composition of capital
S, S_p, $S_u = \frac{D}{K}, \frac{D_p}{K_p}, \frac{D_u}{K_u}$ = effectiveness of utilization of capital
$'$ = rate of growth of a function (e.g., D', K', etc.)

$$D_u = \frac{dK_u}{dt} + \frac{dK_p}{dt} + A_{mu} + A_{mp}$$

where A_{mu} and A_{mp} are amortization due to obsolescence.

From the division itself is determined the part $D_p - \alpha_p$ which goes to sector u to satisfy the direct needs of that portion of workers, white-collar employees, and others engaged in u in one capacity or another. When we calculate in constant prices, $p \cdot D_p$[3] determines that part of D_u produced for the account of the value of net output of p, at the expense of its accumulation. The share of u in productive accumulation is then expressed by the formula:

$$\alpha_u \cdot D_u = D_u - \alpha_p \cdot D_p \quad .$$

Essentially, these formulas exhaust what our schema can yield directly.

However, the following formulas which are derived mathematically from the above fundamental formulas and which establish the mutual relationships of the growth rates of the elements of u and p are also interesting:

$$D' = S' + K' = e' + n' \qquad D'_u = S'_u + K'_u = e'_u + n'_u$$

$$D'_p = S'_p + K'_p = e'_p + n'_p$$

$$S_u = K'_u + a_{mu} + \frac{K_p}{K_u}(K' + a_{mp})$$

where $A_m = a_m \cdot K$, etc.

Finally we introduce the most general formulas of the rate of growth of national income as a whole

$$D' = e' + K' = S' + \frac{dK}{dt} \div K = S' + \frac{D_u - A_m}{K}$$

$$D' = S' + \frac{S(D_u - A_m)}{D},$$

and with $A_m = 0$

$$D' = S' + \frac{D_u}{K} = S' + \frac{S \cdot D_u}{D_u + D_p} = S' + \frac{S}{\frac{1 + D_p}{D_u}} \cdot$$

3. This symbol "p" presumably stands for price index deflator, the reciprocal of the price index number.—Ed.

In analyzing the class relationships of the capitalist economy one must keep in mind that $D_p = D_{pv} + D_{pm}$, i.e., that consumption equals consumption of the proletariat + consumption of the bourgeoisie. The total surplus value is:

$$D_m = D_{pm} + D_u .$$

The rate of surplus value is then expressed by D_m/D_{pv} and the rate of profit by D_m/K.

The connection between these two Marxian categories is expressed by the formula:

$$\frac{D_m}{K} = \frac{S \cdot D_m}{D} = \frac{S \cdot D_m}{D_v + D_m} = \frac{S}{\frac{D_v}{D_m} + 1} + \frac{S\frac{D_m}{D_v}}{1 + \frac{D_m}{D_v}}$$

but

$$\frac{D_m}{D_v} = \frac{\frac{D}{K}}{S - \frac{D_m}{K}}$$

In Table 1 we show in concrete figures how the rate of surplus value must increase with a decline of the effectiveness of capital, depending on the level of the annual rate of profit. We also introduce a calculation of the organic composition of capital [organicheskogo stroeniia kapitala] (OSK).

One can easily derive the dependence of the rate of surplus value D_m/D_v on the organic composition of capital, given the turnover period of variable capital (n) and the effectiveness of utilization of capital (S).

The organic composition of capital is expressed as follows:

$$OSK^4 = \frac{K - \frac{D_v}{n}}{\frac{D_v}{n}} = \frac{n \cdot K - D_v}{D_v} = \frac{n \cdot D - S \cdot D_v}{S \cdot D_v} =$$

$$\frac{n(D_m + D_v) - S \cdot D_v}{S \cdot D_v} = \frac{n}{S} \cdot \left(\frac{D_m}{D_v} + 1\right) - 1 .$$

4. OSK is here defined as the ratio of constant capital $\left(K - \frac{D_v}{n}\right)$ to variable capital $\left(\frac{D_v}{n}\right)$.—Ed.

Table 1

S = .25							
$\frac{D_m}{K}$ =	.01	.02	.05	.10	.25		
$\frac{D_m}{D_v}$ =	.042	.087	.25	.657	∞		
OSK =	7.34	7.69	9.0	12.0	∞		
S = .50							
$\frac{D_m}{K}$ =	.01	.02	.05	.10	.25	.5	
$\frac{D_m}{D_v}$ =	.0204	.0417	.111	.25	1.0	∞	
OSK =	3.09	3.17	3.45	4.0	7.0	∞	
S = 1.0							
$\frac{D_m}{K}$ =	.01	.02	.05	.10	.50	.75	1.00
$\frac{D_m}{D_v}$ =	.0101	.0204	.0526	.111	1.0	3.0	∞
OSK =	1.02	1.04	1.1	1.22	3.0	7.0	∞

On the basis of these formulas we have calculated the organic composition of capital, having arbitrarily chosen n = 2.

2. APPLICATION OF THE ANALYTICAL METHOD TO ILLUSTRATIVE VARIANTS OF A PERSPECTIVE PLAN

The means at our disposal did not make it possible to make precise and thoroughly complete calculations, which are necessary for responsible concrete planning. Our calculations are an illustration of our theoretical presentation and they come more or less close to real planning.

We have first made calculations of the coefficients of effectiveness in the basic sectors of the economy, both according to data for the period 1925/26 to date and according to materials of the Five-Year Plan (Table 2).

The calculated coefficients show great stability and confirm our view regarding the possibility of using them for the analytical method of planning.

On the other hand our attention is forcefully brought to the notion of the necessity of a more thorough analysis of their

Table 2

Beginning of year	1	2	3	4	5	6
D'	.075	.094	.113	.132	.151	.17
D	1	1.085	1.198	1.350	1.540	1.788
$\frac{D_u}{D}$	.167	.209	.251	.293	.336	.378
D_u	.167	.237	.305	.396	.518	.676
Annual increment of D_u	–	+42%	+28.8%	+30%	+31%	30.4%
D_p	.833	.876	.947	1.057	1.204	1.410
Annual increment of D_p	–	+5%	+8.1%	+11.7%	+13%	+17%

change over time. Of particular interest is the indicated time path of the coefficients of effectiveness in industry, which shows growth for the current period and decline for the period of the Five-Year Plan.

This decline occurs, in the main, because of a rapid relative growth of fixed capital. This is confirmed by the following series, which shows the ratio of net output to fixed capital in industry.

Years	1925/26	1926/27	1927/28	1928/29	1929/30	1930/31
	.566	.646	.704	.725	.740	.723

1931/32	1932/33
.691	.666

Assume that we aim to raise the rate of growth of D, by the end of the Five-Year Plan, from 7.5 per cent in 1927/28 to 17 per cent, as is approximately the case in the adopted Five-Year Plan. Considering that under our conditions depreciation due to obsolescence is practically zero, we then obtain the following data for D_u/D. We shall perform the calculation for two variants—for S = .45 and .75—in order to show the significance of increasing the effectiveness of utilization of capital.

We shall make use of the formula:

$$D' = \frac{S \cdot D_u}{D} \quad \text{with} \quad S' = 0$$

where $D_0 = 1$ (national income at the beginning of the Five-Year Plan) = .45 (see Table 2).

Assume now that S gradually increases from .45 to .75:

S = .45, .51, .57, .63, .69, .79 (see Table 3).

Table 3

Years	1	2	3	4	5	6
S'	.133	.118	.105	.095	.087	.08
$\frac{D_u}{D}$	-.129	-.047	+.014	.059	.093	.12
D_u	-.129	.051	+.0168	.080	.143	.214
Annual increment of D_u	—	—	—	+376%	+79%	+49.5%
D_p	1.129	1.136	1.181	1.270	1.397	1.574
Annual increment of D_p	—	+0.5%	+4.0%	+7.6%	+10%	+12.8%

Then, in order to determine D_u/D one must apply the formula:

$$D' = S' + \frac{S \cdot D_u}{D} .$$

We can see from Tables 2 and 3 how differently one may realize the tasks depending on how we shall make use of productive capital. In the second case the consumption of the population is maintained all the time on a very high level even though it grows somewhat more slowly. In the first two years there is not only no need to accelerate accumulation, but, on the contrary, a part of the capital appears to be superfluous for the realization of the plan and can be sold abroad.

On the other hand it is obvious that it would be possible to achieve in the second case considerably higher growth rates of national income if we were to adopt the same relation D_u/D as we had in the first case.

These examples illustrate with what facility one can select, with the use of the analytical method, any type and rate of development of the economy. The only difficulty, but one that is easily overcome, consists in determining the coefficient of effectiveness. It would be necessary to do this for its separate components: (1) the intensity of labor, (2) the duration of the utilization of equipment, (3) the technical relation between net output and the volume of the required capital.

The above rough outline presented to the attention of the reader did not take into consideration the necessity of re-examining, from the viewpoint of realizability, the utilization of capital in the two basic sectors p and u which follows from the relationships obtained in this way. If we were to deal with a more rigid and determined development of S_p and S_u, we should have to consider the equations:

$$S = \frac{S_p \cdot K_p + S_u \cdot K_u}{K} \quad \text{and} \quad K = K_u + K_p \ .$$

If the magnitude of S_p or S_u turns out to be mandatory or if it is adopted in one way or another, then all the other magnitudes will be determined from the two equations presented, given S and K, and this will determine the whole structure of capital and of production as a whole.

Of course, one would have to leave abstraction and deal with concrete things and all planning would have to follow the method of successive approximations or else the analytical-synthetic method.

We have attempted to reveal, by means of the categories which we have established, the nature and the dynamics of our Five-Year Plan and we have outlined two variants: one that is least satisfactory from the viewpoint of utilization of capital but which carries on, in general and as a whole, those lines of development which took place until last year; and a second one, a high intensity variant.

The results of our calculations are contained in Table 4.

We shall present some clarification concerning this table.

The sum of national income (D) and the sum of total capital (K) were obtained directly from Gosplan data. They are expressed in 1925/26 prices. The increment of capital equal to the productively accumulated part of national income (D_u) is obtained from data concerning the growth of capital stock. The consumed part of national income (D_p) is the difference $D - D_u = D_p$.

The effectiveness [of utilization] of all capital is determined by the equation

$$S = \frac{D}{K} \ .$$

The growth rates D', D'_u, D'_p, and K' as well as the ratios D_u/D and D_u/D_p can be calculated directly from the data obtained earlier and we have determined them for each October 1 as average interpolated magnitudes.

Upon closer examination of the dynamics of D_u/D, D', D'_u, and D'_p for the period of the Five-Year Plan (in the first variant) we observe the absence of symmetry in the distribution of national income. Particularly striking is the decline of the rate of growth of consumption as of October 1, 1929, and a substantial tendency to oscillation of D_p for the following years.

Table 4

Dynamics of National Income
billions of rubles*

On Oct. 1	National income D	Accumulation of productive capital D_u	Consumption D_p	Share of accumulation in national income D_u as % of D	Rate of change in structure of national income D_u as % of D_p	Total capital K	Total capital in u K_u	Total capital in p K_p
	1	2	3	4	5	6	7	8
								Variant
1926	22.5	4 0	18.5	17.9	21 8	54 6	8.7	45 9
1927	24 0	4 8	19 2	20 2	25 4	59 0	10.9	48.0
1928	26.2	5.0	21 1	19 2	23.8	63 9	11 1	52 8
1929	29 6	8 9	20 6	30 3	43 5	70.9	20 3	50.5
1930	34.2	12.2	21 9	35.9	55.9	81 5	28 1	53.4
1931	39 6	15.9	23.7	40 1	67 0	95 6	37 1	58 5
1932	46.3	19 4	26.9	41.9	72 0	113 3	45.9	67.4
1935	73 4	29 9	43.5	40 7	68.7	187.3	73.3	114.0
1938	109 6	40 4	69 1	36 9	58 5	292 9	102.8	190 0
1941	153.0	50.9	102 1	33 3	49 9	429 9	134 7	295 2
1944	202 2	61 4	140.8	30 4	43 6	598 5	169 2	429 2
1947	255.4	71.9	183.4	28 2	39 2	798.6	206 7	591.8
1950	310.9	82.4	228 5	26 5	36 1	1 030.2	247 6	782 6
								Variant
1926	22 5	4 0	18 5	17.9	21 8	54 6	8.7	45.9
1927	24 1	4 9	19 2	20.2	25 4	59 1	11.0	48 1
1928	26 2	5.0	21 2	19 2	23.8	64.0	11.2	52.8
1929	29 6	9.0	20.7	30 3	43.5	71 0	20.4	50 6
1930	41.9	15.4	26 5	36.8	58 2	81 9	29 2	52.7
1931	60.6	26.3	34.3	43 4	76 7	100.0	42.6	57.5
1932	91 3	45 6	45.6	50 0	100 0	130 4	64 3	66 0
1935	224.5	112 2	112.2	50.0	100.7	320.7	158.3	162 4
1938	552 2	276 1	276 1	50 0	100 0	788 9	389 3	399 6
1941	1,358 4	679 2	679 2	50 0	100 0	1 940 6	957 7	983 0
1944	3,341 7	1.670 9	1 670 9	50 0	100 0	4,774 0	2 355 9	2.418 0
1947	8,220 7	4 110 4	4,110 4	50 0	100 0	11,743 9	5,795 4	5,948.4
1950	20,222 9	10 111 5	10,111 5	50 0	100 0	28,889 9	14,256.9	4,633 1

*Figures may not add because of rounding – Ed.

1926-1950—Illustrative Data
at 1925/26 prices

Rate of change of structure of capital	Maximum rates of change of D under proportional growth of K'	Rate of growth of capital			Coefficient of capital effectiveness			Rate of growth of national income		
K_u as % of K_p	$K'_u = K'_p$	K'	K'_u	K'_p	S	S_u	S_p	D'	D'_u	D'_p
9	10	11	12	13	14	15	16	17	18	19
Minima										
19.0	7.4	—	—	—	41.2	46.2	40.3	—	—	—
22.8	8.2	8.1	26.0	4.7	40.8	44.4	39.9	6.9	21.1	3.8
21.2	7.9	8.3	1.7	9.8	41.0	45.2	40.1	8.9	3.6	10.3
40.3	12.7	10.9	82.4	- 4.2	44.7	44.1	40.8	12.9	78.1	- 2.6
52.6	15.0	15.0	38.0	5.7	42.0	43.6	41.1	15.6	36.7	6.5
63.5	16.6	17.3	32.1	9.5	41.5	42.8	40.6	15.8	29.7	8.1
68.2	17.2	18.5	23.6	15.2	40.9	42.3	40.0	16.9	22.0	13.5
64.3	16.0	18.2	16.9	19.2	39.2	40.8	38.2	16.6	15.5	17.3
54.1	13.8	16.1	11.9	18.6	37.4	39.3	36.4	14.3	10.5	16.7
45.6	11.8	13.6	19.4	15.8	35.6	37.8	34.6	11.8	8.0	13.9
39.4	10.3	11.7	7.9	13.3	33.8	36.3	32.8	9.7	6.4	11.3
34.9	9.0	10.1	6.9	11.3	32.0	34.8	31.0	8.1	5.4	9.2
31.6	8.0	8.9	6.2	9.8	30.2	33.3	29.2	6.8	4.6	7.6
Maxima										
19.0	7.4	—	—	—	41.2	46.2	40.3	—	—	—
22.8	8.2	8.1	26.0	4.7	40.8	44.4	39.9	6.9	21.1	3.8
21.2	7.9	8.3	1.7	9.8	41.0	45.2	40.1	8.9	3.0	10.3
40.3	12.7	10.9	82.4	- 4.2	41.7	44.1	40.8	12.9	78.1	- 2.6
55.4	18.8	15.4	43.3	4.2	51.1	52.7	50.2	41.3	71.4	28.2
74.1	26.3	22.2	45.8	9.1	60.5	61.7	59.6	44.7	70.7	29.6
97.4	35.0	30.2	51.1	14.8	70.0	70.9	69.1	50.7	73.6	33.1
97.4	35.0	35.0	35.0	35.0	70.0	70.9	69.1	35.0	35.0	35.0
97.4	35.0	35.0	35.0	35.0	70.0	70.9	69.1	35.0	35.0	35.0
97.4	35.0	35.0	35.0	35.0	70.0	70.0	69.1	35.0	35.0	35.0
97.4	35.0	35.0	35.0	35.0	70.0	70.0	69.1	35.0	35.0	35.0
97.4	35.0	35.0	35.0	35.0	70.0	70.0	69.1	35.0	35.0	35.0
97.4	35.0	35.0	35.0	35.0	70.0	70.0	69.1	35.0	35.0	35.0

The growth rate structure of national income (D_u/D_p) rises according to the plan from 1928 to 1929 from 23.8 per cent to 43.5 per cent in a jump; later on the dynamics slows down somewhat and we have the following figures: 55.9 per cent, 67.0 per cent, 72.0 per cent.

The second variant fully guarantees the construction of socialism in the indicated period....

It would be necessary to calculate a whole series of variants, changing only within the limits of the possible the coefficients of utilization of productive capital and the portion of accumulation in national income. Each variant does not require more than two to three days of work of a single qualified statistician. The chief difficulty consists in the determination of the limits for the coefficient of utilization of capital, but even this difficulty is considerably smaller than that of determining how much labor productivity will rise in the future. An outline of these limits would require the utilization of experience coefficients from the practice of the technologically most advanced countries.

In order to give greater reliability to all calculations it would be necessary to organize a more thorough study of the tendencies of the development of the coefficients of effectiveness S, S_u, and S_p in their whole structural complexity.

Having thus calculated a whole series of variants of the possible development of the productive forces and of production, one could decide on a selection of one of them depending on particular political premises.

In the present calculation we have not touched upon either the question of wages, or the question of labor productivity, or the question of the growth of the labor force. We have not done so for the following reasons: (1) given the growth of consumption that we have projected, the question of the wages fund reduces itself to the question of the class distribution of national income, which does not yield itself to mathematical elaboration. In any case, the projected growth of consumption exceeds many times anything that has ever taken place in any country and it represents in any case a full opportunity for unparalleled satisfaction of the growing needs of popular masses; (2) from a theoretical viewpoint these questions represent nothing new on the plane on which we have undertaken our investigations. They have been clarified by us in a previous statement.

We believe that we have elucidated with sufficient thoroughness, and that we have sufficiently justified, the possibilities presented by the analytical method of planning the economy sug-

gested by us. In our opinion it would be quite inadmissible to ignore them and save a few thousand rubles by not using them, considering that they can reveal with exhaustive thoroughness the entire process of our material development in an abstract form and give us a clear, logical foundation for all our plans, calculated for many years to come, whose fulfillment will cost hundreds of billions of rubles. Without such a scale of our economic plans, theoretical errors could cost us hundreds and hundreds of millions of rubles.

N. A. Kovalevskii

ON THE CONSTRUCTION OF THE GENERAL PLAN

...The experience of my work in formulating a working hypothesis of the General Plan indicates that the drafts of the working hypothesis, as they relate to a particular branch or region, shock at the beginning even the boldest and most talented engineer, as they shock even the boldest worker of a new region. As a rule such drafts are initially received by them with complete distrust. People regard a person speaking of such things with great distrust and confusion. But gradually these goals enter into the flesh and blood, they become an integral attribute of our conception of the ways to development of a given branch and region. In all our work, there has not yet been a single case which would represent an exception in this respect.

We adopted these considerations relating to the necessity of an economic conception of the plan as a whole and the necessity of constructing a working hypothesis more than two years ago, when, over a period of several months, we carefully elaborated on the methodology of the work on the General Plan. When we originally discussed the plan of our actions two years ago in the Commission for the General Plan, then later at the special meeting of the Congress of Planning Organs, and finally, in the discussion in the Club of Planning Workers, we agreed that such a working hypothesis was absolutely necessary and that it would shorten such aberrations as would otherwise be inevitable, that it would play its positive role, and then, when the working hypothesis had been constructed, it would, on the one hand, recede, and, on the other hand, with corresponding corrections, changes, and additions, turn into that economic synthesis that will have to be welded into one of the several parts of the plan.

We have set ourselves the task of establishing this economic connection in the General Plan, starting from the famous sche-

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"K postroeniiu general'nogo plana," Planovoe khoziaistvo, no. 3, 1930, pp. 117-144.

mas of Marx presented in the second volume of Capital—the schemas of expanded reproduction.

Following this path, we have segregated the total net product of the country (v + m in Marx's terms) created in the course of a year. We have then segregated that part of it which goes to expand the capital funds of the country in the course of each year, and that part going to direct consumption. Under a system of planned economy such division is now absolutely necessary because it is at this particular point, in this particular planning act, that the working class--the master of the country--exerts its decisive will. The working class decides each year, through its organs, the question of what portion of the country's net output will be devoted in a given year to expansion of the reproduction process, and what portion will be earmarked for consumption. Both the growth rates of the reproduction process, and the direction of the country's development, depend on the solution of this question.

From the analysis of various possible variants of the dynamics of the basic indexes it becomes unquestionably clear that pursuit of a joyful life, of a high level of welfare, would lead, during the coming years, to a drastic decline of growth rates of capital formation. If in the coming years we were to pursue opportunistically as high a level of immediate consumption as possible, we should inevitably--figuratively speaking—eat the chicken that would have laid eggs for us in subsequent years; we should consume those resources which, if invested during the early years in the reproduction process, would yield us in subsequent years an effect that would many times exceed those crumbs, that "mess of pottage," that we could serve the proletariat in the coming years in the form of an immediate, small additional expansion of consumption. This analysis shows the wisdom of the party policy directed toward forcing economic growth to the maximum, the policy of industrialization loans in which the working class, particularly conscious at present of its role of active builder of the future, will relatively contract its consumption in order to expand it subsequently at a rapid rate when the country becomes sufficiently industrialized.

On the other hand, analysis of the possible variants of the reproduction process also shows how erroneous would be policies such as those resembling the position of the Trotskyite superindustrializers which call for developing the reproduction process further and further through over-all contraction of current consumption. Analysis of these variants indicates that there are limits which cannot be overstepped with impunity in either di-

rection. A given mighty development of industry in our country can be achieved only on the basis of well-provided cadres of labor; we can attain the American level of labor productivity only if we drastically raise the present level of consumption in our country, a level which in the initial year of the plan amounts to 137 rubles per capita (in 1927/28 prices). In branches of the economy such as housing this amounts to 11 rubles per capita, while such items as cultural expenditures, national education, health care, transportation, telephone, telegraph, mail, radio, etc. (the category called in the plan GOELRO "expenditures on various forms of communication") amount only to 9 rubles per capita—while in contemporary Australia per capita expenditures on these items exceed 300 rubles....

I shall not dwell here on the content of all the economic concepts with which we shall have to operate in the General Plan. I shall deal only with fundamental economic indicators which appear to be decisive for the construction of the General Plan as a whole and which tie the entire structure together. These basic indicators can be reduced to the following: first, the size of the country's labor force, the number of man-hours which the economy expends in the process of production, and the average hourly productivity of labor. The product of the latter two figures gives us the total net annual output of the economy: net annual product of the economy equals the number of man-hours expended in the course of a year times the average productivity of labor. In practical application this is expressed in constant prices of the initial year of the plan, which enables us to compare the real dimensions of output by sectors. The next indicators are the total capital funds of the economy—fixed and circulating--which represent the aggregate material equipment of labor. When we then compare the magnitude of the total net output of the economy (denoted by the letter "D") with the corresponding size of the capital, or physical equipment of labor (denoted by "F"), we obtain the coefficient D/F. This is the ratio of the total annual product of the aggregate labor force of the economy (the aggregate value created by the labor force) to the aggregate value created by the labor of preceding generations (excluding objects of direct personal consumption), which represents the available equipment of labor.

In other words, the ratio D/F is the ratio of annual net output of the economy to its available resources, including both means of production and supplies of consumption goods available at the beginning of a given production year.

I call this ratio the coefficient of reproduction. It shows the result of the reproduction process from the viewpoint of what part of the available wealth created by the labor of previous generations (excepting objects of direct personal consumption) can be reproduced again in a given year in the form of the net product of the economy. The economy can then dispose of this net product in such a way as it may deem necessary for further improvement of the reproduction process.

We divide the aggregate annual net product of the economy into (1) a part going into expansion of the reproduction process (expansion of fixed and circulating capital funds), denoted by D_r, and (2) a part going, in a given year, into consumption, denoted by D_p. The ratio of the part going into expansion of F to the aggregate net product of the economy is the index of the extent of productive accumulation that we realize in the course of any given year. The coefficient of productive accumulation is thus an index of the degree of intensity of utilization by the economy of its net product (its "national income") for the purpose of increasing its equipment of means of production and increasing its supplies of objects of consumption which secure a normal, uninterrupted process of expanded reproduction.

Finally we denote by the letter "A" the annual amortization and the necessary annual replacement investment. Hence $D_r + A$ is the sum of investment undertaken annually in the process of expanded reproduction.

These elements of the reproduction process are interrelated in a very simple way. Their relationship is so clear that one does not have to prove it; it is sufficient to point it out. This relationship enables us to see—by projecting any one of these indexes—how it is related to the dynamics of the others. Moreover, having projected the two basic synthesizing coefficients, the coefficient of reproduction and the coefficient of productive accumulation and their dynamics in the course of the General Plan, we also get a change in all other indexes of the General Plan. This is so since the answer to the question of the dynamics of D/F—where D = labor productivity · number of man-hours—requires first a determination of the dynamics of labor productivity expected to obtain as a result of reconstruction, and of the number of man-hours of labor which we expect to expend each year, given our projection of the dynamics of the population and the size of the labor force and the corresponding distribution of the labor resources of the USSR.

Determination of the dynamics of the coefficient of productive

accumulation D_r/D calls for providing a directive on economic policy with respect to the dynamics of the people's welfare, given a level of labor productivity and growth of "national income" and hence also of the dynamics of capital investments, because $D = D_r + D_p$.

Having adopted a definite policy of amortization allowance, determined primarily by the rate of technological progress, hence by the periods of technical depreciation and depreciation due to obsolescence, we also obtain the sum $D_r + A$ showing the real magnitude of the economy's annual gross investment.

All the other indexes are set, so to speak, within this complex and they depend upon it.

Thus we have here an economically unified system of indexes which enables us—by means of these extremely simple elementary formulas and categories—to bring together the basic elements of the productive process and to set out a deliberately balanced variant of the working hypothesis of the plan. Herein lies the value of the method of constructing the working hypothesis of the General Plan which we have adopted.

When we apply this method—along with other generally accepted methods—to planning work, we rid ourselves of the extraordinary difficulties associated with the fact that it is impossible for every individual sectoral or regional planning organ to determine its place and significance in the over-all system, its economic weight and scale of production, in isolation from the economic whole and the perspectives of its development. So far we have followed only the method of successive approximations, and since we were unable to rely upon a corresponding working hypothesis we were inevitably forced to perform "syntheses" which corresponded neither to the level nor to the value of the work that must be performed in the process of elaboration. We all know very well that in "synthesizing" we constantly had to do things which—from our own viewpoint—are inadmissible for an economist. Very frequently we had to "cut" and "shred", etc., i.e., we had to do not what we would consider necessary from the viewpoint of balancing the dynamics of the economy, but what we were forced to do because of the inevitable initial imperfections of methodology and organization of our planning work, imperfections due to infantile diseases, perhaps even uterinal diseases, of the emerging science of planning. And later we had to persuade ourselves every time that next year it would be necessary to change the balance of the plan, to introduce in it very essential corrections.

Our task now consists in formulating such a system of work as would provide a deliberately balanced variant—a variant of the plan in which it would be impossible to change any parts painlessly and with impunity, in which any change would lead to a corresponding series of changes in other economically connected components.

Since the basic directions of the development of the economy are before our eyes along with the tasks set by the General Plan, the combination of these tasks and of the projected basic indices determines the structure of production and the combination of its branches. The above indices alone are still inadequate because, in the absence of ultimate tasks, they allow too much freedom for the plan. Given a definite value of the portion of "national income" which you invest in expansion of reproduction, and the portion going annually into direct consumption, you can devote net investment either to agrarization or to industrialization, the alternatives being sufficiently distinct so that there exists between them an infinite number of "degrees," a practically infinite number of combinations, which you can effect in the process of your economic policy, but, of course, not with impunity. Thus we see that, on one hand, the opportunity for volitional direction, and, on the other, the responsibility of the guiding organs of the planned economy, for the direction of the economic policy, are exceptionally great....

Let us consider the analysis of how to select the exact dynamics of the basic indexes of the General Plan. The decisive factor in the dynamics of the reproduction process, the factor to which both Marx and Lenin paid so much attention, is labor productivity. This is the leading and determining factor in all planning.

Since we have set as our goal in the sphere of the technique of production to catch up and overtake, over the period of the General Plan, the most advanced capitalist countries, it is natural that in the orientation calculations of future growth of labor productivity we should first turn to the most advanced of them, the United States of America.

In the initial year of the plan labor productivity in the USA exceeds the average labor productivity in the USSR approximately 6 times. This would be so if we calculated in terms of the prewar parity and the relations of aggregate indexes. Unfortunately, a comparison for different countries of prewar purchasing power, of gold in money units of equal weight, has not yet been made anywhere. This is explained on one hand by the practical diffi-

culty of solving this problem, and on the other by the ruling fetishistic attitude to the monetary unit which makes even the raising of such a question exceptionally difficult.

Rough comparisons indicate that before the war the purchasing power of a monetary gold unit of equal weight was approximately 1.5 times higher in the USA than in Russia. If we adopt this comparison for the purpose of initial projection we obtain a corresponding rise of 50 per cent in the comparable average labor productivity of the USA, i.e., an increase to 9 times that of the USSR in the initial year of the Plan.

But the USA itself is not a country of homogeneous technology. No less than one-half of their enterprises have a technology which is already obsolete. Transition to contemporary technology would raise labor productivity in the USA by no less than one-third, more likely much more than one-third. But even a one-third rise yields a labor productivity 12 times higher than in the USSR during the initial year of the Plan.

But, after all, we do not propose to limit ourselves to contemporary American technology. Technological progress goes rapidly forward; the Americans themselves, as well as capitalists of other countries who compete with them, equip the newer enterprises with a technology that is already more perfect and with labor productivity that is much higher than current American labor productivity. Assuming that in 12 years we shall surpass the 1929 technology and thus the labor productivity of the USA by only 20 per cent, even then our labor productivity will be 14.4 times higher than labor productivity in the USSR in the initial year of the Plan. There is nothing improbable in such a growth of labor productivity over a period of 12 years of rapid reconstruction. The Control Figures of the economy of the USSR for 1929/30 require a 25 per cent rise in labor productivity in industry. With such a rate of growth, labor productivity in industry would increase over a period of 12 years 14.6 times. And we are still only on the first steps of reconstruction. After all, our first enterprises are still under construction; the results of our reconstruction are for the most part still ahead of us. We are only just starting the technical reconstruction of agriculture. Transportation continues to remain untouched in all its virginity. Only the construction processes on such firstlings as the Dnieprostroi approach the contemporary advanced technology of construction, while most construction is still performed by semiancestral methods. This sort of thing can be found in other branches of the economy as well. All this shows

that in coming years we shall have to forge ahead more rapidly than we do now when the first results of reconstruction have, strictly speaking, not yet begun to appear.

With respect to the number of man-hours of labor to be expended by the economy, the growth of population alone will, other things being equal, increase our labor resources, over a period of 12 years, by 32 per cent. But the net output of the economy equals, as we have already said, the average productivity of labor multiplied by the number of man-hours. Consequently, with a 14.6-fold growth of labor productivity and a 1.32-fold growth of the labor force, the net output of the economy will rise 19 times in comparison with the initial year of the Plan.[1]

However, our present utilization of the labor force is far from full. The calculation of man-hours expended in the country during the initial year of the Plan shows that we have reserves of unutilized labor possibilities of about 28 per cent. (These are the so-called "extra mouths" in agriculture, housewives, whose labor is not counted in the net output, and the unemployed registered at labor exchanges, etc.)

This reserve of labor, when rationally utilized, allows us to shorten the length of the working day as compared to the initial year of the Plan or to raise the volume of production, given the length of the working day. Further shortening of the length of the working day will depend, on the whole, on the growth of labor productivity over the 14.4-fold increase mentioned above.

In conjunction with our ends we can thus adopt as a directive for the General Plan a 14.4-fold increase of labor productivity in the economy of the USSR. Along with the 1.32-fold increase of man-hours (corresponding to the growth of population), this yields a 19-fold increase of net output.

American output increased over a period of 75 years, roughly speaking, 21 times. But in the USA the 75 years between 1850 and 1925 hardly represent a more significant period economi-

1. Net output = average labor productivity · number of man-hours
Net output of year 23 = 14.4 (average labor productivity of year 11) · 1.32 (man-hours of year 11) = 19 (net outputs of year 11)

[In this note the term "year" refers to the 11th year after the revolution, 1928, the initial year of the first Five-Year Plan; the "year 23" after the revolution (12th year of the assumed General Plan) refers to 1940.—Ed.]

cally than the 25 years in the USSR following the October Revolution. The US growth is even more interesting from the viewpoint of particular indexes. Thus the physical volume of output of extractive industries in the USA increased in those 75 years 63 times and that of manufacturing industries increased 38 times. During the same period the physical volume of agricultural output--and this is extremely interesting and indicative of structural changes--increased altogether only 7 times.

During this period we plan to raise the level of production of the whole economy 19 times, i.e., to triple the output compared to the USA, with the same capital.

We are asked: (1) Where are you going to get capital equal to that of the Americans? (2) How can you expect to raise your output at three times the American level, with a total capital only matching the American level?

To answer the first question we mention the policy of accumulation projected by the working hypothesis. Having determined, for our orientation, the annual net output of the economy, we then adopt a definite policy of allocating that output into two basic channels: annual consumption (D_p) and annual net investment, that is, increments of fixed and circulating physical capital funds (D_r). We take the annual replacement investment (A) to equal the total actual wear and tear of fixed capital increased annually by the sum of the net investments of that year (D_r).

Our accumulation policy is coordinated with the policy of increasing welfare, which on one hand depends on the growth of investment and the equipment of labor, and on the other hand determines them.

Thus the answer to the above question is the dynamics of the coefficient of productive accumulation projected by the working hypothesis. In the initial variant of the working hypothesis of the General Plan, after we have projected various approximate variants and after we have felt through the results of various dynamics of the coefficient of productive accumulation we adopted the following dynamics for this variable: following a sharp rise from 20.1 to 37.7 per cent in the current year we adopt a much milder further growth, a rise to 45.3 per cent and 46.4 per cent in the next three years, the last years of the Five Year Plan, i.e. a much milder and smoother growth than at present. Growth of the current year is the most rapid, investment in the entire economy rising by 223 per cent, while in the coming years we shall have a much slower growth of investment, which will make possible a substantial rise of consumption. We project the fol-

lowing growth of the consumed portion of national income (D_p): for the next year (1930/31) a rise of 15 per cent, for the year after, a rise of 31 per cent, then a rise of 44 per cent, etc. When we consider, in particular, the current process of collectivization, the fact that the new village will have different demands from the old, and that the workers' government cannot keep the communard on the collectives in bast shoes and hemp clothes—we believe that we shall have to take particular care that consumption should grow on a scale providing a rapid growth of production both in industry and in agriculture.

Later on, after the Five-Year Plan has been fulfilled, we plan a rather significant decline of the coefficient of productive accumulation, bringing it down, gradually over a period of 10 years, to approximately 33 per cent by 1939/40, and over a period of 15 years down to almost 31 per cent. Thus we are thinking of even the minimum intensity of our productive accumulation during the latter period in terms of equality or near-equality with the intensity of productive accumulation in the USA during the war years. Until the imperialist war, America knew no such intensity. Over a period of half a century, even 60 years, the maximum US intensity occurred during the sixties of the last century before the start of the Civil War and amounted to 23 per cent. It then declined sharply to 15 per cent and before the imperialist war it was down to 6 per cent during depression years. This is quite clear: during periods of depression productive accumulation and investments are sharply reduced. During the imperialist war the US coefficient of productive accumulation attained 36 per cent and then declined again sharply to 7 per cent during the postwar depression (1921). Since then the coefficient has again risen. On the average the coefficient of productive accumulation in the USA is around 15 per cent while in our economy it currently stands at 37.7 per cent. The same policy of productive accumulation will also permit realization of the development of the USSR economy without any significant foreign loans and capital. And this is the origin and source of growth of those capital funds on whose basis we expect to increase our output 19 times as compared to the initial year of the Plan.

How can this output increase 3 times more rapidly than that of the USA if our capital is only equal to the American capital? Only a man without experience in guiding our economy can ask such a question. Even he who is a little acquainted with the dynamics of the USSR economy knows that the advantages of a planned economy consist in the ability to turn out a much higher volume of output with much smaller equipment than a capitalist

economy. Currently we reproduce each year 37 per cent of the national wealth created by labor (not counting goods of personal consumption) while the USA reproduces 22 per cent, and much less than that during depressions.

If you look closely at the coefficient of reproduction

$$\left(\frac{D}{F} = \frac{P \cdot Ch}{F}\right)^2$$

you will see why this is so. The USA utilizes her capital funds with an intensity of around 75 per cent under the prevailing system of work shifts, which is close to unity in that country. Our system of work shifts equals currently 1.5 to 1.6 while before the war it was equal to 1.3. The upper limit of the number of shifts, with a 7-hour working day, can be thought of as equal to 3.4. However, such a limit is unattainable. What is practically possible is bound to be significantly lower, since there are a number of industries in which continuous production around the clock is irrational from the technical viewpoint. But if you take this comparison, you will see that on account of rational utilization alone by the planned economy of all existing equipment through the introduction of a multi-shift system one can raise the effectiveness of reproduction approximately 2.5-fold as compared to the USA. The growth of the coefficient of reproduction which is currently taking place in our country can be explained by the fact that we have a larger number of shifts; that we are already introducing a continuous production year, which does not exist in other countries; that we possess elements of a planned economy, which allows us to attain the greatest economies through unification of our electric power stations and optimal combining of our existing enterprises and available resources; etc. All this, taken together, provides an exceptional growth of the coefficient of reproduction, which, according to our first draft, should increase, at the time of catching up with the USA with respect to capital funds, to twice our coefficient of

2. [P = labor productivity
Ch = number of man-hours
D = net output
F = capital—Ed.]

production in the current year and three times that of the USA recent years of prosperity[3]....

Let me dwell some more on the effects of the growth rates of vestment on the productive structure of the economy. I have eady stated at the beginning that very high coefficients of oductive accumulation correspond to the colossal construction, the gigantic development of the means of production. And it precisely here, in case of excessive increase of the coeffi-ent [of productive accumulation] that we arrive at the point ien quantity is transformed into quality, at the point which ll then force us to change drastically the policy of allocating e economy's net output, and to state that during the second riod of the General Plan--when the economy has already at-ined a high level of industrialization--we shall no longer be erested in the coefficient of productive accumulation, i.e., /D, but rather in D_p/D. I call the latter the coefficient of use-l activity of the entire system. We shall be interested in what rtion of human energy is lost, so to speak, in the channels ex-nded on overcoming all obstacles, and what part reaches the d. It is the ratio D_p/D that we shall begin to see by that time the coefficient of useful activity.

Following one of my first reports on the General Plan, G. M. zhizhanovskii pointed out to me that the structure of the US onomy is not bad in this respect. I had called a capitalist untry with a coefficient of productive accumulation of only 8 10 per cent, which consumes over 90 per cent of its net out-t, a Yorkshire hog on short legs unable to grow rapidly, while alled the USSR, with her variants of high productive structure der the General Plan, an Arabian stallion with long legs, as mpared to its body, and therefore able to rise exceptionally gh. One could perhaps find a better illustration, using an dustrial example, for the period of reconstruction than an abian stallion, but this illustration is appropriate in the sense at a high structure of production enables us to move forward pidly. However, if you come to think of those points of which

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D of year 23 = 19 (D of year 11)

$$\frac{D}{F} \text{ of year 23} = \frac{14.4 \text{ (labor productivity of year 11)} \cdot 1.32 \text{ (no. of man-hours) of year 11}}{9 \text{ (F of year 11)}}$$

$$= \frac{19 \text{ (D of year 11)}}{9 \text{ (F of year 11)}} = 2.1\left(\frac{D}{F} \text{ of year 11}\right)$$

we spoke above, it becomes clear that beyond a certain limit, here as everywhere else, quantity is transformed into quality: an excessively high structure of production becomes absurd since a much smaller annual coefficient of productive accumulation becomes sufficient to secure a gigantic growth of production and consumption....

APPENDIX

GUIDE TO SOVIET SOURCES ON THE DEBATES ON ECONOMIC GROWTH

The following selected list aims to provide a guide to the main Soviet economic sources of the mid-1920's, during which the problems of economic development were debated in the USSR. The list is not exhaustive, since the amount of secondary material is enormous. In the introductory notes to certain sections I have included also a few basic non-Soviet sources which concern some specific aspect of the Soviet 1920's and which appear to me indispensable for understanding the subject matter and the period under review.

The following abbreviations are used:

B—Bol'shevik (Bolshevik)
EO—Ekonomicheskoe obozrenie (Economic life)
GIZ—Gosizdat (State Publishing House)
PI—Puti industrializatsii (The path of industrialization)
PK—Planovoe khoziaistvo (Planned economy)
VF—Vestnik finansov (Financial herald)
VKA—Vestnik kommunisticheskoi akademii (Herald of the Communist Academy)

I. GENERAL

1. Bibliographies

Five main official bibliographies cover the years under review. The basic source is Deborin et al., continued by Sragovich.

Deborin, G.; Sragovich, G.; and Chernin, M. Teoriia i praktika planirovaniia narodnogo khoziaistva SSSR 1917-1927 i pervoe polugodie 1928 g. Bibliografiia (Theory and practice of planning of the national economy of the USSR 1917-1927 and first

half of 1928. A bibliography). Introduction by A. S. Mendel'son. Moscow-Leningrad, Gosizdat, 1929.

N. T. and A. N. Bibliograficheskii obzor izdanii tsentralnogo statisticheskogo upravleniia Soiuza SSR za 10 let (1918-1928) (Bibliographical survey of the publications of the Central Statistical Office of the USSR for 10 years 1918-1928). Moscow, Central Statistical Office, 1928.

Sikorskii, K. P. and Ianovskii, A. S. Alfavitno-predmetnyi i geograficheskii ukazatel' k osnovnoi literature po piatiletnemu planu narodnogo khoziaistva stroitel'stva SSSR (Alphabetical subject index and geographical survey of the basic literature of the Five-Year Plan of construction of the national economy of the USSR). Moscow, Gossotsekizdat, 1931.

Sragovich, G. "Bibliografiia planovoi literatury" (Bibliography of planning literature) Planovoe khoziaistvo, no. 6, 1929, pp. 281-286; no. 7, 1929, pp. 300-308; no. 8, 1929, pp. 290-298; no. 10, 1929, pp. 285-294; no. 4, 1930, pp. 304-311; no. 6, 1930, pp. 287-296; no. 7-8, 1930, pp. 329-343; no. 9, 1930, pp. 252-264; no. 2-3, 1931, pp. 300-314.

Vaisberg, R. "Bibliograficheskii ukazatel' literatury po planirovaniiu i regulirovaniiu" (A bibliography of the literature on planning and economic controlling). Planovoe khoziaistvo, no. 3, 1926, pp. 250-286, and no. 4, 1926, pp. 241-261.

2. Official Documents

The stenographic reports of the XIIth to the XVth congresses of the party give the debates in full, including the points of view of the various factions. A large portion of these documents was first published in the party's organ Pravda. The various volumes concerning the "directives" contain the economic resolutions and decisions of the party leadership.

Dvenadtsatyi s'ezd RKP(b). Stenograficheskii otchet (1923) (The Twelfth Congress of the Russian Communist party. Stenographic report). Moscow, GIZ, 1924.

Trinadtsatyi s'ezd RKP(b). Stenograficheskii otchet (1924) (The Thirteenth Congress of the Russian Communist party. Stenographic report). Moscow, GIZ, 1925.

Chetyrnadtsatyi s'ezd VKP(b). Stenograficheskii otchet (1925) (The Fourteenth Congress of the All-Union Communist party. Stenographic report). Moscow, GIZ, 1926.

Piatnadtsatyi s'ezd VKP(b). Stenograficheskii otchet (1927) (The Fifteenth Congress of the All-Union Communist party. Stenographic report). Moscow, GIZ, 1928.

Malın, V. N., and Korobov, A. V., eds. Dırektıvy KPSS i sovetskogo pravitel'stva po khoziaistvennym voprosam (Directives of the Communist party of the Soviet Union and of the Soviet government on economic problems). Vol. I, 1917-1928. Moscow, Gospolitizdat, 1957.

Savel'ev, M. Direktivy VKP (b) v oblasti khoziaistvennoı polıtıki za 10 let, 1917-1927 (Directives of the All-Union Communist party in the domain of economic policy for 10 years, 1917-1927). Moscow, GIZ, 1928.

Vsesoiuznaia Kommunısticheskaia partıia (bol'shevikov) v resoliutsiiakh i resheniiakh s'ezdov, konferentsıı ı plenumov (All-Union Communist party; resolutions and decisions of Congresses, Conferences, and Plenums). Part I, 1898/1925. Part II, 1925-1939. Moscow, Ogiz-Gospolıtızdat, sixth edition, 1941, 1940.

II. PERIODICALS

The main analytical economic studies of the period were published in Ekonomicheskoe obozrenie, Planovoe khoziaistvo, and the Vestniki (Heralds) of the Communist Academy, of the Central Statistical Office, and of the People's Commissariat of Finance. The editorial boards of the journals listed until the mid-1920's the names of V. A. Bazarov (Ekonomicheskoe obozrenie) and P. I. Popov (Vestnik statistiki), and included among their usual contributors policy makers and economists of various persuasions. Ekonomicheskoe obozrenie numbered among its usual contributors V. A. Bazarov, V. G. Groman, A. M. Ginzburg, N. P. Oganovskıı, P. I. Popov, L. Shanin, S. G. Strumilin, and others. Planovoe khoziaistvo and the Vestnik kommunisticheskoi akademii presented similar lists of contributors, including personalities from the Left and Right, particularly N. I. Bukharin, G. L. Piatakov, E. A. Preobrazhenskıı, L. D. Trotsky, as well as V. G. Groman, P. I. Popov, G. M. Krzhizhanovskii, S. G. Strumilin, and J. V. Stalin (for the Vestnik kommunisticheskoi akademii only). Until the late 1920's, the Vestnik finansov listed among its collaborators a number of "bourgeois professors," including Professors V. Zheleznov, L. Litoshenko, and L. Iurovskii, as well as L. Shanin, G. Sokol'nikov, and others.

The following is a list of the basic economic periodicals of the mid-1920's:

Biulleten' kon'iunkturnogo instituta (Bulletin of the Institute of

Economic Conditions). Moscow, 1922-1929. 1922-23, 15 issues (June-December, December-January); 1923-1927, 12 issues per year; 1928, 10 issues (January-October); 1929, 9 issues (January-August). Titles: 1922 nos. 1-2, 4/5 to 1924, Ekonomicheskii biulleten' (Economic bulletin); 1925-1928 no. 4, Ekonomicheskii biulleten' kon'iunkturnogo instituta (Economic bulletin of the Institute of Economic Conditions). Supplement: Voprosy kon'iunktury (Questions of economic conditions), 1925-1926.

Bol'shevik (Bolshevik), monthly organ of the Central Committee of the Communist party. Moscow, 1924- .

Ekonomicheskoe obozrenie (Economic survey), monthly journal published by Ekonomicheskaia zhizn' (Economic life), Moscow, 1923-1930. 1923, 12 issues (issues 1-2, published by Sovet Truda i Oborony (Council of Labor and Defense); 1924, 24 issues; 1925-1929, 12 issues per year; 1930, 3 issues (January-March). It replaced Mesiachnye obzory narodnogo khoziaistva (Monthly surveys of the national economy). In 1930, after issue no. 3, merged with Planovoe khoziaistvo (Planned economy).

Finansy i ekonomika (Finance and economics). Issued monthly by People's Commissariat of Finance. Moscow, 1922, 2 issues (June-July). Discontinued with no. 2 and replaced, together with Narodnoe khoziaistvo (The national economy), by Sotsialisticheskoe khoziaistvo (Socialist economy).

Izvestiia ekonomicheskogo fakulteta (Leningradskii politekhnicheskii institut im. M. I. Kalinina) (Proceedings of the Faculty of Economics, Leningrad Polytechnical Institute M. I. Kalinin). Leningrad, issue I (25), 1928—Number (25) continued the numbering of the Izvestiia Sankt-Peterburgskogo politekhnicheskogo instituta, Otdelenie nauk ekonomicheskikh i iuridicheskikh (Proceedings of the St. Petersburg Polytechnical Institute, Section of Economic and Juridical Sciences), interrupted in 1915 with volume 24.

Izvestiia Vyshego soveta narodnogo khoziaistva (Proceedings of the Supreme Council of the National Economy). Moscow, 1921-1922. 1921, 19 numbers (July-December); 1922, 11 numbers (January-April).

Na planovom fronte (On the planning front), bi-weekly organ of the presidia of the Gosplans of the USSR and the RSFSR. Moscow-Leningrad, 1929-1931. 1929, 8 numbers (September-December); 1930, 24 numbers.

Narodnoe khoziaistvo (The national economy), monthly issued by

Editing and Publishing Section of the Supreme Council of the National Economy of the RSFSR, Moscow, 1918-1922. 1918-1919, 12 issues per year; 1920, 16 issues (January-August), 2 unnumbered issues (November-December); 1921, 12 issues; 1922, 10 issues. Discontinued with no. 9/10, 1922, and replaced, jointly with Finansy i ekonomika (Finance and economics), by Sotsialisticheskoe khoziaistvo (Socialist economy).

Narodnoe khoziaistvo SSSR (The national economy of the USSR), statistical and economic annual. Moscow, Ekonomicheskaia zhizn', 1920-1924. One unnumbered issue for 1920 and the first half of 1921 published in 1921 under title: Narodnoe khoziaistvo (national economy); issues 1-2, 1921, titled Narodnoe khoziaistvo Rossii (The national economy of Russia); issues 3-4 of 1921 published in 1922; issue 2, 1921-1922, published in 1923; issue 3, 1922-1923, published in 1924; issue 4, 1923-1924, published in 1925.

Nashe stroitel'stvo (Our construction), organ of the Gosplan of the USSR and of the Gosplan of the RSFSR. Moscow, 1929—1929, 19 issues; 1930, 24 issues per year.

Planovaia rabota (Planning work), information bulletin of USSR Gosplan. Moscow, 1925-1929. 1925, no. 1; 1926-1928, 12 issues per year; 1929, 2 issues. Title 1925-1928 Informatsionnyi biulleten' Gosplana (Information bulletin of Gosplan).

Planovoe khoziaistvo (Planned economy), political and economic journal of USSR Gosplan. Moscow, 1923 to date. 1923, 12 issues; 1924, 10 issues; 1925-1930, 12 issues per year. In 1930 the journals Ekonomicheskoe obozrenie, Vestnik statistiki, and Statisticheskoe obozrenie were merged with Planovoe khoziaistvo.

Problemy ekonomiki (Problems of economics), monthly journal of the Institute of Economics of the Academy of Sciences of the USSR. Moscow, 1929-1930. Published from 1929 to 1930 (no. 3) by the Economic Section of the Communist Academy; merged in July 1930 with Sotsialisticheskoe khoziaistvo (Socialist economy).

Puti industrializatsii (The path of industrialization), bimonthly organ of the Presidium of the Supreme Council of the National Economy of the USSR. Moscow, 1928-1931. Published by Izvestiia up to 1930; afterward by Za industrializatsiiu.

Puti selskogo khoziaistva (Path of agricultural economy), monthly scientific organ of Commissariat of Agriculture of the RSFSR and the Timiriazev Agricultural Academy. Moscow, 1925-1929. First issue June 1925. Discontinued October 1929.

Sotsialisticheskoe khoziaistvo (Socialist economy), published by the Institute of Economics of the Russian Association of Scientific Research Institutes in the Social Sciences (RANION). Moscow-Leningrad, 1923-1930. 1923, 10 issues (March to November-December); 1924, 5 issues; 1925-1929, 6 issues per year; 1930, 3 issues. Had first replaced Narodnoe khoziaistvo and Finansy i ekonomika; in 1930, after publication of issue no. 3, merged with Problemy ekonomiki. Up to 1927, organ of the Supreme Council of the National Economy and of the People's Commissariat of Finances.

Trudy Gosplana SSSR (Transactions of the USSR Gosplan). Moscow, 1922-1925. Issues 1-6.

Trudy komissii ekonomicheskikh issledovanii (Transactions of the Commission for Economic Research), published by Editing and Publishing Division of the Supreme Council of the National Economy. Moscow, 1923-1924. 3 issues.

Trudy kon'iunkturnogo instituta (Transactions of the Institute of Economic Conditions). Moscow, 1929-1930. 2 volumes.

Vestnik finansov (Financial herald), monthly journal of financial science and financial statistics. Organ of the People's Commissariat of Finances of the USSR. Moscow, 1922. First issue March 1922. Temporarily discontinued in 1930.

Vestnik kommunisticheskoi akademii (Herald of the Communist Academy), bimonthly issued by the Academy. Moscow, 1923—. Replaced the Vestnik sotsialisticheskoi akademii (Herald of the Socialist Academy), issued in 4 volumes in 1923, and dated Moscow-Petrograd. Discontinued in 1930.

Vestnik statistiki (Statistical herald), monthly periodical for statistical methodology and practice. Organ of the Central Statistical Administration of the USSR. Moscow, 1919-1930. Temporarily discontinued in 1930.

Voprosy kon'iunktury (Questions of economic conditions). Moscow, Institute of Economic Conditions, vols. 1-4, 1925-1928. In 1925-1926 published as a supplement to Ekonomicheskii biulletin' kon'iunkturnogo instituta (Economic bulletin of the Institute of Economic Conditions).

Za rabotoi (At work). Economic construction of the USSR and the world economy. Moscow-Leningrad, 1925-1931. 1925, 3 unnumbered issues (January-February, March-April, June-December); 1926-1931, 12 numbers per year.

I. SOURCES ON THE DEBATES

. On the Economics of the "Transition Period"

a. The Soviet Economy and Its "Laws"

The early positions of the Communist party concerning a) the nature of the Soviet economy (is it a "commodity-monetary" economy or not) and (b) the economic "laws" applying to it the law of value, or the so-called planning principle) were expressed in 1920 in the joint work of Bukharin and Preobrazhenskii, The ABC of Communism, and in Bukharin's Economics of the transition period. The official position, stating that Soviet Russia's economy was no longer a "commodity-monetary" system and that it had freed itself of the "law of value," was challenged in the mid-1920's—during the NEP—first by "bourgeois" economists like Professor Iurovskii, later even by Communists such as Stepanov-Skvortsov. Officially the party continued to adhere, in a rather equivocal way, to its original positions until many decades later. The economic works of the mid-twenties, particularly the important book of Preobrazhenskii (New economics), concerned essentially the ways in which the state-banking complex, in which allegedly the "planning principle" was now reigning, could use, in relation to its surroundings, the "law of value." The economic textbooks of the late twenties present, usually with little distinction, either some of the positions of the "Right" (e.g., the Aikhenval'd text) or of the Center, against the "bourgeois economists" (e.g., A. Leont'ev's works) and against the other party factions (e.g., the Lapidus and Ostrovitsianov textbook).

Aikenval'd, A. Y. Sovetskaia ekonomika. Ekonomika i ekonomicheskaia politika SSSR (Soviet economics. The economics and the economic policy of the USSR). Preface by N. I. Bukharin. Moscow-Leningrad, GIZ, 1927.

Borilin, B. "Lenin ob 'ekonomike perekhodnogo perioda'" (Lenin on the "economics of the transition period"), B, no. 20, October 1929.

Bukharin, N. Ekonomika perekhodnogo perioda. Obshchaia teoriia transformatsionnogo protsessa (Economics of the transition period. The general theory of the transformation process). Part I. Moscow, Gosizdat, 1920.

Bukharin, N., and Preobrazhenskii, E. The ABC of Communism

(1919). Trans. Eden and Cedar Paul for the Communist Party of Great Britain, London, Unwin Bros., 1922.

Iurovskii, L. N. Denezhnaia politika sovetskoi vlasti (1917-1927) (The currency policy of the Soviet government). Moscow, Finansovoe Izd., 1928.

Lapidus, T., and Ostrovitsianov, K. An Outline of Political Economy. Political Economy and Soviet Economics. New York, International Publishers, 1930. (The original Russian edition was not available to me.)

Lenin, V. I. "Zamechaniia na knigu N. I. Bukharina: 'Ekonomika perekhodnogo perioda'" (Comments on N. I. Bukharin's book: "Economics of the transition period"), in Bukharin, N. I.; Molotov, V. M.; and Savel'ev', A. U., eds., Leninskii sbornik (Lenin collection), vol. XI, Moscow, GIZ, 1929.

Leont'ev, A. Sotsialisticheskoe stroitel'stvo i ego kritiki (Socialist construction and its critics). Moscow, GIZ, 1928.

Leont'ev, A., and Khmelnitskaia, E. Sovetskaia ekonomika. Opyt teoreticheskogo analiza (The Soviet economy. Attempt at a theoretical analysis). Moscow-Leningrad, Planovoe khoziaistvo, 1926.

Preobrazhenskii, E. A. "Sotsialicheskie i kommunisticheskie predstavleniia o sotsializme" (The Socialist and Communist images of socialism). VKA, no. 12, 1925, part I, pp. 19-75; no. 13, 1925, part II, pp. 3-33.

_____. Novaia ekonomika. Opyt teoreticheskogo analiza sovetskogo khoziaistva (New economics. Attempt at a theoretical analysis of the Soviet economy). Vol. I, part I. Second enlarged edition. Moscow, Izd. Komakad, 1926.

Smilga, I. T. Vostanovlenie khoziaistva SSSR i rekonstruktsiia ego proizvoditel'nykh sil (The restoration of the economy of the USSR and the reconstruction of its productive power). Moscow, Ekonomicheskaia zhizn', 1925.

Stepanov-Skvortsov, I. I. "Chto takoe politicheskaia ekonomiia" (What is political economy?). Discussants: Bukharin, N. I.; Dvolaitskii, Sh. U.; Bogdanov, A. A.; Preobrazhenskii, E. A.; Ossinskii, V.V.; Pokrovskii, M.N.; Marestskii, D.; Kon, A.F.; Kristman, L. N.; Smirnov, V. U., and others. VKA, no. 11, 1925, pp. 257-346.

Trotsky, L. D. K sotsializmu ili k kapitalizmu? Analiz sovetskogo khoziaistva i tendentsii ego razvitiia. (Toward socialism or toward capitalism? Analysis of the Soviet economy and of the tendency of its development). Moscow-Leningrad, Planovoe khoziaistvo, 1925.

b. Macro-economic models

Starting usually from Marx's schema of simple and enlarged reproduction, the Soviet analyses focus on the network of relations between different industries and different sectors.

Boiarskii, A., and Brand, L. "Problema statistiki tsen i tovarooborota" (The problem of statistics of prices and of commodity turnover). PK, no. 11, 1930, pp. 239-277.

Fal'ker, S. A. "Iz istorii idei narodnokhoziaistvennogo balansa" (From the history of the idea of a national economic balance). PK, no. 10, 1928, pp. 153-174.

Fel'dman, G. A. "K teorii tempov narodnogo dokhoda" (On the theory of growth rates of national income). PK, 1928, no. 11, pp. 146-171; no. 12, pp. 151-181.

Groman, V. G. "Balans narodnogo khoziaistva" (Balance of the national economy). PK, no. 11, 1926, pp. 62-80.

Karmolitov, A. "K voprosu o ravnovesii v ekonomicheskoi sisteme SSSR" (The problem of equilibrium in the economic system of the USSR). B, no. 12, 1928, pp. 11-25.

Litoshenko, L. "Metodika sostavleniia narodno-khoziaistvennogo balansa" (Methods of constructing a national economic balance) in Balans narodnogo khoziaistva Soiuza SSR 1923/24, Moscow, 1926.

Popov, P. I. "Balans narodnogo khoziaistva 1923/24 g." (Balance of the national economy of the USSR in 1923/24). Ekonomicheskaia zhizn', March 29, 1925.

Popov, P. I., ed. Balans narodnogo khoziaistva Soiuza SSR 1923/24 g. (The balance of the national economy of the USSR 1923/24). Trudy Tsentral'nogo Statisticheskogo Upravleniia (Transactions of the Central Statistical Office), vol. XXIX, Moscow, 1926.

Preobrazhenskii, E. A. "Problema khoziaistvennogo ravnovesiia pri konkretnom kapitalizme i v sovetskoi sisteme" (The problem of economic equilibrium in actual capitalism and in the Soviet system). VKA, nos. 17-18, 1926, pp. 35-76 and no. 22, 1927, pp. 19-71. Articles intended to form a sequel to Novaia ekonomika.

Strumilin, S. G. "O metodakh postroeniia balansa narodnogo khoziaistva i, v chastnosti, narodnogo dokhoda. Tezisy doklada" (On the methods of constructing the balance of the national economy and in particular of the national income. Theses of a report). Vestnik statistiki, 1927, no. 1, pp. 56-64.

2. On Strategies of Development

The debate on a strategy of development for a backward agricultural country started in Russia long before the Bolshevik revolution. It echoed socio-economic, literary, and even metaphysical preoccupations, vented during long-drawn-out discussions which occurred in that country throughout the second half of the nineteenth and the beginning of the twentieth century. After the revolution, the debate reached a high intensity during the so-called scissors crisis and grew to its final climax in 1927. In the mid-twenties, two principal policy makers and economists led the debates: Bukharin for the Center and then the "Right," in favor of a "balanced" agricultural-industrial development; Preobrazhenskii, for the Left, in favor of the "dictatorship of industry" and of heavy industry in particular. Bukharin's positions up to 1925 are presented in the brochure, Some questions of economic policy; his theoretical attack against the economic positions of the Left is formulated in the Critical remarks on the book of E. Preobrazhenskii; the final form of the Right's argument is developed in Notes of an economist. Preobrazhenskii's theses are included in his book, New economics; his critique of Bukharin's positions of the mid-twenties is presented in the introduction to the second edition of New economics and in an appendix to the same volume; the final form of the theses of the Left is to be found in the so-called Platform of the opposition written in 1927, mostly by Trotsky.

The main sources available in the West on the economic arguments involved in the Soviet discussions are: M. Dobb, Soviet Economic Development since 1917, London, Routledge and Kegan Paul, 1948; E. H. Carr, A History of Soviet Russia. Socialism in One Country, 1924-1926, Vol. I, New York, Macmillan, 1958; and A. Erlich, The Soviet Industrialization Debate, 1924-28, Cambridge, Harvard University Press, 1960.

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3. On Pace and Efficiency

a. On Pace of Growth

"The question of tempo is"—as Trotsky put it—"decisive in every struggle and all the more so in a struggle on a world scale." "Time—the decisive factor"—tormented the Left opposition from the early 1920's, and the party's leadership as a whole from the late 1920's. Those who claimed that the rates of growth of economic output could slacken were liquidated and the party set its eyes on higher and higher goals. Except for Bazarov's and especially Fel'dman's articles, the theoretical discussion on the pace of growth yielded, however, relatively meager results. Fel'dman's articles have been discussed by Professor Evsey D. Domar in an essay, "A Soviet Model of Growth," included in his book of Essays in the Theory of Economic Growth (New York, Oxford University Press, 1957).

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Strumilin, S. G. "K diskussii o piatiletke (Otvet t. Motylevu)" (On the discussion of the Five-Year Plan [reply to comrade Motylev]). B, no. 13-14, 1928, pp. 109-116.

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b. On Capital Allocation

Numerous articles were published in the late 1920's on the

question of "effectiveness" of capital investments. While the planners favored an eclectic approach in this field—as may be seen for instance from the Materials for the Five-Year Plan of Development of Industry, 1927/28-1931/32 (edited by A. M. Ginzburg), as well as from various reports of the members of the Supreme Council of the National Economy—a number of economists, like Gol'dberg, Rozentul, and others sought to unify the various proposed indicators into a single generalized formula.

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Iushkov, L. "Osnovnoi vopros planovoi metodologii. Metody planirovaniia kapital'nykh zatrat po linii maksimal'noi ikh effektivnosti" (The basic question of planning methodology. Methods of planning capital investment and of maximizing its effectiveness). VF, no. 10, October 1928, pp. 26-40.

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Shaposhnikov, N. N. "Ob osnovykh printsipakh industrializatsii" (On the fundamental principles of industrialization). EO, no. 1, 1927, pp. 42-53.

Smit, M. "K voprosy ob uchete effektivnosti kapital'nykh vlozhenii" (On the question of the accounting of the effectiveness of capital investments). Problemy ekonomiki, no. 2, 1930, pp. 10-23.

Strumilin, S. G. "K probleme effektivnosti kapital'nykh zatrat" (On the problem of the effectiveness of capital expenditures). PK, no. 7, 1929, pp. 59-74.

4. On Planning

a. History, Documents, and Related Materials

The step-by-step development of Gosplan's organization and planning methods during the period under review may be followed through the pages of Gosplan's Biulletin' and of its journal Planovoe khoziaistvo. An over-all view of the development of its work may be gained from the following reports of Krzhizhanovskii, its chairman, from Gordon's and Markovich's accounts, and finally from Strumilin, one of the main architects of Soviet planning practice.

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national economy of the USSR. Published for Gosplan by Planovoe khoziaistvo, Moscow, 1926, 1928, 1929, 1930.

Kontrol'nye tsifry piatiletnego plana narodnogo khoziaistva i sotsialnokul'turnogo stroitel'stva RSFSR, 1928/29-1932/33 gg. (Control figures of the Five-Year Plan of economic and social-cultural construction of the Russian Soviet Republic, 1928/29-1932/33). Vols. I, II. Moscow, Gosplan, 1929.

Kratkii otchet Gosplana (A brief account of Gosplan). Moscow, Gosplan, 1924.

Krzhizhanovskii, G. M. Khoziaistvennye problemy RSFSR i raboty gosudarstvenno-obshcheplanovoi komissii (Gosplan) (The economic problems of the RSFSR and the work of the State General Planning Commission [Gosplan]). Moscow, Gosplan, 1921.

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Strumilin, S. G. "Pervye opyty perspektivnogo planirovaniia" (First experiences with perspective planning). PK, no. 12, 1930, pp. 241-262.

"Vsesoiuznyi s'ezd planovykh rabotnikov" (All-Union congress

of planning workers). Reports of Krzhizhanovskii, G. M.; Shub, G. V.; Zeilinger, V. I.; and others. Biulleten' gosplana, no. 3-4, 1928, pp. 23-40.

b. Theory and Methods

Proposals for a single, all-embracing economic plan were formulated early in 1920; among these proposals Gusev's pamphlet, advocating the introduction of the most advanced technology in the socialized branches of the economy, exercised a deep influence on Soviet economic thinking. The theoretical debates on planning methodology, which reached their peak in the mid-1920's, were dominated particularly by V. A. Bazarov, N. D. Kondrat'ev, G. A. Feld'man, and S. G. Strumilin. Until recently the debates continued to be treated derisively in some Soviet economic writings, for example, in the collective work of the Academy of Sciences of the USSR, Sovetskoe narodnoe khoziaistvo v 1920-25 gg. (The Soviet national economy in 1920-25), Moscow, 1960, pp. 36 ff. Interest in them has now revived as Soviet economists are turning their attention to problems of consistency and optimality in planning. Among the Western works which described or analyzed the planning problems of the period in an illuminating way are: Pollock, F., Die planwirtschaftlichen Versuche in der Sowjetunion 1917-1927 (Economic planning attempts in the Soviet Union 1917-1927), Leipzig, C. L. Hirschfeld, 1929; Kaufman, A., "The Origin of the Political Economy of Socialism," Soviet Studies, January 1953; Bobrowski, C., Formation du système soviétique de planification, Paris and The Hague, Mouton, 1956.

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Groman, V. G. "O nekotorykh zakonomernostiakh empiricheski obnaruzhivaemykh v nashem narodnom khoziaistve" (On certain regularities empirically observable in our economy). PK, no. 1, 1925, pp. 88-101 and no. 2, 1925, pp. 125-141.

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Kondrat'ev, N. D. "Kriticheskie zametki o plane razvitiia narodnogo khoziaistva" (Critical remarks on the plan for the development of the national economy). PK, no. 4, 1927, pp. 1-34.

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Sarab'ianov, V. N. Osnovnye problemy NEPa. Plan. Regulirovanie. Stikhiia. (Basic Problems of NEP. Plan. Controls. Market forces). Moscow-Leningrad, Moskovskii Rabochii, 1926.

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