

POLITICAL ECONOMY

by
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GENERAL PROBLEMS

Translated from Polish
by
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FOREWORD TO THE FIRST POLISH EDITION

THIS book is the first part of a larger work which will deal with all of the most important problems in political economy. I began writing at the beginning of 1957 at first intending to confine myself to a single volume. In the course of composition the work increased in size and will consist of three volumes of which this is the first.

This volume deals with the general problems of political economy—its subject matter, the connection between political economy and the materialist interpretation of history, economic laws, the method employed by political economy, the relation of political economy to praxiology, the problem of social conditioning and the social function of economic knowledge. Non-Marxist trends in political economy are also briefly discussed. In this way the volume is a self-sufficient whole dealing with the general bases of the science of political economy.

The next volume will be a critical exposition of the most fundamental problems of political economy. It will deal with the theory of reproduction and accumulation, market production and the law of value, and will contain a general comparative economic analysis of social formations. The last volume will be devoted to a detailed analysis of the mode of operation and the “law of motion” of the capitalist and socialist formations.

I had for a long time intended to write a systematic account of political economy. This intention hardened as my economic studies progressed and as I gained more experience in the practice of economic policy. This intention was finally crystallized by the conviction that many contentions and disputes in political economy can only be solved on the basis of

a systematic exposition of this science. Individual economic problems are bound together in a whole and it is difficult to grasp them in isolation. To resolve these problems it is also necessary to bear in mind the current state of scientific literature and contemporary historical experience. It is only in this way that the development of Marxist scientific thought in the field of political economy is possible.

This book is not a textbook but rather a systematic monograph. For this reason the chapters vary greatly in length and some problems are dealt with at greater length and in greater detail than others. I have tried to devote more space to new and controversial problems than to those which have accepted solutions, although these are also dealt with in order to maintain the systematic character of the work.

Although this book was not conceived as a textbook I none the less hope that it will contribute to the systematization of concepts and ideas in political economy. I also hope that, in some measure, it will be of practical service in the building of socialism in Poland.

Warsaw
15th April 1959

OSKAR LANGE

FOREWORD TO THE ENGLISH TRANSLATION

THE present volume is the first part of what is intended to be a systematic treatise on political economy. It was first published in Polish in the end of 1959 in 30,000 copies. This edition was sold out in a few months and a second Polish edition appeared in 1961. The English version is a translation of the second edition. It was undertaken by Mr. Angus H. Walker to whom I want express my thanks for his effort. I also wish to express my thanks to Dr. Zdzisław Sadowski and Mr. Adam Ponikowski, who helped me in editing the English version of the book.

The success which my book had in Poland encourages me to present it to readers in other countries. A French and an Italian edition have already appeared and some other translations are in progress.

The book is an attempt at a synthesis of my studies in various fields of economic science. It seems to me that the present state of economic science as well as the course of economic development we witness in various parts of the world present conditions ripe for such a synthesis. Even more, a synthetic view of economic science is required as a basis for the appraisal of modern economic developments.

Such a synthesis, in my opinion, is possible only on the basis of the Marxian conception of political economy as a science which studies the processes of economic development in a broad framework of historically shaped social conditions. It has to establish the laws which govern the development of modern economic society and to show how these laws can be utilized successfully to shape consciously and purposively the socio-economic processes, to subject them to the control of human will and human objectives.

In the countries which have adopted a socialist economic

system economic development is planned. In these countries the science of political economy serves as a basis for economic planning. Not only nature, but also social and economic development are gradually being subjected to scientific control. Interest in economic planning, however, has spread far beyond the socialist countries. It is particularly keen in the countries designated as "underdeveloped" which look for ways of overcoming a situation of economic and social stagnation, or even retrogression, and of entering upon a road of rapid economic and social progress. But even in highly developed capitalist countries interest in economic planning grows, largely because of the challenge which the rapid progress of socialist economy presents to the old capitalist order.

Mankind is no longer willing to accept economic and social development as a result of some inescapable Fate, Providence or alleged laws of Nature. Peoples wish to take their destiny in their own hands, to shape social and economic conditions so as to accelerate progress, to realize their aspirations in the fields of welfare, justice and cultural achievement. Economic science has to provide the means of satisfying this end.

This is the view of the social role of economic science which inspires my work. The reader will judge to what extent the present book meets these requirements.

Warsaw

September 1962

OSKAR LANGE

CHAPTER ONE

THE SUBJECT MATTER OF POLITICAL ECONOMY ELEMENTARY CONCEPTS

POLITICAL economy, or social economy, is the study of the social laws governing the production and distribution of the material means of satisfying human needs.

Human needs and means of satisfying them

Man living in society at a certain stage of historical development has various needs. He needs food, clothing, shelter, facilities for educating his children, amusement, and many other things. Some of these needs are biological and must be satisfied in order to sustain life: other needs result from the fact that men live together in society and are determined by the complex set of factors which constitute what is called the culture of a given society. Even biological needs take on specific forms and character according to the culture of a society as is the case, for example, with food. Human needs may be individual or they may be collective. Collective needs, such as the need for security and for certain kinds of entertainment, are a direct result of the fact that men live together in society. Human needs, although originally derived from biological necessity, are thus a result of the existence of society and are conditioned by the stage of development which society has reached.

The material objects—bread, houses, coal, films, books, ball-dresses, pavements, street-lamps, buses, schools—necessary for the satisfaction of human needs—we call *goods*. Goods then are the material means of satisfying human needs. These

means are drawn from nature. Some of these means—such as the air necessary for respiration—are provided directly by nature in a form requiring no human activity to prepare them for use¹. As no human activity is involved political economy does not concern itself with them. The overwhelming majority of the means of satisfying human needs, however, are drawn from nature by extracting and processing them, by changing their physical, chemical, and biological properties, by conveying them in space and preserving them over time.

Production, labour

The activity which adapts natural resources in order to make goods we call *production*, and the goods which are the result of this activity we call *products*. It follows that all the goods with which political economy deals are products. When we think of material objects as the means of satisfying human needs we call them goods: when we think of them as being the result of the human activity of production, we call them products.

Production is the human activity which adapts natural resources to human needs. It is a conscious and purposive activity and it is this consciousness and purposiveness which distinguish men from animals². Production consists of various

¹ They are often called “free goods”.

² Most animals make direct use of nature without adapting it in any way. In animal communities like those of the ants or the termites, the adaptation of environment (e.g., the building of ant-hills) is the result of unconscious instinct and is not due to a consciously purposive activity. See L. Krzywicki, *Rozwój społeczny wśród zwierząt i u rodzaju ludzkiego. Studia Socjologiczne*, (Social Development among Animals and Human Beings. Sociological Studies), PIW, Warsaw 1951, pp. 193–200. (Ludwik Krzywicki [1859–1941], sociologist, economist, ethnologist, publicist and public figure. He was the first prominent Marxist theoretician in Poland where his role in the development of Marxism was similar to that of Kautsky in Germany, Labriola in Italy and Plekhanov in Russia. He wrote the first study in Polish on the materialist interpretation of history, was the chief editor of the Polish translation of Book I of Marx's *Capital* and popularized Marxism in his articles. At the end of

activities which we call *labour*. By labour man acts upon nature and transforms it according to his needs. But at the same time man transforms himself by the labour which he performs—he himself is moulded as he acquires and develops the ability to perform various operations. “Labour”, writes Marx, “is primarily a process going on between man and nature, a process in which man, through his own activity, initiates, regulates, and controls the material reactions between himself and nature. He confronts nature as one of her own forces... By thus acting on the external world and changing it, he at the same time changes his own nature. He develops the potentialities that slumber within him, and subjects these inner forces to his own control”³.

Means of production and means of consumption

Production then is based on labour. But in his work man makes use of various material objects, e.g., ploughs, draught animals, machines, trucks, ships, steel, sulphur and so on. We call these objects *the means of production*. We can divide the means of production into two groups. The first group consists of those means of production which are processed by human labour. This category includes natural resources like soil, wild animals, minerals, together with raw materials and semi-finished products like cotton and unfinished machinery. Such objects are called *objects of labour*. The second

his life he entirely abandoned political activity in order to devote himself exclusively to his academic work). This had already been noted by Marx who wrote: “A spider carries on operations resembling those of the weaver: and many a human architect is put to shame by the skill with which a bee constructs her cell. But what from the very first distinguishes the most incompetent architect from the best of bees is that the architect has built a cell in his head before he constructs it in wax. ... What happens is not merely that the worker brings about a change of form in natural objects: at the same time, in the nature that exists apart from himself, he realizes his own purpose, the purpose which gives the law to his activities, the purpose to which he has to subordinate his own will”. K. Marx, *Capital*, Everyman, London 1930, vol. I, pp. 169–170.

³ K. Marx, *Capital*, ed. cit., vol. I, p. 169.

group consists of those means of production which are used in processing the objects of labour. Under this heading we place the objects made for the performance of certain operations like axes, saws, machines, chemical apparatus and so on, which we call tools. Other objects which, although not in themselves tools, facilitate the use of tools, like buildings, stores, harbours, roads and land, are also included in this group. All such objects we call the *means of labour*.

Although the means of production do not serve directly to satisfy human needs, none the less, they are indispensable for the production of those objects which do directly satisfy human needs, and for that reason we classify them as goods. To differentiate between the means of production and other goods we call the former, *producer goods* and the latter, *consumer goods*. Sometimes the self-explanatory terms *indirect goods* and *direct goods* are used. The difference between producer goods and consumer goods is not physical since the same object, coal for example, may be either a means of production or a means of consumption. The distinction is functional; it depends on the way in which a good is used to satisfy human needs.

The activity by which man satisfies his needs is called *consumption*. Consumer goods are either, like food, used up in the process of consumption all at once, or, like clothes, over a period of time. Producer goods, or the means of production, are not the object of consumption. They are, however, used up in the process of production either, like raw materials, all at once, or, like machinery, over a period of time, and this process is sometimes called *productive consumption*⁴. This is not, however, consumption in the strict sense of the word and it is better to distinguish between the *immediate* and the *gradual* using up of the means of production.

Social nature of production and distribution

The production of the material means of satisfying human needs is always *social* production. Robinson Crusoe, who

⁴ *Ibid.*, p. 176.

engaged in production in isolation from human society, is a fiction without counterpart in reality. As Marx, the first to make a consistent analysis of the social character of production, wrote, "The... *material* production by individuals as determined by society, naturally constitutes the starting point... The further back we go into history, the more the individual, and, therefore, the producing individual seems to depend on and constitute a part of a larger whole... Whenever we speak, therefore, of production, we *always have in mind production at a certain stage of social development, or production by social individuals*"⁵.

The social character of production is a result of the social character of labour. Men producing goods do not work in isolation. The labour of an individual is closely connected with the activity of other workers, men collaborate and they work for each other: the work of one man is dependent for its success in the completion of the production process on the work of another. Collaboration in production is called *co-operation* and the working of men for each other takes the form of the *division of labour* by which men specialize in various kinds of labour. Thus the efforts of an individual are only part of the joint labour of all the members of society, of the *social labour* which produces goods which serve, directly or indirectly, to satisfy human needs in society.

Since products are the result of social labour they, too, are social in character. They serve, directly or indirectly, to satisfy the individual or collective needs of people living in society. This implies the *distribution* of products among the members of society. Products are distributed both to individuals for individual consumption and to organized groups of individuals like local authorities, associations and institutions for collective consumption. The social character of distribution is obvious: distribution by its very nature is a social act. Distribution assumes different forms at different stages in the histo-

⁵ K. Marx, *Introduction to the Critique of Political Economy*, in *A Contribution to the Critique of Political Economy*, Charles H. Kerr and Company, Chicago 1904, pp. 265, 267, 268.

rical development of society. One such form, of particular importance in social history, is *the exchange of products*. This is, however, not the only form of distribution to be found in history⁶.

Productive and non-productive labour (services)

The distribution of products is equally a human activity requiring the performance of conscious and purposive operations; the activity of a salesman in a shop or of a person allocating products in kind is labour. There are also human activities or kinds of labour, such as that of the artist or the teacher, which directly satisfy human needs without producing material objects or goods. Neither the labour involved in the distribution of goods nor activities which themselves directly satisfy human needs produce any material objects. For this reason they are usually called *non-productive labour* in contradistinction to *productive labour*.⁷ All activities connected with the satisfaction, directly or indirectly, of human needs which do not result directly in the production of goods are called *services*. For the sake of brevity from now on we shall use the word labour only in the sense of productive labour, i.e., labour engaged in the production of material objects, and

⁶ Frederick Engels defined political economy as "the science of the laws governing the production and exchange of the material means of subsistence in human society". See F. Engels, *Anti-Dühring*, Lawrence and Wishart, London 1955, p. 203. This agrees entirely with the definition which we have adopted above. We have only replaced the term "exchange" by the term "distribution". From the context it can be seen that by "exchange" Engels understood "distribution". However, since in general the expression "exchange" is used in the above sense only to denote a certain historical form of distribution, we have used in our definition of the subject of political economy the word "distribution". The reader will also notice that the expression used by Engels "the material means of subsistence in human society" has been replaced in our definition by "material means of satisfying needs". The expression used by Engels may leave the impression that he is concerned with the means of satisfying biological needs, excluding the means of satisfying other needs. It is obvious from his work as a whole that Engels did not have this in mind.

⁷ K. Marx, *Capital*, ed. cit., vol. I, p. 173.

use the word *services* to cover all other operations connected with the satisfaction of human needs.

In order that services may be carried out, certain material objects like school buildings, films, musical instruments and so on are necessary. These we call *the means of performing services*. Particularly important among these are *the means of distribution* in the shape of facilities like shop-accommodation, shelves, cash-registers. Since the performance of services satisfies human needs without producing material objects the means of the performance of services must be classified as consumer goods. These means are employed and used up in the process of satisfying human needs.

Political economy, the science of the social laws of the economic process

Political economy is concerned with the social laws of production and distribution. It deals with the social laws of the production of goods and their distribution to the consumers, i.e., to those who use the goods to satisfy their individual or collective needs. It does not deal with the act of consumption itself, the study of which is the concern of biology, hygiene, psychology, education, and other branches of science. Consumption, then, (together with services) marks the boundary of political economy's sphere of interest. The production of goods and the distribution of goods—two fields of social activity—may, taken together, be called *economic activity*. So we can say that political economy is the science of the social laws of economic activity⁸.

The production and distribution of goods do not constitute a simple, single act. They involve the continual repetition of certain human activities. For this reason we talk about the *process* of production and distribution, the *economic process*. The word *process* means here a human activity which is continually repeated. It is only in such a process, in the continual repetition of a human activity that a pattern of regularity can

⁸ See the note on the expression "political economy" and related terms at the end of this chapter.

be observed. Strictly speaking, therefore, the concern of political economy is the investigation of the regularities in this process, the study of the social laws governing the economic process.

Economic relations

In the economic process more or less permanent relations arise between men (social relations). Social relations are definite types of permanent (i.e., perpetually repeated) mutual interactions among men arising out of a continuous activity of a definite kind. There are various kinds of social relations; the relation, for example, between those who govern and those who are governed which results from the exercise of political power, or the relation between the teacher and the pupil which is a result of the process of teaching. The social relations which emerge in the economic process differ from all other types of social relations in that they come into being in connection with material objects that serve to satisfy human needs—they arise in connection with the means of production or in connection with consumer goods. The social relations which come into being in this way are called *economic relations*. As Engels put it “these relations are... always *attached to things*”⁹. Things, material objects, here constitute a binding social link between men¹⁰.

⁹ F. Engels, *Karl Marx, A Contribution to the Critique of Political Economy*, in Marx and Engels, *Selected Works*, Lawrence and Wishart, London 1958, vol. I, p. 374.

¹⁰ See L. Krzywicki, *Social Development among Animals and Human Beings. Sociological Studies*, in Polish, ed. cit., p. 201. Also, by the same author, *Rozwój kultury materialnej, więzi społecznej i poglądu na świat* (The Development of Material Culture, of Social Bonds and of Views of the World), *Świat i Człowiek*, Warsaw 1912, no. 3, p. 86. It is perhaps worth quoting an example given by Krzywicki: “If we consult the Land Registry in any town, what do we find there? Enormous books serially numbered, each of which represents a house. On examining the contents of these books we find that they record the mortgages and obligations of each house, i.e., they show its past and present condition. The names of the owners and creditors change, but the book remains as unchanged as the house”. Here the houses are the binding factor in the social links between men.

Economic relations can therefore be represented in the following way:

man→thing←man

Those relations between man and thing which form the intermediate link in relations between men constitute a component of economic relations. In the process of production these relations between man and thing appear as the relationship between the labour exerted and the quantity of products resulting, i.e., the productivity of labour. In the process of distribution they appear as the relationship between human needs and the various products, i.e., utility, also called use value¹¹. These relations between man and thing are the subject of political economy only in so far as they constitute a link in the economic relations between men: in other words, political economy is only concerned with their social aspect. Their physical aspect lies outside the field of political economy: in the production process this is the concern of technology (industrial technology, agronomy, transport technology, etc.) while in the distribution process it is the concern partly of technique (e.g., trading technique, the expert knowledge of commodities), and partly of biology, medicine, psychology, and so on.

Political economy, then, in investigating the social laws governing the economic process, deals with a certain specific type of social relations. This specific type is constituted by economic relations, a term which also covers those relations between man and thing which constitute links in economic relations. There are two kinds of economic relations. Those of the first kind appear in the process of production and are called *relations of production* or *production relations*, those of the second kind appear in the process of distribution and are called *relations of distribution* or *distribution relations*; where, at a particular stage of historical development distribution takes the form of exchange, distribution relations are called *exchange relations*¹².

¹¹ Engels also uses the term "useful effect" (Nutzeffekt). See F. Engels, *Anti-Dühring*, ed. cit., p. 430.

¹² The term "relations of production" Marx introduced in his famous

Production relations and social productive forces

The special characteristic of production relations is that they are formed in the labour process, i.e., in the process of man's acting on nature and the course of the development of man himself as a result of this activity—in the process, as Marx said, of “an exchange between man and nature”. Production relations are simply the result of the social character of labour, a result of the fact that the process of production involves co-operation and the division of labour. Hence, production relations depend on those relations between man and thing which develop in the production process; that is, they depend on the way in which man acts on nature and on the way in which he himself is formed by that activity.

The mode and means used by man to act on nature in the process of production and the abilities which he develops in his activity were called by Marx *productive forces*. Since the process of production is a social phenomenon then this is also true of productive forces: they are social productive forces.

Within the category of social productive forces we place the technical methods of production, the means of production and especially the instruments of labour, tools. Also under this heading are found human experience and men's ability to make use of the means of production, together with the men themselves who are experienced in this way and possess such ability. In other words, the social productive forces are a complex of all those factors which determine the social productivity of labour at a given stage in the historical development of society: they express the “productive potential of society”.

preface to *A Contribution to the Critique of Political Economy*, (1859). See K. Marx, *A Contribution to the Critique of Political Economy*, ed. cit., p. 11. However, in the lectures given in 1847 under the title *Wage Labour and Capital*, he had already spoken of “social relations of production” (K. Marx, *Wage Labour and Capital*, in Marx and Engels, *Selected Works*, ed. cit., vol. I, p. 89). Engels also wrote of “relations of exchange” understanding them in a broad sense as relations of distribution. Engels defined relations of production and relations of exchange as being together economic relations. See F. Engels, *Anti-Dühring*, ed. cit., p. 41.

A distinction can be made between physical productive forces and human productive forces¹³. Both are developed in close interdependence, since it is human beings who create the means of production and the technical methods of applying them, while human abilities are themselves developed in the process of producing things and in the use of the means of production. Marx also used the term "material productive forces"¹⁴, thus stressing the fact that productive forces express man's relation to the surrounding material world. At the same time they express the active nature of that relation.

Since production relations develop in the process of production, they correspond to the requirements of co-operation and the division of labour in the social labour process. But in each case these requirements depend on the stage which the historical development of the social productive forces has reached at any given moment. This was described by Marx:

"In production, men not only act on nature but also one upon another. They produce only by co-operating in a certain way and mutually exchanging their activities. In order to produce, they enter into definite connections and relations with one another and only within these social connections and relations does their action on nature, does production, take place.

"These social relations into which the producers enter with one another, the conditions under which they exchange their activities and participate in the whole act of production, will naturally vary according to the character of the means of production...

*"Thus the social relations within which individuals produce, the social relations of production, change, are transformed, with the change and development of the material means of production, the productive forces"*¹⁵.

¹³ See H. Cunow, *Die Marxische Geschichts-, Gesellschafts- und Staatstheorie*, Berlin 1923, vol. II, p. 158.

¹⁴ *Preface to A Contribution to the Critique of Political Economy*, K. Marks and F. Engels, *Selected Works*, vol. I, p. 363.

¹⁵ K. Marx, *Wage Labour and Capital*, ed. cit., vol. I, p. 89.

Distribution relations and production relations

While production relations are shaped according to the historical stage which the productive forces have reached, i.e., according to the way in which man's action on nature is developed, distribution relations are themselves dependent on production relations. The way in which products are distributed in society is determined by the way in which men participate in the social process of production.

"The relations and methods of distribution appear, therefore, merely as the reverse sides of the agents of production. An individual who participates in production as a wage labourer, receives his share of the products, i.e., of the results of production, in the form of wages. The subdivisions and organization of distribution are determined by the subdivisions and organization of production. Distribution is itself a product of production, not only in so far as the material goods are concerned, since only the results of production can be distributed; but also as regards its form, since the definite manner of participation in production determines the particular form of distribution, the form under which participation in distribution takes place"¹⁶. Therefore distribution relations are determined by production relations: they change when the relations of production change.

Production relations are thus the foundation of the whole of economic relations. Man's active attitude to the material world around him in the social process of production determines production relations which in turn determine distribution relations. This is the key to the understanding of the laws governing the social process of the economic activity of human beings, the key to the understanding of the laws, the investigation of which is the concern of political economy.

¹⁶ K. Marx, *Introduction to the Critique of Political Economy*, ed. cit., p. 284.

NOTE ON THE EXPRESSION "POLITICAL ECONOMY" AND RELATED TERMS

The word "economy" dates back to Aristotle and means the science of the principles of household management. It is derived from the Greek *oikos* meaning a house, and *nomos* meaning law. The term political economy was first used early in the seventeenth century by Montchrétien in his *Traité de l'économie politique*, published in 1615. The adjective "political" indicates that the work was concerned with the principles of state economy, since Montchrétien was mainly interested in state finance. Later the term "political economy" began to be widely used to denote research on problems of social economy. The Greek word πολιτικός means "social" (Aristotle defines man as a "social animal" — ξῶν πολιτικόν). Therefore the terms "political economy" and "social economy" are considered to be synonymous although "social economy" gives perhaps a better idea of the subject matter of the science.

Political economy is, therefore, sometimes defined as the science of "social economy". Supiński, for example, uses this expression in the title of his work *Szkola polska gospodarstwa społecznego* (The Polish School of Social Economy, 1862–1865). In France, in conformity with the tradition originating with Montchrétien in 1615, the term "political economy" has been and is used commonly right up to the present day. It is characteristic, however, that the well-known manual by Charles Gide, *Principes d'économie politique* (1884), was published in Polish as *Zasady ekonomii społecznej* (The Principles of Social Economy). The term "social economy" was widely used in Poland in the late nineteenth century and early twentieth century. It had its supporters in other countries as well. In Italy, Luigi Cossa published *Economia Sociale* (1891). In Germany, Heinrich Dietzel wrote *Theoretische Sozialökonomik* (1895).

In England the term "political economy" came into use probably under the influence of French terminology. It was first used by James Steuart in the title of his book *Inquiry into the Principles of Political Economy* (1767).

It is from this Anglo-French tradition that the term "political economy" as used by Marx and Engels comes. They used it to denote the study of the social laws of the production and the distribution of goods: Marx sometimes called his work a "critique of political economy", i.e., a critique of the doctrines of what is known as classical political economy. Since then

generally the term "political economy" has been regularly used in Marxist literature. The only exception is Rosa Luxemburg, who in her expositions of political economy referred to the "science of national economy" (Nationaloekonomie). (See Rosa Luxemburg: *Einführung in die Nationaloekonomie. Ausgewählte Reden und Schriften*, Berlin 1951, vol. I).

This term—national economy—from the middle of the nineteenth century established a firm place for itself in German learning (Nationaloekonomie, Volkswirtschaftslehre). It is an expression of the specific role ascribed to the nation as an economic factor by what was known as the historical school, the dominant trend in the German academic circles of the time. It is worth noting that the same term was first used by the Venetian monk Giammaria Ortes in his book *Della economia nazionale* (1774). In Poland, Fryderyk Skarbek entitled his lectures on political economy *Ogólne zasady nauki gospodarstwa narodowego* (General Principles of the Science of National Economy, 1859). In Russia, the term "political economy" was used consistently, at first under the influence of the Anglo-French tradition, and later as the term universally used in Marxist literature.

After Alfred Marshall published his *Principles of Economics* in 1890 the term "economics" was used by increasing numbers of writers in academic circles in the English-speaking countries. Here it drove out the term "political economy", which was still used by William Stanley Jevons (*The Theory of Political Economy*, 1871). In Poland Edward Taylor placed especial stress on the term "economics": see *Wstęp do ekonomiki*, (Introduction to Economics), 2nd ed., Gdynia 1947. See also Adam Krzyżanowski, *Założenia ekonomiki* (The Foundations of Economics), Cracow 1919. This is connected with a change in the object of economic research (a matter to be discussed later). At present, in English-speaking countries, the term "political economy" is used almost exclusively in Marxist literature, which consciously opposes the political economy of the classical school and of Marx and Engels to contemporary academic "economics". (Cf. Maurice Dobb, *Political Economy and Capitalism*, London 1937).

CHAPTER TWO

MODES OF PRODUCTION AND SOCIAL FORMATIONS

THE MATERIALIST INTERPRETATION OF HISTORY

Dependence of production relations on social productive forces

THE basic regularity encountered by political economy in its investigation of the social laws governing human economic activity is formed by the dependence of production relations on social productive forces. A given level of development of social productive forces requires a specific form of co-operation and of the division of labour in the process of production. The co-operation and division of labour in a large factory, using large-scale specialized machinery and installations, necessarily differ from those in a craftsman's workshop where work is done with fairly simple tools. The division of labour and co-operation on a large farm, where tractors, combines, artificial fertilizers, and electric power are employed, differ from those on a small and backward family holding, where the land is tilled by old, traditional methods.

Krzywicki illustrates this very well with the example of a railway line: "There must be someone in the booking office at the appropriate time, someone else must weigh the luggage, there must be others to drive the engine, check the coaches, and operate the telegraph. The functions for which each of these individuals is responsible are strictly and precisely adjusted to the duties of all the other individuals involved. Each person is, as it were, a living adjunct of this or that inanimate object—the train, the booking-office, the warehouse. This group of people, together with the entire railway line, form a single whole: their activities cannot be understood without bearing

in mind the time-table, the way in which the trains operate, and the movement of goods"¹.

Production relations, however, are not confined to the single economic unit (factory, farm, railway line), within which the production process takes place. The social process of collaboration in labour extends so as to cover people working in different production units. Take, for example, a textile factory in Łódź. Its machines have been made in other factories which specialize in the production of machines and which may even be solely occupied with the production of machines for the textile industry. These factories may be situated in other cities, or even abroad. The cotton which a textile factory uses as its raw material may have been grown in Uzbekistan, America, or Egypt. The coal it uses has been mined in a Silesian colliery. The cotton and the coal are brought to the factory by ships and trains. Against this background arises the complicated system of social relations between individuals which we call production relations.

Ownership of the means of production as basis of production relations

In order to understand the system of social relations which emerge in the process of production, one must first of all pick out from among them certain fundamental relations which determine the character of the entire complicated network. The basic relation arises from the ownership of the means of production. This ownership is not mere possession. It is property, i.e. possession which is recognized by members of society, which is protected by generally respected social standards in the shape of laws and customs, and which is guarded by the existence of sanctions against the violation of these social rules.

The ownership of the means of production is the social relation on which the entire complex of human relations developed in the social process of production is based. For it is the

¹ L. Krzywicki, *Social Development among Animals and Human Beings. Sociological Studies* (in Polish), ed. cit., pp. 201-202.

ownership of the means of production which decides the ways in which they are used and which thereby determines the forms taken by co-operation and the division of labour. Moreover the ownership of the means of production determines the issue of who owns the products, and hence decides how they are distributed.

The ownership of the means of production forms the foundation, the organizational principle, of production relations and distribution relations. It follows that production relations must be classified according to the ownership of the means of production which can be either social or private.

If the means of production are socially owned, they are the common property of all members of society where by "society" we mean all those who are connected by the relations resulting from co-operation and the division of labour. In a primitive tribe where all hunt together, "society" includes all the members of that tribe: in a self-sufficient village community it includes all the village inhabitants. The contemporary use of the word "society" refers, in principle, to the citizens of a given nation, but because of the international division of labour it in fact has a wider scope.

Private property may be owned by individuals or it may be vested in groups of people like a family, a company or corporation, provided only that such a group does not include all the members of a given society. Some forms of property occupy a half-way position, being neither purely social nor purely private: such, for example, is the case with the property of a co-operative or of other associations which embrace only part of the members of a given society.

Modes of production

The social productive forces and the production relations connected with them and based on a given type of the ownership of the means of production are jointly termed *the mode of production*². A study of the historical development of human society enables us to distinguish five basic modes of pro-

² The term "mode of production" comes from Marx. See *Preface*

duction, which roughly coincide with certain periods of human history.

The first is *the primitive community*, where the majority of the means of production, especially land, is common property.

The second is *slavery*, where both the means of production and those who use them are the property of others—the slave owners. Slaves can be either private property, or they may be the property of the state, that is to say, of a monarch.

The third is *feudalism*. In this case the land is partly private and partly state (royal) property, or belongs to associations like the Church or monastic orders. Those who till the land are attached to it as “serfs” and cannot leave it at will. The landowners allot them plots of land for their personal use and in return they are obliged to till the landowners’ fields and pay as tribute part of the produce of the land allotted to them.

The fourth mode of production is *capitalist production*. Here, production is undertaken for exchange, it is what we call commodity production. The means of production are the property of a certain section of society, the capitalists. The rest of the members of such a society, and they form the majority, do not possess their own means of production. They work as free wage-labourers, operating the means of production owned by the capitalists. The capitalists may own the means of production either individually or corporately (e.g. in the form of companies). This kind of production is characterized by large production units, mainly factories or large farms, where large numbers of hired workers are employed and within which co-operation and the division of labour are well developed. Under such conditions the owners of the means of production appropriate part of the product manufactured in the social process of labour.

Finally, the fifth mode of production is *socialist production*. In this case the means of production are the property of the whole society (social property). Under certain conditions part of the means of production may be jointly owned by co-oper-

to A Contribution to the Critique of Political Economy in K. Marx and F. Engels, *Selected Works*, ed. cit., vol. I, p. 363.

ative associations or municipalities, rural communities etc. The production process is deliberately planned and directed by society, i.e., by agencies representing the whole of the community, in order to satisfy the needs of all its members.

These modes of production, as we have already stated, roughly correspond to certain periods in the historical development of mankind. Between these periods there are, however, transitional stages when two or more different modes of production exist side by side³. Moreover, even in an epoch characterized by a particular mode of production, remnants of some other mode may persist for a long time, and may even survive the epoch itself. Under capitalism, for example, elements of feudalism in many countries survived and still have not been finally extinguished. In identifying certain modes of production with certain periods the modes of production we have in mind are those whose production relations determine the development of economic relations in society. The elements of other modes of production which are found along with the dominant one are not only those which have survived from the past but also those incipient forms which will only develop fully later in the historical process: there were, for instance, incipient forms of capitalist production in the period when feudalism was prevalent.

Apart from these five modes of production, there is also another which, although never dominant in any period, continually appears as a subsidiary mode of production—and one which is frequently very important. This is *simple commodity production*, also called *small-scale commodity production*. In this case the means of production are the private property of the producers who themselves, and sometimes together with their families, use them and exchange their products for the products of other producers. Simple commodity production in the shape of handicrafts plays a particularly important role in the later feudal period. In the form of private peasant production, it

³ "...no hard and fast abstract lines can be drawn between the epochs of social history any more than between the epochs of geological history". K. Marx, *Capital*, ed. cit., vol. I, p. 391.

plays an important part under capitalism and in the initial phases of the development of socialism.

Antagonistic and non-antagonistic modes of production

An examination of the modes of production specified above shows that they can be classed into two types according to their production relations. In one type of production relations all members of society share in the ownership of the means of production. This is the case when the means of production are socially owned, i.e., in the primitive community and in the socialist mode of production. The situation would be similar in the case of simple commodity production should it ever dominate society, for then each member of society (or each family) would be the individual owner of the means of production which he used in his work.

In the other type of production relations not all members of society share in the ownership of the means of production. Slaves do not own any means of production and, moreover, they themselves are the property of other people. Serfs own no land: they work on land belonging to others: they are tied to the land on which they work, and must pay tribute for the land allotted to them for their own use. Under capitalism, hired labourers use the means of production owned by the capitalists. In all these modes of production, the ownership of the means of production is the *privilege*, or, as some put it, the *monopoly* of one part of society only. In such a case we say that society is divided into *social classes* and that production relations, and consequently the whole mode of production, are *antagonistic*⁴.

In an antagonistic mode of production there are two social classes: one made up of those who own the means of production and the other comprising those who are deprived of the means of production. Those who belong to the second class use in their work means of production owned by members of the first class. As a result, the means of production are employed in such a way

⁴ See K. Marx, *Preface to A Contribution to the Critique of Political Economy*, in K. Marx and F. Engels, *Selected Works*, ed. cit., vol. I, p. 363.

that the process of production does not serve to give the best satisfaction of the needs of society as a whole, but serves first and foremost the satisfaction of the needs of the owners of the means of production, even to the detriment of the rest of society. Hence the term "antagonistic".

Law of necessary conformity between production relations and character of productive forces

The mode of production is an internally balanced whole in which production relations, and especially the base on which they rest—the ownership of the means of production—are adjusted to the requirements of a given state of the development of social productive forces. We know that production relations cannot be arbitrary for given productive forces. A large industrial unit like an iron works or a locomotive factory, where a great number of people are employed using large and numerous specialized machines and technical installations, cannot exist in conditions of simple commodity production, where the ownership of the means of production is scattered among a very large number of individuals. Such a production unit requires either capitalist or socialist production relations.

Slavery as a mode of production is characterized by great carelessness on the part of the slave in the handling the instruments of labour. Marx gives the following example: "It is a universal principle in production by slave labour that none but the rudest and heaviest implements shall be used, such tools as are difficult to damage owing to their sheer clumsiness. In some of the slave States of the American Union, those bordering on the Gulf of Mexico, down to the outbreak of the Civil War, the only ploughs used were constructed upon an old Chinese model: ploughs which burrowed into the soil like a pig or a mole, but did not cut a furrow and turn the earth over"⁵. Better, improved instruments of labour require different production relations. Nor was the development of large-scale industry based on modern technology possible under

⁵ K. Marx, *Capital*, ed. cit., p. 191 n. The quotation is from J. E. Cairnes, *The Slave Power*, London 1862.

feudalism since such development is dependent on the emancipation of the peasants from serfdom and the emergence of a class of free hired workers who can be employed in large factories.

A given state of productive forces demands, as we can see, appropriate production relations. Equally, production relations influence the development of productive forces. Production relations adjusted to the requirements of the productive forces stimulate the further development of these forces. On the other hand, production relations which are not adjusted to the productive forces impede this development. A feudal serf, for example, takes greater care of the instruments of labour than a slave, but makes poor material for factory work, as the experience of several countries in the eighteenth century demonstrates. Accumulation—the increase in the stock of the means of production—finds more favourable conditions under capitalist ownership of the means of production than when production is in the hands of small craftsmen. Capitalist ownership is also a powerful stimulus to technical progress whereas hand-workers are noted for their conservative attitude to any change in production methods. The socialist ownership of the means of production ensures greater accumulation and a quicker economic growth than capitalist ownership. In this way the stimuli resulting from production relations either help or hinder the growth of productive forces. It depends on the degree to which production relations are adjusted to the needs of the productive forces.

This connection between production relations with the state and the development of productive forces accounts for the fact that the mode of production at a definite stage in social development is an internally balanced whole. Marx put this in an undoubtedly oversimplified but terse and suggestive way “The hand-mill gives you society with the feudal lord; the steam-mill, society with the industrial capitalist”⁶.

⁶ K. Marx, *The Poverty of Philosophy*, Lawrence and Wishart, London 1936, p. 92.

This is the basic pattern to which conforms the development of production relations. We define it as *the law of the necessary conformity between production relations and the character of the productive forces*⁷.

This is the first and basic law of political economy. We shall see, however, as we go on, that the dependence of production relations on productive forces is of vital importance not only for the shaping of all economic relations but also for the shaping of all other social relations. For this reason we shall also term this law the "*first basic law of sociology*". By sociology we mean the science of the laws governing the development of human societies.

Social consciousness

Economic relations are not the only social relations. Apart from economic relations in which the social bond is forged through the intermediary of material objects, there are other social relations which result directly from the behaviour of men towards each other, from behaviour which is constantly repeated according to a given pattern. These are the social relations which result from family life, customs and the moral rules recognized by society. The activity of state authorities gives rise to political relations and there are also legal relations resulting from rules laid down by the state which regulate human activity.

Such social relations as mentioned are characterized by the fact that they are conscious relations. People are conscious of the fact that they affect one another through the behaviour in which these social relations are revealed. On the other hand, people are usually—although not always—unconscious of the

⁷ This is a comparatively recent term introduced by J. Stalin in his *Economic Problems of Socialism in the U.S.S.R.*, Foreign Languages Publishing House, Moscow 1952, p. 75. It is now generally used in the Soviet Union; see, for example, *Istoricheskii materialism*, (Historical Materialism) Gosudarstvennoye Izdatel'stvo Politicheskoy Literatury, Moscow 1954, p. 70. From the quotations given above it is quite clear that the law itself was discovered and formulated by Marx.

economic relations existing between them. They are generally aware of the existence of distribution relations: collecting wages, interest, rent, and so forth.

Certain production relations, like the relations between slave-owner and slaves or the relations of co-operation and of the division of labour in a factory, are also conscious. Men are not, however, aware of the relations of the division of labour which are created by the exchange of products between producers in simple commodity production and capitalist production.

A Manchester mill worker and a Negro working on an African cotton-plantation are not conscious of the social relation between them. The same applies to a textile worker in Manchester and a steel worker in Sheffield who is producing the steel of which textile machinery is made. "In all social formations of any complexity", writes Lenin, "—and in the capitalist social formation in particular—people in their intercourse are *not conscious* of what kind of social relations are being formed, in accordance with what laws they develop, etc. For instance, a peasant when he sells his grain enters into "intercourse" with the world producers of grain in the world market, but he is not conscious of it: nor is he conscious of the kind of social relations that are formed on the basis of exchange"⁸.

In so far as men are conscious of social relations certain ideas take shape in their minds. They are conscious of social relations through the agency of these ideas. There also emerge legal and political, moral and religious, philosophical, scientific and artistic ideas, on the basis of which men evaluate social relations. Such ideas are called social ideas, and a system of such ideas is called an *ideology*. Along with social ideas people also develop certain more or less distinct psychological attitudes towards various social relations (e.g., the hostile attitude of the members of some social groups towards state

⁸ V. I. Lenin, *Materialism and Empirio-Criticism*, Lawrence and Wishart, London 1948, pp. 334–5.

authority, or the respect which members of some social groups have for the representatives of organized religion). These attitudes constitute what we call *social psychology*. An ideology or social psychology may be the expression of the social ideas and socio-psychological attitudes of an entire society or of parts of that society such as social classes or other social groups. To this complex of social ideas and psychological attitudes we give the name *social consciousness*. The social relations themselves of which people are aware and which are the subject of social ideas and socio-psychological attitudes we call the *object of social consciousness*⁹.

Within the complicated arrangement of social relations other than production relations and of the various elements of social consciousness (i.e. social ideas and socio-psychological attitudes) existing in a given society, some are indispensable for a given mode of production. In every antagonistic mode of production for example, there must be legal and political relations arising from the activity of the state authority in protecting the privilege enjoyed by one part of society through its ownership of the means of production: there must be moral, religious, and philosophical ideas which convince the whole of society that the ownership of the means of production is in the right hands. In addition to the appropriate legal and political relations the feudal mode of production requires the appropriate moral, religious and philosophical ideas—the socio-psychological attitude of submissiveness on the part of the peasant towards his lord is indispensable. The capitalist mode of production requires of its social psychology that, among other things, private property should be respected, that workers should be accustomed to the discipline of working

⁹ Because as a rule men are conscious of the relations of distribution these relations are the object of social consciousness. Those relations of production of which people are conscious are also the object of social consciousness. As we shall see as we go on, in simple commodity production and in capitalist production the basic relations of production are outside the social consciousness of the producers. In socialist production, however, they become the object of social consciousness.

together in a factory, and that people should feel professionally responsible for the quality of the work they do (professional ethics).

Concept of social formation. Base and superstructure

We call *the superstructure* of a given mode of production that part of social relations (outside of production relations) and of social consciousness which is indispensable for the existence of that particular mode of production. The mode of production, together with its superstructure is called the *social formation* or *social system*, and the production relations proper to a given social formation are called its *economic base*¹⁰. The superstructure does not include all conscious social relations nor the whole social consciousness of a given society. It embraces only those conscious social relations (except conscious production relations, for these are part of the base) and those social ideas and socio-psychological attitudes which are necessary for the existence of a given mode of production, which make possible the continuation of the existing production relations and which, in particular, consolidate the established system of ownership of the means of production¹¹.

¹⁰ The terms "economic base", "superstructure", "social formation", and "social consciousness" come from Marx. See *Preface to A Contribution to the Critique of Political Economy*, ed. cit., pp. 363-364. Marx also called the relations of production "the economic structure of society" (ibid.).

¹¹ Marx identified the superstructure with the whole of the manifestations and content of social consciousness. In *Preface to A Contribution to the Critique of Political Economy* we read, "The sum total of these relations of production constitutes the economic structure of society, the real foundation, on which rises a legal and political superstructure and to which correspond definite forms of social consciousness" (ibid., p. 363). In his work *Concerning Marxism and Linguistics*, ("Soviet News", London 1950), Stalin differentiates between various elements of social consciousness. "The superstructure is created by the base precisely in order to serve it, to actively help it to take shape and consolidate itself,... The superstructure has only to renounce this role of auxiliary... and it loses its virtue and ceases to be a superstructure" (p. 4). According to Stalin, language is not part of the superstructure since it does not change

Thus, a social formation is an internally balanced and harmonized whole, a definite objective historical fact. Marx distinguished the Asiatic, ancient, feudal, and bourgeois formations with their corresponding historical periods. To-day we can add to this list the primitive community and the socialist formation.

These formations correspond to the modes of production described above—the ancient formation corresponding to slavery and the bourgeois formation to capitalist production¹². The mode of production which was the base of the formation called by Marx “Asiatic” still includes many obscure points which remain to be cleared up. It was founded on the state ownership of the land which resulted from the necessity for large-scale collective works connected with the regulation of rivers and the building of reservoirs and canals in an agriculture relying on artificial irrigation. Such state ownership of land existed

when the economic base changes. According to contemporary Soviet sociologists, objects and manifestations of social consciousness like family relations, national culture, and science also do not, in their entirety, belong to the superstructure. See *Historical Materialism* (in Russian), ed. cit., pp. 125–131 and 411–422. Kautsky anticipated Stalin in the limitation of the concept of superstructure, confining it to that part of conscious social relations and social consciousness which *must* change when the economic base of society changes. Kautsky writes, “In the social organizations, legal forms, theories etc., of every epoch, it is necessary to differentiate between those elements which it has taken over from its predecessors and those which it has itself created. Only the latter result from the economic conditions of the epoch. Spiritual forms which it has taken over are not the result of, are not part of, the superstructure of the new economy, nor of the new forms of consciousness corresponding to it. The examination of a period of history from a historical materialist point of view must always start out by differentiating the old from the new, both in ideology and in economics. What is new in ideas then leads directly to the economic relations”. See *Die materialistische Geschichtsauffassung*, Berlin 1927, vol. I, pp. 45–46.

¹² See *Preface to A Contribution to the Critique of Political Economy*, ed. cit., vol. I, p. 363. Marx and Engels added the primitive community to the list of social formations later after learning of the results of L. M. Morgan’s researches. See the note added by Engels in 1888 in the *Communist Manifesto*. K. Marx and F. Engels, *Selected Works*, ed. cit., vol. I, p. 34 n.

in Egypt, Mesopotamia, Persia, India, China, Ceylon, and other Eastern countries. As Marx says: "Here the state is the supreme owner of land. Sovereignty depends on the ownership of land concentrated at the national level. For this reason there is no private ownership of land although the possession and use of land may be both private and common"¹³. The political superstructure corresponding to the mode of production based on the state ownership of land took the form of oriental despotism, whose social function was the central direction of the collective works connected with artificial irrigation. The collapse of the power of the Eastern monarchies resulted in the ruin of the irrigation systems, a decline in production and the decline of the highly developed civilizations based on this mode of production. "However great the number of despotisms"; writes Engels, "which rose and fell in Persia and India, each was fully aware that above all it was the entrepreneur responsible for the collective maintenance of irrigation throughout the river valleys, without which no agriculture was possible there. It was reserved for the enlightened English to lose sight of this in India: they let the irrigation canals and sluices fall into decay..."¹⁴.

Opinions differ as to the type of labour employed in the Asiatic social formation. A widely held view, shared by K. Ostrovitianov¹⁵, is that it was slave labour. He states that this social formation is a mode of production constituting

¹³ K. Marx, *Das Kapital*, Dietz Verlag, Berlin 1951, vol. III, p. 841.

¹⁴ F. Engels, *Anti-Dühring*, Lawrence and Wishart, London 1955, p. 249. See Engels' letter to Marx of 6th June 1853: "This artificial fertilisation of the land, which immediately ceased when the irrigation system fell into decay, explains the otherwise curious fact that whole stretches which were once brilliantly cultivated are now waste and bare (Palmyra, Petra, the ruins in the Yemen, districts in Egypt, Persia and Hindustan): "It explains the fact that one single devastating war could depopulate a country for centuries and strip it of its whole civilization" K. Marx and F. Engels, *Selected Correspondence*, Lawrence and Wishart, London 1934, p. 67.

¹⁵ K. Ostrovitianov, *Ocherki ekonomiki dokapitalisticheskikh formatsii*, (An Outline of the Economics of Pre-capitalist Formations), Ogiz 1945, pp. 46-49.

a form of slavery, in which the majority of people are slaves owned by the monarch. This, however, seems to be an oversimplification since the Asiatic social formation preserved for millenia village communities that had developed from the primitive community. This had already been noted by Marx.¹⁶ Although slavery undoubtedly existed in ancient Asiatic societies, the position of the majority of peasants who lived in village communities was much more like that of the serfs who had to pay taxes in kind to the state (bringing in such payments is a common subject of wall-paintings in Egyptian tombs) and contribute forced labour.¹⁷ According to Marx, the surplus product took the form of a tax in kind or labour-service¹⁸. On the strength of this observation some authors have tried to define the Asiatic social formation as a variation of feudalism, using the term "bureaucratic feudalism"¹⁹. This, too, is an oversimplification. The Asiatic social formation is an independent formation in which taxes in kind, compulsory

¹⁶ See K. Marx, *Capital*, ed. cit., vol. I, pp. 378-379. "The simplicity of the productive organism in these self-sufficient communities—which continually reproduce their kind, and, if destroyed by chance, reconstruct themselves in the same locality and under the same name—this simplicity unlocks for us the mystery of the unchangeableness of Asiatic society, which contrasts so strongly with the perpetual dissolutions and reconstructions of Asiatic States, and with the unceasing changes of dynasties. The structure of the economic elements of the society remains unaffected by the storms in the political weather".

¹⁷ In India, for example, slavery was mostly domestic and did not play an important part in agricultural production. See M. D. Malaviya, *Village Panchayats in India*, New Delhi 1956, pp. 112-194; D. D. Kosambi, *An Introduction to the Study of Indian History*, Popular Book Dept., Bombay 1956, p. 349. S. A. Dange puts forward a different point of view, however, in *India from Primitive Communism to Slavery*, 3rd, New Delhi 1955.

¹⁸ K. Marx, *Das Kapital*, ed. cit., vol. III, p. 841.

¹⁹ See the *Bolshaya Sovietskaya Enciklopedia* (Great Soviet Encyclopaedia), 1936, vol. 32, article entitled "Kitai", pp. 530 and 538. The society of ancient China beginning from the Han dynasty is described as "feudal bureaucratism" by Joseph Needham in *Science and Civilization in China*, Cambridge 1954, vol. I, pp. XXXVII, 103 and 139. Needham also draws attention to the fact that slavery did not play an important part in production. See pp. 109 and 119.

peasant labour and slavery are combined into a uniform mode of production by the state ownership of land and large-scale collective irrigation works undertaken by the state.

*Law of necessary conformity between superstructure
and economic base*

Superstructure cannot be arbitrary: by its very nature it is adjusted to the economic base, and consequently to the entire mode of production characteristic of a historical period. When the fundamental production relations change (i.e., when the ownership of the means of production changes), the superstructure changes as well: a new social formation is born. This is called "*the law of necessary conformity between superstructure and the economic base*", or "*the second basic law of sociology*".

When the economic base changes only these other social relations and those elements of social consciousness which are incompatible with the requirements of the new economic base change with it. At the same time such new social relations and new elements of social consciousness are developed as are indispensable for the new economic base and the new mode of production. Other social relations and elements of social consciousness remain unchanged. Hence the social relations other than production relations and the social consciousness of a given society, shaped by the historical process, are only in part the superstructure of the social formation existing in that historical period. In part they derive from earlier times, are survivals from the superstructure formed in previous social formations²⁰, remnants which do not hinder

²⁰ Krzywicki and Kautsky especially noted this. "Every phase of social development", writes Krzywicki, "leaves a legacy behind it which results from, and intertwines with, the legacy of earlier periods". (See *Idea i życie. Studia Socjologiczne* [Idea and Life. Sociological Studies.], ed. cit., p. 111.) Kautsky writes, "What is new in a given period can only be explained on the basis of new economic laws which govern the new economic process peculiar to it. On the other hand, what is old is the product of the past, and not only of the immediately previous century but of the whole of human history, on which every period leaves its mark.

the development of the new economic base. Sometimes these surviving elements become included in the superstructure of the new social formation.

Christianity, for example, originated as part of the superstructure of the ancient social formation during its decline, was then transformed into the superstructure of the feudal formation, survived the period of capitalism—partly as a remnant, partly included in the new superstructure—and continues to survive in the first phase of socialism.

Thus we may illustrate the structure of the social activity of man as well as the structure of the social relations, social ideas and socio-psychological attitudes resulting from that activity by means of the diagram on p. 33.

Of course, social consciousness and social relations become much more complicated in the periods of transition between social formations, when different modes of production co-exist (e.g., capitalist, feudal and simple commodity production; or socialist, capitalist and simple commodity production) or when, though one mode of production clearly predominates, remnants of another mode of production are yet preserved. In such cases, superstructures of different existing economic bases, possibly together with remnants of the superstructure of extinct production relations and the nuclei of the superstructure of the future social formation, are found in the existing social relations and the social consciousness. The diagram we have given makes it possible, however, to dismantle such a complex situation into its component parts, or, as Marx put it, to disclose the “anatomy” of human society²¹.

The first and second basic laws of sociology lay down the conditions necessary for the inner harmony and balance

Each leaves an inheritance for the coming generations. In order to understand a period it is not enough to know its new mode of production, it is also necessary to know the previous history from which it has developed. (See *Die materialistische Geschichtsauffassung*, ed. cit., vol. II, pp. 689–690).

²¹ *Preface to A Contribution to the Critique of Political Economy*, ed. cit., p. 363.

of social formations, the conditions for the mutual adjustment of the component parts of a given formation. The first law states that there must be conformity between the production relations and the character of the productive forces, the second, that there must be conformity between the superstructure and the production relations (the economic base). We might describe these laws as the laws of the conservation of social formations. If the conditions laid down by these laws are not satisfied, an inner contradiction develops within the formation, and the various component parts of that formation cease to be adjusted to one another. In such a case the social formation disintegrates and a new one emerges in its place.

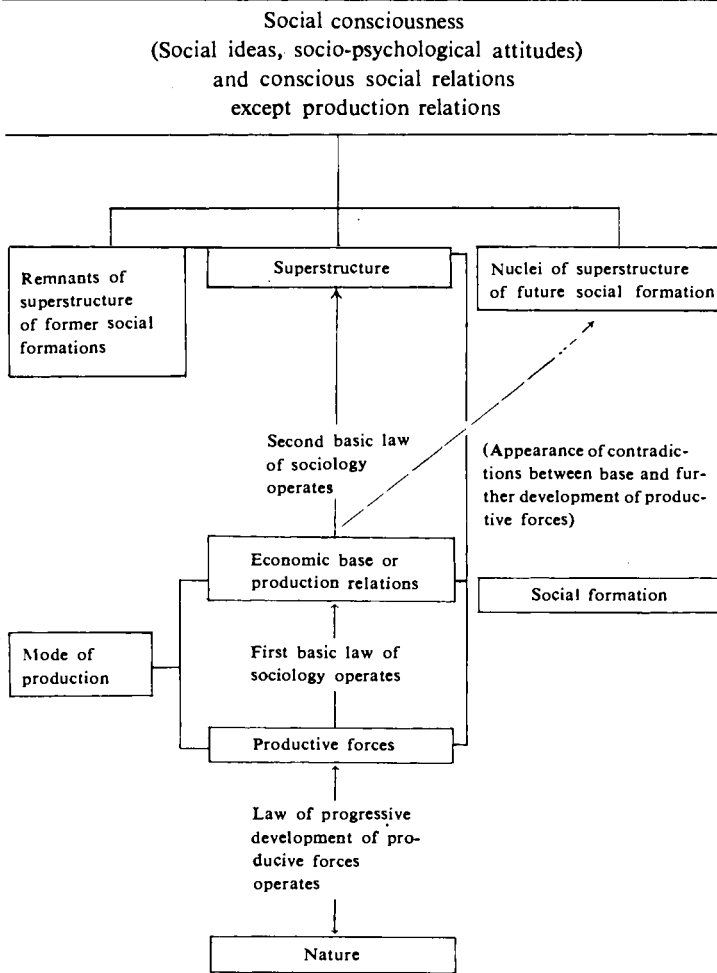
To understand the historical process by which human society changes from one social formation into another, it is necessary to know what factor it is that upsets the inner balance of the social formation, undermines the mutual adjustment of the component parts, and breaks the formation to pieces. This factor is to be found in the development of the productive forces. Man's growing ability to transform nature and adapt it to his needs leads to changes in the way in which he acts upon it in the process of production.

*Conservative character of social relations and social
consciousness*

Every social process consists of a continually repeated human activity of a certain kind. Social relations are types of repeated behaviour of men towards each other—as a result of this continual interaction social ideas and socio-psychological attitudes emerge and take shape in men's minds. Actions continually repeated form the foundation of the patterns of regularity discernible in social life and thus make it possible to analyse it scientifically²².

²² Lenin draws attention to this in his polemic with the subjective trend in sociology. See *What the "Friends of the People" Are and how They Fight against the Social-Democrats*, in *Selected Works*, vol. I, Lawrence and Wishart, London 1936.

SCHEMA OF SOCIAL STRUCTURE AND DEVELOPMENT



The continual repetition of an action results in the forming of *habit* or *routine*, i.e., a tendency to go on repeating that action in the same way as before²³. A complex of actions

²³ Tadeusz Kotarbiński describes routine as “especially consisting in the replacement of the necessary creative invention by the automatism of an easy copying of action previously performed”. See *Traktat o dobrej robocie* (Treatise on Good Work), Łódzkie Towarzystwo Naukowe, Łódź 1955, p. 310.

which are performed habitually and become a routine is called a *custom*. Habits and customs are repeated until a new, external stimulus brings them to an end and introduces a change into the kind of activity which has been going on: this new activity then in turn becomes a habit. This is a general feature of the behaviour of human beings as bio-psychical organisms²⁴. As a result of this regularity, social relations, which are, after all, nothing more than continually repeated actions of certain kinds, together with the social ideas and socio-psychological attitudes which result from these social relations, have a tendency to grow into habits and to form a complex of customary social behaviour. Social relations and the whole of social consciousness tend to be slow to change, weighed down by conservatism and a peculiar inertia which can only be overcome by external stimuli.

Law of progressive development of productive forces

There is, however, one field of human activity in which habit and routine can never prevail for long since new external stimuli are continually appearing, forcing men to alter their behaviour. That field is the process of production in which man acts on nature and is himself affected by it in the social process of labour. The way in which man acts on nature is determined by the existing productive forces, i.e., by the means of production, and in particular by the instruments of labour and the human experience and ability available to use such instruments. In the social process of labour, man transforms his natural environment and creates a new one which consists of the products of his labour (houses, towns,

²⁴ This is referred to in every modern textbook of psychology, e.g., R. H. Thouless in *General and Social Psychology*, 3rd ed. London 1951 p. 55, "The carrying out of an action or of a system of actions facilitates its subsequent performance... The failure to carry out an action or system of actions over a sufficient length of time reduces their tendency to reappearance". This is what he calls the law of the modification of behaviour. It seems that this regularity in human behaviour derives from the regularity in the higher nervous functions, noted by Pavlov, and known as "conditioned reflexes".

villages, canals, workshops and factories, transportation, equipment and so on). These new surroundings are sometimes called *the artificial environment*²⁵ or *the historical material attainment of society*²⁶.

This new material environment is a stimulus which causes changes in the social process of production. New or better instruments of labour are made, the possibility of making use of new objects of labour arises and the ability to make use of instruments increases. This in turn brings about a further change in the new "artificial environment" thus creating a new stimulus toward changes in behaviour, and so on. Man surrounds himself with an artificial environment the complexity of which incessantly increases: this artificial environment continually supplements man's natural powers, thus strengthening his domination over nature. Each new human action gives rise to more and more new external stimuli which bring about fresh changes in human activity. In this way, the social forces of production are continually developing.

Thus, whereas social relations, social ideas and socio-psychological attitudes tend to be slow to change, productive forces are constantly developing and raising the "production potential of society". The American anthropologist A.L. Kroeber has drawn attention to the difference between the ease with which changes are introduced into production processes and the slowness of adaptation in other fields of

²⁵ This term, "terreno artificiale", was introduced by Antonio Labriola in *Del materialismo storico*, written in 1896, and reprinted in *La concezione materialistica della storia*, Bari 1947. See p. 151. The same term was also used by Kazimierz Krauz in *Materializm ekonomiczny* (Economic Materialism), "Książka", Cracow 1908, p. 7. (Kazimierz Kelles-Krauz [1872-1906], prominent sociologist and one of the principal theoreticians and publicists of the Polish Socialist Party).

²⁶ This term was introduced by Krzywicki. He saw the cause of the difference between the historical development of human society and the non-historical nature of animal societies in the existence of "historical attainment" in the shape of material objects, the products of human labour, which are the binding link in the social bonds between men. See *Social Development among Animals and Human Beings. Sociological Studies* (in Polish) ed. cit., p. 185.

human activity: "In mechanical or "practical" matters people adjust themselves to the pressure of new conditions more quickly. ... If, on the other hand, a calendar becomes antiquated, the simple act of will, the mere exercise of community reason needed to correct it, is resisted vigorously... As long as men are concerned with their bodily wants, those which they share with the lower animals, they appear plastic and adaptable. In proportion, however, as the socially systematized products of their intellects are involved, when one might most expect foresight, reason and cool calculation to be influential, societies seem swayed by a conservatism the strength of which looms greater as we examine history more deeply"²⁷.

This shrewd observation by an eminent student of human societies needs only to be expanded by noting that the ability to adapt quickly to new conditions is not connected with the satisfaction of basic biological needs (which, in any case, in contemporary civilized society form only a part of the needs satisfied by production); this human flexibility results from the process we have described above, in which each change in behaviour gives rise to new stimuli which in turn bring about a new change in behaviour.

The pattern of regularity in the development of the social productive forces described above is called *the law of the progressive development of productive forces*. This law states the necessity of a continual change in productive forces, leading to a higher and higher "production potential" of society. As we have shown, this necessity is the result of the continual emergence of new stimuli which, by altering the artificial material environment created by man in the process of production, also bring about changes in the mode of interaction between man and nature. This is a process which leads to an ever greater domination by man over the material world around him.

Process of development and change in social formations

The operation of the law of the progressive development of productive forces undermines, sooner or later, the con-

²⁷ A. L. Kroeber, *Anthropology*, New York 1948, p. 522.

formity between production relations and the character of the productive forces. The inner harmony of the mode of production is broken, it ceases to be an internally balanced whole, and a contradiction arises between production relations and the new productive forces. The operation of the first basic law of sociology restores the conformity between the production relations and the new productive forces: the production relations are adjusted to the new requirements of the productive forces.

A change in the relations of production undermines, however, the conformity between superstructure and economic base. An internal contradiction between the superstructure and the requirements of the new economic base shows itself. The working of the second basic law of sociology restores the conformity between the superstructure and the requirements of the economic base: a change in superstructure occurs, and this issues in the emergence of a new social formation.

This process is illustrated by the diagram on p. 33 (Schema of social structure and development). The development of productive forces is always the primary stimulus to changes in social formations, or, in Engels' phrase, the stimulus "in the last resort"²⁸. This is because social relations, social ideas and socio-psychological attitudes are slow to change, whereas productive forces undergo incessant changes and are always rising to higher levels of development. From the conservative character of both the economic base and its superstructure it follows that they are adjusted only to the degree required by the two basic laws of sociology.

Hence, remnants of the production relations dominant in a previous formation often survive into a new social formation (e.g., remnants of feudal relations may still exist in the capitalist formation). Hence also a change in superstructure

²⁸ See Engels' letters to J. Bloch of 21-22 September 1890, and to H. Starkenburg of 25 January 1894, in K. Marx and F. Engels, *Selected Works*, ed. cit., vol. II, pp. 443 and 457.

does not entail a transformation of all the ancient social relations and of the entire social consciousness: many elements from the superstructures of former social formations continue to exist alongside the new superstructure. Finally it must be pointed out that the first and second basic laws of sociology do not operate consecutively in different periods of time—they work simultaneously, although the adjustment of superstructure usually takes considerably longer than the process of adapting the relations of production.

Moreover, the new superstructure is not created out of nothing: it draws its component parts from past and present social relations, social ideas, socio-psychological attitudes and then transforms and adapts them all to the needs of the new economic base. “Ideas do not fall from heaven, nor do we receive them as a gift of God while we sleep”, says Antonio Labriola²⁹. The same capitalist production relations gave rise in England to a superstructure in the form of Puritanism, and in France to materialism and the free thinker movement³⁰. This was due to the fact that what we call *the historical substratum*³¹, on which the new superstructure was shaped, was different in the two cases. It often happens that the emerging superstructure takes up social relations and social ideas from an earlier period which have ceased to be valid, but which recover their validity in the new social formation. Roman civil law, for example, suited as it was to commodity production, became obsolete under the feudal mode of production, but recovered its force under the capitalist mode of production. Further, it often happens that a superstructure or the elements of a superstructure are taken over from other countries, where the new production relations with their corresponding super-

²⁹ A. Labriola, *Del Materialismo storico*, ed. cit., p. 183.

³⁰ See Engels' special introduction to the English edition of *Socialism: Utopian and Scientific*, in K. Marx and F. Engels, *Selected Works*, ed. cit., vol. II, pp. 94–99.

³¹ This term was introduced by Krzywicki, who also gave an analysis of the part played by the historical substratum in the forming of a new superstructure. See *Idea and life. Sociological Studies* (in Polish).

structure are already well established and developed³². In this way various elements drawn from different periods of time combine to make up the superstructures of emerging social formations.

Consequently, the superstructure corresponding to a new set of production relations varies from country to country according to the historical substratum from which it emerged. Within the same capitalist formation there are considerable differences between the superstructure in different countries. There are still greater differences in social consciousness as a whole, which includes, besides the superstructure of a given social formation, numerous elements inherited from the superstructures of earlier formations like Christianity in Europe, Shintoism and Buddhism in Japan, or the Monarchy in Great Britain and the Republic in North America. In this way a given social formation can display a great wealth and a variety in social relations and in the social ideas and socio-psychological attitudes which go to make up social consciousness. The same mode of production may be associated with widely differing structures of social relations and of social consciousness and even with profoundly different features of its superstructure.

³² Krzywicki drew attention to what is called the "migration of ideas" in time and space. See *Idea and Life. Sociological Studies*. (in Polish), ed. cit., pp. 88-109. Marx also drew attention to the role of the past in the process of the formation of a new superstructure, "The tradition of all the dead generations weighs like a nightmare on the brain of the living. And just when they seem engaged in revolutionizing themselves and things, in creating something that has never yet existed, precisely in such periods of revolutionary crisis they anxiously conjure up the spirits of the past... Thus Luther donned the mask of the Apostle Paul, the Revolution of 1789 to 1814 draped itself alternately as the Roman Republic and the Roman Empire, and the Revolution of 1848 knew nothing better to do than to parody, now 1789, now the revolutionary tradition of 1793 to 1795. In like manner a beginner who has learnt a new language always translates it back into his mother tongue". *The Eighteenth Brumaire of Louis Bonaparte*, in K. Marx and F. Engels, *Selected Works*, ed. cit., vol. I, p. 246.

Dialectical processes in social development

Thus, the process of transition from one social formation to another consists in the appearance in society of a number of contradictions followed by a series of adjustments which lead to the disappearance of these contradictions. Such a process of development through the emergence and disappearance of contradictions is called a *dialectical process*³³.

The development of human society consists of three dialectical processes. The first is to be found in the continual emergence of contradictions in the interaction between man and nature, in that "exchange of matter between man and nature" in the social process of labour. By the creation of an artificial material environment contradictions are set up between his previous activity and the stimuli to which this new environment gives rise. These contradictions are eliminated by a change in activity, i.e., by a change in productive forces which, however, produces new stimuli and, consequently, new contradictions, and so the whole process goes on continually. The second dialectical process starts with the appearance of a contradiction between the new productive forces and the old production relations. This contradiction, which at first hampers the productive forces, disappears when the production relations have been adjusted to the new productive forces. The third dialectical process starts with the emergence of a contradiction between the new production relations, i.e., the new economic base, and the old superstructure. This contradiction which at first hinders the birth and growth of the new economic base, is

³³ Marx and Engels took over the concept of the dialectic from Hegel, but they transformed Hegel's dialectic—a self-generating development of ideas through the rise and disappearance of contradictions—into a materialist dialectic which interprets the real world as a process of development through the rise and disappearance of contradictions. Engels put it this way: "The dialectic of concepts itself became merely the conscious reflex of the dialectical motion of the real world and thus the dialectic of Hegel was placed upon its head; or rather turned off its head, on which it was standing, and placed upon its feet". *Ludwig Feuerbach and the End of Classical German Philosophy*, in K. Marx and F. Engels, *Selected Works*, ed. cit., vol. II, p. 350.

eliminated when the superstructure has been adjusted to it. These three dialectical processes taken together form the social development of mankind.

Social development in antagonistic formations: class struggle and social revolutions

This pattern in the process of social development is true of all social formations. The source of this regularity lies in the conservative nature of the economic base and superstructure (or rather, social relations and social consciousness in their entirety), as contrasted with the continuous development of productive forces. In social formations based on antagonistic production relations, there is an additional factor which fortifies the conservative character of production relations and their superstructure. This lies in the fact that it is in the interest of the class to which the established production relations ensure the privilege of owning the means of production to maintain these production relations and their corresponding superstructure. This class strives to maintain, more or less consciously, in its own interest, the existing economic base and superstructure, thus further holding up any tendency to change. To this end it employs legislation and the apparatus of the state. As a result, the class or classes whose interests are bound up with the development of productive forces fight for the abolition of the social privilege arising from the established production relations and demand changes in the superstructure corresponding to these relations.

In these circumstances the contradictions between the new productive forces and the old production relations, and between the requirement of the new production relations and old superstructure, give rise to *a class struggle*. These contradictions are eliminated by depriving the possessing class bound up with the old production relations of their social privilege. i.e., by means of *a social revolution*. This is not normally a gradual transformation but a more or less violent upheaval, especially in the political and legal superstructure which protects the relations of ownership of the means of production.

Because of the resistance to change by the class interested in maintaining the old production relations, the class or classes interested in the new mode of production produce its or their own social ideas and socio-psychological attitudes, and under favourable circumstances also its or their own political organizations. A split in social consciousness takes place. Alongside the superstructure of the existing economic base and the remnants of the superstructures of earlier social formations, a nucleus of the superstructure of the future social formation appears in the social consciousness. This nucleus emerges in the class or classes struggling for new production relations. The class struggle becomes a struggle between ideas and entire social ideologies, a struggle between different socio-psychological attitudes, and, under favourable circumstances, a struggle waged by new political organizations against the existing state authority. This struggle is guided by new social ideas and new socio-psychological attitudes³⁴.

The class privileged under the old production relations usually succeeds, with the help of the state authority, legal relations, ideology, and those socio-psychological attitudes which are favourable to it, in prolonging the life of the old social formation. Consequently, the transition from one social formation to another is delayed, so that when the transition does finally take place it tends to be "explosive". The "explosion" takes place when the growing new social forces break the "dam" of the old social formation. The dialectical process of social development takes on the form of class struggle and social revolution.

Marx gave what is now the classical account of the transition from one social formation to another when production relations are antagonistic;

"At a certain stage of their development, the material productive forces of society come in conflict with the existing relations of production, or—what is but a legal expression for

³⁴ The active role played by new social ideas in such periods is excellently set out by Krzywicki in *Idea and Life. Sociological Studies* (in Polish), ed. cit., pp. 41–150.

the same thing—with the property relations within which they have been at work hitherto. From forms of development of the productive forces these relations turn into their fetters. Then begins an epoch of social revolution. With the change of the economic foundation the entire immense superstructure is more or less rapidly transformed”³⁵.

Classes and social strata

To this we should add that the preservation of the production relations and superstructure is supported not only by the class whose privileges are bound up with the established relations of ownership of the means of production but also by those social strata who owe their economic and social position to the superstructure of the existing social formation. By *social stratum*, as opposed to social class, we mean a group whose position is determined not by the relations of ownership of means of production, but by the specific features of a given superstructure. Groups like state officials who exercise the functions of the state authority, or the priests of a religion forming part of the superstructure of a society, may equally have a “vested interest” in the preservation of the old social forma-

³⁵ *Preface to A Contribution to the Critique of Political Economy* in K. Marx and F. Engels, *Selected Works*, ed. cit., vol. I, p. 363. In this preface written in 1859, Marx assumed that a social revolution would always be able to do away with obsolete relations of production. In this way every social formation would give place to a new one, corresponding to a higher stage of productive forces. This is certainly true when dealing with mankind as a whole. On the other hand, the history of individual societies sometimes ended in the collapse of productive forces, civilization and culture, or in stagnation, brought about by the fact that the class which defended the old relations of production was too strong, and the class bent on change too weak and lacking a clear conception of its social objective for a victorious social revolution to occur. It seems that this was particularly the case in the Asiatic social formation, which ended either in collapse and a regression to a lower level of social development (Egypt and Mesopotamia), or in stagnation (India and China). The necessity of preserving the state-operated irrigation works probably made it impossible to deprive the ruling class of power. Even the ancient social formation ended in a decline of productive forces.

tion, they are part of the "establishment" provided by this social formation.³⁶ Conservative social strata of this kind, owing their social position to the existing superstructure, may also be found in non-antagonistic social formations e.g., in the socialist formation. The existence of these groups may result in a certain "turbulence" in social development even where society is based on non-antagonistic production relations and in which there is no class struggle. None the less, these obstacles to social progress are overcome, if not without resistance and struggle, at least without social revolution. Their elimination requires the adjustment of the superstructure to the requirements of the economic base—it is not necessary to change production relations.

Historical materialism

The theory which maintains that there is a pattern of regularity in social development as we have set it out is called *the materialistic interpretation of history*, or *historical materialism*. It explains the entire development of human society as a complex of dialectical processes in which the primary, incessantly repeated stimulus is the interaction between man and his material

It is only since the Middle Ages that there has been continuous progress in the development of productive forces in Europe, a progress aided by victorious social revolutions. This has broken the vicious circle of the successive rise and fall of cultures and civilizations. To-day a return to the vicious circle is impossible because all mankind is so bound up together by the exchange of products, productive forces and social ideas, that the victorious social revolution which, in some countries, has eliminated the antagonistic character of production relations guarantees, in the long run, social progress in all societies.

³⁶ See Engels' letter to C. Schmidt of October 27, 1890, in K. Marx and F. Engels, *Selected Works*, ed. cit., vol. II, p. 445. "Society gives rise to certain common functions which it cannot dispense with. The persons appointed for this purpose form a new branch of the division of labour *within society*. This gives them particular interest, distinct, too, from the interests of those who empowered them; they make themselves independent of the latter and—the state is in being". (pp. 446-7). "As soon as the new division of labour which creates professional lawyers becomes necessary, another new and independent sphere is opened up..." (p. 447).

environment in the social process of production. Marx's discovery of this pattern and the further study of its principal consequences by Engels laid the foundations for a scientific analysis of the development of human society. The historic importance of this discovery was appraised by Engels in the following words: "Just as Darwin discovered the law of development of organic nature, so Marx discovered the law of development of human history"³⁷

And on ideology: "The people who attend to this belong in their turn to special spheres in the division of labour". (p. 449).

³⁷ *Speech at the Graveside of Karl Marx*, K. Marx and F. Engels, *Selected Works*, ed. cit. vol. II, p. 153.

NOTE ON SOME FORMULATIONS
AND ON THE NAME OF
“THE MATERIALIST INTERPRETATION OF HISTORY”

Certain variations in the formulation of the materialist interpretation of history are to be found in Engels' works. In *Anti-Dühring* he writes (p. 369), “The materialist conception of history starts from the proposition that the production (of the means to support human life) and, next to production, the exchange of things produced is the basis of all social structure”. It follows from the context that by “exchange” Engels means the division or distribution of products. This is not an incorrect formulation since distribution depends ultimately on production relations and is closely connected with the mode of production. To specify distribution in this context is, however, superfluous, since it obscures the formulation.

We find a considerably greater difference in formulation in Engels' preface to the first edition of *Origin of the Family, Private Property, and the State*, in K. Marx and F. Engels, *Selected Works*, ed. cit., pp. 155–6: “According to the materialistic conception, the determining factor in history is, in the last resort, the production and reproduction of immediate life. But this itself is of a twofold character. On the one hand, the production of the means of subsistence, of food, clothing and shelter and the tools requisite therefor: on the other, the production of human beings themselves, the propagation of the species. The social institutions under which men of a definite historical epoch and of a definite country live are conditioned by both kinds of production: by the stage of development of labour, on the one hand, and of the family, on the other. The less the development of labour, and the more limited its volume of production and, therefore, the wealth of society, the more preponderatingly does the social order appear to be dominated by ties of sex”.

Thus, in a primitive society, not only the development of productive forces but also the development of family relations, operating as an independent factor, would determine social development. This assertion was criticized by K. Krauz (*Economic Materialism* [in Polish], ed. cit., p. 71 ff.), H. Cunow, (*Die Marxsche Geschichts-, Gesellschafts- und Staatstheorie*, vol. II, pp. 138–142), and K. Kautsky, (*Die materialistische Geschichtsauffassung*, vol. I, p. 842 ff.) See also K. Ostrovitianov: *An Outline of the Economics of Pre-capitalistic Formations* (in Russian), ed. cit. p. 26. Krzywicki, on the other hand, defended a view similar to

that held by Engels, maintaining that the laws of historical materialism as formulated by Marx did not hold for the clan system (See *Sociological Studies* [in Polish], ed. cit., p. 217). According to Krzywicki the laws of the materialistic interpretation of history begin to operate only in what he called the "territorial system", in which material objects become the binding link in social relations. He thought that in the clan system there were no production relations and that the only social relations were direct ones between individuals of the clan relations based on kinship. This view is incorrect since the production process is also found in the clan system and consequently there arises a social bond resulting from the use of material objects i.e., production relations appear.

Some writers have tried to introduce other terms to describe the materialist interpretation of history. Paul Lafargue, Marx's son-in-law, who was one of the first to write about historical materialism, entitled his principal work *Le déterminisme économique de Karl Marx* (Paris 1909). George Plekhanov called his exposition of historical materialism *A Contribution to the Problem of the Development of a Monistic Interpretation of History* (St. Petersburg 1894). The expression "monistic interpretation of history" was probably included with an eye on the Tsarist censorship; in the text he wrote plainly of materialism as the foundation of the comprehension of the historical processes.

Since then, especially in the beginning of the twentieth century, many authors preferred to use the term "economic interpretation of history". Kazimierz Krauz, who in principle, despite inconsistencies, was an adherent of the materialist interpretation of history, suggested the term "mono-economic interpretation of history" (cf. *Economic Materialism* [in Polish], ed. cit., p. 4). "Economic interpretation of history" and similar terms are not appropriate since they do not convey the essence of historical materialism. According to historical materialism, the primary and decisive stimulus in social development is not economic relations, nor even that part of economic relations which constitutes production relations: it is the dialectic process of interaction between man and his *material* environment—that is the development of social productive forces. It is, quite literally, a *materialist* interpretation of history.

Some authors like to use the term "economic materialism" in order to dissociate themselves from philosophical materialism, i.e., a materialist view of the world. But historical materialism originates from this materialist view of the world: not, of course, a primitive, metaphysical materialism, but dialectical materialism which takes into consideration man's active role in knowing and changing the material world. See F. Engels, *Ludwik Feuerbach and the End of Classical German Philosophy*, in K. Marx and F. Engels, *Selected Works*, ed. cit., vol. II, pp. 324–364.

The materialist interpretation of history cannot be treated in isolation from the view of the world from which it sprang. The interaction between

man and his material environment, which manifests itself in the development of productive forces, is man's grappling with what really and objectively exists, independently of his will and consciousness. It is man's grappling with his objective material environment, with matter, and not with products of his own imagination, mind or will. Human activity is also part of the real, objectively existing world. It changes the objective world and adapts it to man's needs. Without the premise that the material world is an objective reality transformed in the social process of production, any scientific analysis of the laws governing the development of human societies would be devoid of all sense, it would be a mere figment of human fantasy.

ECONOMIC LAWS

General concept

THE economic process is a complex of continually repeated human actions. Under certain conditions, resulting from the historical development of a given society, this activity repeats itself in a particular way, that is to say, it has its own peculiar pattern of regularity. This pattern may be resolved into certain elements, i.e., continually recurrent connections or relationships¹ between various actions or the simpler acts of which these actions consist. Such relationships or connections are called *economic laws*.

Laws of causation, concomitance and functional relationship

All laws, economic and other, i.e. all relationships continually recurring in nature and human society, can be classified into three types: causal laws, concomitance laws, and functional laws. *Causal laws* are relationships in which a given event (in our case an action or act) is always followed by some other definite event, such sequence of events taking place in time. The first, earlier event, is called the cause, and the second, later event, is called the effect.

Concomitance laws are relationships in which two or more events always occur jointly. Concomitance laws are often called *structural laws* since events continually occurring together form a kind of regular structure. Finally there are *functional laws* which operate when there is a connection or relationship between events that are measurable quantitatively: these can be formulated as mathematical functions.

¹ The terms "connection" and "relationship" are here used interchangeably.

Of these three kinds of laws it is the causal laws which are of fundamental importance since both concomitance and functional laws are reducible to causal laws. If certain events always occur jointly in a particular structure then this structure is a result of certain earlier events which are its cause. Concomitance laws are simply descriptions of the effects of certain (known or unknown) causes. Functional laws are relationships which consist either of a constant sequence of events in time, or else a regular concomitance of events which are quantitatively measurable. Thus, they are a special case of either laws of causation or laws of concomitance which arises when the events in question are quantitatively measurable.

These general considerations hold good for every kind of law in nature and human society and are thus also applicable to economic laws. Consequently we may distinguish between causal economic laws, structural economic laws, and functional economic laws. It is, however, the causal economic laws which are of fundamental importance since the other kinds of economic laws are reducible to them.

Objective character of economic laws

Economic laws are continually repeated connections (relationships) between various elements of the economic process. They are thus specific to a certain complex of human actions, and express certain inner relationships within that complex of human actions. Therefore economic laws are objective, i.e., they are a real and actual characteristic of the economic process. "A law" says Lenin, "is what is identical in phenomena..."². We express this by saying that economic laws "govern" the economic process, that they "operate" in the course of that process. These are metaphorical statements which indicate the objective character of economic laws.

² V. I. Lenin, *Cahiers Philosophiques*, Editions Sociales, Paris 1955 p. 125. Cf. "the law is not outside of the phenomenon, it is *directly immanent* in it".

Economic laws and laws of political economy

Political economy studies these objectively “operating” economic laws, or, speaking colloquially, “discovers” them. The results of this study are formulated in statements about the operation of economic laws. These statements are called *the laws of political economy*. The laws of political economy constitute a more or less adequate reflection of the objective economic laws. The conformity of the statements formulating the laws of political economy with the real operation of objective economic laws is the criterion of their truth, the criterion of whether such statements “reflect” objective economic laws, and whether they have equivalents in the real economic process.

The laws of political economy are a more or less adequate reflection of economic laws. This means that economic laws do not reflect all the details of the repeatable connections or relationships which occur in the economic process. They reflect only what is necessary, i.e., essential, in these relationships. The adequacy of the laws of political economy depends precisely on their subsuming from the relationships occurring in reality all that is necessary or *essential* in them, i.e., all that always repeats itself in each real occurrence of a given connection or relationship. It is precisely these necessary, i.e., always recurrent, connections or relationships, which constitute economic laws. The laws of political economy are adequate reflections of economic laws in so far as they reflect what is necessary, i.e., essential.

In the individual, single acts, of which the economic process consists, those necessary, i.e., essential, relationships do not occur in isolation. There are other connections or relationships which do not appear every time that a given activity takes place but which only accompany particular individual acts. These are called accessory or *accidental relationship*³. Acces-

³ Kotarbiński gives the following definition of an accidental property: “In the general logical sense, every and only such property is accidental in a given set of objects, which is an attribute of only some of those objects,

sory, accidental relationships, accompanying individual acts but not recurring in every case, disturb, as it were, the operation of economic laws.

For this reason economic laws can only be observed if the human actions which are the elements of the economic process are frequently repeated. The laws of exchange, like the laws of price formation or of money circulation, are not revealed in single, isolated acts of exchange, but only if these acts are repeated in large numbers. The laws characteristic of certain relations of production are similarly only revealed when the activity of production is repeated on a mass scale. In single isolated cases no regularity may be perceptible since the operation of economic laws is sometimes disturbed by accessory connections or relationships which may occur only in one particular case. Because they only reveal themselves when human actions are repeated on a mass scale, we say that economic laws are *stochastic* or *statistical*⁴. Stochastic, or statistical, laws, are laws which can only be observed when events of a given type are repeated on a mass scale.

Stochastic (statistical) character of economic laws

The statistical character of economic laws was noted by Marx and Engels. Analysing the process of production Marx

and not of all of them" (see T. Kotarbiński, *Kurs logiki dla prawników* [A Logic Course for Lawyers], PWN, Warsaw 1953, p. 45). Similarly, a property which is an attribute of every object belonging to a given set, can be defined as essential or necessary. The terms "essential" and "necessary" are used interchangeably, as are "accidental" and "accessory".

⁴ The expression "stochastic" was first introduced by Jacob Bernoulli in his book *Ars Coniectandi*. This book, published at Basle in 1713 (eight years after the author's death), was the first systematic treatise on the theory of probability. The expression "stochastic" means "liable to occur", i.e., occurring in a mass of cases, but not necessarily in a single case. It is derived from the Greek "stochazostai", which means "to foresee possibilities". This term is now used to denote relations which include, besides a necessary or essential element, accidental elements as well. Since an essential element manifests itself only when the given phenomenon is repeated on a mass scale, that is, under "statistical" conditions, the term "statistical laws" is also used.

writes: "In every branch of industry, the individual worker, Peter or Paul, differs to a greater or lesser extent from the average worker. These individual variations (or "errors" as they are sometimes called, in the technical terminology of mathematics) balance one another, and rule one another out, when we come to deal with a large number of workers at the same time"⁵. Discussing the process of the realization of value in the market, Marx writes: "If each case is taken separately, chance governs everything. The inner law which emerges from the operation of chance becomes visible only when individual cases are combined in large numbers"⁶.

Engels, discussing the formation of the average rate of profit under capitalism, writes: "In reality the rates of profit vary from business to business and from year to year according to different circumstances, and the general rate only exists as an average of many businesses and a series of years. But if we were to demand that the rate of profit—say 14.876934... — should be exactly similar in every business and every year down to the 100th decimal place, on pain of degradation to fiction, we should be grossly misunderstanding the nature of the rate of profit and of economic laws in general—none of them has any reality except as approximation, tendency, average, and not as *immediate reality*. This is due partly to the fact that their action clashes with the simultaneous action of other laws, but partly to their own nature as concepts"⁷.

Further on he writes: "Or take the law of wages, the realization of the value of labour power, which is only realized as an average, and even that not always, and which varies in every locality, even in every branch, according to the customary standard of life"⁸.

In this way, to use Engels' words again, "necessity asserts itself athwart all accident"⁹ when a great number of actions is

⁵ K. Marx, *Capital*, ed. cit., vol. I, p. 337.

⁶ K. Marx, *Das Kapital*, Dietz Verlag, Berlin 1951, vol. III, p. 882.

⁷ K. Marx and F. Engels, *Selected Works*, ed. cit., vol. II, p. 527.

⁸ Ibid.

⁹ Letter to H. Starkenburg, 25 January 1894, Marx and Engels, *Selected Works*, ed. cit., vol. II, p. 458.

repeated on a large scale. In a mass of repeated actions, the consequences of accessory, accidental relationships cancel one another out and the necessary or essential relationships—i.e., economic laws—can be clearly seen. The mutual compensation of the results of accidental relationships, and the appearance of necessary relationships, which occurs under certain conditions when events of a given kind are repeated on a mass scale, is called *the law of large numbers*¹⁰. The law of large numbers enables economic laws to manifest themselves in the economic process, or, as it is sometimes put, it constitutes the specific form in which economic laws manifest themselves¹¹. That is why we have said that economic laws are stochastic or statistical. The law of large numbers also serves as a basis on which political economy can formulate its laws as approximate and adequate reflections of the objective economic laws operating in the actual economic process: it makes it possible to distinguish between the necessary or essential relationships and the merely casual.

Economic laws are independent of human consciousness and will

The objective character of economic laws arises from the fact that they are a real characteristic of economic processes. They are not, as idealistic theories of cognition would have it, a product of the human mind, either as *a priori* categories of perception, or as convenient conventions. Neither are they a product of the science of political economy; as we have seen, science merely studies and “discovers” laws. Furthermore, economic laws are not a product of human consciousness or will. They operate regardless of whether people are conscious of them or not, and regardless of whether or not they conform to human intentions.

¹⁰ See Oskar Lange, *Teoria statystyki* (The Theory of Statistics) Part One, Polgos, Warsaw 1952, pp. 22–25.

¹¹ See F. Livshits, *Zakon bolshikh (sryednikh) chishyel v obshchestvennykh yavlyeniyakh. Uchenye zapiski po Statistike*, (Law of Large [Mean] Numbers in Social Phenomena. Scientific Notes on Statistics), vol. I, Soviet Academy of Sciences, Moscow 1955.

Since economic relations and especially the relations of production are only in part conscious¹², the economic laws which result from such relations of production also operate independently of human consciousness. For example, the laws governing the exchange of products under capitalist production relations operate in such a way that the producers are either not conscious of them at all or else they think of them falsely as laws dealing with the relationships between things instead of as relations between the activities of producers. "These magnitudes", writes Marx, "are perpetually changing, independently of the will, foreknowledge, and activity of those who make the exchanges, whose own social movement seems to them a movement of things—of things which control them, instead of being controlled by them"¹³. Thus, consciousness of the fact that economic laws operate is not a condition of their operation: lack of such consciousness, or even quite mistaken ideas about them, do not prevent economic laws from operating: they are independent of human consciousness.

They are also independent of human will. The results of their operation may be quite at odds with the desires of those participating in the economic process. Take, for example, the laws of the exchange of products under the capitalist relations of production referred to above. These laws not only operate whether or not the people engaged in production are aware of it or not, but also quite independently of their will. The best proofs of this are the phenomena which are the result of such laws: depressions, financial crashes, and bankruptcies. Thus economic laws are not arbitrary; their operation is a necessity resulting from the conditions in which the economic process takes place.

The independence of economic laws from human will and consciousness requires a more detailed explanation. For if economic activity is conscious and purposive¹⁴, how can the

¹² See Chapter Two above.

¹³ K. Marx, *Capital*, ed. cit., vol. I, p. 48.

¹⁴ This is the difference between the social activity of men and the

laws governing that activity be independent of human will and consciousness? The answer is to be found in the fact that economic activity is conditioned by the existence of historically developed material productive forces and economic relations between men. These conditions, in particular the existence of production relations, do not allow economic activity to be arbitrary. They determine the furrow which economic activity is forced to follow, that is to say, the aims and means of action, and the manner in which the activities of various individuals or groups interplay. These conditions, determined by history independently of human will and consciousness, determine the economic laws which operate in such conditions.

Marx showed how historically determined productive forces make it impossible for economic laws to be arbitrary:

“... men are not free arbiters of *their productive forces*—which are the basis of all their history—for every productive force is an acquired force, the product of former activity. The productive forces are, therefore, the result of practical human energy; but this energy is itself circumscribed by the conditions in which men find themselves, by the productive forces already acquired, by the social form which exists before they do, which they do not create, which is the product of the preceding generation”¹⁵.

Thus his material environment, made by man for himself and comprising the products of his work or, as Krzywicki called it, the material historical achievement of society¹⁶, determines the means at the disposal of men in their economic activity. That also means—according to the law of necessary conformity between production relations and the character of productive forces — that the material environment determines

community behaviour of animals—animals being guided by unconscious instinct. See L. Krzywicki, *Social Development among Animals and Human Beings. Sociological Studies* (in Polish), ed. cit., pp. 193–200.

¹⁵ K. Marx. Letter to P. V. Annenkov, December 28, 1846, Marx and Engels, *Selected Works*, ed. cit., vol. II, p. 401.

¹⁶ L. Krzywicki, *Social Development among Animals and Human Beings. Sociological Studies* (in Polish), ed. cit., p. 185.

production relations which, equally, are not arbitrary¹⁷. Production relations and the other economic relations between men determine the aims which men set themselves in their economic activity (e.g., the maximization of profits or the satisfaction of the needs of society) and the manner in which the activities of individuals inter-operate (e.g., co-operation, division of labour, exchange of products, competition, monopoly, joint planning).

Hence, although the individual actions of persons and groups are consciously and purposively undertaken, the social result of these actions is different from the intentions of those engaged in the economic process and, moreover, is often either misunderstood or not comprehended at all. Engels writes: "In the history of society... the actors are all endowed with consciousness, are men acting with deliberation or passion, working towards definite goals; nothing happens without a conscious purpose, without an intended aim... That which is willed happens but rarely; in the majority of instances the numerous desired ends cross and conflict with each other, or these ends themselves are from the outset incapable of realization or the means of attaining them are insufficient. Thus the conflicts of innumerable individual wills and individual actions in the domain of history produce a state of affairs entirely analogous to that prevailing in the realm of unconscious nature. The ends of the actions are intended, but the results which actually follow from these actions are not intended; or when they do seem to correspond to the end intended, they ultimately have consequences quite other than those intended. Historical events thus appear on the whole to be likewise governed by chance. But where on the surface accident holds sway, actually it is always governed there by inner, hidden laws and it is only a matter of discovering these laws"¹⁸.

¹⁷ Marx described the relations of production as "definite, necessary, independent of their will" (i.e., of the will of men). See *Preface to A Contribution to the Critique of Political Economy*, ed. cit., pp. 362-363.

¹⁸ K. Marx and F. Engels, *Selected Works*, vol. II, p. 354. This aspect of economic laws as necessary relationship, independent of human will, was

What Engels has to say about the independence of the results of the complex of human activity from human will and consciousness applies also to economic laws. That is why economic laws are necessary relationships, independent of the consciousness and will of the human beings from whose activity they result.

Technical and balance laws of production

We come now to study more closely the way in which material productive forces and economic relations determine economic laws. Necessary relationships between individual acts or actions develop in the process of production, in the course of man's acting upon nature, in the course of his own conditioning by his own activity, in that "exchange of matter between man and nature" referred to by Marx. These relationships are determined by the technical conditions of production existing at a given stage of historical development. A particular expenditure of labour and particular quantities of the various means of production are needed to produce a definite product; e.g., definite quantities of labour, coal, ore, electric power, etc., are needed to produce a definite quantity of steel; definite quantities of raw materials, machines, buildings and human labour are needed to produce a certain quantity of textiles. In this way relationships resulting from the technical conditions of production develop between human actions or acts. These are technical relations in production. Over and above this, material technical conditions determine certain relationships which might be called balance relationships. For example, no more coal can be used than has been produced (plus or minus imports or exports, if any); a given product cannot be stored in reserve if the whole output (plus imports, if any) is used up. Balance relationships result from the fact that production, like all economic activity, deals with material objects.

what Marx had in mind when he spoke of economic laws as natural laws (Naturgesetze) and defined the economic laws of capitalist production as "tendencies working with iron necessity". See Marx and Engels, *Selected Works*, vol. I, p. 449.

Certain technical and balance relations appear particularly clearly if we regard the production process as a continually repeated process, as a process of reproduction. If the production process is to be maintained at a given level all the products cannot be consumed; some of the products must be devoted to renewing the means of production as they are used up. As a result only a portion of the products can be held to be means of consumption, another portion must take the physical form of the means of production which it is necessary to renew. The quantity of products taking the physical form of the means of production depends on the degree to which the means of production are used up and hence on the technical conditions of production. If, however, an increase in the stock of the means of production takes place (expanded reproduction), the quantity of the means of production produced in the production process must be greater than the amount required to renew the means of production. The amount of the means of consumption produced must be correspondingly smaller¹⁹. Technical and balance relations occurring in production make it imperative that certain relationships be maintained in the production process (given a certain level of technology). These relations we call *the technical and balance laws of production*.

Laws of human behaviour and laws of interplay of human actions

The economic relations between men existing at a given stage of historical development, also give rise to necessary relations between various economic actions and acts. Production relations determine the ownership of the means of production and thereby the ownership of the products. Thus production relations determine the relations of distribution, the categories of the distribution of the product (in wages, profits, rents, etc.) and whether distribution is to take place in the form of exchange or allotment. Production and distribu-

¹⁹ Marx explained the regularity connected with this in *Capital*, Sarawaty Library, Calcutta 1945, vol. II, pp. 300-404.

tion relations determine the objectives of men's economic activity (e.g., the maximization of profit, the direct satisfaction of needs, personal career), as well as the way in which these objectives are attained (by securing a monopoly position in the market, reducing production costs, increasing yields, improving professional qualifications, etc.). A situation which induces men to pursue a certain objective in their economic activity is called an *economic stimulus*, and the objective itself is frequently called an *economic incentive*. It can also be said that production relations and distribution relations determine the economic stimuli and incentives which guide human activity, and also the way in which men react to those stimuli. In this way economic laws emerge which are the expression of existing economic stimuli and the way in which men react to them. These are called *the laws of human behaviour*²⁰.

Production and distribution relations also determine the way in which people co-operate and work for one another, that is to say, they decide the form taken by co-operation and the division of labour, the way in which the production process is organized (e.g., the organization and mutual relations of enterprises), the way in which distribution is organized, and so on. This in turn determines the way in which human economic activities inter-operate. For instance, the activities of enterprises under free competition inter-operate differently if certain enterprises have monopoly positions, and work differently again if they are all covered by a common economic plan. As human economic activities inter-operate, balance relationships between material objects appear as they do in the production process. It is not possible, for example, in the process of distribution, to allot a greater quantity of a given product than is available; given a definite quantity of a specific product, the purchase of a greater quantity by some people reduces the quantity which others can buy. These balance relationships also cause the activities of the individuals participating in the economic process to inter-operate. Thus economic relations give rise to *laws of the inter-operation or interplay of human actions*.

²⁰ In German *Verhaltensgesetze* in French *lois de comportement*.

Some economic relations—certain relations of distribution—do not depend directly on the relations of production, but are a result of the superstructure of a given mode of production. For instance, the state imposes taxes and duties, regulates conditions of exchange, pays salaries and wages, and grants subsidies; social organizations collect voluntary contributions and spend them on specified purposes; religious organizations prohibit certain activities; accepted customs require the performance of certain activities, etc. The influence of the superstructure—of the state in particular—on the relations of distribution creates new stimuli, modifies existing stimuli, and also affects the possibility of reacting to certain stimuli (e.g., by prohibiting certain activities); in this way it becomes the source of certain laws of human behaviour. At the same time the superstructure—the state in particular—influences the way in which human activities inter-operate. For instance, the state, in the field of distribution, may introduce rationing and the allotment of certain commodities, fixing their prices, ordering enterprises to combine in cartels and prohibiting certain activities (e.g., certain forms of stock exchange speculation). This affects the interplay of human actions.

Thus, with regard to the conditioning effect of the material productive forces and the economic relations between men, we distinguish three kinds of economic laws. They are: the technical and balance laws of production, the laws of human behaviour, and the laws of interplay of human actions. Laws of the first kind result from the material and technical necessities of the production process. That is why they are independent of human will; but, on the other hand, people are as a rule conscious of them, and those involved in the production process take them into account in their activity. Laws of the second kind—laws of human behaviour—are also independent of human will, though they deal with purposive activity. Yet a given system of economic relations (the relations of production and the relations of distribution) gives rise, inescapably, to definite economic stimuli and certain ways of reacting to them. Reacting to economic stimuli is in itself

conscious and purposive behaviour, but the very fact that given economic relations create certain economic stimuli and not others (that, for example, under capitalist production relations there is a tendency to the maximization of profits, and competition accounts for a tendency to reduce production costs etc.) is something independent of human will, and is, moreover, something which people do not often realize. Certain economic stimuli cannot be separated from certain economic relations.

Finally, laws of the third kind—laws of interplay of human actions—are also independent of human will and frequently do not enter into men's consciousness or else are misunderstood. Individual actions by human individuals and groups are conscious and purposive, but the complexes of these actions, which arise in particular economic relations, are, as Engels demonstrated, unintended and unconscious. A typical example is to be found in the operation of the laws of the market under capitalist relations of production which we discussed above. The law of the average rate of profit under capitalist competition provides a further illustration. Every capitalist strives to obtain the maximum profit, but competition accounts for the fact that the rate of profit in the various industries levels down to an average. The law of the appearance and disappearance of surplus profit (i.e., profit over and above the average rate) operates in a similar way; every capitalist endeavours to obtain surplus profit by introducing technological improvements which cut down production costs, but competition forces all capitalists to introduce technological improvements in order to reduce production costs, so that the price of the product falls and the surplus profit vanishes. All these are examples of the laws of interplay of human actions. In other economic relations, e.g., if competition is replaced by a monopoly or by planning on a national scale, human actions inter-operate in other ways, and other laws of interplay of human actions develop.

Historical scope of economic laws

Economic laws, being a result of the historical development of material productive forces and economic relations, are products of the historical development of human society and the scope of their operation is also historically determined. Every law, whether in nature or in human society, has its scope of operation limited both in time and space²¹. For every law operates in strictly defined conditions, and ceases to operate when these conditions are changed. Since "...nature also has its history in time..."²² the laws of nature also change. Yet the changes occurring in nature are extremely slow as compared with changes in the history of mankind, and consequently as compared with changes in the conditions of the operation of economic laws. These conditions change from one historical epoch to another. Political economy, as Engels observed, "deals with material which is historical, that is, constantly changing; it must first investigate the special laws of each individual stage in the evolution of production and exchange..."²³. Thus economic laws are not universally valid covering all stages of social development but are historical laws dealing with definite stages of social development. They emerge at certain moments in that process and disappear as society develops further. As Engels put it, "so called economic laws are not eternal laws of nature but historic laws which arise and disappear..."²⁴.

The historical duration of economic laws varies, however, with the duration of the conditions which account for the

²¹ See J. Pelc, M. Przełęcki, K. Szaniawski, *Prawa nauki* (The Laws of Science), PWN, Warsaw 1957, pp. 30-40.

²² See F. Engels, *Anti-Dühring*, ed. cit., p. 40, and *Dialectics of Nature*, Lawrence and Wishart, London 1940, pp. 9-13.

²³ *Anti-Dühring* ed. cit., p. 204.

²⁴ Engels' letter to F. A. Lange, March, 29 1865. See Marx and Engels, *Selected Correspondence*, Lawrence and Wishart, London 1934, p. 198. It must however be remembered that as Engels emphasized, the laws of nature are not eternal: they are only apparently so by comparison with economic laws. In any case, some economic laws may prove to be longer lived than some laws of nature in, say, the field of climatology.

operation of such laws. For this reason, the field within which the various conditions and their corresponding economic laws are valid must be described more exactly.

Scope of technical and balance laws of production

The laws with the widest application in history are those arising from the production process—the technical and balance laws of production. The most general of these laws are universal in character, which means that they are valid at all stages of social development in which production is a conscious and purposive human activity—i.e. beginning with the appearance of mankind. A general technical and balance law of production of this kind arises from the very existence of certain necessary technical and balance relationships in the production process²⁵. General technical and balance laws also appear in the process of simple reproduction, namely in the renewal of the means of production as they are used up. The more detailed technical and balance laws of production, however, change with the development of the productive forces. The greater the development of productive forces the more developed these laws are. At a certain stage of development we find, for example, a differentiation between fixed and circulating means of production, the accumulation of a part of the product for the purpose of increasing the stock of the means of production, the storage of goods earmarked for the replacement of the means of production as they are used up, the storage of goods as an emergency reserve, the intensified use of labour and of the durable means of production and so on. Detailed tech-

²⁵ In a letter to Kugelmann, July 11, 1868, Marx writes: "Every child knows, too, that the masses of products corresponding to the different needs require different and quantitatively determined masses of the total labour of society. That this *necessity* of the *distribution* of social labour in definite proportions cannot possibly be done away with by a *particular form* of social production but can only change the form in which it *appears* is self-evident. No natural laws can be done away with. What can change, in historically different circumstances, is only the form in which these laws operate". K. Marx and F. Engels, *Selected Works*, ed. cit., vol. II, p. 418-419.

nical and balance laws of production corresponding to these new conditions develop. Such laws are not universal in application and appear only at a definite level of the development of productive forces. They are, however, characterized by the fact that they are not directly dependent on economic relations between men, but develop in the process of interaction between man and nature—in the process of production.

The technical and balance laws of production are social and historical in so far as the very process of production is a social and historical process. Since according to the law of the progressive development of productive forces²⁶, these forces in principle develop in one direction, their development gives rise to new, more diversified, technical and balance laws of production; the older, more general laws do not, however, cease to operate on that account²⁷. Every new social formation which emerges in history inherits old productive forces to which in the course of time it adds; it also takes over the old technical and balance laws of production and prepares the ground for new ones. Capitalism took over such laws from the pre-capitalistic formations, and socialism is taking them over from capitalism. The laws of production do not cease to operate with the transition from one social formation to another, they are only enriched by more highly developed ways of operating arising from the development of productive forces in the new social formation.

Laws specific to a given social formation

The situation is different when it comes to the laws of human behaviour and the laws of interplay of human actions. These laws are products of economic relations between men, and change as those relations change. Three kinds of these laws can be distinguished.

²⁶ See Chapter Two above.

²⁷ The technical and balance laws of production do not cease to operate. But quite obviously the concrete numerical values of particular relations change. If, for example, these laws are expressed in mathematical equations or inequalities, the value of the parameters of these equations or inequalities change, but not the equations or inequalities themselves.

Laws of the first type are determined by the relations of production and the corresponding relations of distribution, so that the operation of these laws is confined to a single social formation or even to a single phase in the development of a formation. These are *the specific economic laws* of a given social formation. They form a set of laws of human behaviour and laws of interplay of human actions which result exclusively from the relations of production forming the economic base of a given formation.

The decisive role is played by the ownership of the means of production, which conditions all the relations of production constituting the economic base of the social formation in question. The ownership of the means of production determines the goals to which the means of production are directed and hence to which all the productive forces of a given society are turned. It also determines the means of obtaining those objectives. The ownership of the means of production determines, moreover, the objectives and activity of all those persons who are not owners of the means of production. Thus the ownership of the means of production determines the economic stimuli at work in a given social formation, as well as the nature of reactions to such stimuli. This is the way laws specific to capitalism develop in the capitalist formation (e.g., the capitalist's endeavour for maximum profit, the laws determining the level of wages, etc.). Other specific laws of human behaviour operate under feudalism and other ones under socialism. Under socialism, the productive forces are employed to obtain the best possible satisfaction of the needs of society, and the ways of achieving this end—including the forms of reaction to economic stimuli—depend on the organization of the socialist production relations and on the management of the process of production and distribution.

The relations of production forming the economic base of a given social formation also determine certain laws of interplay of human actions. Some of these laws do not result from the general character of the relations of produc-

tion specific to a given formation, but from certain more detailed forms assumed by these relations, forms which change as the formation develops. The activities of capitalist entrepreneurs at first inter-operate through competition. This gives rise, as we have already pointed out, to the law of the average rate of profit. In the next phase of the development of capitalism, competition gives way to monopolies which dominate certain branches of production. The law of the average rate of profit loses its validity for those branches and is replaced by new laws dealing with the division of profits within the capitalist class. Under socialism the activities of individual enterprises inter-operate on the basis of a general plan covering the whole of society. Yet the details of that inter-operation depend on the way in which production is directed and planned. Changes in methods of planning and management give rise to changes in the way in which the activities of enterprises inter-operate and also produce changes in some of the economic laws. In general it might be said that, in difference to the laws of human behaviour which are generally specific to a given social formation throughout its duration, a considerable part of the laws of interplay of human actions changes in the course of the historical development of a formation.

Economic laws common to different social formations

The second type of laws of human behaviour and of interplay of human actions are economic laws also determined by relations of production, but by the properties of those relations which appear in more than one social formation. These laws express features common to the economic bases of more than one social formation; they are valid in all those formations whose economic bases reveal those common features. They are *common economic laws*, common to certain social formations²⁸. This is seen very clearly when production

²⁸ I.e., common with regard to the common features of the relations of production in the given social formations. Technical and balance laws of production are also common to different social formations, but this is not because of features common to relations of production (relations

relations are such that products are exchanged. This feature of the relations of production is then expressed by the operation of the law of value, and the distribution relations determined by that law find expression in the laws of the market, (the law of supply and demand, laws of price formation). When exchange is effected by means of money, a number of general laws of money circulation also begin to operate. The historical extent of these laws coincides with the historical extent of the features of the production or distribution relations with which they are associated²⁹.

Laws resulting from the influence of superstructure

Finally, economic laws of the third type are those which result from the influence of the superstructure on economic relations in a social formation or *the laws arising from the influence of superstructure*. Economic laws of this kind change in the course of the development of a social formation together with changes in the operation of the superstructure. In a capitalist economy, for example, there may either be free trade or tariff protection, there may be a currency based on gold or there may be various forms of fiduciary currency or paper money, there may be a free market for foreign currency or there may be special foreign currency regulations, and so on. All this is a result of the action of superstructure—in this case of legislation imposed by the state. This activity moulds certain economic relations to which definite economic laws correspond; these laws operate as long as the economic relations resulting from these state activities exist. Gresham's law for example, dealing with the circulation of metal currency,

between men), but due to general characteristics of the productive forces, i.e., of the interaction between man and nature.

²⁹ In a postscript to Volume III of *Capital*, Engels writes of the law of value: "Commodity exchange appears in the period before written history, in Egypt reaching back two thousand five hundred and perhaps five thousand years, in Babylon, four and perhaps six thousand years B.C.: the law of value thus reigned supreme for a period of time lasting from five to seven thousand years". *Das Kapital*, ed. cit., vol. III, pp. 34-35.

states that bad money drives out good. Obviously this law ceases to operate when a metallic currency is replaced by paper money. But even with metallic currency it operates only if different kinds of money with differing values of metallic content have the same legal force on (or, more generally—if the relationship between the legal rates of exchange of different kinds of money differs from the relationship between the values of the metal they contain). If there is no rate of exchange fixed by the state, Gresham's law does not operate, and the relationships between the rates of exchange of the various kinds of money are determined by the laws of the market in proportion to the value of the metal they contain. Thus Gresham's law is typical of the laws arising from the action of superstructure—in this case from the action of the state in fixing the legal rate of exchange for various kinds of money.

Thus in every historically determined social formation the economic laws operating in it are, as it were, stratified according to their various validities over time, and the various ways in which they are connected with the economic base. These laws include technical and balance laws of production which are determined by the stage reached in the development of the productive forces: the majority of these laws have been inherited from previous formations and are transmitted to future formations together with the given formation's own contributions. Further, they include economic laws common to several formations, laws resulting from certain features of the economic base, common to a number of social formations. They also include economic laws specific to a given formation—the expression of the specific properties of the relations of production which form the base of that formation, and distinguish that base from the bases of all other social formations. Some of these specific properties change in the course of historical development, a process which is accompanied by changes in certain economic laws specific to that formation, so that such laws are specific only to certain phases in the development of the formation concerned. Finally, they include laws resulting from the influence

of the superstructure and these change as the superstructure itself—in particular the political and legal superstructure—undergoes various changes.

Among the economic laws operating in a given social formation those laws which are specific to the formation are especially important. For they express what distinguishes that formation from other social formations, they express the specific properties of that formation as well as of the corresponding historical epoch. As we shall see later, such laws decide a social formation's character and development.

Mode of operation of social formation

As we know, every social formation is an internally balanced whole. Such a balanced whole is formed by the productive forces and relations of production which make up the mode of production. The relations of production themselves are also a balanced whole since they form the economic base of a social formation and its superstructure. The inner balance of a social formation, the mutual adjustment of its productive forces, and the relations of production and superstructure are maintained by the operation of the first and second basic laws of sociology—the law of necessary conformity between the relations of production and the character of the productive forces, and the law of necessary conformity between superstructure and economic base. All this means that human actions within a given social formation—the process of production in which man transforms nature, the mutual interaction of men constituted by the relations of production and of distribution, and the social relations forming part of the superstructure—are all connected with each other. They form a whole, a system of actions bound together internally. These inner links, the fact that human actions form a whole, mean that social formations are objective products of social development existing independently of human will and consciousness³⁰.

³⁰ Thus the definition and classification of social formations are not the results of an arbitrary semantic convention, but the reflections of objective historical facts. Feudalism, socialism, capitalism and other

Therefore laws operating within a social formation do not operate in accidental combinations, independently of one another. Their operation forms a whole; a system of economic laws develops which is characteristic of the social formation. This kind of system is called *the mode of operation of the social formation*; sometimes the description "mechanism of operation" or "mode of functioning" is used. It is a network of connections of cause and effect arising within a social formation, with individual economic laws forming the links³¹.

social formations are real entities existing independently of our scientific classification; they are internally connected systems of repeatable human actions (i.e., relations). They form objective "wholes" in the sense that the properties of these systems of human activities are different from the properties of the various parts of these systems, i.e., the individual human actions taken separately. Concerning such "whole" systems see L. Kołakowski, *Aktualność sporu o powszechniki. Światopoglądowe i metodologiczne problemy abstrakcji naukowej* (The Topicality of the Controversy over Universals. Philosophical and Methodological Problems of Scientific Abstraction), I, PWN, Warsaw 1957, pp. 154–155. Cf. Zbigniew Czerwiński, *Zagadnienie całości* (Problems of "Wholeness"), "Zeszyty Problematyczne Nauki Polskiej XII", Zakład im. Ossolińskich, Wrocław-Warsaw 1956. A recent science, cybernetics, which we will discuss again later, makes possible an exact approach to this problem. Cybernetics studies systems of elements interacting on one another. Cybernetics has established that the behaviour of a system depends not only on the way in which its elements operate, but also on the way in which the operation of individual elements of the system are "coupled" to one another—to use the terminology of cybernetics. The same elements operating in the same way but joined ("coupled") to each other in a different way form a different system which behaves differently. The system is a "whole" possessing properties different from the properties of its elements. These separate properties result from the combination of the operations of individual elements; a knowledge of the way in which each individual element operates is not sufficient to determine the way in which the system operates. See Ross Ashby, *An Introduction to Cybernetics*, Chapman and Hall, London 1958, p. 66. Cf. also Oskar Lange, *Wholes and Parts. A General Theory of System Behaviour*, Pergamon Press, London 1963.

³¹ The expressions "mechanism of operation" and "mode of functioning" are here used metaphorically. They do not mean that the connections of cause and effect are mechanical or biological. These are social connections, i.e., they depend on the interplay of human actions. For this

The key to the understanding of the mode of operation of a social formation is to be found in the economic laws resulting from the relations of production specific to that formation. Neither the technical and balance laws of production, the majority of which are inherited from earlier formations, nor the economic laws expressing properties common to the relations of production in more than one social formation can provide such a key. Nor can this role be played by the economic laws resulting from the influence of superstructure since their operation changes as the formation develops. Hence the particular importance of the economic laws specific to a given formation in understanding its mode of operation, for these laws express the specific properties of the relations of production in a given formation.

Basic economic law of a social formation

As we know, the relations of production in every social formation result from the fundamental relationship constituted by the ownership of the means of production. The ownership of the means of production is, so to speak, the organizing principle which determines the relations of production in their entirety. Out of the economic laws specific to a given formation it fashions a single law which determines the entire mode of functioning of that social formation. This is called *the basic economic law* of the social formation³². The basic economic law,

reason the best is the description "mode of operation" of a social formation; we give the other expressions since they are met with in economic literature.

³² The term "basic economic law" was introduced by Stalin in *Economic Problems of Socialism in the U.S.S.R.*, Foreign Languages Publishing House, Moscow 1952. Stalin defines the basic economic law of a social formation as the law which determines "all the principal aspects and all the principal processes" of a social formation, "the essence", "the content" of a mode of production (see pp. 40-41). The concept of the basic economic law, though not the name, is found in Marx and Engels who stated that the law of surplus value is a "specific characteristic", "the nucleus" of the capitalist mode of production. Marx writes: "... what especially distinguishes the capitalist mode of production is the production of surplus value as the

resulting from the type of ownership of the means of production dominant in a given social formation, determines the goal to which the means of production and the entire productive forces of society are directed, in other words it determines the main economic incentive of the owners of means of production. It also determines the means of attaining this goal. In other words, the basic economic law of a given formation determines the main economic stimulus together with the way of reacting to that stimulus within the formation. When, for example, the means of production are owned by capitalists, the stimulus is the capitalists' desire of maximum profits; when the ownership of the means of production is socialist the stimulus is constituted by the desire to provide the maximum satisfaction of the needs of society³³.

The basic economic law of a given social formation also determines the objectives (incentives) and means of action of those persons who are not owners of means of production (e.g., workers under capitalism or serfs under feudalism), and thereby determines also the economic laws governing the stimuli which arise in these circumstances and the way people react to them. It also determines the inter-operations of human activity and its corresponding economic laws resulting from the nature of the ownership of the means of production. The basic economic law of a given social formation thus determines the operation of all the other economic laws specific to that formation. Moreover in any given social formation it also influences the operation of the economic laws expressing the features of the relations of production common to more than

immediate aim and deciding motive of production". (*Das Kapital*, ed. cit., vol. III, p. 937). Engels, on the other hand, writes: "In thus showing how surplus value arises, and how alone surplus value can arise under the domination of the laws regulating the exchange of commodities, Marx exposed the mechanism of the existing capitalist mode of production and of the mode of appropriation based on it; he revealed the core around which the whole existing order has crystallized". (*Anti-Dühring*, ed. cit., p. 284). Thus we can say that Marx and Engels believed the law of surplus value to be the basic economic law of the capitalist mode of production.

³³ See p. 59-60 above.

one social formation as well as the form of the technical and balance laws of production. The basic economic law of capitalism, for example, influences the operation of the law of value, which under capitalism leads to the production and appropriation of surplus value; competition, which is a particular complex of human activity found in various forms of commodity production, under capitalism leads to the formation of an average rate of profit. The basic economic law of a social formation also gives a specific form to the operation of the technical and balance laws of production. Under capitalism, means of production take on the form of constant capital, and their replacement takes place through amortization; human labour power engaged in the production process becomes variable capital; technical relationships become the costs of production while balance relationships become profits and losses. The consequences of the economic laws arising from the influence of superstructure—the imposition of taxes and duties, for example—similarly depend on the basic economic law of the social formation. They are different, for instance, under capitalism and feudalism, since economic stimuli and the ways of reacting to them are different in these formations. The operation of all economic laws is thus subordinated to the basic economic law of a given formation.

Economic laws and dialectic social processes

It can be said, therefore, that the basic economic law of a given social formation determines that formation's mode of operation. It combines all the economic laws operating in a given formation into a systematic whole and gives its own stamp to their operation. But social formations are not static; they emerge, develop and decay, making way for new formations. This, as we know, is the result of three dialectic processes: 1) the continual appearance of contradictions in the process of the mutual interaction between man and nature, which causes the development of productive forces: 2) the accumulation of contradictions between the new productive forces and the old relations of production: and 3) the emergence

of contradictions between the new relations of production required by the productive forces (i.e., the new economic base) and the old superstructure³⁴. Undermined by these contradictions, the social formation loses its internal balance and coherence. The operation of the first and second laws of sociology sets in motion a process of adjustment which results in the birth of a new social formation.

These dialectical social processes affect the operation of economic laws. As the inner contradictions within a given social formation accumulate and undermine the mutual adjustment of productive forces, production relations and superstructure, contradictions in the operation of the economic laws of that formation also begin to appear. These laws are no longer properly adjusted to one another and their operation becomes contradictory, finally rendering impossible the functioning of that social formation. The process of "ageing"³⁵, a decline of the social formation, sets in, and this can only end with the birth of a new formation with an internally balanced mode of operation³⁶.

Contradictions in the operation of economic laws reflect the sociological contradictions we have enumerated. Contradictions arise between the operation of the technical and balance laws of production, on the one hand, and the operation of the specific economic laws resulting from production relations, on the other. The technical and balance laws also conflict with the economic laws common to the production relations of their own and other social formations. Contradictions arise between the operation of economic laws resulting from production relations, and the operation of the economic laws which

³⁴ See Chapter Two above.

³⁵ This is a metaphorical expression. There is, however, an indisputable analogy with the process of ageing in an organism, a process which consists in the loss of co-ordination between the operation of various biological laws.

³⁶ Marx states this as follows: "the evolution of the contradictions within a historical form of production is the only historical way in which these contradictions can be resolved, and a new form comes into being". *Capital*, Dent, London 1930, vol. I, p. 527.

result from the influence of superstructure. In particular, a contradiction emerges between the operation of the various economic laws and that of the basic law of the formation concerned. As we shall see later, the operation of the basic laws of capitalism, for example, eventually contradicts the economic technical and balance laws, the operation of the law of value, and the various laws resulting from the influence of superstructure. Contradictions which develop in the operation of economic laws within a given formation—in particular contradictions between the formation's basic economic law and the other economic laws—are the moving force of its development and final decline.

“Economic law of motion” of a social formation

The contradictions which manifest themselves in the working of economic laws impart a specific character to the mode of operation of social formations. The operation of economic laws in a given social formation forms a system of actions which are both interconnected and contradictory; the mode of operation of a social formation becomes a dialectic process of development. This dialectic character of the mode of operation of a social formation Marx called its *economic law of motion*³⁷. “The economic law of motion” arises from the operation of the basic economic law of a given formation, which, working

³⁷ In his Preface to the first edition of vol. I of *Capital* Marx writes that “it is the ultimate aim of this work to lay bare the economic law of motion of modern society” (K. Marx and F. Engels, *Selected Works*, ed. cit., vol. I, p. 451). Undoubtedly he was thinking here of what we have called the mode of operation of a social formation and thought of that mode of operation as a dialectical process of development. This is borne out by his approving reference to a review of the Russian edition of *Capital*. (See The Afterword to the Second German Edition of the first volume of *Capital*, Marx and Engels, *Selected Works*, ed. cit., vol. I, p. 454). We read there: “The one thing which is of moment to Marx, is to find the law of the phenomena with whose investigation he is concerned; and not only is that law of moment to him, which governs these phenomena, in so far as they have a definite form and mutual connection within a given historical period. Of still greater moment to him is the law of their variation, of their development, i.e., of their transition from one form into another, from one series of connections into a different one”.

through the contradictions in the operation of the various economic laws, prevents the formation from congealing in a stationary state and produces continuous changes of a definite direction. "The economic law of motion" produces development of the social formation; it also sets the direction of this development.

Spontaneity in operation of economic laws

Economic laws are objective phenomena; their existence and operation is independent of human will and consciousness. But economic laws may operate in a way which coincides with man's conscious aims and the activities intended to achieve those aims, or they may not. In the first case we say that economic laws operate in a way *intended* by man, and in the second case, that they operate *spontaneously*. The majority of economic laws in all the social formations preceding the emergence of the socialist formation have worked spontaneously.

It is true that even in pre-socialist formations certain economic laws may operate in a way intended by man, but they are not laws which determine the development of the social formation. In most cases they are laws of the economic influence of superstructure, especially of the state, or certain technical and balance laws of production. The specific economic laws which result from the relations of production, in particular the basic economic law of a social formation, and those laws which express features common to the relations of production in more than one social formation, do not operate in conformity with man's aims. The spontaneity of their operation is partly due to the fact that economic stimuli and the ways of reacting to them—in ways that are unintended and in most cases unconscious—arise from the historic arrangement of the relations of production and the corresponding relations of distribution, partly because the various stimuli are at variance with each other, and partly because a complex of human actions gives a combined result which was not intended by any of the persons or human groups involved. We again quote Engels: "That which is willed happens but rarely; in the majority of instances

the numerous desired ends cross and conflict with one another, or these ends themselves are from the outset incapable of realization, or the means of attaining them are insufficient”³⁸. Thus, the mode of operation of the pre-socialist formation and the dialectical process of development—“the economic law of motion”, as Marx called it, are spontaneous. The birth, development and decline of social formations is a spontaneous process.

Fetishization of economic laws

The spontaneity of this process accounts for the fact that it develops like a process of natural history even though it is the result of conscious and purposive human actions. As Engels goes on to say in the passage from which we have already quoted: “... the conflicts of innumerable individual wills and individual actions in the domain of history produce a state of affairs entirely analogous to that prevailing in the realm of unconscious nature”³⁹. In the same sense Marx, writing about the development of capitalism, stated that “my standpoint” is one “from which *the evolution of the economic formation of society is viewed as a process of natural history*”⁴⁰. This “natural history” type of process is in fact the result of human actions. Each of these actions taken separately is conscious and purposive, but the conditions independent of human will in which these actions take place, as also the interplay of those actions, make their social outcome a spontaneous process.

³⁸ K. Marx and F. Engels, *Selected Works*, ed. cit., vol. II, p. 354.

³⁹ Ibid. See also Engels’ letter to H. Starkenburg, January 25, 1894, “Men make their history themselves, but not as yet with a collective will according to a collective plan or even in a definite delimited given society. Their aspirations clash, and for that very reason all such societies are governed by necessity, which is complemented by and appears under the forms of accident. The necessity which here asserts itself athwart all accident is again ultimately economic necessity”. (Marx and Engels, *Selected Works*, ed. cit., vol. II, p. 458).

⁴⁰ K. Marx and F. Engels, *Selected Works*, ed. cit., vol. I, p. 451. In the original German the expression is *naturgeschichtlicher Prozess*. See *Das Kapital*, ed. cit., vol. I, p. 8.

This spontaneity explains why men misunderstand the nature of economic and sociological laws. Instead of the unintended result of their own actions they see the working of some superhuman force, the operation of the eternal "laws of nature", or the influence of supernatural divine, or daemonic powers.

A metaphysical fetishization of economic and sociological laws takes place⁴¹; they become dehumanized and their origin is sought outside the sphere of human activity⁴².

⁴¹ The term, "fetishism" appears in Marx's *Capital*, ed. cit., vol. I, p. 45. Fetishization consists in that men conceive economic and sociological laws to be the results of superhuman powers dominating man: "whose own social movement seems to them a movement of things—of things which control them, instead of being controlled by them". (Ibid., p. 48). In the earlier period of their activity Marx and Engels, to denote this phenomenon, used the expression *alienation* (*Entfremdung*) which was common in contemporary German philosophy. They give the following description of alienation, "The social power, i.e., the multiplied productive force, which arises through the co-operation of different individuals as it is determined within the division of labour, appears to these individuals, since their co-operation is not voluntary but natural, not as their own united power but as an alien force existing outside them, the origin and end of which they are ignorant, which they thus cannot control, which on the contrary passes through a peculiar series of phases and stages independent of the will and the action of man, may even be the prime governor of these". K. Marx and F. Engels, *The German Ideology*, Parts I and III, London 1938, p.24. See also on this subject D. Rozenberg, *An Outline of the Development of the Economic Studies of Marx and Engels in the 1840's* (in Russian), and Auguste Cornu, *Essai de critique marxiste*, Paris 1951, pp. 48–54.

⁴² This dehumanization of economic and sociological laws takes two forms: naturalistic and supernaturalistic. The first finds its expression in "the eternal laws of nature" which supposedly rule man's life in society. Its theoretical formulation is to be found in the economic systems of the physiocrats, classical political economy, and to some extent in some later economic theories, as well as the organic and racial theories in sociology. The latter finds its expression in religious philosophy and in the histori-sophical speculations of objective idealism which are merely abstract variations of the more colourful images of religious imagination. Contemporary Protestantism which fully accepts the picture of the world presented by natural science is especially concerned to justify a religious outlook on the basis of the spontaneity of the operation of economic and sociological laws. The English historian, Professor Herbert Butter-

Socialism overcomes spontaneity of economic laws

Scientific socialism is an undertaking to overcome the spontaneity of social development and to set up a system of production relations in which economic laws would work in a way intended by man. It starts from the assumption that the evolution of the capitalist mode of production itself prepared conditions in which the new, socialist system of relations of production becomes both possible and necessary. Necessary, that is, in the sense that it constitutes a condition for the further development of productive forces and the saving of society from disintegration caused by the spontaneous accumulation of inner contradictions in the capitalist social formation, contradictions leading inevitably to its collapse.

field, for example, writes, "not merely by our votes but by our actions and by all the interplay that goes between us we are engaged in a work of history-making — engaged in weaving that fabric of events upon which the historians of the future will have to write and speculate. It is necessary however, to remember that the pattern of the history-making which we shall carry out will not be the product of my will or of yours or indeed of anybody else's, but will represent in one sense rather what might almost seem to be a compounding of these wills or at least of their effects—something which sometimes no single person will either have intended or anticipated... A very considerable part of the attention of historians is concentrated in fact upon that kind of history-making which goes on so to speak over our heads, now deflecting the results of our actions, now taking our purposes out of our hands, and now turning our endeavours to ends not realized". *Christianity and History*, Fontana Books, London 1957, pp. 123–124. It is clear that this is an analysis of the spontaneity of the process of social development, very similar to the analysis made by Engels. The author draws, however, different conclusions, "For in the first place there is a Providence that we must regard as lying in the very constitution of things. Whether we are Christians or not, whether we believe in a Divine Providence or not, we are liable to serious technical errors if we do not regard ourselves as born into a Providential order. We are not by any means sovereign in any action that we take in regard to that order, and not by any means in a position to recreate it to the heart's desire". *Ibid.*, p. 126. The chapter from which we quote is entitled "Providence and the Historical Process". Others see in history, apart from Providence, the working of demonic powers. Paul Althaus, the theologian, writes: "Over and above the human will... there are still other living forces at

The basic condition for controlling the mode of operation of social formation is the establishment of social ownership of the principal means of production. This makes it possible to set economic stimuli so that people react to them in conformity with the will of organized society. When this is so, the economic laws of human behaviour operate in a way intended by man. Moreover, social ownership of the means of production makes it possible to plan the way in which human actions inter-operate. As a result, the laws of interplay of human actions also operate in a way intended by man. Finally, social ownership of the means of production eliminates the antagonistic character of production relations and at the

work in history: superhuman trends, tendencies, "ideas". They are not devised and directed by man... They overpower him (or a whole people and even a whole period of time), harness him in their own service, and force him on to an aim which he does not know, and to results which he did not expect... Historical spiritual powers of this kind are certainly not all bad. But among them are found evil *demons*. We speak, for example, of the *demon* of power... Power is an end in itself which employs every means and breaks all moral constraints and so becomes a destructive force". *Die Christliche Wahrheit. Lehrbuch der Dogmatik*, Gütersloh 1949, 2nd ed., vol. II, pp. 153-154. Paul Tillich, the American philosopher and theologian, writes of "the demonic-tragic structures of individual and social life" opposing man as a superhuman power. *Systematic Theology*, Nisbet, London 1955, vol. I, p. 55. Similarly, contemporary existentialist philosophy refers to "existential situations" in which man is involved with no means of escape and which fill his existence with fear and anxiety. Engels also speaks of the results of the spontaneous operation of economic and sociological laws as forces which "act blindly, forcibly, destructively...", "...in spite of us, in opposition to us...", "...master us..." and compares them to demonic powers which control the fate of man. (See *Anti-Dühring*, ed. cit., p. 387). The materialist interpretation of history, however, explains the "demonic-tragic structures" which oppress the lives of societies and individuals without resorting to metaphysical constructions, naturalistic or supernaturalistic. It explains them as resulting from the interplay of human activities in certain historical conditions of social life, in which the process of social development is spontaneous. The materialist interpretation of history thus gives a humanistic interpretation of spontaneity in the operation of economic and sociological laws and at the same time shows that it is possible to overcome this spontaneity and indicates the conditions necessary for so doing.

same time removes the obstacle formed by privileged, vested class interests which oppose any attempt to make economic laws operate in a way intended by, and in conformity with the will of the whole of society⁴³. In this way the socialist mode of production affords an opportunity for controlling social development and the working of economic laws.

Economic laws under socialism

This does not mean to say that in the socialist social formation economic laws cease to operate independently of human will and consciousness. The technical and balance laws of production, the laws of human behaviour, and the laws of interplay of human actions continue to operate objectively, independently of human will and consciousness. This cannot be changed by the socialist, or any other, mode of production. Yet the social ownership of the means of production enables these laws to give results intended by man. This was very clearly set out by Engels, when he explained the difference between the way in which economic laws operated in pre-socialist formations and the way in which they operate under socialism: "...they can, in the hands of the producers working together, be transformed from master demons into willing servants. The difference is as that between the destructive force of electricity in the lightning of the storm, and electricity under command in the telegraph and the voltaic arc; the difference between a conflagration, and fire working in the service of man"⁴⁴.

⁴³ This does not mean that social conflicts cannot arise as a result of the conservative interests of certain strata or social groups whose position depends on the place which they occupy in the superstructure. The opposition of these strata or groups, which are not based on the relations of production, cannot, however, in the long run prevent the adjustment of the operation of economic laws to the will and interest of the whole of society and cannot restore the spontaneity of the process of social development. Cf. Chapter Two above, and O. Lange, *The Political Economy of Socialism*. Institute of Social Studies, *Publications on Social Change*, No. 16, The Hague 1958, pp. 5-6.

⁴⁴ F. Engels, *Anti-Dühring*, ed. cit., p. 387.

Just as the laws of nature are utilized by contemporary technology so economic laws are also put to use by creating conditions in which these economic laws operate in such a way that their effects coincide with the aims of man. As Engels so clearly put it: "The laws of his own social action, hitherto standing face to face with man as laws of nature foreign to, and dominating him, will then be used with full understanding, and so mastered by him. Man's own social organization, hitherto confronting him as a necessity imposed by nature and history, now becomes the result of his own free action. The extraneous objective forces that have hitherto governed history pass under the control of man himself. Only from that time will man himself, with full consciousness, make his own history—only from that time will the social causes set in movement by him have, in the main and in a constantly growing measure, the results intended by him"⁴⁵.

The control of social development consists, then, not in the elimination of the operation of economic laws, since this is impossible, but in the creation of conditions in which "social causes set in movement by him" produce "the results intended by him". But the intended effects of social causes set in movement by men are a result of the operation of objective laws, independently of human will. It is necessary to bear in mind the difference between the spontaneity of operation and the objective character of economic laws. Their objectivity stems from the fact that they are a characteristic of the real economic process taking place in objective reality, i.e., independently of human will and consciousness, whereas spontaneity is a characteristic of the way in which economic laws operate and is an indication that the operation of economic laws does not agree with the intentions of man. The control of the operation of economic laws, that is to say, the securing of their agreement with human intentions, is achieved by the proper use of the objective operation of economic laws.

⁴⁵ Ibid., pp. 392-393.

Objective character and spontaneity of economic laws

Confusion of the concept of the spontaneity of the operation of economic laws with the concept of the objectivity of economic laws has led some economists to the false conclusion that there are no objective economic laws in the socialist formation and that the fact that their spontaneity has been overcome is the result of the fact that they have ceased to operate⁴⁶. To appreciate the falsity of this conclusion it is only necessary to realise that without objective economic laws it would not be possible to direct social development consciously and purposefully; incalculable chaos would prevail, in which man would

⁴⁶ This has led some economists to assert that in socialist society the science of political economy loses its subject-matter. At the most it could only engage in the retrospective examination of pre-socialist social formations. Rosa Luxemburg held this view. Limiting the subject matter of political economy to the laws of commodity production, especially capitalist commodity production, she came to the conclusion that, "political economy finishes its role as a science the moment that the anarchic economy of capitalism gives way to an economy planned, consciously organized and directed by the whole of the working society. The victory of the modern working class and the realization of socialism thus means the end of political economy as a science". *Einführung in die Nationalökonomie, Ausgewählte Reden und Schriften*, Berlin 1951, vol. I, p. 491. She did recognise the existence in socialist society of technical and balance laws which govern the process of reproduction. Cf. *The Accumulation of Capital*, English translation, London 1951, pp. 128-131 and 321-323. But the relations of production under socialism she thought to be so simple and conspicuous that no special science of political economy was needed. A similar opinion was expressed earlier by Rudolf Hilferding: "Political economy then ceases to exist in the form we have hitherto known and is replaced by a science of the 'wealth of nations'". *Boehm—Bawerk's Criticism of Marx*, ed. by Paul M. Sweezy, New York 1949, p. 191. Bukharin went even farther. In his book on the economy of the transition period he writes: "Essentially, as soon as we consider an organized social economy all the basic 'problems' of political economy disappear... Thus there is a place here for a descriptive system on the one hand and a system of norms on the other. But there is no room for a science which studies 'the blind laws' of the market since the market no longer exists. Thus the end of capitalist commodity production means the end of political economy". *Oekonomik der Transformationsperiode*, Verlag der Kommunistischen Internationale, Hamburg 1922, p. 12. Political

be utterly lost and unable to influence the economic process. Objective laws do continue to exist in the socialist formation, and are no less objective (i.e., they are in no less degree a property of the real economic process) than in the pre-socialist formations. But economic laws operate differently under socialism. Socialist relations of production mean that it is possible to control economic laws; conditions are created in which the operation of those laws conforms more and more closely to the intentions of man⁴⁷.

economy is not limited to the study of "the blind laws" of the market. The social relations appearing in the economic processes of socialist society and the economic laws associated with them require scientific study.

⁴⁷ Stalin, in his book, *Economic Problems of Socialism in the U.S.S.R.*, strongly emphasized the existence of objective economic laws under socialism: "Hence, the laws of political economy under socialism are objective laws, which reflect the fact that the processes of economic life are law-governed and operate independently of our will. People who deny this postulate are in point of fact denying science, and, by denying science, they are denying all possibility of prognostication—and, consequently, are denying the possibility of directing economic activity". *Economic Problems of Socialism in the U.S.S.R.*, ed. cit., p. 12. The problem of the existence and mode of operation of economic laws under socialism was put very clearly by Karl Kautsky. He writes, "This is perhaps a suitable point to draw attention to a mistake which is not uncommon even in socialist circles. It is asserted that its operation according to certain laws is a peculiarity of commodity production. This is supposedly due to the fact that commodity production is carried on anarchically by a great number of producers each of whom disposes of his own means of production. The situation is held to be quite different when society itself takes over the ownership of the means of production. Production can then be organized exactly as society sees fit, quite independently of all economic laws. This is a mistake. If a manufacturer organizes a factory, he cannot behave arbitrarily just as he pleases even though he can freely dispose of his own means of production. If certain natural laws of production are not taken into account his enterprise will never be capable of producing anything. The same is true of socialist society... The difference between capitalist and socialist production is of another kind. In capitalist production it is impossible for the adjustment of production to economic laws to take place without the occurrence of crises. In the socialist mode of production, however, it is possible consciously to adjust production to the natural laws of the mode of production and to maintain in this way the flow of the productive process without catastrophes and crises. This, of course, provided that

Dialectic processes in the socialist formation

The dialectic processes which are the moving force of the development of a social formation are also at work in the socialist social formation. Productive forces develop as a result of the dialectic process of mutual interaction between man and nature; there always remains the necessity to adjust, on the one hand, the relations of production to the development of productive forces, and the superstructure to the changes in the relations of production on the other⁴⁸. This necessity gives rise to contradictions which have to be resolved. These contradictions are, like economic laws, objective, and are a property of real social development, independent of human will and consciousness. These contradictions in turn lead to contradictions in the operation of economic laws and, if they are not removed in time, to disturbances in the economic process.

In the socialist formation, however, these sociological contradictions, like the contradictions in the operation of economic laws which result from them, can be removed before they become a source of uncontrolled processes. When the means of production are socially owned, there are no privileged class interests to oppose the adjustment of the relations of production to the needs of the development of the productive forces, and although certain social groups and social strata may be

these natural laws are studied. A socialist society which believes that these laws can be opposed by force if only it controls the means of production will always be defeated". *Die Materialistische Geschichtsauffassung*, Dietz Verlag, Berlin 1927, vol. I, p. 876-879.

⁴⁸ It is not possible, therefore, to agree with Krzywicki that the principles of the materialist interpretation of history do not apply to the development of socialist society. "The principles we have shown", wrote Krzywicki with reference to historical materialism, "as guiding social development, do not represent an iron law binding every epoch of history... If the territorial system (by which Krzywicki understood all systems following the clan system—O. L.) sometimes gives way to a classless system based on the conscious regulation of production throughout the whole country, spontaneity will disappear and the principles we have laid down along with it". *Social Development among Animals and Human Beings. Sociological Studies* (in Polish), ed. cit., p. 217. Krzywicki is not quite clear what type of social development would operate under socialism. In

interested in the preservation of obsolete elements of the superstructure, yet, lacking the support of any privileged social class, they are unable, in the long run, to oppose the adjustment of the superstructure to changes in the social formation's economic base⁴⁹. Consequently, the operation of the first and second basic sociological laws in the socialist formation is controlled by man and ceases to be a source of spontaneous disturbances in social development. Thus, even under socialism, development is still a dialectic process of the emergence and resolution of contradictions, a process in which tensions arise and are removed. All this, however, does not take place spontaneously but is mastered by the conscious and purposive activity of organized society, an activity which utilizes objective sociological and economic laws in order to realize human aspirations⁵⁰.

primitive society he thought that demographic and anthropological factors are decisive: the direct interaction between man and nature rather than the social relations formed in the process of production.

⁴⁹ Concerning the role of social groups and strata having a vested interest in particular forms of superstructure and who act as a factor hampering the development of socialist society, see Chapter Two and note 43 of this Chapter.

⁵⁰ The naive belief that contradictions do not arise in the course of the development of socialist society is a result of a religious eschatological interpretation of socialism as the realization of the Kingdom of God on earth. It is an expression of the same deep human desire which has been the origin of every form of religious eschatology. It is foreign to scientific socialism, which interprets socialism as a new stage in the development of human society subject to the general sociological laws formulated by the theory of historical materialism. Recently Mao-Tse-Tung has drawn attention to this: "Many people still refuse to admit that contradictions still exist in a socialist society... They do not understand that socialist society grows more united and consolidated precisely through the ceaseless process of correctly dealing with and resolving contradictions... The basic contradictions in socialist society are still those between the relations of production and the productive forces, and between the superstructure and the economic base... Contradictions arise continually and are continually resolved; this is the dialectical law of the development of things". *On the Correct Handling of Contradictions among the People*, Foreign Languages Press, Peking 1957, pp. 22, 23, 26. See also

Socialist formation opens new epoch in human history

Since the contradictions which arise in the course of the development of socialist society are consciously and purposively removed, the intensification of those contradictions which is a feature of all earlier social formations does not occur. The contradictions between the organization of the relations of production and the requirements of the new productive forces are removed in time by a conscious adjustment of this organization. Superstructure is similarly adjusted to the new conditions. Because of this, the socialist formation is not subject to the process of "ageing" and is not threatened with decay. The social ownership of the means of production makes it possible to resolve consciously and purposively the

the interesting book by Carlos Astrada, *El Marxismo y las Eschatologias*, Buenos Aires 1957, pp. 228-235. Scientific socialism is in no way eschatological, i.e., it does not expect the disappearance of the contradictions of individual and collective life. But it is, however, an undertaking to resolve these contradictions purposively, and consciously to direct the life of human society by a proper use of the sociological and economic laws discovered by science. The conquest of spontaneity in social development eliminates the basis of the dehumanization of economic and sociological laws in both its natural and supernatural forms. Social life can then be seen to be the product of human activity formerly unconscious and unintentional, but now and in the future to be ever more conscious and in conformity with man's intentions. The "demonic-tragic structures" which oppress man are thus overcome. This is not, however, the result of passive waiting for the fulfilment of eschatological prophesy, but is brought about by men's activity, by a ceaseless struggle with hindrances and contradictions, and by the use of a knowledge of the objective laws governing nature and social life in order to achieve the aims man has set himself. The dialectical tensions and contradictions which arise in the course of this struggle, necessitate a constantly active attitude towards reality, and a differentiation between what is consistent with the requirements of the tasks to be accomplished and what is not, i.e., a moral attitude which evaluates the facts of individual and collective life. Together with the naturalistic and supernaturalistic fetishization of economic and sociological laws, socialist society also rids itself of the eschatological expectation of the "end of contradictions and struggles", whether in the shape of the Christian Kingdom of God or in the shape of Hindu or Buddhist Nirvana. Eschatological fantasies were the products of social

contradictions in the operation of economic laws, which emerge in the process of development. In other words: the socialist formation has an unlimited ability to adjust its relations of production and superstructure to the requirements of developing social productive forces. Thus, instead of decaying as do all earlier social formations, it transforms itself into new and ever higher phases of social development⁵¹.

By controlling social development and by creating conditions in which it is possible for man consciously to employ economic laws for his own ends, socialism opens a new epoch in human history. The spontaneous and repetitive cycles of the emergence, development and decay of consecutive social formations are replaced by social development controlled by man and taking place within a social formation capable of unlimited adjustment to the needs of the development of human society⁵².

formations in which the spontaneous results of human activity ruled over man like a foreign, superhuman power. These fantasies disappear as the spontaneity of social processes is replaced by social activity which achieves the aims it sets itself.

⁵¹ Usually, the higher phases into which the socialist social formation develops are called communism. Marx distinguished a higher stage in which the development of the productive forces makes it possible to separate the relations of distribution from the individual's contribution to the social process of labour. Cf. Marx, *Critique of the Gotha Program*, in Marx and Engels, *Selected Works*, ed. cit., vol. II, p. 23. Normally, the name socialism is only applied to the first phase of the development of a social formation based on the social ownership of the means of production (e.g., Lenin, *State and Revolution*, in *Selected Works*, Lawrence and Wishart, London 1937, vol. VII, p. 75.) It is true that we might say of socialism, thought of in this way, that it is historically transitory, but this is only the transitory phase of a broader social formation that is not itself transitory, but final. For thereafter social development does not entail changes of the social formation.

⁵² Undoubtedly this is what Marx had in mind when he wrote that the bourgeois social formation "brings the pre-history of human society to a close". *A Contribution to the Critique of Political Economy*, K. Marx and F. Engels, *Selected Works*, ed. cit., vol. I, p. 364. The period of spontaneous social development comes to an end with capitalism and the period in which man consciously and purposively shapes his history

Practical significance of knowledge of economic laws

As we know, economic laws operate independently of human consciousness, independently of whether men are conscious of their operation or not and independently of whether they understand their operation correctly or not. Yet economic laws will operate as man intends only if he understands them correctly. A proper understanding of economic laws is an indispensable condition for their control. For men cannot control economic and sociological laws—as well as laws of nature—and use these laws in order to achieve certain aims, if they do not know these laws or if they misconceive them. Without a true knowledge of the laws governing nature and the social life of men, no effective activity is possible. Laws which are unknown or misunderstood will always operate spontaneously.

A true understanding of economic laws is thus a prerequisite for controlling them and hence the practical importance of political economy as a science. Since it is the science which studies the social laws governing the economic process, political economy provides man with knowledge indispensable for his utilization of the operation of economic laws to serve his ends. Thus, the knowledge supplied by political economy is an instrument of social practice.

From the very beginning political economy was intended by those who studied it to be a source of knowledge at the service of social practice. Yet the possibilities of using political economy for practical purposes were at first limited by the fragmentary understanding of economic laws and the fact that, as a result of the social conditions that then prevailed, the operation of many economic laws was misunderstood. Before there could be an effective social application of the results obtained by political economy, two historical conditions had to be satisfied. In the first place social conditions were required which would make it possible for at least some of those who

begins. Spontaneous “prehistory” ends, and “history”, consciously and purposively shaped, begins.

study political economy to understand correctly the economic and sociological laws governing the development of social formations. Secondly, social conditions were required which would make it possible to undertake to control economic laws.

As we have already stated, even in pre-socialist formations, certain economic laws could operate as man intended. For this reason a knowledge of economic laws, gradually acquired and deepened by political economy, always had a certain practical importance. Since, however, these laws had no fundamental significance for the operation and development of society, the practical importance of political economy was necessarily quite limited. Even in those cases where political economy succeeded in acquiring a true knowledge of the more important laws governing the economic process, it remained practically ineffective. At best it could do no more than come to an understanding of the spontaneous economic process of social development, upon which man could exert no influence whatsoever. It was only with the emergence of scientific socialism—a historic undertaking intended to control social development, and to create conditions in which it would be possible to use economic laws in order to obtain intended effects—that political economy acquired a new, creative, practical role. From being a passive observer of the spontaneous economic process, it has changed into a source of knowledge serving to direct that process. To fulfil this function, political economy must supply true knowledge i.e., knowledge, which is an adequate reflection of the social laws operating in the economic process.

CHAPTER FOUR

THE METHOD OF POLITICAL ECONOMY

Political economy as a theoretical discipline

POLITICAL economy is the study of economic laws, that is, the study of the relationships continually recurring between the elements of the economic process. It establishes the existence of economic laws, their character, extent in history, mode of operation and mutual interrelationships. Political economy is thus the study of aspects of the economic process which manifest themselves in economic laws. It is a *theoretical discipline*, in contradistinction to economic history and descriptive economics, which study concrete economic processes at definite times and in definite places.

Economic sciences, their subject matter and relations to each other

The study of the development of concrete economic processes in time is the concern of *economic history* (e.g., the economic history of Poland). *Descriptive economics* is concerned with concrete contemporary economic processes (e.g., the present economic situation in Poland). If concrete economic processes are formulated quantitatively, this is economic statistics; if they are discussed with regard to their distribution on the surface of the earth then this is the concern of economic geography. Economic statistics and economic geography form part of descriptive economics and, in so far as they refer to concrete economic processes in time, part of economic history. Political economy, economic history and descriptive economics (including economic statistics and economic geography) together form what are known as *the economic sciences*, i.e., the disciplines dealing with the economic process.

The various economic disciplines are dependent on each other. The study of concrete economic processes demands a knowledge of the laws which govern these processes. Economic history and descriptive economics must therefore make use of political economy, at the same time supplying political economy with information about concrete economic processes—information which is necessary if the theoretical generalizations of political economy are to reflect reality.

Applied economics, its branches

Political economy deals with the economic process as a whole, in which the constituent parts are connected with each other by economic laws. For practical purposes, it is necessary, however, to analyse separately the various fields or aspects of the economic process, both theoretically (i.e., with regard to economic laws) and descriptively (i.e., with regard to concrete processes). These problems are dealt with by the various branches of *applied economics*. These are often, although not always, called *branch economics*; we refer to the economics of industry, the economics of agriculture, the economics of trade, the economics of banking; but we refer to the *science* of public finance etc. Applied economics is thus a combination of sections of political and descriptive economics corresponding to the division of the economic process into branches or aspects. A combination of this kind is needed in teaching, in the organization of research institutions, and especially in training a qualified personnel specializing in various aspects of the economic process. The various branches of applied economics are, of course, reckoned as part of economic science.

Political economy and economies of various social formations

As we know, the operation of economic laws is confined to particular periods of time in history. These laws, moreover, do not operate in isolation, but combine within a given social formation to form an interconnected system which is called the mode of operation of the social formation¹. Here the eco-

¹ See Chapter Three above.

conomic laws specific to a given social formation are of basic importance, especially the basic economic law of the formation. Political economy, therefore, investigates economic laws historically, analyses the operation of economic laws within various social formations, studies the mutual connections in the operation of economic laws, and endeavours to discover the mode of operation of social formations in order to lay bare their "economic law of movement".

Because of this, political economy is divided into parts corresponding to historical social formations: the political economy of the primitive community, the political economy of the Asiatic and ancient formation, the political economy of feudalism, the political economy of capitalism, and the political economy of socialism. Each of these "political economies" deals with the economic laws specific to its social formation, the mode of operation of that formation and its "economic law of movement", thereby providing an explanation of the process of emergence, development and decay of each social formation concerned.

The historical scope of economic laws does not always exactly cover the same period of time as the social formations. Only those laws which are specific to a given social formation synchronize with it. Other economic laws operate over more than one social formation, as in the case of the technical and balance laws of production and those economic laws which express characteristics of the economic base common to more than one social formation; others, like those economic laws which are the expression of a single phase of the development of the base of a social formation, operate over a shorter period, as is often true also of the laws resulting from the influence of superstructure. The stratification of economic laws operating within a given social formation, the fact that laws are not synchronous in their historic scope and the fact that various laws are differently connected with the economic bases of social formations means that the "political economies" of the various formations do not form independent and separate disciplines. Their investigations to some extent overlap and are based on a common foundation.

This common basis is to be found in the fact that the various regularities in the economic process in different social formations are manifestations—in different historical conditions—of the same social process, i.e., the production and distribution of the material means of satisfying human needs. The “political economies” corresponding to various social formations are therefore ramifications of a single common discipline which is political economy. But political economy is more than the political economies of individual social formations. It also deals with problems which affect more than one social formation and there are even general properties of the economic process which appear in all social formations (some technical and balance laws of production for example). Besides the parts dealing with the economic laws and mode of operation of various social formations, political economy must also comprise a part which deals with the general problems common to various social formations².

Political economy of pre-capitalist formations

When discussing the division of political economy into parts corresponding to the various social formations, it must be borne in mind that so far only the political economy of capitalism is a fully developed branch of political economy.

² Engels also referred to a branch of political economy which dealt with general problems. He writes, “Political economy, therefore, cannot be the same for all countries and for all historical epochs... It deals with material which is historical, that is, constantly changing; it must first investigate the special laws of each individual stage in the evolution of production and exchange, and only when it has completed this investigation will it be able to establish the few quite general laws which hold good for production and exchange in general”. *Anti-Dühring*, Lawrence and Wishart, London 1955, pp. 203, 204; it should be remembered that Engels uses the expression “exchange” in the sense of “distribution”, a fact to which attention was drawn above on page 6 n. 6. It does seem, however, that Engels did not fully appreciate the significance of this branch of political economy. Marx had a much fuller understanding of the mutual connections between problems of different social formations. See *A Contribution to the Critique of Political Economy*, ed. cit., pp. 271–272.

Classical political economy confined itself to the study of the capitalist mode of production, and regarded pre-capitalist social formations “much as the Fathers of the Church have always treated pre-Christian religions”³. Marx himself explicitly stated that the subject matter of his investigations was the capitalist mode of production, and that “it is the ultimate aim of this work to lay bare the economic law of motion of modern society”⁴. What was called by Marx vulgar economy also confined itself, in practice, to the study of the problems of the capitalist social formation. In 1878 Engels could say “Political economy, however, as the science of the conditions and forms under which the various human societies have produced and exchanged and on this basis have distributed their products—political economy in this wider sense has still to be brought into being. Such economic science as we possess up to the present is limited almost exclusively to the genesis and development of the capitalist mode of production”⁵.

The later development of political economy has not much progressed beyond the investigation of the economic processes of capitalist society⁶. As Krzywicki wrote in 1900: “The first economists examined economic phenomena from the standpoint of our own times”, and added “there have been other formations apart from our own which have, or at least ought to have, their own political economy also, and the economy of the future should embrace all those economic epochs which followed one another and whose development

³ *Capital*, ed. cit., vol. I, p. 56.

⁴ See Marx and Engels, *Selected Works*, ed. cit., vol. I, p. 451.

⁵ Engels, *Anti-Dühring*, ed. cit., p. 208.

⁶ Melville J. Herskovits has drawn attention to this in his *Economic Anthropology. A study in Comparative Economic Systems*, New York 1952, pp. 42–53. It should be added that the trend, discussed later, which treats political economy as a universal science whose laws have a universal validity regardless of historical conditions is only an apparent exception. In practice these supposedly universal laws are applied to the capitalist economy. The so-called historical school in political economy has, it is true, devoted a great deal of attention to pre-capitalist economic relations, but it was concerned with economic history rather than political economy

is mutually involved. Let it be made clear in advance that it is only a desideratum which textbooks do not fill"⁷.

A number of studies have been made of the political economy of pre-capitalist formations, of feudalism in particular, especially by Marx and Engels. For, as Engels said, "In order to carry out this critique of bourgeois economy completely, an acquaintance with the capitalist form of production, exchange and distribution did not suffice. The forms which had preceded it or those which still exist alongside it in less developed countries, had also, at least in their main features, to be examined and compared"⁸. An important contribution to the study of the political economy of feudalism was made by Lenin, in his discussion of the development of capitalism in Tsarist Russia where feudal elements still prevailed⁹. When discussing the political economy of pre-capitalist social formations the works of Krzywicki and Cunow call for special attention¹⁰.

⁷ L. Krzywicki, *Ekonomia Polityczna. Poradnik dla samouków*, (Political Economy. A Handbook for the Self-taught), Warsaw 1900, vol. III, p. 88.

⁸ F. Engels, *Anti-Dühring*, ed. cit., p. 209. Apart from numerous remarks on the economy of pre-capitalist social formations scattered throughout the works of Marx and Engels, this subject is treated especially by Engels in *The Origin of the Family, Private Property and the State*, which appeared in 1884. (English translation—Marx and Engels, *Selected Works*, ed. cit., vol. II, pp. 155–296.)

⁹ See especially Lenin, *The Development of Capitalism in Russia* in *Selected Works*, Lawrence and Wishart, London 1936, vol. I, especially Chapter Three.

¹⁰ Of the greatest importance is Krzywicki's great work, *Ustroje społeczno-gospodarcze w epoce dzikości i barbarzyństwa*, (Socio-economic Systems in Savagery and Barbarism), Warsaw 1912, and *Spółczeństwo pierwotne, jego rozmiary i wzrost*, Warsaw 1937 (also published in English under the title *Primitive Society and its Vital Statistics*), and his *Pierwociny więzi społecznej* (The Earliest Form of Social Bond), published as Volume One of *Dziela Ludwika Krzywickiego* (The Works of Ludwik Krzywicki) Warsaw 1957. A popular essay by him, *Rozwój stosunków gospodarczych* (The Development of Economic Relations) in the collection *Świat i Człowiek*, Warsaw 1912, no. 3, is also worth mentioning. Heinrich Cunow wrote *Allgemeine Wirtschaftsgeschichte*, 4 vols., Berlin 1926–1931. The first volume deals with the problems of the political economy of pre-feudal

Kautsky also devoted a great deal of study to problems connected with the political economy of pre-capitalist social formations¹¹. In recent years in the Soviet Union there has been much discussion about the basic economic law of the pre-capitalist social formations. It has helped to elucidate certain aspects of the political economy of these formations. The first attempt to work out in outline the political economy of feudalism has been made by Porshnev¹².

All these studies are, however, fragmentary. Thus the political economy of pre-capitalist social formations, as a systematic branch of political economy, still does not exist¹³.

Political economy of socialism

The socialist October Revolution in Russia, the revolutions in Central Europe which followed the end of the First World War, the emergence and development in the Soviet Union of the socialist mode of production, and the building of socialist economies in many other countries after the Second World War have raised the question of the political economy of socialism. Much of importance was written on the subject in post-1917 revolutionary Russia and in Central Europe, and it found an echo in Western Europe and America, especially during the Great Depression of the nineteen thirties. In the Soviet Union the discussion has been carried further,

social formations. The remaining three volumes deal with economic history, beginning with early feudalism.

¹¹ A systematic exposition of Kautsky's view of the political economy of pre-capitalist formations is contained in Volume Two of his *Die materialistische Geschichtsauffassung*, especially parts I-VIII.

¹² B. Porshnev, *Ocherki politicheskoy ekonomii feodalizma* (An Outline of the Political Economy of Feudalism), Moscow 1956. See also the discussions on the basic economic law of feudalism in "Voprosy Istorii" 1953-1956. It is also worth mentioning the synthesis by Edward Abramowski, *Feudalizm*, (E. Abramowski, *Pisma* [Works], Warsaw 1927, vol. III.)

¹³ There is an attempt to give a synthesis of this kind in the popular handbook by A. Bogdanov, *An Outline of the Science of Political Economy* (in Russian), Moscow 1925, and in the popular study by K. Ostrovitianov, *An Outline of the Economics of Pre-capitalist Formations*, (in Russian), ed. cit.

in the light of the practical issues of planning and management of the socialist economy. In recent years the discussion has become particularly vigorous in all socialist countries, especially in the Soviet Union, Poland and Hungary. The first outlines of the political economy of socialism are now beginning to emerge¹⁴.

The fact that the socialist mode of production is still very young and in many countries still *in statu nascendi*, and that the superstructure of the socialist formation is still quite fluid, explains why the economic laws specific to the socialist formation have not yet fully crystallized. The weight of the capitalist, and in some countries the pre-capitalist, heritage

¹⁴ A brief systematic discussion of the basic problems and the conclusions to date is contained in an essay by Oskar Lange, *The Political Economy of Socialism*, Institute of Social Studies, Publications on Social Change, no. 16, The Hague, 1958. He also deals with the research which has been carried out on this subject so far. Among Soviet publications on this subject the most important is still by Stalin, *Economic Problems of Socialism in the U.S.S.R.* Foreign Languages Publishing House, Moscow 1952, although recently this book has been seriously criticized. It has had great influence on the development of thought in this field. The textbook *Political Economy*, published by the Academy of Sciences of the U.S.S.R., Moscow 1954, includes a section which deals with socialism systematically. This is mainly a descriptive account of the way in which the Soviet economy is organized and managed, but also contains an attempt to formulate the political economy of socialism, i.e., to analyze theoretically the economic laws operating in a socialist social formation. A deeper analysis and systematic exposition of the political economy of socialism is presented in *Politicheskaya ekonomia socializma*, edited by K. N. Shafiev, Moscow 1960. See also *Politicheskaya ekonomia socializma*, edited by M. S. Atlas and others, Moscow 1960. The more important contributions to the Polish discussion of the problems of the political economy of socialism as well as attempts at a systematic treatment of these problems are to be found in: W. Brus, *Ogólne problemy funkcjonowania gospodarki socjalistycznej* (General Questions Concerning the Functioning of the Socialist Economy), E. Lipiński, *Teoria ekonomii i aktualne zagadnienia gospodarze* (Economic Theory and Current Economic Problems), B. Minc, *Ekonomia polityczna socjalizmu* (Political Economy of Socialism), the collective work *Zagadnienia ekonomii politycznej socjalizmu* (Problems of the Political Economy of Socialism) ed. Oskar Lange, "Książka i Wiedza", Warsaw 1958.

is still being felt. The specific historical conditions in which the first socialist societies emerged, the fact that they appeared in backward countries and that the capitalist world engaged in a fierce struggle against socialism, have been responsible for deformations in the development of these societies, especially in their superstructures, i.e., they have produced phenomena which contradict the character and requirements of progress of socialist society. The operation of economic laws has also been affected. The shaping of these laws has further been made difficult by the extraordinarily swift development of productive forces in the contemporary world, a world of atomic energy, electronic "brains" and space flights. This development has been much more rapid than in the dawn of capitalism not to mention earlier social formations. The results achieved in the field of the political economy of socialism, although considerable, are thus still only a beginning.

General characteristics of the method of political economy

In order to achieve its aim of understanding economic laws, their character, historical scope and mode of operation, their relations to each other and the "economic law of motion" of social formations—political economy employs a number of cognitive means, systematically applied. The stock of cognitive means forming a systematic procedure for obtaining true knowledge, i.e., knowledge forming an adequate reflection of objective economic laws, is the *method*¹⁵ proper to this science.

¹⁵ Method in the general sense of the word means a mode of behaviour (i.e., a definite sequence of actions) employed regularly, consciously, and purposively. A method is thus a set of means which are used in a given way in order to obtain a certain end. Scientific method is a special case of method in its most general meaning, since scientific investigation is a human activity with the definite aim of acquiring knowledge about reality and the laws by which it is governed. On the role of method in human activity in general, and in scientific investigation in particular see T. Kotarbiński, *O pojęciu metody* (The Concept of Method), PWN, Warsaw 1957; *Traktat o dobrej robocie*, (Treatise on Good Work), Łódź 1955, pp. 87–89 and 189 *Kurs logiki dla prawników* (A Logic Course for Lawyers), PWN, Warsaw 1953, p. 156 ff.

The use of an effective method, adapted to the general conditions of human cognition as well as to the specific conditions of observation arising from the nature of the subject, is indispensable for political economy, as indeed it is for every science.

The method of political economy consists of three consecutive investigation procedures; abstraction, successive concretization, and verification. *Abstraction* consists in isolating the essential elements (i.e., those which are continually repeated in given circumstances) of the economic process and of the constant relationships between them. Abstraction establishes the most general elements and laws in the economic process. The *successive concretization* of the result obtained by abstraction consists in taking into consideration increasingly detailed elements of the economic process and the relationships between them. This is done by introducing those elements and relationships which repeat themselves only in more specific conditions, which are, in other words, the less essential elements and relationships. Finally, *verification* consists in confronting the results obtained by successive concretization with the concrete, actual economic process observed in given conditions.

These three procedures of investigation are common to all theoretical sciences dealing with processes taking place in the empirical world (i.e., the world which we experience). From experience to abstraction, and from abstraction, through successive concretization, back to experience—this is the path of all cognition from which true knowledge emerges¹⁶.

¹⁶ Lenin described this process as follows: "Reasoning, in proceeding from the concrete to the abstract, does not—if it is correct...diverge from truth, but draws closer to it... From live perception to abstract thought and *from this to practice*—this is the dialectical path to *true* understanding, to the understanding of objective reality". *Cahiers philosophiques*, Editions Sociales, Paris 1955. p. 142. In a similar way Mao-tse-tung describes the path to the apprehension of reality. It is made up of three stages. The first is perception—contact with the external world, the second is rational elaboration (which includes both abstraction and successive concretization in our terminology), which leads to the third—verification through practice. *On Practice*, Peking 1951, pp. 13–17.

This process expresses the dialectic character of cognition. Human thought is shaped through practice in continual friction with the external objective world. An abstraction is made from objective experience—a simplified reflection of the external world in the human mind. Successive concretization and verification lead to the renewed confrontation of the thought with objective reality. As a result of this confrontation, the original abstraction is improved in order to adjust it more closely to reality. Once again successive concretization and verification follow and the whole process is repeated. In the course of the repetition of this process the contradiction between thought and practical experience is gradually removed.

In its general outline the method of political economy does not differ from the method employed by other theoretical disciplines concerned with the various aspects of the empirical world¹⁷. But the nature of the subject matter of political economy causes these procedures of investigation to assume particular forms. The exposition of these forms is the task of the methodology of political economy.

Role of abstraction in political economy

Abstraction plays a particularly important part in political economy. This is because the economic process is very complex. The economic process is a set of highly diverse actions repeated many times by a great number (sometimes reaching millions) of people, performing various activities in varying conditions. Further, every activity (e.g., labour) consists of diverse acts and operations. These activities affect man's material environment and are themselves affected by it; they are a reaction

¹⁷ These are disciplines like physics, chemistry, biology, psychology, sociology—as distinct from logic and mathematics. The last two are not directly concerned with the empirical external world but with our modes of thought. They do not, therefore, require verification by the confrontation of their conclusions with empirical reality. Dialectical materialism explains their fitness as instruments for the understanding of reality, by the fact that human modes of thought are shaped in practical activity (i.e., in man's contact with the external world).

to various kinds of stimuli and are interconnected in different ways. Only by the use of abstraction can this complex of interconnected and repeated human activities be unravelled and the economic relations between men, together with their regularities, be laid bare.

Abstraction consists in the mental elimination of everything which is casual or accidental, i.e., occurring only occasionally, and in singling out the event which constantly under given conditions reappears, which constantly repeats itself, i.e., is essential, or necessary. Abstraction also consists in the careful separation of the elements and relations which are interwoven and meshed together in order to establish those peculiar to given conditions. The more complicated the subject of investigation, the more numerous the accidental elements which intertwine with the essential elements, the greater the number of essential elements in the process under examination—the greater the importance of abstraction in research. Abstraction, therefore, is of particular importance in political economy.

In political economy abstraction is especially difficult since political economy cannot experiment. Abstraction is much easier in those disciplines which are not hampered in this way. Experiment makes it possible to eliminate accidental elements from the actual process under observation (e.g., physical or chemical processes can be observed at constant temperature or pressure) and to isolate the various constituent elements (e.g., the effect on a chemical reaction of the presence of a catalyst may be observed). In this way experiment makes it possible to state which elements and relationships are essential in a process under investigation. This provides a basis for mental abstraction—an adequate reflection of the real processes under investigation. This is impossible in political economy because the economic process is an indissoluble whole composed of human activities and the relationships between them, all combining to form the mode of operation of a given social formation.

Since large scale experiment is impossible¹⁸, scientific abstraction in political economy is based on the *comparative observation* and *analysis* of the process under investigation, the analysis consisting in differentiating between (or as some put it, in mentally isolating) those elements and relationships which are more, and those which are less general, those which are essential and those which are casual (or accidental). Abstraction based on comparative observation is a considerably more difficult way of obtaining an adequate reflection of real processes than abstraction based on experiment, since it demands much more efficient analytic thought. "In the analysis of economic forms, moreover", says Marx, "neither microscopes nor chemical reagents are of use. The force of abstraction must replace both"¹⁹.

Economic categories, laws of political economy and economic theories

The result of scientific abstraction by political economy is the creation of abstract concepts which express the general properties common to the elements of the economic process in given conditions, i.e., common properties of certain economic activities and relations (which, as we know, can also be reduced to continually repeated human activities). These are concepts like labour, exchange, commodity, value, money, price, market, capital, interest, wages, rent etc., and are called *economic categories*²⁰. These represent general properties either of

¹⁸ As we shall see later on, this does not mean that experiment must be altogether excluded from the method of political economy. Its use is, however, confined to certain detailed processes, and experiment may thus serve in a limited measure as an instrument of verification but not as a starting point for scientific abstraction. Moreover, even in this limited field, experiment only attains real importance under socialism. See pp. 130-132.

¹⁹ Marx and Engels, *Selected Works*, ed. cit., vol. I, p. 449.

²⁰ The expression "category" is used in various senses. First used in logic by Aristotle, it at first meant a type of predication. Later philosophers used it in different senses (See T. Kotarbiński, *Elementy teorii poznania, logiki formalnej i metodologii nauk*, (Elements of Epistemology, Formal

actions continually repeated in certain conditions, e.g., labour or exchange, or of economic relations which always appear, given certain conditions like value, capital, wages, interest, or rent. Economic categories are thus the result of abstraction generalizing individual aspects of the real economic process.

Political economy establishes between economic categories relationships which always appear in specified conditions. In this way we arrive at general, abstract *laws of political economy*, i.e., statements about the operation of certain economic laws. Laws of this kind are: the law of supply and demand, which states the market relationship between price and the readiness of buyers and sellers to exchange certain quantities of a commodity at a certain price; the law of value, which states the relations between the amounts of social labour represented by commodities and the corresponding rates of exchange; the law of the average rate of profit; which states the relations between the rate of profit obtained by various capitalists in free competition. These laws are established on the basis of scientific abstraction which, in this case, consists in the elimination of casual relationships, inessential in given conditions, from the relations between the elements of the actual economic process. (The law of the average rate of profit, for example, disregards—as inessential to the process of competition between capitalists—the fact that the investment of capital in different fields is accompanied by varying degrees of risk and the fact that the carrying out of such investments requires varying periods of time). In this way the regular patterns in the actual economic process are treated as abstract relations between economic categories.

Finally, the abstract laws obtained in this way are combined to form logical systems called *economic theories*. Economic

Logic and the Methodology of Science), Lwów 1929, pp. 59–60. Marx often used the term “categories” in the same sense in which it is used in this book, i.e., to denote abstract ideas which define broad classes of phenomena. This is the same as the colloquial use of the word “category”, i.e., meaning a “division” (e.g., different categories of arable land, categories of workers in a given industry etc.).

theories give simplified pictures of the economic process including only what is essential and leaving out what is casual and accidental. The theory of value, for example, gives a simplified, abstract picture of the economic relations between producers who exchange their products; the theory of the business cycle gives an abstract picture of the cyclical process of reproduction in a capitalist economy, etc.

Theoretical models

Economic theories specify the conditions in which abstract laws are true and connected in a definite way. The conditions specified in an economic theory are called its *assumptions*, and a set of such assumptions has recently come to be called a *theoretical economic model*²¹. Thus we refer to a model of free-competition capitalism, i.e., an abstract picture of capitalist relations of production in which all capitalists operate in conditions of free competition; or we speak of a model of the process of reproduction in which, let us say, all the means of production are used up in the same period of time; or of a model of the process of accumulation in which accumulation consists of a certain percentage of the national income, and so on. Economic theories and their corresponding models normally cover part or one aspect of the economic process, e.g., the theory of money, the theory of rent. The aim of political economy, however, is the formulation of a general theory for every social formation, which would cover abstractly the whole mode of operation of that formation. This is *the economic theory of a social formation*. A fully developed theory of this kind so far exists only for the capitalist mode of production²².

The abstractions of political economy—economic categories, the laws of political economy and economic theories—are formed

²¹ On the role of theoretical models in political economy see Tjalling C. Koopmans, *Three Essays on the State of Economic Science*, New York 1957, pp. 142–144. Koopmans says that theoretical models “seek to express in simplified form different aspects of an always more complicated reality” (p. 142).

²² The economic theory of the capitalist mode of production is set out in Marx’s *Capital*.

by a logical process of generalization and the isolation of the essential from the accidental. Hence the picture of the properties and patterns of regularity of the actual economic process which they give is not only simplified but clarified²³. This is so because it sets out the basic features and relationships of the economic process, which in reality are confused, blurred, and not immediately visible. This is only so, however, if these abstractions adequately reflect the real historical economic process, that is to say, when they really omit all that which is accidental and separate out all that which is essential. Thus the abstractions of political economy—like those of every science dealing with empirical phenomena—cannot be arbitrary. These abstractions cannot be subjective mental constructions but must be dictated by, and must be the adequate expression of, the objective properties of the economic process²⁴.

²³ As Lenin notes, this is true of all scientific abstractions: "The abstraction of *material*, of natural *law*, the abstraction of *value*, etc., in short, all scientific abstractions (correct, serious, not absurd) reflect nature more deeply, more faithfully, more *completely*". *Cahier Philosophie*, ed. cit., p. 142).

²⁴ Hence the fallaciousness of the methodology of the various subjectivist approaches in political economy which hold that abstractions result from general psychological considerations or from the "logic of choice" of the economic subject, and which formulate their economic categories without regard to the historic course of the economic process. Equally false is the methodology employed in those approaches which recognize the historic nature of the economic process but formulate their abstractions on the basis of an idealistic theory of knowledge as *a priori* categories of cognition, and thus in isolation from objective reality. It is worth mentioning in this connection Max Weber's so-called ideal types. Weber recommended the construction in political economy and sociology of abstract models embracing certain features of the economic process which he considered to be essential. He called these models ideal types and gave as examples capitalism, feudalism, "urban economy" and handwork. Weber compared these types to the model of a physical reaction taking place in a complete vacuum (*Wirtschaft und Gesellschaft*, 3rd ed., Tuebingen 1947, p. 10). He also referred to the works of Marx as "the most important case of the construction of ideal types (*Die Objektivität sozialwissenschaftlicher und sozial-politischer Erkenntnis. Gesammelte Aufsätze zur Wissenschaftslehre*, Tübingen 1922, p. 204). The methodology of ideal types

Historical basis of abstraction in political economy

Abstractions in political economy must thus be based on, and correspond to, the real historical economic process. It follows that abstractions in political economy—categories, laws and theories—are both logical and historical: logical, because they are the product of a logical process of analysis and generalization, historical, because they correspond to the actual economic process which is a historical development. Engels formulated this very clearly: "...the logical method... is nothing else but the historical method, only divested of its historical form and disturbing fortuities. The chain of thought must begin with the same thing with which this history begins, and its further course will be nothing else but the reflection of the historical course in abstract and theoretically consistent

shows a certain similarity to the theoretical economic models which we have discussed, based on scientific abstraction as employed by Marx. This similarity lies in the fact that the abstraction of ideal types is based on the actual historical economic process and is opposed to the non-historical abstraction of classical political economy and the subjectivist trend. It is not clear, however, what features Weber wanted to be included in the model ("one-sidedly brought into prominence" as he puts it, ed. cit., p. 191). It seems from certain of his examples that he meant to include the features which continually recur and omit those which are accidental—just as in our own assumptions formulated above. One example is the characteristic he gives for the ideal type corresponding to abstract economic theory. "It gives us an ideal picture of events on the commodity market in a social organization based on an exchange economy, free competition and strictly rational activity". (p. 190). This clearly corresponds to the concept of the theoretical economic model. But at the same time, under the influence of the idealistic neo-Kantian theory of knowledge and methodology which he professed, Weber stressed the fictitious and exclusively heuristic nature of ideal types and did not consider them to be the reflection of real historical processes; sometimes it seems that in the construction of the ideal type he recommended the selection of characteristics according to their "significance", from the point of view of cultural values (ed. cit., pp. 192–193, 195, 203–204). Weber probably had no clear conception of the problem of the selection of characteristics in the construction of ideal types. His conception of ideal types is an unsuccessful attempt to construct theoretical models in political economy.

form; a corrected reflection but corrected according to laws furnished by the real course of history itself..."²⁵.

Consequently, validity of categories, laws and theories of political economy have a definite historical extent which corresponds to the historical scope of the processes which they reflect. "Economic categories", says Marx, "are only the theoretical expressions, the abstractions of the social relations of production... Thus these ideas, these categories, are as little eternal as the relations they express. They are *historical and transitory products*"²⁶.

The historical periods covered by economic categories coincide with the historical extent of the specific conditions under which the phenomena represented by these categories occur. As Marx observed, "So, likewise, the economic categories previously considered bear traces of their historical origin. Special historical conditions are requisite before a product can *become a commodity*. If a product is to become a commodity, it must *not* be produced *for the direct purpose of satisfying the producer's wants*, of satisfying his need for the means of subsistence... On the other hand, when we turn to consider *money*, we find that its existence presupposes that the exchange of commodities must have undergone a very considerable evolution... It is otherwise with *capital*. The mere appearance of the circulation of commodities and the currency of money does not suffice to supply the *historical* conditions necessary for the existence of capital. It arises only where the owner of the means of production and the means of subsistence finds in the market *a free worker* who offers his labour power for sale. *This one historical condition* implies a whole phase of universal history. The first appearance of capital therefore heralds a new epoch in the social process of production"²⁷.

The same is true of the laws of political economy and economic theories. The laws of political economy have a

²⁵ F. Engels, *Karl Marx, A Contribution to the Critique of Political Economy*, K. Marx and F. Engels, *Selected Works*, ed. cit., vol. I, p. 373. This is a review of Marx' book written in 1859.

²⁶ K. Marx, *The Poverty of Philosophy*, ed. cit., pp. 92-93.

²⁷ K. Marx, *Capital*, ed. cit., vol. I, pp. 156-157.

historical validity which coincides with the economic laws which they reflect. The law of value goes as far back into history as does commodity production and the objective economic laws connected with it; the law of surplus value goes as far back as does capitalist production and the objective process of the production of surplus value; the laws of money circulation go back as far as the established use of money and the regularities associated with it. The same holds for economic theories. The theory of price formation applies only to those historical conditions in which goods are exchanged by means of money; the theory of wages is applicable only in those historical conditions in which there is hired labour, etc. Thus, economic theories, like economic categories, have a definite historical scope.

Abstractions in political economy are thus a product of the logical analysis of the properties and regularities of the real process which is itself subject to historical development. They make it possible to take this process at certain stages of its development and to isolate its essential aspects, but they lose their validity when that stage is superseded by another. These stages of development are primarily social formations, since within individual social formations the operation of economic laws combines to form a whole—the mode of operation of the formation. Above all, abstraction in political economy endeavours to isolate the economic categories and laws specific to a given formation. It defines a formation's *basic economic category* and formulates the corresponding basic law (an abstract reflection in political economy of the objective *basic economic law* of the formation). In the capitalist formation, for instance, the basic economic category is surplus value, and the basic economic law, the law of surplus value. These are the principal fundamental scientific abstractions in the political economy of capitalism.

Writing about the method of political economy, Marx said: "For instance, nothing seems more natural than to start with rent, with landed property, since it is bound up with land, the source of all production and existence, and with the first form

of production in all more or less settled communities, viz. agriculture. But nothing would be more erroneous... The reverse is true of bourgeois society. Agriculture comes to be more and more merely a branch of industry and is completely dominated by capital... Rent cannot be understood without capital, nor can capital, without rent. Capital is the all-dominating economic power of bourgeois society. It must form the starting point as well as the end and be developed before land-ownership is"²⁸. It follows from this that surplus value, produced by capital, is the basic economic category of the capitalist social formation. "What especially characterizes the capitalist mode of production is the production of surplus value as the immediate aim and decisive motive of production. Basically, capital produces capital, and does this only in so far as it produces surplus value"²⁹. It is otherwise in the feudal social formation. There the base is formed by the ownership of land and the basic economic category is land rent. "One can understand the nature of tribute, tithes, etc.," writes Marx, "after one has learned the nature of rent"³⁰.

To some extent, however, abstractions in political economy extend beyond the historical scope of individual social formations. They also include—without straying from their historical basis—properties and regularities in the economic process common to several social formations. The corresponding economic categories, theories and laws are derived from this. The economic category of value and the law of value are an abstraction of this kind. Although the historical validity of the category of value is wider than that of the capitalist social formation, this category is nonetheless indispensable to an understanding of capitalism since under capitalism all production is commodity production. "The production of commodities", says Marx, "does not differentiate it from other

²⁸ K. Marx, *A Contribution to the Critique of Political Economy*, ed. cit., pp. 252-253.

²⁹ K. Marx, *Das Kapital*, ed. cit., vol. III, p. 937.

³⁰ K. Marx, *A Contribution to the Critique of Political Economy*, ed. cit., pp. 300-301.

modes of production, what does make it different is the fact that the governing and determining characteristic of the product is that it is a commodity"³¹. In earlier social formations commodity production forms a more or less considerable part of social production but under capitalism all production is commodity production, and as such it is also the production of surplus value. The basic economic relation in the capitalist mode of production, i.e., the employment of hired labour and the production of surplus value, also takes effect through the medium of commodity production. Thus the economic categories of commodity and value are indispensable for an understanding of the economic process in the capitalist formation, since only such categories make it possible to define the economic category of surplus value. Thus abstractions are needed, which extend beyond the limits of individual social formations and deal with such aspects of the economic process as appear in more than one social formation.

Finally, political economy produces even wider abstractions which embrace all social formations, thus reflecting the most general aspects of the economic process appearing at all stages of its historical development. Abstractions of this kind are economic categories like labour, the means and objects of labour, productive forces and relations of production, simple and expanded reproduction, the means of production and the means of consumption etc. The most general of these economic categories, like the categories of productive forces and the relations of production also form part of sociology which formulates general laws of social development as part of the theory of historical materialism.

Abstractions in political economy and the concrete nature of economic processes

The definition of the basic economic category and the formulation of the basic economic law of a social formation demand very far-reaching abstraction. This abstraction omits as acci-

³¹ K. Marx, *Das Kapital*, ed. cit., vol. III, p. 939.

dental everything which is not directly connected with the nature of ownership of the means of production—the foundation of the relations of production forming the economic base of a social formation. This abstraction thus omits everything which does not always reappear in a given formation. An economic category of this kind, the most general category of the capitalist mode of production, is that of capital i.e., capitalist ownership of the means of production, and its result is surplus value. At this level of abstraction the various forms in which surplus value empirically manifests itself—profit, interest and rent—are disregarded. They are complications for which there is here no room.

When it comes to isolating the economic category of surplus value, it is also of no importance that the organic composition of capital is different in different branches of production and that the prices of commodities do not exactly reflect their value. These problems, vital in the consideration of the division of surplus value among capitalists, are not only unimportant in a consideration of the economic category of surplus value and the law of surplus value but even constitute a superfluous complication. In other social formations the situation is similar. The understanding of their mode of operation demands a very far-reaching abstraction. When establishing, for example, the basic economic category of the feudal formation—rent—it is necessary to disregard the various forms in which rent empirically manifests itself (like tribute, tithe, labour dues, etc.), as well as many other important aspects of feudal economy.

A very advanced stage of abstraction is indispensable for the isolation of the basic economic category of social formations, for the formulation of the basic economic law of these formations, and thus for obtaining the key to the understanding of their mode of operation. Abstraction at an equally advanced level is necessary in order to establish categories which reach beyond the individual social formations—e.g., the category of value or the categories connected with the social process of reproduction. Abstraction of this kind, however, while

picking out the essential elements of the economic process carries us away from the actual economic process from which we started. The essential aspects are emphasized at the cost of disregarding many aspects of reality, regarded as accidental and casual, which nevertheless make their appearance in the course of the actual economic process. Abstractions, then—economic categories, laws and theories—cannot be directly confronted with the actual economic process with its great variety of concrete facts; they cannot be directly verified.

Surplus value as such, for example, does not appear in the actual economic process. On the other hand various forms of it, like profit in industry and trade, interest on loans, dividends from shares, rent for the use of agricultural or building land etc., appear in its place. Similarly, value does not appear as such in reality: it appears in the form of prices and the costs of production.

Successive concretization of abstractions of political economy

The confrontation of highly abstract economic categories with reality thus cannot take place directly; a number of intermediate steps are necessary. These intermediate steps consist in introducing more detailed assumptions into the theoretical model, in passing from general to less general abstraction. For example, when passing from a general consideration to a more detailed examination of capital, we have to take into account the fact that the owners of capital may be divided into the owners of industrial enterprises, merchants, financiers, landowners, urban real estate owners, etc.; or when confronting the category of value with reality we must take into consideration the fact that the organic composition of capital varies according to the branch of industry in which it is invested and that products are sold in a market where there may be free competition, monopoly or various kinds of oligopoly³². Sometimes the transition from a higher to a more detailed stage of abstraction

³² The meaning of the term oligopoly is explained below p. 305 n. 28.

must be gradual. It may be insufficient, for example, to distinguish between the basic forms of surplus value—profit, rent and interest—these forms may demand more detailed specification. Interest must be considered by division into discount on bills of exchange, interest from bank deposits, interest from bonds, mortgages etc., and rent may be divided into: rent from tenants, share cropping, participation in profits etc.

The laws of political economy and economic theories at a high level of abstraction—like economic categories—cannot be directly verified. Their verification, like the confrontation of economic categories with reality, requires a transition to a lower level of abstraction by enriching the theoretical model with more detailed assumptions. The law of surplus value must be actualized in the theory of profit, the theory of interest, the theory of land rent, the theory of urban rent, etc. The law of value must be rendered into the more concrete form of the theory of production prices, the theory of monopoly and oligopoly prices, the theory of prices in international trade, the theory of regional price formation, etc. Only by lowering the level of abstraction it is possible to verify the laws and theories formulated by political economy³³.

³³ Failure to take this into account in political economy, as in other theoretical disciplines, leads to a methodological error, which the logician and philosopher Alfred North Whitehead described as “the fallacy of misplaced concreteness”; see *Science and the Modern World*, New York, 1956, p. 523. The error consists in falsely considering the abstract as concrete and in drawing concrete conclusions from abstract conceptions or theories. This error is often committed in attempts to verify the “absolute general law of capitalist accumulation” contained in Volume One of *Capital* (ed. cit., vol. II, p. 712), and the theory of pauperization resulting from it. This law and theory are formulated at a level of abstraction which does not permit their direct confrontation with reality. Marx drew attention to this when immediately after the formulation of the law he added: “Like all other laws, it is modified in its actual working by numerous considerations, with the analysis of which we are not here concerned” (p. 713). As Paul M. Sweezy neatly explains: “the law in question is derived on a high level of abstraction; the term “absolute” used in describing it is used in the Hegelian sense of “abstract”, it constitutes in no sense a concrete prediction about the future”. (*The Theory of Capitalist Devel-*

The transition from a higher to a lower level of abstraction must often be made in several steps; with each step, new, more detailed assumptions are added to the theoretical model. For example, in order to verify the theory of capitalist reproduction and accumulation it is necessary to take into account the fact that goods are sold at production prices or at monopoly prices; that there are, besides capitalists and wage-labourers, other categories, i.e., small commodity producers, or even producers working within the framework of natural economy; the existence of foreign trade; that the life of the durable means of production often varies; that enterprises have amortization funds that vary in size; that changes in money circulation occur; that the credit apparatus of the banks is at work; that the state collects taxes and spends money. All this is disregarded in the most general and abstract formulation of the theory of capitalist reproduction and accumulation.

The lowering of the level of abstraction through the introduction of more and more detailed assumptions into the theoretical model is called *successive concretization* or *successive approximation*. This is, after abstraction, the second procedure of investigation in political economy, the second stage in its method. It leads back to the actual economic process but at the same time differentiating the essential from the accessory and accidental. After abstraction the method of

opment, London 1946, p. 19). Lenin understood the problem in the same way, "Marx talked about an increase in poverty, degradation etc. but at the same time indicated the existence of a counteracting tendency and of real social forces which are the only ones capable of producing that tendency". (*Review of Kautsky's "Bernstein and the Social-Democratic Programme"*, in *Sochinyenya* [Works], vol. IV). S. G. Strumilin has drawn attention to the need for concretization in considering the problem of the trend of real wages under capitalism: "Abstract theory does not solve, in its full historical concreteness, this problem which has such enormous social significance. And, unaided, it cannot settle it definitively because in the various circumstances of time and place it meets with a whole series of mutually contradictory tendencies, the specific weights of which have so far not been determined". (*Problemy ekonomiki truda*, [Problems of Economics of Labour]. Moscow 1957 p. 547).

political economy returns by way of successive concretization to reality, a reality *now better understood* than before subjecting it to the logical procedure of abstraction. This has been put very well by Włodzimierz Brus: "To give a true and exhaustive picture of reality it is necessary to start from concrete manifestations and by analysing them, that is by using the method of abstraction, to reach the *essence* of the phenomena; and then to go backwards, from the abstract to the concrete, to concrete manifestations now illuminated by an understanding of their *real content* and therefore constituting a many-sided whole, rich and pulsating with life"³⁴.

Marx's "Capitalas" example of successive concretization

Marx's *Capital* is a classic example of successive concretization. As Brus says: "The whole of the further exposition of the first volume of *Capital* is a progress, step by step, from abstraction to ever higher stages of concretization until the historical tendency of capitalist accumulation is shown. But the whole of Volume One gives a picture of capitalism at a certain level only. For in principle, it is an analysis of the capitalist process of production in its pure form, an analysis of the *essence* of capitalist production relations. Marx here omits the circulation of capital and (in connection with this) the concrete forms assumed by the *essential content* of capitalist relations of production. The second volume of *Capital* contains an analysis of the circulation of capital and it is only in the third volume that Marx gives an analysis of the process of capitalist production viewed as a whole, in which the production process and the circulation process, the content of capitalist relations and their concrete (fetishistic) forms are subsumed in a single unit. Moreover within both the second and third volumes Marx's exposition proceeds from the abstract to the concrete"³⁵

³⁴ W. Brus, *Niektóre zagadnienia metody dialektycznej w świetle Kapitalu Marksa* (Some Problems of the Dialectic Method in the Light of Marx's "Capital"). Scientific session devoted to the third Polish edition of Volume One of *Capital* by Karl Marx, "Książka i Wiedza", Warsaw 1952, p. 195.

³⁵ *Ibid.*, pp. 192-3. Henryk Grossmann has also drawn attention

In passing from higher to lower levels of abstraction by means of successive concretization (successive approximation) the method of political economy brings the abstraction nearer and nearer to the reality of the concrete economic process and attains a degree of concretization which allows the laws and theories formulated by economic science to be directly confronted with reality. Then the way is open to verification.

Econometrics as an instrument in concretization of laws of political economy

In the procedure of concretization discussed here an important part is played by a method developed in the course of the

to the method of successive concretization employed in Marx's *Capital* in the introduction to his book *Das Akumulations-und Zusammenbruchsgesetz des kapitalistischen Systems*, Leipzig 1929, pp. vi-vii. Grossmann writes as follows: "The object of study is the empirically given world of events. It is, however, too complicated for it to be known directly. We can only approach it by degrees. To this end a number of simplified assumptions are made which allow us to study its *basic structure*. *This is the first stage of knowledge* in the Marxist procedure of approximation... It is thus clear that, on account of these fictitious assumptions, we have diverged from empirical reality, while it is just this reality which has to be clarified. It follows that the knowledge obtained in this way can only be *temporary* and that after the first stage of knowledge there must follow a second *definitive* one. Each simplified premiss demands a subsequent *correction* which takes into account the elements of actual reality passed over before. In this way the whole study is gradually approximated to the complicated world of phenomena and brought into agreement with it". Grossmann points out that in Marx as a rule there appear two or three stages of such a successive approximation (p. viii). This quite correct description of Marx's method—the method of political economy as a science—has been subjected to ill-grounded criticism by Fritz Behrens. In *Zur Methode der politischen Oekonomie* (Berlin 1952) Behrens accuses Grossmann of having failed to understand Marx's method and states that his understanding is in contradiction with the dialectic (pp. 46-47). He refers to the expression "fictitious" used by Grossmann and to the fact that Grossmann considers (undoubtedly wrongly) that the basic, most general abstraction in Marx is his scheme of reproduction. If, however, we disregard the terminology and the problem of what constitutes the most general abstraction in Marx, Grossmann sets out Marx's theory accurately and clearly. Marx's method (and the method of political economy) is

last thirty years called *econometrics*³⁶. Econometrics deals with the numerical concretization of the laws established by political economy on the basis of a concrete description of economic processes supplied by economic statistics; to this end it employs the scientific apparatus of mathematical statistics.

Two examples by way of illustration. Political economy formulates the law of supply and demand in the form of functional laws to which a mathematical expression may be given. Econometrics makes it possible to determine the concrete form of the functional relationship between the demand for a commodity, on the one hand, and its price and the consumers' income, on the other, in given historical conditions; e.g., the functional relationship between the demand for butter, its price, and the income of manual and white-collar workers in Poland in 1959. Political economy formulates laws for the process of reproduction and accumulation, and establishes the general relationship, in given conditions, between the rate of growth of the production of the means of production and the rate of increase in the production of the means of consumption. Econometrics makes it possible to establish a concrete numerical expression of this relationship in concrete historical circumstances, e.g., in Poland in 1959. Hence econometrics

similarly understood by Sweezy. He states that "the results achieved in Volume One have a provisional character. In many cases, though not necessarily in all, they undergo a more or less extensive modification on a lower level of abstraction, that is to say, when more aspects of reality are taken into account" (op. cit., p. 18). He then explains that the task of Volumes Two and Three was to take into account factors deliberately overlooked in Volume One, i.e., "to bring the analysis to progressively lower levels of abstraction" (ibid., p. 19).

³⁶ The term *econometrics* was introduced in 1926 by the Norwegian economist Ragnar Frisch in a paper entitled *Sur un problème d'économie pure*. It was coined in imitation of the expression "biometrics" which had long been current and used to describe the field of biological studies employing mathematical statistics. The expression "anthropometrics" has also been in use for a long time to indicate a similar field of study in physical anthropology. On econometrics see O. Lange, *Introduction to Econometrics*, Pergamon Press and Państwowe Wydawnictwo Naukowe, second edition, London and Warsaw 1962.

is an important instrument in the concretization of the laws and theories formulated by political economy and as such constitutes a means of their verification.

Verification of laws of political economy and economic theories

The verification of laws and theories is the third and last procedure of investigation, the third and last stage in the method of political economy. This stage consists in the confrontation of laws and theories, formulated at an appropriately low level of abstraction, with the actual economic process, and in verifying the agreement or otherwise of the assertions of science with reality. In this way the truth or falsity of these assertions is established, i.e., the truth or falsity of the laws and theories formulated by political economy. It should be noted here that not all laws and theories subjected to verification need to be formulated at the same level of abstraction. In every case of verification successive concretization must have been carried far enough to allow a confrontation with reality. Economic categories, the laws of political economy and, economic theories on different levels of abstraction (or concretization) may, however, be confronted with various aspects of the concrete economic process. It depends on the empirical extent of repetition of these aspects. Those aspects which are repeated on a wider scale i.e., those which repeat themselves within the framework of a wider set of conditions, make it possible to confront categories, laws and theories formulated at a higher level of abstraction with reality. On the other hand, those aspects the scale of whose recurrence is narrower, i.e., those which only repeat themselves under comparatively restricted conditions, can only be confronted with more concrete economic categories, laws and theories of political economy. In other words, they require a more detailed economic model. Thus the degree of concretization necessary for verification varies according to the extent to which the various aspects of the concrete economic process are repeated.

The verification of the laws and theories of political economy requires, first of all, the confrontation of the economic categories

which appear in these laws and theories with actual properties of the concrete economic process, i.e., with actual economic activities and relations; secondly, it requires the confrontation of the laws formulated by science with the regularities appearing in the concrete economic process. This gives rise to two problems: that of *practical identification* and that of *the required degree of agreement*. These are the two fundamental problems of the verification procedure; they are to be found in the verification of assertions in all theoretical disciplines³⁷, but they cause especial difficulties in political economy because of the complicated nature of its subject matter.

Practical identification of economic categories

Economic categories, even if their concretization is very far advanced, are general concepts, i.e., they are still abstract. The properties of the actual economic process, on the other hand, are quite concrete. They are always individual, repeating themselves in a way which is more or less similar but never identical. Consequently it is necessary to confront a still abstract economic category with the concrete, individual properties of the actual economic process. It is necessary to establish which elements of reality correspond to the theoretical economic category, i.e., those concrete elements of reality which we consider to be the equivalent of the economic categories must be identified. This problem is found in all economic sciences dealing with the concrete economic process—and therefore in descriptive economics and economic history, and with particular clarity in economic statistics. It most frequently appears in these sciences in the form of the problem of classification and aggregation of the concrete elements of the economic process.

Two examples, in which the difficulty of identification depends on the difficulty of classification, make this clear. For instance, in the theory of reproduction we divide products

³⁷ On the problem of practical identification in physics—the determination of the experimental or observational correspondents of the categories of theoretical physics—see the very clear exposition given by G. Y. Rainich in *Mathematics of Relativity*, New York 1950, p. 169.

into the means of production and the means of consumption. Theoretical schemata are erected on this basis to represent the relations which must exist between the production of the means of production and the production of the means of consumption in order to ensure the smoothness of the process of reproduction. When, however, it comes to the practical identification of certain products as belonging to this or that category, it turns out that the problem is not so simple. Coal, for example, serves both as a means of production and as a means of consumption, and so it is necessary to divide the production of coal according to its actual use. But how is the actual use of the coal burnt by a handworker working in a room which is both his workshop and his home to be reckoned?

A similar difficulty arises when industry is divided into branches producing the means of production and the means of consumption. Another example of the difficulty of classification is the difficulty of dividing the rural population into working peasants and rural capitalists. In Poland, we have found that such a classification and consequently the class identification of individual holdings is not at all easy. There is often a similar difficulty in the division of the rural population into peasants and industrial workers (when it is a question of so-called peasant-workers, who have holdings of their own but also work in a local factory). Many problems of classification causing difficulties in practical identification are found in economic statistics and other branches of descriptive economy, and also in economic history, where they are aggravated by a scarcity of sources. It is, for example, difficult to decide whether certain rural relations are feudal or capitalist and it is correspondingly difficult to identify the concrete historical processes concerned.

Another difficulty is found in proper aggregation. In political economy we have an economic category of the price of a given commodity. Let us try and establish in practice the price of rye in Poland in 1959. It turns out that the price varies in different parts of the country, that there are regional differences. Furthermore the price varies with the time of year.

Which of these prices is the true "price of rye" of which political economy speaks? Moreover rye is not a homogeneous commodity, there are various kinds of it and each one has a different price. Reality is much richer than the economic category, "the price of rye". Thus in this case the difficulty of practical identification depends on the difficulty of making a proper aggregate of the different varieties of rye in an unqualified aggregate "rye", and a proper aggregation of the different prices varying according to time and locality into a single aggregate "the price of rye in Poland in 1959".

The practical identification of economic categories forms part of the disciplines which are concerned with the concrete economic process like economic history and descriptive economics and especially economic statistics. It is also carried out by various branches of applied economics which, as we know, unites theoretical consideration with concrete descriptive study. The results obtained by these disciplines are used in the practical identification of the economic categories formulated by political economy. It must, however, be remembered that the identification of economic categories by these disciplines is necessarily imprecise and that certain conventional elements are unavoidable.

Sometimes it is difficult to identify laws formulated by political economy with the corresponding regularities in the concrete economic process. It is known that if a functional relationship is established between price, on the one hand, and supply or demand, on the other, on the basis of statistical data in the form of time series of prices of commodities and quantities of commodities sold, it is not clear whether the empirical relationship obtained represents a demand function, a supply function, or neither. A special procedure has been worked out in econometrics which makes an approximate identification possible³⁸.

³⁸ See O. Lange, *Introduction to Econometrics*, ed. cit., pp. 120-136. A more general discussion of the problem of identification in the econometric examination of theoretical relations formulated by political economy is to be found in *Statistical Inference in Dynamic Economic Models*, ed., T. Koopmans, New York 1950.

*Degree of agreement of laws and theories of political economy
with the real economic process*

After the practical identification of economic categories it is possible to proceed to the verification of the laws and theories of political economy. This is done by confronting them with the actual economic process and checking their agreement with the regularities which appear there. This agreement, however, can never be complete. In the first place, the practical identification of the economic categories which appear in the laws and theories of political economy, is only approximate and to some extent even arbitrary (because of a certain conventional element). Secondly, and more important, the laws and theories of political economy, even at a low level of abstraction, only express the essential relationships between economic categories. The actual economic process, on the other hand, is quite concrete. Apart from the essential elements, which find their expression in theoretical formulations, it contains a great many of more or less important accidental elements.

Hence, as we know, the economic laws operating in the real economic process are stochastic and can be seen only when the human actions which are the components of the economic process are repeated on a mass scale; only the operation of the law of large numbers makes it possible to see these laws at work. As a result, the verification of the laws and theories of political economy is only possible when they are confronted with real processes taking place on a mass scale and not by a confrontation with a single case. Yet even such a confrontation can only establish approximate agreement with the patterns which occur in reality since these patterns even in phenomena occurring on a mass scale always contain an accidental component which disturbs the operation of economic laws³⁹. The question then arises as to what degree of agreement between scientific assertions and the real economic process is sufficient

³⁹ See O. Lange, *Teoria statystyki* (Theory of Statistics), Polgos, Warsaw 1952, pp. 20-21.

for their verification. This is the problem of the required degree of agreement referred to above.

Statistical verification

Two kinds of verification may be distinguished, depending on the nature of the accidental component preventing complete agreement between a scientific assertion and the real economic process. If the process under investigation is quantitatively measurable⁴⁰, and if, moreover, the accidental component is a result of the operation of a great number of causes, each of which, if taken separately, produces a comparatively small *random* effect, then probability calculus may be applied. Here the required degree of agreement between the assertions of a theory and the actual economic process can be established by the use of mathematical statistics.

Mathematical statistics has developed a procedure which makes it possible to verify statistical hypotheses⁴¹. This procedure makes it possible to accept or reject hypotheses with the minimum probability of accepting a false hypothesis, if there is an arbitrarily determined probability of rejecting a true hypothesis (or *vice versa*)⁴². Thus, adopting a certain value for

⁴⁰ Economic categories need not necessarily be quantitatively measurable; it is sufficient if the frequency of their appearance is quantitatively measurable. Take, for example, the economic categories "capitalists", "small commodity producers" (peasants and handworkers), "hired labourers". An assertion may refer to the frequency of occurrence of these categories as for example in the statement, that the relative number of capitalists and small commodity producers is decreasing and that the relative number of hired labourers is increasing.

⁴¹ A hypothesis is an unverified scientific assertion (law or theory). A statistical hypothesis is a hypothesis formulated in such a way that it can be verified by mathematical statistics.

⁴² The procedure for verifying statistical hypotheses as employed in modern mathematical statistics was developed by J. Neyman and E. S. Pearson. An introductory exposition of this procedure will be found in Neyman's book *A First Course in Probability and Statistics*, New York 1950, pp. 250-345. Its first presentation in Polish is in Neyman's article *Przyczynek do teorii wiarygodności hipotez statystycznych*, (A Contribution to the Theory of the Likelihood of Statistical Hypotheses), "Kwartalnik Statystyczny", Warsaw 1928. A general consideration of the theoretical

the probability of rejecting a true hypothesis ("the degree of risk", equal, say, to 1%, i.e., a risk that a true hypothesis may be rejected in one case out of a hundred), or *vice versa*, adopting a certain value for the probability ("degree of risk") of accepting a false hypothesis, mathematical statistics determines the minimum degree of agreement between the hypothesis and reality required before a hypothesis may be accepted as true. Or, in other words, mathematical statistics establishes the largest permissible degree of non-agreement between a hypothesis and reality for which the hypothesis can still be accepted as true. This kind of verification is called *statistical verification*. Detailed statistical methods of verifying the agreement of the laws and theories of political economy with reality are dealt with by econometrics⁴³.

In many cases, however, sufficient agreement between the assertions of political economy and the actual economic process as shown by economic statistics is immediately obvious. In such cases verification can be carried out without resorting to the special procedures of mathematical statistics and econometrics. This is called *simple statistical verification*.

Historical verification

If the accidental component disturbing the operation of economic laws does not allow the application of the probability calculus, then *historical verification* is used. This is when the economic process under examination is not quantitatively measurable (e.g., the transition from free-trade to protection) or when, although the process is measurable by economic statistics, there is a chance element resulting from individual causes or a group of causes which have large effects and which are at the same time unique events⁴⁴. Causes of this kind may

bases of this procedure are given by A. Wald in *Statistical Decision Functions*, New York 1950.

⁴³ Methods of this kind are discussed in L. R. Klein, *Textbook of Econometrics*, Evanston 1953. See also G. Tintner, *Econometrics*, New York 1952.

⁴⁴ Cf. Lange, *Introduction to Econometrics*, ed. cit., p. 23.

be historical events like wars or changes in economic policy (e.g., Great Britain's abandonment of the gold standard in 1931), or natural disasters (e.g., drought). Historical verification consists in the detailed determination of those historical events or processes which may interfere with the operation of economic laws, and in deciding whether these events are sufficient to explain the divergence between the assertions of political economy and the actual economic process. If this is not so then the relevant assertions are rejected as false.

The English political economist, John Neville Keynes, gives the following example of historical verification: "...it may be pointed out that in accordance with the principles of deductive political economy, the repeal of the Corn Laws must have tended to bring about a permanent fall in the price of wheat in England. Yet no such fall occurred immediately. The explanation of the apparent discrepancy is to be found in the interference of such circumstances as the failure of the potato crop, the Crimean War, and especially the depreciation of gold, which contributed to maintain the price up to 1862, notwithstanding free trade"⁴⁵.

Another example: In the most advanced capitalist countries at the end of the nineteenth century a growing number of monopolistic combinations of large capital began to appear. This should have led, according to the theory of accumulation developed by Marx, to an aggravation of economic crises. In fact, the period 1896–1913 was one of mild and short depressions. Does this mean that Marx's theory of capitalist accumulation is false? In order to answer this question it is necessary to examine the historical events and processes which might explain the lack of agreement between the theory of capitalist accumulation and the actual course of the business cycle. It turns out that the period 1896–1913 is one of a large

⁴⁵ J. N. Keynes, *The Scope and Method of Political Economy*, New York 1955, 4th ed., pp. 235–236. This book—the author of which was the father of the famous economist John Maynard Keynes—was written in 1890. Written in the spirit of the classical and the early neo-classical school, it is distinguished by a great deal of sound common sense.

and rapidly increasing export of capital from the most advanced capitalist countries, a period of great investment in underdeveloped countries, especially outside Europe (the construction of railways, ports, public utilities and the development of merchant marines carrying trade with these countries). At the same time, there were political changes as a result of which these countries passed under the rule, or at least the influence, of the most advanced capitalist countries. This is sufficient to explain the divergence between Marx's theory of capitalist accumulation and actual historical and economic development.

Similar observations must be made with regard to the theory held by many, especially American, economists, according to which there is a tendency to stagnation and the incomplete employment of the labour force in highly developed capitalist countries and especially in the United States⁴⁶. The historical verification of this theory must take into account historical events like the second World War, post-war reconstruction in Europe, the Marshall Plan, the huge scale of armaments, the Korean War, military aid for certain countries in Europe and Asia, the fact that a great deal of investment is carried out by the state, etc.

In none of the cases mentioned above does historical verification justify the rejection of the economic theories subjected to this verification—what it does show, on the other hand, is that the level of abstraction at which these theories are formulated is so high that considerable divergences between the formulated theories and the actual economic process are only to be expected. Theoretical models must be more concrete if they are to show better agreement. Sometimes, however, laws and theories of political economy formulated at a high level of abstraction may be verified without further concretization; this is so when the most general laws of the mode of operation and the development of social formations are concerned. For

⁴⁶ The principal advocate of this theory was Alvin H. Hansen, author of *Full Recovery or Stagnation?* New York 1938. The theory was worked out with greater precision by J. Steindl in *Maturity and Stagnation in American Capitalism*, Oxford Institute of Statistics 1952.

example: Marx's theory of the concentration and centralization of capital and the related Lenin's theory of the increasing monopolization of capitalist production, of the consequent growing importance of the export of capital from the most advanced capitalist countries, of the growing conflicts between capitalist powers, and of the transformation of capitalist economy from free competition to monopoly and imperialism—all find confirmation in the actual historical and economic process, without any need of further concretization.

Historical and statistical verification

As we know, political economy attempts to construct theories of the operation of social formations, embracing the whole mode of operation of social formations at a high level of abstraction and especially their "economic law of motion". These theories require historical verification on the basis of the whole concrete economic process of a given social formation. Further concretization, a transition to a lower level of abstraction, is unnecessary, since the numerous and diverse manifestations of the economic process only include limited aspects of it and are not essential to the mode of operation and the development of a social formation as a whole. Historical verification is also the verification proper to detailed laws and theories dealing with those aspects of the economic process which do not lend themselves to statistical verification. Both simple statistical verification and verification carried out by the use of mathematical statistics and econometrics are confined to laws and theories at a high level of concretization dealing with processes which are numerically measurable and in which accidental disturbances are such that probability calculus may be applied, i.e. they are random disturbances. This is a relatively narrow class of economic processes, and historical verification is hence the principal method of verifying the laws and theories of political economy. Furthermore, historical verification is necessary in ascertaining the historical scope of the validity of these laws and theories.

Historical verification and statistical verification are not mutually exclusive. They may supplement each other; statistical verification often plays a role auxiliary to historical verification. This is the case when economic theories which include a complex of connected laws at different levels of abstraction referring to different aspects of the economic process are verified. The most general of these laws, together with those laws which deal with aspects which are not quantitatively measurable and aspects where the operation of economic laws is disturbed by unique historical events, are verified historically. More detailed laws, on the other hand, where disturbances are random, i.e. they are the result of a large number of causes each of which has a relatively small effect, are verified statistically. The process of verification as a whole forms a joint *historico-statistical* verification. The classical field of operation of this verification is the capitalist business cycle. Here, verification is both historical, based on the examination of the history of business cycles in capitalist economy, and also statistical, often employing a complicated apparatus of mathematical statistics and econometrics. Only by the joint application of these methods of verification is an evaluation of the agreement with reality of various theories of the business cycle possible. The problem of changes in the socio-economic structure of capitalist agriculture may serve as another example; the various laws and theories dealing with this question must be subjected to historico-statistical verification⁴⁷.

Experiment as an instrument of verification in political economy

Finally, an additional method of verifying the results of political economy is by *experiment*. Experiment consists in

⁴⁷ It is worthwhile making mention here of the numerous writings of Lenin on the development of agriculture under capitalism, especially in Russia. In these works Lenin employed combined historical and statistical verification of the different theories of the development of agriculture under capitalism and on the basis of this verification rejected the theories of the narodniks and revisionists. See, for example, *Selected Works*, Lawrence and Wishart, London 1936, *The Development of Capitalism in Russia*, vol. I, p. 219, and *New Facts about the Laws of the Developments of Capitalism in Agriculture*, vol. XII, p. 219.

changing some of the conditions in which the economic process takes place, in order to establish relations between various properties of the process, and in the elimination of external influences which might disturb these relations. As we have shown, experiment cannot be the foundation of scientific abstraction in political economy, since it cannot be carried out on an adequate scale. It can, however, be used as a method of verification on a limited scale. The limitations in the employment of experiment arise from the fact that the economic process is a complicated and indivisible whole of human activities, economic relations and their connections. Certain aspects of the process cannot be completely isolated and arbitrarily changed, and it is not possible to create conditions in which some aspects would not influence other aspects. It is possible, however, in some special fields, in detailed processes of production and exchange, in the circulation of money and in credit relations, in the tax policy of the state etc. In these areas, which are mainly the concern of applied economics, experiment is possible.

Kotarbiński, who was probably the first to draw attention to the significance of experiment as a method of verification in political economy, gives the following examples: "For example, return tickets, season (e.g., monthly) tickets, season tickets valid for particular lines, or a particular kind of train, or for certain times of day, are introduced and then statistical data are collected to show how a particular kind of innovation has affected the number of passengers and the finances of the transport concern. Various methods of encouraging particular kinds of saving are introduced (e.g., premium bonds, or freeing of certain kinds of state bonds from taxation) and then an investigation is made to see how these measures have affected the total sum of savings⁴⁸.

In 1957-8 many experiments were carried out in Poland in the management of socialist industrial and construction

⁴⁸ T. Kotarbiński, *Kurs Logiki dla prawników* (A Logic Course for Lawyers), PWN, Warsaw 1953, p. 148.

enterprises. These experiments consisted in studying the effects of various incentives (e.g., profit-sharing, various kinds of bonus) and various forms of organization.

The possibility of carrying out such experiments depends, however, on the conditions of the social system in which the economic process takes place. In free-competition capitalism experiments are in principle impossible. In the face of competition, a single enterprise has very little freedom to deviate from the universally adopted standard pattern. Its activity is imposed by the market and a firm cannot behave differently without running the risk of bankruptcy. The state, on the other hand, following the principle of *laissez faire*, does not interfere with economic relations. At the most then, there is room for experiment in monetary and financial policy, etc. The possibility of experiment increases under monopoly capitalism, since monopolies and oligopolies are not obliged to submit passively to the spontaneity of competition and the market, and increases still further as the intervention of the state in economic relations gradually grows. Monopolies and oligopolies can experiment with price policy, with the organization of advertising, with the organization of their contacts with other firms, etc. Similarly the state acquires more room for experiment (e.g., in a policy of stabilizing the prices of farm products). But a really broad field for experiment aimed at verifying economic theories is only provided under socialism, under the social ownership of the means of production. Yet even here experiment must be confined to detailed theories dealing with limited sections of the whole economic process; it is further limited by the impossibility of isolating these sections from the economic process as a whole. The more general laws and theories cannot be verified experimentally, only historically and statistically⁴⁹.

⁴⁹ The part played by experiment in the verification of economic theories is dealt with by Zbigniew Madej in an article entitled *Metoda eksperymentalna w naukach ekonomicznych* (The Experimental Method in the Economic Sciences), "Życie Gospodarcze" no. 49 (8 January 1957). Madej's explanation of the role and significance of experiment is correct

Modes of inference in political economy

The methods of investigation which constitute the method of political economy employ certain logical operations, which consist in various methods of inference, i.e., of reasoning asserting the truth of certain statements on the basis of the truth of other statements. Contemporary logic distinguishes three basic types of inference. They are: *deduction*, i.e., the drawing of conclusions from premisses; *reduction*, i.e., the justification of premisses on the basis of conclusions drawn from them; and *induction*, i.e., the drawing of general conclusions from premisses which are particular cases of these conclusions⁵⁰. Political economy makes use of all these methods

but his definition of experiment is too broad. Madej discusses experiment on the scale of a whole national economy and gives as examples "the English experiment which consists in the partial nationalization of industry, a corresponding tax policy and attempts at planning economic development", and West Germany, "which in 1949 began to experiment with what is called social market economy". According to this definition of experiment every act of economic policy, on whatever scale, is an experiment; such experiments with economic processes have existed since the dawn of history. The whole economic history of mankind would be experiment. Such a definition may correspond with the colloquial use of the word, but it goes beyond its scientific meaning. An experiment *sensu stricto* is a purposeful change in some conditions—at the same time eliminating the operation of accidental conditions—in order to obtain additional knowledge. The economic measures taken in England and Western Germany are not experiments in the scientific meaning of the word. They lack the essential feature of experiment, i.e., changes of only a few conditions while eliminating the operation of all external influences. Conclusions drawn from these measures are not arrived at on the basis of experiment but on the basis of comparative observation. Verification based on these conclusions is historical or historico-statistical verification and not experimental verification. The similarity between these economic measures and experiment consists in the fact that in both cases certain hypothetical suppositions are verified in practice. But these are different kinds of practice.

⁵⁰ See T. Kotarbiński, *A Logic Course for Lawyers*, (in Polish), ed. cit., pp. 118–140, and K. Ajdukiewicz, *Zarys logiki* (An Outline of Logic), PZWS, Warsaw 1955, pp. 160–188. Formerly, a distinction was made only between deduction and induction, reduction being treated as a kind of induction. Reduction is however a mode of inference different from

of inference, each of them being particularly connected with one of the three procedures of investigation which make up the method of political economy.

The first procedure, abstraction, consists in induction. The starting point here, as we have already pointed out, is the comparative observation of the concrete economic process in different historical conditions. Material is provided by descriptive economics (together with economic statistics and economic geography), economic history, and by direct observation of the current economic process. Comparative observation and analysis based on it enable certain generalizations to be made and make it possible to remark the recurrence of various properties of the economic process and the connections between them, and to note the extent and kind of chance disturbances in them. Then the essential and accidental aspects are distinguished i.e., abstraction is applied. Finally, economic categories, theoretical models and their corresponding laws and theories are formulated. All this is done by induction.

The second procedure, successive concretization, consists in principle of deduction, with induction playing an important auxiliary role. A theoretical model is successively completed with additional, more detailed assumptions, after which, with the help of deductive inference, the economic categories, laws, and theories are made more concrete. The introduction of additional more detailed assumptions into the theoretical model is the result of inductive inference, based—quite as in the model on a higher level of abstraction—on the comparative observation of the concrete economic process. On the other hand, the concretization of economic categories and the development of more detailed laws and theories from more abstract laws and theories is accomplished by deduction. The concretization of economic categories is arrived at by classification, i.e., by making more detailed categories within the more

induction and consists in reversing the direction of deductive inference. On the other hand, inductive inference does not consist in reversing deduction but in a specific construction of premiss and conclusion, i.e., the premiss here consisting of special cases of the conclusion.

general ones, by differentiating, for instance, between industrial capital, commercial capital and money capital within the general category of capital. The criteria for this concretizing classification are provided by the comparative observation of the actual economic process; they are established by inductive inference. But the act of classification is itself the application of deductive inference. Similarly with the development of the more detailed laws and theories. Laws and theories at a higher level of abstraction together with the additional concretizing assumptions (obtained by induction) are premisses from which the conclusions drawn are more detailed laws and theories.

Finally, the third procedure, verification, consists in reduction. After the practical identification of economic categories, the theoretical model having been brought to the desired level of concreteness, conclusions are drawn which are verified by confronting them with the corresponding aspects of the concrete economic process. Having established the truth or falsity of these conclusions, it can then be said whether their premisses are true or false. Hence this is reductive inference, i.e., inference in the reverse direction to that followed by deductive inference.

Induction, deduction and reduction are thus the three modes of inference employed by the method of political economy. From induction, based on the comparative observation of reality, through deduction, which draws verifiable conclusions from the results of induction, to reduction, which states on the basis of the verification of these conclusions, whether the results of the induction first carried out are true or not—this is the order of inference in political economy as in every theoretical discipline concerned with the examination of empirical reality. All three modes of inference are necessary here. Without induction, deductive inference would be based on premisses unconnected with reality; it would not be inference relating to the real economic process. Without reduction it would not be possible to state whether or not the results of induction are true, it would not be possible to verify these results. Finally, without deduction there could be no transition from the

results of induction to verifiable conclusions making it possible to state whether or not the results of induction are true.

Role of deduction in political economy

The role of deduction in political economy deserves special attention. Induction is effected on the basis of the data supplied by descriptive economics and economic history, as well as by the direct observation of the economic process; reduction is based on the confrontation of the conclusions with these same data. The major part of reasoning done in political economy itself consists in deduction—i.e., in drawing verifiable conclusions from abstract general assumptions which are the result of previous induction.

That part of political economy which consists in deduction is often separated from the rest and called *economic theory* or *pure theory*. Such a separation is permissible on the condition that it is not forgotten that “pure theory” is only part of political economy, that the whole of political economy is a theoretical science, and that that part of it which consists in induction and reduction also serves in the discovery of economic laws and in verifying the results obtained. The identification of what is called pure theory—i.e., that part of political economy which employs deduction—with the discipline as a whole is erroneous, as we shall show below.

The importance of deduction lies in the fact that it is only on this basis that the logical necessity of the operation of definite economic laws under given conditions can be established. Given the assumptions on which the theoretical model is based, then economic laws can be deduced. We know that deductive inference is infallible, the conclusions follow from the premisses with logical necessity. Assuming, for example, the operation of certain economic stimuli and a certain mode of the interplay of human actions in the economic model, by deduction we arrive at conclusions which are logically necessary. If, for example, the incentive to production is the desire of the owners of capital to obtain maximum profit, and if production is carried on in conditions of free competi-

tion and capital may be freely transferred from one branch of production to another, then the rate of profit in the various branches of production tends to the same level. This is the logically necessary conclusion from the premisses adopted.

This necessity could not be established without deductive inference. This also applies to other theoretical disciplines engaged in the study of empirical reality. "The empiricism of observation alone can never adequately prove necessity. *Post hoc* but not *propter hoc*... This is so very correct that it does not follow from the continual rising of the sun in the morning that it will rise again to-morrow"⁵¹. However, if the statement that the sun will rise to-morrow is a conclusion based on true premisses—i.e., here, that the earth revolves on its axis—then this is a logical necessity. This necessity is at the same time an objective necessity as long as the premisses remain true i.e., as long as the objective conditions of which these premisses are a mental reflection prevail. It follows that objective necessity has a definite historical compass. The sun will no longer rise every day if the earth ceases to revolve on its axis. The rates of profit in the various branches of production cease to tend to a common level when free competition is replaced by monopoly or when private capitalist production in which the incentive is a desire for maximum profit is replaced by social production with the satisfaction of the needs of society as its aim.

Axiomatization and formalization—role of mathematics in political economy

It is obvious that the conclusions arrived at by deduction are logically necessary only if inference has been logically faultless. Two means are used to ensure that inference is free from logical error. The first is the *axiomatization* of theoretical economic models, i.e., the explicit specification of the assumptions which form the premisses of inference, where the role of the directives of inference (i.e., the rules

⁵¹ F. Engels, *The Dialectics of Nature*, Lawrence and Wishart, London 1940.

determining the mode of inference) is played by the laws of formal logic⁵². The second is the *formalization* of inference, and in particular the use of mathematics. The formalization of inference consists in making use of the schemata (formulae) established by logic, while mathematics is just a more specialized formalization of inference, in which, among other things, magnitudes appear⁵³. Many economic categories are magnitudes like value, price, profit, production cost, amounts of commodities etc.; others are not magnitudes, like wage earner, capitalist, competition, monopoly, etc., but the frequency of their appearance is a magnitude—the number of wage earners in the population of a country, the number of factories in socially owned industry etc. Mathematics is consequently particularly important as a tool of deductive inference in political economy.

Strictly speaking, all deductive inference dealing with magnitudes is mathematical inference, even if it is not formalized, i.e., even if it does not use mathematical formulae. For example, the inference mentioned above concerning the equalization of the rate of profit in various branches of production is a math-

⁵² In a deductive system of inference axioms are those premisses from which all conclusions are drawn directly or indirectly, and which themselves are not conclusions drawn from other premisses. Instead of the term "axioms" the term "postulates" is also used. These terms are synonymous. In political economy as in every science dealing with processes taking place in the empirical world, the axioms or postulates appearing in deduction are drawn from experience by induction and the abstraction of various aspects of the actual course of the processes under investigation. Recently Tjalling C. Koopmans has drawn attention to the advantage of the axiomatization of economic theory (*Three Essays on the State of Economic Science*, New York 1957, pp. 132–149).

⁵³ Mathematics is a formalized deductive system in which, among other things, magnitudes appear. It is not, however, confined to magnitudes; for mathematics deals also with such concepts as sets, relations, figures, transformations, etc. Bertrand Russell and A. N. Whitehead in their now classic work *Principia Mathematica*, published 1910–1913, showed that all mathematical theorems are conclusions resulting from the axioms of logic and from an additional axiom asserting the existence of an infinite number of objects.

emathical inference although it is not formalized. The whole economic theory is full of this kind of mathematical inference even though there may not be a single mathematical formula in a given book on the subject. The formalization of mathematical inference in political economy is, however, necessary, and that for two reasons. First, in order to ensure that reasoning is free from error. It is difficult to avoid error in reasoning in political economy when the premisses are complicated, without the axiomatization and formalization of inference. Secondly, because non-formalized inference is only possible within very narrow limits when the relationships between magnitudes are being dealt with. Without formalization we would be unable to solve a great number of problems, e.g., the problem of the allocation of sources of supply to consumers in order to reduce transport costs to a minimum, or the choice of the most effective variants of investment. The deductive part of political economy i.e., economic theory, must use formalized mathematics. There is, of course, no need to use axiomatization and formalization, (and hence formalized mathematics), when the assumptions of the theoretical model are uncomplicated and the course of inference is simple. To insist on axiomatization and formalization in such cases would be unnecessary pedantry, a waste of effort. Here non-formalized language is quite sufficient.

Premises in deduction are results of induction

The conclusions drawn by deduction, are, as we have pointed out, logically necessary. On the other hand, they are objectively necessary, i.e., necessarily in agreement with reality, only when the premisses of deduction are true. That the sun will rise tomorrow is a logically necessary conclusion from the premiss that the earth revolves round its axis. But it is objectively necessary only if the earth really revolves around its axis, and it will cease to be so when the earth ceases to revolve around its axis. Thus, faultless deduction is no guarantee of the truth of conclusions. Conclusions are only true if premisses are true. In political economy, as in other disciplines dealing

with the empirical world, the premisses of deduction are a result of induction based on observation. We know that induction, however, is not an infallible mode of inference. The truth of the premisses, in this case the particular observations, do not guarantee the truth of the conclusion which generalises these results. This is because induction is incomplete⁵⁴. Therefore the premisses on which deductive reasoning in political economy is based may be false, in spite of the truth of the observations made.

⁵⁴ Here we disregard complete induction which appears in political economy only in exceptional cases. The fact that induction is not a reliable method of inference has inclined some logicians to use the term *inductive reasoning* instead of *inductive inference*. The term inference is reserved exclusively for deduction which alone has the force of logical necessity (e.g., J. Łukasiewicz, *O nauce. Poradnik dla samouków, On Science. A Guide for the Self-taught*) Warsaw 1951, vol. I, p. xvii, and also T. Kotarbiński, *Elements of Epistemology, Formal Logic and the Methodology of Sciences (in Polish)* ed. cit., pp. 262–270, and *A Logic Course for Lawyers (in Polish)*, ed. cit., pp. 118–127). Neyman goes even further, for he rejects even the term “inductive reasoning” and talks about “inductive behaviour”, meaning by this the application of the method of trial and error (*A First Course in Probability and Statistics*, pp. 1–2). It must, however, be noted that man uses reasoning in inductive behaviour. Neyman’s book is concerned with precisely such reasoning. Ajdukiewicz employs the term inference to mean both inductive and reductive reasoning as well as deductive reasoning (*Zarys logiki [An Outline of Logic]* ed. cit., pp. 160–179) Kotarbiński has also recently adopted this terminology, (*Wykłady z dziejów logiki [Lectures on the History of Logic]*, Ossolineum, Łódź 1957, pp. 242–243). A new justification for this usage is given by Henryk Greniewski in *Elementy logiki indukcji (Elements of Inductive Logic)*, PWN, Warsaw 1955; Greniewski shows that induction may be reduced to deduction. Induction is deduction based on two kinds of premiss, i.e., (1) the assumption that the relations occurring in the process under investigation are uniquely determinate and that experience may be repeated and (2) the results of concrete observations. Inductive inference, as a special case of deductive inference, is infallible inference. Any uncertainty as regards the results of induction is not the result of the lack of infallibility of inference but is due to the uncertainty of the original premiss regarding the unique determinateness of observed relations. If these relations are not uniquely determinate and their occurrence, for example, only probable, the result of induction will also be only probable.

For this reason, conclusions inductively inferred in political economy must be treated with caution. The correctness of the inference and the precision of the observations which serve as the basis of its premisses do not guarantee the truth of its conclusions. It is particularly important to establish precisely the historical scope of the validity of the conclusions drawn inductively. They may be true inside certain historical limits and false outside them. The same is true of conclusions drawn deductively from premisses consisting of the inductive conclusions mentioned above.

Reductive inference as instrument of verification

Final conclusions drawn from the premisses supplied by induction and arrived at by deduction are verified. It can then be stated whether the premisses are true or false. Verification is thus reductive inference. Reduction, however, is not an infallible mode of inference either, because a true conclusion may result both from a true premiss and from a false one. For example: "I was born in January, therefore I was born in winter". In deductive inference, if the statement that I was born in January is true, then it follows that the statement that I was born in winter is true. On the other hand, in reductive inference, from the statement that I was born in winter, I infer the truth of the statement that I was born in January. Yet I could have been born in winter, even if I had been born in February, and not in January. In this case, a reduction stating that I was born in January is false, since a true conclusion here results from a false premiss. Hence, if in the process of verification it is stated that the conclusion obtained by deduction is true, this fact does not guarantee the truth of its premisses.

On the other hand, reduction can enable us to assert that the premisses used in deduction are false, for if verification shows the conclusion to be false the premisses must also be false, since a false conclusion results only from a false premiss. To return to our example: "If I was not born in winter then I was certainly not born in January". Hence, the verification

of the assertions of political economy can lead to the rejection, as certainly false, of only those assertions in which the conclusions drawn by deduction are shown to be false. Of those assertions whose conclusions prove to be true it can only be said that they may be true; there is no certainty that they are true. In other words, in political economy as in other disciplines concerned with the study of empirical reality, verification can only disprove beyond any doubt assertions whose conclusions are at variance with reality, but it cannot with certainty confirm the truth of those assertions whose conclusions agree with reality.

In the latter case, however, verification can establish that these assertions are probably true. In practice verification consists in checking not one but several of the conclusions which follow from a given premiss (i.e., an assumption in a theoretical model). If all the conclusions prove to be true, then the greater their number the more probable it is that the premiss is true. It is sufficient to mention that the truth of the premiss that I was born in January inferred from the statement that I was born in winter, becomes more probable if I add that I was born in a month which has 31 days. For then the range of the logical possibilities, which was three months—January, February, March—is reduced to two—January and March. Sometimes the verification of a greater number of conclusions following from a given premiss so reduces the range of the possibilities that the result of reduction becomes certain. If, for example, it is stated that I was born in winter, in a month that has 31 days, and in a month in which an equinox (there is one in March) does not occur, then it is certain that I was born in January, since the possibilities of my having been born in February or March have been excluded.

If it can be said after verification that a greater number of conclusions following from a given premiss is true then this increases the probability of the truth of the premiss, since the number of alternative true premisses leading to the same conclusions has been reduced. The more alternative premisses, which can be excluded by verifying additional conclusions,

the more probable is the truth of the premiss in question. We therefore try to draw from a given premiss such conclusions as reduce the number of alternative premisses to a minimum. Sometimes, a careful choice of verified conclusions makes it possible to eliminate alternative premisses entirely: the truth of the premiss is then certain. More frequently, the number of the alternative premisses can be so reduced that the truth of the premisses may be regarded as almost certain, i.e. certain from a practical rather than a logical point of view. The majority of verified assertions in the disciplines dealing with the empirical world are true in this practical way, e.g., the law of gravity and other established physical laws. The same is true of those laws of political economy which have been established beyond doubt, e.g., the laws of supply and demand in the exchange of commodities. The possibility that the verified conclusions of which these laws are the premisses result from other premisses is so small that such a possibility is in practice disregarded.

The less probable it is that the conclusion would be true regardless of the truth of the premiss, the more probable is that the premiss is true, since in such a case the possibility that the conclusion results from some other true premiss is still less. If, for example, the electric light in my flat fails, I may infer that a fuse has blown. This is a probable but not a certain inference, since the failure may be due to a fault at the power station. The less frequently, however, such faults occur at the power station, the greater is the probability that the failure of the light is connected with the blowing of a fuse, and the greater the probability of the inference that the premiss, that a fuse has blown, is true. In this way, by drawing for the purpose of verification conclusions, whose confirmation, if we exclude the premiss under consideration, is improbable, it is possible to bring reductive inference nearer to practical certainty.

Thus, when verifying the laws and theories of political economy, if we check a greater number of conclusions drawn from them and select such conclusions the probability of

whose confirmation, regardless of the truth of the laws and theories in question, is small, we may reach a practical certainty that these laws and theories are true⁵⁵. It is not always possible to obtain such a result in a single verification procedure. When this is so, additional conclusions are drawn from the premisses under verification whose confirmation is rather improbable if the premiss is not true. The verification of these additional conclusions still further reduces the range of possibility of alternative premisses. In this way practical certainty may be obtained, and sometimes—by way of successive approximations—even complete certainty.

Economic policy as the practical application of political economy

The knowledge of economic laws furnished by political economy serves a practical purpose. The practical application of the laws discovered by political economy is the task of *economic policy*. Economic policy consists in making use of economic laws in order to achieve certain desired results.

⁵⁵ This is the concern of a separate branch of logic dealing with probable inference. See T. Czeżowski, *O sprawdzaniu w naukach empirycznych* (Verification in the Empirical Sciences), Odczyty filozoficzne, Toruń 1958. This branch of logic—with which the economist John Maynard Keynes in his book *A Treatise on Probability*, London 1921, was one of the first to deal—ascribes to premisses and conclusions a definite probability expressed in numbers and determines the probabilities of various kinds of inference. In Poland this branch was developed by Czeżowski in *Logika* (Logic), Warsaw 1949, pp. 164–204. These probabilities relating to inference must be distinguished from the concept of probability in the branch of mathematics called the calculus of probability; this latter concept deals with random events appearing in mass processes taking place in objective reality, it is a property of objective events and is connected with the frequency of their appearance. On the other hand, the probability connected with inference pertains to the properties of our reasoning. Certain formal analogies between the theory of probable inference and the calculus of probability related to the frequency of occurrence of random events do, however, suggest that there is a connection between the two. The connection is to be found in fact that both the theory of probable inference and the calculus of probability make use of the rules of the algebra of sets.

As we know, all economic laws can be reduced to laws of causation⁵⁶, i.e., laws which state a relationship between cause and effect. The way in which economic policy operates consists in putting into effect such causes, which, in conformity with economic laws, bring about as their effects the ends desired by economic policy. Economic policy sets itself certain aims and uses certain means to accomplish them. In order to achieve these aims, economic policy must employ means made up of causes which have these aims as their effects. This demands a knowledge of economic laws and their application. Without a knowledge of economic laws and without their application economic policy fails and is ineffective. The economic process then develops spontaneously.

The ability to apply a knowledge of economic laws in economic policy consists in using laws which correspond to the degree of concreteness of the aims of economic policy. The aspects of the economic process which are to be changed by economic policy may be more or less general. This determines the level of generality or concreteness of the economic laws which are to be employed. The use of laws which are too concrete to bring about a change in aspects which are more general leads to the aim being achieved only in part or not at all. We say then that the means used are "too weak". The use of economic laws with a wider scope of validity in order to change particular individual aspects of the economic process usually results, over and above what was intended, in additional unintended effects. This is like curing a sprained ankle by amputating the leg. We say then that the means are "too strong". Practical ability in economic policy—"the art", so to speak, of economic policy—consists in choosing means which are appropriate to the kind and scope of the aims.

Economic policy attempts to influence the course of the economic process in the direction man intends. Consequently it strives to eliminate, wholly or in part, the spontaneity of this process. Thus, an effective economic policy is possible

⁵⁶ See Chapter Three.

only in a social system which favours the elimination of spontaneity in the economic process. Under free-competition capitalism, where *laissez faire* prevails, there is no room for economic policy, since the economic process is in principle left to its own spontaneous course. Economic policy exists only in a confined area in which the state regulates the economic process in the form of monetary and credit policy, customs policy, etc. Under monopoly capitalism, the intervention of the state in economic life increases, and the field of operation of economic policy correspondingly broadens. Under monopoly conditions, capitalist corporations develop their own economic policies, making use, for their own purposes, of economic laws like the laws of the market. Since, however, the economic laws which are decisive in the development of the capitalist formation continue to operate spontaneously, economic policy influences only certain aspects of the economic process and then often proves ineffective, because the results intended are disturbed by the spontaneous operation of uncontrolled factors.

It is only under socialism that economic policy acquires greater possibilities, and, most important, the possibility of guiding the development of the economic process as a whole. We may divide economic policy into two parts. One is *socio-economic structure policy*, and is concerned with the formation of the structure of production relations and other economic relations. The other, *current economic policy*, is concerned with the development of the economic process and its various aspects within the framework of given economic relations. The former employs laws with a high degree of generality, the latter applies more detailed laws since it is concerned with the realization of narrower ends. Elements of a current economic policy appear under capitalism and develop as the state and organizations of big capital increasingly interfere with the economic process. In these conditions only a limited part of political economy, i.e., that part dealing with certain detailed economic laws corresponding to the needs of current economic policy, is actually applied. Socio-economic structure policy on the other hand, even though some of its nuclei are to be found under capitalism, only

finds a broad field of application when production relations begin to change from capitalist to socialist. Only then those branches of political economy which deal with general economic laws, with the mode of operation and the development of the social formation—its most important branches—also take on a practical significance. Then the whole of the science of political economy takes part in the practical shaping of reality; political economy becomes an instrument of economic policy consciously directing the entire economic development of society.

CHAPTER FIVE

THE PRINCIPLE OF ECONOMIC RATIONALITY POLITICAL ECONOMY AND PRAXIOLOGY

Economic activity and technique

HUMAN economic activity is conscious and purposive activity. In the general economic conditions determined by production and distribution relations, certain economic stimuli together with certain ways of reacting to these stimuli make their appearance. This finds expression in the economic laws of human behaviour which we have discussed above. Economic stimuli determine the aims of economic activity, i.e. economic incentives. The reaction to these stimuli consists in the application of certain means in order to realize these ends. Economic activity consists in the realization of given ends by the use of certain means.

The set of means serving to realize the end together with the mode of application is the *technique* of a given economic activity. We thus talk about the technique of production and the technique of distribution, and, more specifically we distinguish between agricultural technique (agrotechnics, zotechnics), mining technique, the technique of steel production, the technique of chemical production, transport (land and water) techniques, trade technique, the technique of financial operations and many others. In the broad sense of the word the term "technique" is synonymous with the term "method", which, as we know, denotes a systematic mode of behaviour directed to the achievement of a given aim¹.

¹ See above p. 100 n. 15 on the meaning of the term "method". The term "technique" is often used in a similar sense. Max Weber for example,

The technique of economic activity has, however, a special feature in that the means which it uses are material objects and the ends which it achieves are connected with material objects. Production consists in the manufacture of material objects i.e., goods, by the use of the means of production (the means of labour and the objects of labour) which are also material objects. Distribution is the division of goods among men, and hence the division of material objects; its performance requires the existence of material objects which we call the means of distribution (e.g. warehouses, shop buildings, and fittings like shelves, counters, scales etc.). Even the performance of services which directly satisfy the needs of man requires as a rule material means (e.g., the instruments of the hair-dresser, of the doctor, of the musician, of the teacher, the premises on which services are carried out, and the fittings of these premises); moreover, normally the service has a material effect (hair-cutting, medical treatment, the showing of a film). The technique of economic activity is thus a *material technique* and consists in the use of material means in order to achieve material ends². Such technique is frequently called *technics*.

writes that each purposeful human activity has its own technique and gives as examples the technique of prayer, the technique of thought, the technique of scientific research, the technique of mnemonics (i.e., the technique of remembering), the technique of education, the technique of administration, the technique of love-making, the technique of war, musical technique, painting technique etc. (*Wirtschaft und Gesellschaft*, ed. cit., p. 32). The expression "technique" comes from the Greek τέχνη meaning "art". We often speak of the art of medicine, the art of engineering, the art of sailing etc.

² The fact that the technique of economic activity is a material technique was noted by W. Sombart: *Der moderne Kapitalismus*. 3rd ed., Munich and Leipzig 1919, vol. 1, pt. 1, p. 5. He also uses the term "instrumental technique" to denote the technique of economic activity. He defines this as follows: "By this I understand behaviour of a kind which, in order to achieve a technical end, applies real objects, instruments". F. von Gottl-Ottilienfeld, in a book dealing with technique and economy, uses the term "Realtechnik" to mean the technique of "intervention in the external sensual world". He distinguishes between individual technique (mnemonic technique, the technique of physical exercise), social technique (the technique of fighting, the technique of government and

Technique realizes the goal of an activity by evoking causes which have the effect of realizing the end. The means employed by a technique are causes having the desired end as their effect. The achievement of this end, or the *effectiveness* of the technique, consequently depends on the employment of such means which, as causes, in accordance with the causal laws existing in that particular field of activity, have the intended effect. A knowledge of these laws and the ability to make use of this knowledge constitute the conditions for the effectiveness of technique; the degree of effectiveness of a technique depends on the extent of the knowledge of the appropriate causal laws and on the ability to make use of them. In the material technique applied in economic activity it is the knowledge and ability to make use of the appropriate physical, chemical, biological and also (in the process of labour) psychological laws which determine its effectiveness. The study of the various types of material technique used in economic activity is called *technology*. Thus we have, for example, the technology of ship construction, the technology of land and water transport, the technology of storing meat products, the technology of showing films, etc.

Technology is thus the study of the means used to realize the various aims of economic activity, dealing with a vast assortment of material techniques. The aims which are actually realized in the course of economic activity, and the means which are applied, depend on the economic conditions in which economic activity takes place, and also on certain properties of the economic activity connected with these conditions.

Traditional character of economic activity in natural economy

Before the development of commodity production and commodity-money exchange, or when such production and exchange

administration), and intellectual technique (the technique of computation, the technique of playing chess). Gottl-Ottilienfeld comes to the conclusion that the peculiar technique of economic activity is "Realtechnik". See *Wirtschaft und Technik, Grundriss der Sozialoekonomik*, pt. 2, Tuebingen 1923, p. 9. It seems that the term, "material technique" best denotes the technique of economic activity.

have not yet developed fully, production and distribution are devoted to the direct satisfaction of needs. This is what is called *natural economy*. The stimuli determining the aims of economic activity are concrete needs. A great variety of needs results in correspondingly diverse aims of economic activity. Thus there are various aims like the acquisition of different kinds of food, clothing, housing, weapons, artistic objects, amusements, etc. These needs are, as we know, the product of that set of conditions of social life, which we call the culture of a given society. In a given culture, then, human economic activity has particular aims. These aims are established by custom and morality, approved by religion, and sometimes also sanctioned by legislation. The means employed to realize these aims, the technique of economic activity, are discovered and established by collective experience, and are moulded in the social process of labour by, as it were, "trial and error". Collective experience, moulded in the process of labour, discovers new means, evaluates their effectiveness in practice, retains those which are effective and discards those which are not. In this way a spontaneous "natural selection" of means takes place and the technique of economic activity is developed.

The aims of economic activity thus established together with their corresponding technique are carried over by tradition. Each new generation of society takes over aims and techniques of economic activity which have arisen from a particular culture. Economic activity realizes goals established by tradition with the help of means established by tradition without carrying out a reasoned analysis of either. This kind of economic activity is called *customary* and *traditional* activity. It is true that slow changes do take place in the aims and means of economic activity, for in every society the law of the progressive development of productive forces is at work in greater or less degree³. This, as we know, is the result of the mutual interaction on each other of man and the artificial environment which he creates in the social process of

³ See Chapter Two.

production. These changes take place spontaneously and as a rule so slowly that they do not affect the traditional character of economic activity; in the life of the individual these changes are too minute to affect the traditional aims and means of his economic activity⁴. Only in periods of sharp contradiction between production relations and the nature of productive forces sudden and great changes do take place in the aims and means of economic activity. Once agreement has been re-established between the relations of production and the character of the productive forces a new set of aims and means of economic activity is established, becomes customary, and is passed down by tradition. Economic activity again becomes a customary, traditional activity.

Thus, within the framework of social formations in which natural economy prevails, economic activity is customary and traditional. This is a fact familiar to anthropologists, ethnologists, and economic historians. The American anthropologist Herskovits states: "The element of tradition is thus of great importance in determining the forms of technological and economic aspects of culture no less than of any other aspects"⁵. Sombart, the historian of capitalism, in describing the traditionalism of economic activity in pre-capitalist social formations, wrote: "Empirical, traditional economy means economy as it has been taught and handed down, and to which people have become accustomed. In deciding on some undertaking or activity, a man does not look in front of him, to his

⁴ Krzywicki called these minor almost imperceptible changes "social differentials": "In the heart of society, that is of civilized society, minor differentials accumulate in the material substratum which finally result in a revolution in all fields of social life... Minor changes in the shaping of the productive forces, *social differentials*, slowly accumulate and just as a small annual subsidence of the land after hundreds of years gives it an altogether different form so after a time these minor social changes give birth to the *integral*, i.e., the framework of completely new relations". *Social Development among Animals and Human Beings. Sociological Studies* (in Polish), ed. cit., pp. 207-8 and 210.

⁵ M. J. Herskovits, *Economic Anthropology*, Alfred A. Knopf, New York 1932, p. 80.

goal, he does not exclusively consider the purpose of his decision, but he looks back to the examples and experiences of the past"⁶. He goes on to explain: "From our birth onwards, and maybe even before, our environment imposes itself upon us and obliges us to follow a particular path of ability and volition: our knowledge, study, activities, feelings, views of our parents and teachers are all handed down to us... To the power of tradition, later in life, a second equally strong force is added: force of habit, which makes a man inclined always to do what he has done before so that as a result he is still more firmly held into the groove into which he has slid... Moreover a particular member of a group in trying to show that he is a worthy member of this group particularly esteems the cultural values which characterize his group... In this way primitive man is set on the track of an existing culture by various forces... The internal unity of all these individual features of pre-capitalist economy, as of the whole of pre-capitalist cultural life, find their expression in a basic concept of life as perpetuation..."⁷.

Economic activity in pre-capitalist societies was similarly described by Max Weber who, however, emphasized two other elements in his explanation of the problem. These two elements were the interest of certain social classes or groups in the preservation of traditional forms of activity, and magico-religious sanctions. Weber writes: "At the beginning we find *traditionalism* and the sanctity of tradition everywhere, which will only allow activity and economy of the kind which has been practised by previous generations... An inability and general reluctance to leave accustomed paths is the main reason for adhering to tradition. This primitive traditionalism may, however, become much stronger in two circumstances. In the first place *material interests* may be involved with the maintenance of tradition... Even stronger is the effect of the *magical stereotypization* of activity, the fear of altering a traditional way of life for fear of supernatural harm. This

⁶ W. Sombart, *Der Moderne Kapitalismus*, ed. cit., vol. 1, pp. 37-8.

⁷ *Ibid.*, pp. 38-39.

generally corresponds with the interests of priests, but its basis is a general belief in supernatural dangers"⁸.

Marx drew attention to the importance of class interest as a factor in maintaining the traditionalism of economic activity in pre-capitalist formations. Writing about the feudal mode of production he says: "It is thus obvious that in the primitive and undeveloped conditions on which this social production relation and its corresponding mode of production are based, tradition must play an all-powerful part. It is equally obvious that, as always, it is in the interest of the governing section of society to sanction the existing state of things as the legal one and to consolidate as legal the framework created by custom and tradition"⁹.

Separation of gainful activity from household activity in a commodity-money economy. Change in structure of ends of economic activity

Since natural economy prevails in pre-capitalist formations, economic activity in these formations is mainly traditional and customary. This has survived right up to the present day wherever considerable elements of peasant economy have survived. The development of commodity production and commodity-money exchange, however, which begin in pre-capitalist social formations, undermines the traditionalism of economic activity. This occurs with peculiar force when the capitalist mode of production is developed and the whole of production becomes commodity production, and not only products but labour power is the object of commodity-money exchange. The whole process of production and distribution then takes place in the conditions of commodity and monetary economic relations.

⁸ M. Weber, *Wirtschaftsgeschichte*, Munich and Leipzig 1924, pp. 302-3. As an example of magical stereotyping Weber tells how when railway construction was started in China the inhabitants objected to the disturbance of certain mountains, forests and rivers on the grounds that it would disquiet the spirits of their ancestors.

⁹ K. Marx, *Das Kapital*, Berlin 1951, vol. 3, p. 844.

Commodity production and commodity-money exchange lead to the severance of the direct connection between economic activity and the satisfaction of needs. Human economic activity falls into two separate kinds of activity: *gainful activity* and *household activity*. Gainful activity consists in the production, sale and re-sale of goods (including labour power), in order to obtain a certain amount of money, or *money income*. Money income is spent on the purchase of goods which in the household are adapted and used to satisfy various needs (most frequently in the family, but also, for example, in an orphanage, a hospital, in military barracks etc.). All these are household activities.

The division of economic activity into two distinct kinds of activity leads to a new system of economic aims. In the household the aims of activity are still directly dictated by needs. These aims are multiple, corresponding to a variety of needs—for food, for clothing, housing, entertainment etc. Gainful activity on the other hand has only one aim: to obtain money income. This aim is always and everywhere the same, independent of the form which gainful activity may take. Whether it is agricultural production or industrial production, marine transport or trade in timber or textiles, financial operations or the performance of wage labour, medical or artistic services, or other concrete kinds of gainful activity—their aim is always the same: to obtain money income. This aim is also independent of the concrete needs to be satisfied by the proceeds of gainful activity. Whether it is a matter of supporting a family (providing them with food, housing and clothing), of medical treatment, of tourist travel, of amusements, of philanthropic activity, or of other concrete needs—gainful activity, which is to ensure the possibility of satisfying these needs, has always one and the same aim: money income.

The division of economic activity into gainful activity and household activity thus produces a general end, the realization of which is the condition for the realization of all other aims of economic activity. The aims connected with household activity and determined by various needs can only be realized

in so far as the end of gainful activity i.e., the obtaining of money income, is realized. In these conditions the end of gainful activity is the *key end* since on its realization depends the realization of all other aims. This gives rise to a specific *structure of ends*: one end, that of obtaining money income, becomes the means of realizing all other ends, or aims. The aims of economic activity are connected with each other by the fact that there is a common means for their realization, which means is in turn the end of gainful activity. Instead of parallel aims existing side by side, as in natural economy, there is a system of ends with a definite structure. The key end of this system, the obtaining of money income, becomes the focus of all human economic activity; gainful activity becomes the foundation of all economic activity.

The development of a structure of ends in economic activity makes it impossible to preserve the traditional character of this activity in its entirety. The aims of domestic economic activity can and, as a rule, do preserve their traditional and customary character because they are determined by traditional cultural conditions, social status and its corresponding "way of life". The end of gainful activity, on the other hand, is imposed ineluctably by the economic relations of commodity production and commodity-money exchange. Money income in a commodity-money economy is an *economic necessity*, independent of a society's cultural traditions. This necessity acquires the nature of an economic law of commodity-money economic relations. Without money income all other economic activity is impossible. This undermines the traditional and customary set of aims of economic activity, whatever they may be, introduces gainful activity as the key end and transforms the set into the structure referred to above, composed of mutually connected aims with the key end as its focus. Thus the end of gainful activity is independent of the cultural setting of society and the traditional aims of the economic and other activities connected with it.

Since in gainful activity there is one end only and not—as in natural economy—a multiplicity of aims, all the means

and operations of this activity, the whole of its technique, are subordinated to this one common end. We express this by saying that *an integration of means by a common end* takes place. This integration combines the means into a purposive system of applying them. By comparison with natural economy this creates quite new conditions for economic activity. In natural economy there are a great variety of parallel ends and an equally great variety of means; some means are specifically applied to particular ends (e.g., bread for food), others may serve various ends (e.g., wood for building houses, making carts, building bridges or for fuel). This complicated system of ends and means is established by tradition and becomes the object of traditional and customary economic activity. On the other hand, the fact that in gainful activity there is only one end, that this end is unconditionally necessary and that all means are subordinated to this one end, simplifies activity, making it easy to analyze. The integration of means through the end of gainful activity wrenches them from their traditional and customary paths. For integration requires at all times the evaluation of the usefulness of a given means from the point of view of the end of gainful activity, i.e., money income. Unsuitable means are discarded, without regard to the tradition on which they are based and the choice of means is made on the basis of a calculation of their relation to the money income that can be attained.

Rationality—the characteristic of gainful activity

Thus, in a commodity–money economy, both the end and the means of gainful activity break with tradition. Gainful activity becomes an activity based on reasoning, a *rational activity*¹⁰. The end of gainful activity emerges with logical

¹⁰ The concept of rational activity applies to all kinds of activity besides economic activity. Max Weber, whose classification of types of behaviour gained wide acceptance, uses the term *zweckrationales Handeln* in distinction from another kind of rational behaviour, *wertrationales Handeln*. See *Wirtschaft und Gesellschaft*, vol. 1, p. 12. But it seems that this second type can be reduced to the first, and that one category of rational activity is sufficient. Kotarbiński distinguishes only one category:

necessity in the process of reasoning as the indispensable condition for the realization of any other aim of economic activity, while the means are evaluated by applying logical inference to the known laws of nature, economic relations and concrete facts.

In this connection we distinguish two kinds of rationality of action: factual rationality and methodological rationality¹¹. The first occurs when the choice of means corresponds to the true objectively existing situation, i.e., to the actually existing facts, laws and relations. Factual rationality of action

Treatise on Good Work, ed. cit., p. 137. Weber further distinguishes traditional activity and emotional activity (p. 12). Emotionality of behaviour, however, is connected with a different principle of classification: both rational and traditional behaviour can be positively or negatively coloured by emotion, they can have pleasant or unpleasant associations. The division into rational and traditional behaviour is sufficient. It is significant, moreover, that Weber only uses two of these categories in his books on economic history; see for example *Wirtschaftsgeschichte*, pp. 15 and 302-3. Ludwig von Mises' assertion that human action is necessarily always rational and that the term "rational action" is therefore pleonastic and must be rejected as such, is completely mistaken. (Ludwig von Mises, *Human Action—A Treatise on Economics*, London 1949, p. 18). Mises states that "the opposite of action is not irrational behaviour, but a reactive response to stimuli on the part of the bodily organs and instincts which cannot be controlled by the volition of the person concerned" (p. 20). This leaves no room for traditional behaviour which is also conscious and purposeful activity but is distinguished by the fact that the aim and the means of this activity are established by tradition and are not the result of reasoning. Both in traditional activity and in rational activity there is a consciousness of aim and means; the difference between these two kinds of activity consists in the fact that in one case the aim and the means adopted are traditional and in the second case they are arrived at by reasoning. Gerd Alschner gives a penetrating criticism of Mises' view in *Rationalität und Irrationalität in den wirtschaftlichen Handlungen und ihre Erfassung durch die Wirtschaftstheorie. Schmollers Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft*, 1957, pp. 5-12.

¹¹ Kotarbiński makes this distinction in *Treatise on Good Work* (in Polish), ed. cit., pp. 137-9. He gives the following example of activity which is methodologically but not factually rational: "Someone bases his plan of travel on the official time-table but fails to reach his destination, because contrary to the information given the train does not stop there".

is thus synonymous with its effectiveness. The second, methodological rationality means that the activity is rational from the point of view of the knowledge possessed by the agent, or, in other words, that the logical inference determining the choice of means is correct within the framework of the knowledge possessed, without going into the question of whether this knowledge is in agreement with the actual state of things. It is obvious that the rationality of gainful activity is methodological rationality, because the inference involved in this activity is based on the knowledge possessed by the individual carrying out this activity. At all events only methodological rationality is a property of activity as a mode of behaviour; factual rationality is a matter of the adequacy of the knowledge on which the activity is based.

The transition from customary and traditional economic activity to rational gainful activity, i.e., the *rationalization* of economic activity, is made gradually, in keeping with the development of commodity and monetary relations. This transition is hampered by the fact that apart from gainful activity there are alternative methods of obtaining the means of satisfying needs, in the form of direct production and distribution. The feudal lord and peasant, and even the handworker as yet not completely severed from the cultivation of land, the rearing of animals and other forms of labour for his own needs, still have available means of satisfying their needs other than gainful activity. Money income is still not an absolute economic necessity. It is only with the development of the capitalist mode of production that commodity and monetary relations become general, even labour power becomes a commodity, and gainful activity becomes a universal economic necessity. The whole process of production and distribution becomes a rational economic activity, and traditionalism in economic activity is restricted to domestic economy (although even here advertising and other methods of capitalist enterprise break through). In production and distribution the traditional activities linger on only in peasant economy, where even under capitalism natural economy persists on a considerable scale.

The factor which is the turning point in the transition from traditional and customary activity in production and distribution to rational gainful activity is the emergence and activity of the capitalist enterprise.

An enterprise is a group of people systematically engaged in gainful activity. Capitalist enterprise is distinguished by the fact that the material means of gainful activity (means of production, of distribution or of rendering services) are the private property of one person or group of people (capitalists), who employ hired workers; these workers are rewarded with wages.

In a capitalist enterprise economic activity is for the first time concentrated on money income as its sole and exclusive end. The large scale activity of the class of owners of such enterprises—the bourgeoisie—results in the spreading of commodity and monetary relations. The *Communist Manifesto*, written in 1847 at a time when the capitalist mode of production was spreading throughout Western Europe, sums up the changes brought about by the capitalist mode of production in the following words: “The bourgeoisie, wherever it has got the upper hand, has put an end to all feudal, patriarchal, idyllic relations... and has left remaining no other nexus between man and man than naked self-interest, than callous ‘cash payment’ ”¹². And further on: “All that is solid melts into air, all that is holy is profaned, and man is at last compelled to face with sober senses his real conditions of life and his relations with his kind”¹³. Rational economic activity spreads from the capitalist enterprise to all classes and social strata. All are drawn into the economic necessity of gainful activity.

Quantification (measurability and commensurability) of the end and means of gainful activity. Category of profit

The development of commodity and monetary relations, and especially the capitalist mode of production, by singling out and making gainful activity general and by turning it into

¹² K. Marx and F. Engels, *Selected Works*, ed. cit., vol. 1, p. 36.

¹³ *Ibid.*, p. 37.

a rational activity based on reasoning, leads to the quantitative measurability and commensurability of the end and means of this activity. A *quantification* of the end and means takes place and is expressed in *uniform units of measurement*, in monetary units. The end of gainful activity is from the very beginning a quantitative category expressed in monetary units. Quantitative categories are also formed by the outlay of means, but they are at first expressed in different physical units like pounds, yards, quarts and pieces. Commodity-money exchange leads to the expression of this outlay in uniform monetary units so that various outlays may be compared as constituent parts of *cost*, expressed in money. At the same time they become commensurable with the end of gainful activity—money income.

It is then possible quantitatively to compare the end achieved and the means used and to express the result of this comparison in monetary units. In pre-capitalist forms of production and commodity exchange this commensurability is still incomplete since it does not include the outlay of labour. The capitalist mode of production, by transforming labour power into a commodity and thus into an element of cost expressed in monetary units, achieves the full commensurability of the means and end of economic activity in a capitalist enterprise. The quantitative comparison of money income with the cost incurred finds its expression in the economic category of *profit*. Profit becomes the uniform, quantitatively measurable end of the activity of capitalist enterprise.

Calculation and book-keeping in capitalist enterprises

The quantification of end and means in uniform units of measurement and the emergence of the economic category of profit means that the rationality of the operation of an enterprise finds expression in *calculation*, the monetary reckoning of all the components of income and cost. Book-keeping is developed. This at first appears in capitalist enterprises engaged in trade where the quantification of the end and the means appears earliest, and then gradually spreads

to all kinds of enterprise. The complete calculation of all the elements, together with the results of the activity of an enterprise, was made possible by the invention of double-entry book-keeping, which consists in connecting all accounts dealing with individual operations of the enterprise with one main account synthesizing the whole activity of the enterprise. The next step was the introduction of a separate account called the capital account which, together with the account of income and expenditure, makes it possible to evaluate the value of the property of the enterprise in terms of money (in the form of a balance of assets and liabilities).¹⁴

¹⁴ The beginnings of systematic commercial book-keeping are to be found in the 13th century. Merchants in Italian cities, especially Florence, began to keep systematic accounts (in Italian "copto", hence "account") of their more important commercial operations. In the 14th century accounting is to be found in France as well. Double-entry book-keeping appeared at the end of the 14th century in northern Italian cities, probably first in Genoa, and then developed especially in Venice (so that it was called Venetian book-keeping). From there it spread to all the major trading centres in Western Europe and especially Holland. The first systematic exposition of double-entry book-keeping was given by Luca Paccioli in *Summa di arithmetica, geometria, proportioni et proportionalita*, published in Venice in 1494. An important part was also played by decimal notation and the method of calculation connected with it, which was taken from the Arabs, having first appeared in India. The turning point in this field was marked by the appearance of Leonardo Pisano's *Liber abaci* published in Florence in 1202. The transition to the decimal system is closely connected with the development of accounting and commercial book-keeping. In northern Italian cities, and later in other countries as well, special schools were set up to train youths in accounting and book-keeping in order to prepare them to be merchants. These schools already existed in Florence in the 14th century. Capital accounting appeared later, in the sixteenth century. The Dutch author, Simon Stevin (who contributed a great deal to the practical application of decimal fractions) demanded in 1608 that a balance sheet for an enterprise should be drawn up every year as well as when a merchant died or a firm was dissolved. It is worth noting that in Italian the term "ragione" was adopted to denote an enterprise and in French the term "raison" (both come from the Latin "ratio"), which originally meant both "reason" and "calculation". Thus the rationality of capitalist enterprise and its connection with commercial calculation shows itself even in etymology. Sombart writes about the development of book-keeping in capitalist enterprise and its significance

Calculation is the expression of fully developed rationality in the activity of an enterprise, since it consists in the quantitative comparison of all the constituents of income and cost, together with changes in the value of the property (capital), thus employing logical and mathematical inference. Calculation is also an instrument which serves to make that rationality more precise, and is especially a means of fully integrating the means through the end—within the framework of an enterprise. By the use of calculation the means employed by an enterprise are evaluated from the point of view of their profitability. The material technique of production and distribution, like all other operations, is strictly subordinated to the unique end of the enterprise—profit.

as a factor in the rationalization of economic activity in *Der moderne Kapitalismus*, ed. cit., vol. 2, pt. 1, pp. 110–138. Sombart also draws attention to the indirect influence which the rationalization of economic activity, in the form of calculation, exerts on the development of the natural sciences; he also emphasizes the influence of this rationalization on the development of scientific economic categories: “Double-entry book-keeping is based on the consistent application of a conception which treats all phenomena as quantities—quantification, an idea which has brought to light all the marvels of nature and which here, for the first time in history, has become quite clearly the basic idea of a particular system. It requires no great mental effort to see in double-entry book-keeping the germ of the ideas of gravitation, the circulation of the blood, the conservation of energy and other ideas which have proved so fruitful in natural science” (p. 119). Further on, discussing balance accounts, he writes: “This approach determined the creation of the concept of capital. One can also say that before double-entry book-keeping the category of capital did not exist” (p. 120). Sombart also points out that the categories of fixed and circulating capital, the categories of changes in the form of capital, of commercial turnover, capital turnover, production costs, and other categories of political economy arose out of the practical activity of capitalist enterprise. Max Weber notes that in contrast to capitalist enterprise, merchants, usurers and bankers in non-capitalist societies do not keep books and money accounts. (*Wirtschaftsgeschichte*, ed. cit., pp. 198–203). Marx drew attention to the significance for the development of book-keeping of the development of enterprise trading in money, especially of cash enterprises and associations in Venice and Holland. This resulted in a division of labour in which cashiers took upon themselves the responsibility of book-keeping. (*Capital*, Saraswaty Library, Calcutta 1946, vol. II, pt. 4, p. 251.

Maximization of profit—an economic necessity for a capitalist enterprise

The quantification of the aim of gainful activity results in a tendency to its *maximization*, i.e., to the realization of the end to the greatest extent possible in the circumstances. This happens because this end is the means of realizing all other aims of economic activity; if it is realized in a greater degree, then the greater the number of other aims which may be realized and the greater the number of needs which can be satisfied. The tendency to the maximization of money income develops together with the development of commodity and monetary relations. It appears in pre-capitalist social formations, frequently threatening to undermine the traditional way of life established there; this arouses counteraction, especially on the part of the ruling class and the strata connected with them, living in a natural economy.

Aristotle drew attention to this, noting that the desire for riches in the form of objects of use is limited, "for the quantity of possessions of this kind capable of making life pleasant is not unlimited", while the desire for money is unbounded, to such an extent that the quest for riches in the form of money "knows no limits to its aim, but is an end in itself"¹⁵. In the middle ages the tendency to the maximization of money income was denounced by the teaching of the church which declared that man's possession of worldly goods ought to be such as made possible a life "appropriate to his station"¹⁶. Life according to one's station was enforced in the middle ages by numerous sumptuary laws which attempted to limit

¹⁵ K. Marx, *Capital*, Dent, London 1930, vol. 1, pp. 137-138.

¹⁶ The great systematizer of medieval philosophy and theology Thomas Aquinas wrote: "... dum scilicet homo secundum aliquam mensuram quaerit habere exteriores divitias, prout sunt necessariae ad vitam eius secundum suam conditionem. Et ideo in excessu huius mensurae consistit peccatum: dum scilicet aliquis supra debitum modum vult acquirere vel retinere. Quod pertinet ad rationem avaritiae quae definitur esse immoderatus amor habendi" (It is understood then that man desires a certain amount of external riches to the extent to which they are necessary

the expenditure of burghers growing rich on commodity-money exchange¹⁷.

However, the growth of commodity production and commodity-money exchange, the development of capitalism in commerce and shipping, and the subsequent development of capitalist industrial production—gradually broke down this resistance. The expression of this process is the mental and moral revolution in the period of the Renaissance, Humanism, and Reformation. The tendency to maximize money income was finally recognized and later even approved. The immediate result of the penetration of feudal agricultural production by commodity exchange was the attempt to increase money income from land rent and a growth in peasant exploitation¹⁸.

for him to live in accordance with his station. It is in exceeding this amount that sin consists: if someone wishes to obtain or retain more than is his due, this is reckoned as avarice, which is defined as an excessive desire of possession). *Summa theologica*, secunda secundae, quaestio 118, articulus 1.

¹⁷ In Poland sumptuary laws of this kind were introduced in the 14th century. In the 17th century they were used in order to prohibit burghers to wear furs, silk robes and girdles, and morocco leather shoes. In the 18th century this feudal measure was again used on a large scale but for a purpose different from the former one; the measure was designed to prevent imports—above all the import of luxury goods, and at the same time to promote national industry and the accumulation of capital. Sumptuary laws first affected the burghers but later embraced the gentry as well. These laws were backed by heavy fines and the confiscation of the luxury goods in question. (See Z. Kaczmarczyk and B. Leśnodorski, *Historia państwa i prawa polskiego*, [A History of the Polish State and Law], Warsaw 1957, pt. 2, pp. 261, 365, 483).

¹⁸ This gave rise to the phenomenon which Marx called the greed for surplus labour (Heiss hunger nach Mehrarbeit). This appears wherever the product of surplus labour becomes a commodity. "It is obvious, however", writes Marx, "that when a society is so constructed that, from the economic standpoint, the use-value of products predominates over their exchange-value, surplus labour is restricted within a smaller or larger circle of wants, and that, in such a society, an unquenchable thirst for surplus value cannot arise as the direct outcome of the very nature of the method of production... As soon, however, as peoples among which production still takes the lower form of slave labour, serf labour, and the like, are attracted within

The tendency to the maximization of money income is the inevitable consequence of the break-down of economic activity into gainful activity and domestic economic activity. Like calculation, it is the expression of the rationality of gainful activity. Rational activity directed to one single quantified end must tend to the realization of this end to the maximum quantitative extent possible in given conditions. A failure to desire the realization of this end in the greatest measure would indicate that apart from this end there existed other aims, that this end is not the only one.

The tendency to the maximization of money income cannot be fully developed in conditions in which there exist other possibilities for obtaining the means of satisfying needs beside gainful activity. A peasant, for example, may give up the maximization of his money income in favour of the employment of part of his own products in his own domestic economy (e.g., consume butter instead of selling it on the market), a wage labourer may give up the maximization of his money income in favour of working in his own garden (e.g., devoting less days in the week to wage labour) or in order to conserve his health (e.g., working less intensively when on piece-work). In a capitalist enterprise, on the other hand, there can be no alternative to the drive for profit: everything is quantified and calculated in monetary units, everything is bought or sold for money, and profit is the only end of the enterprise's activity. In a capitalist enterprise the *maximization of profit* is an economic necessity.

the domain of the world market which is dominated by the capitalist method of production, so that the sale of products made for export becomes their leading interest, the civilized horrors of overwork are grafted on to the barbaric horrors of slavery, serfdom, etc." (*Capital*, ed. cit., vol. 1, pp. 235-236.) In Poland, the growth in the production of marketable grain, especially for export, which began in the 16th century, led to the development of an economy of large holdings and an increase in the labour dues demanded from the peasants. See *Historia Polski*, (History of Poland), ed. Tadeusz Manteuffel, Warsaw 1958, vol. 1, pt. 2, pp. 91-9 and 429-432.

The principle of economic rationality and its two variants: the principle of the greatest efficiency and the principle of the economy of means

The maximization of profit in capitalist enterprise is accomplished by the application of a general rule of procedure which is called the *economic principle* or the *principle of economic rationality*. This is a general principle of procedure when the end and means of activity are quantified. This principle asserts that the maximum degree of realization of the end is achieved by proceeding in such a way that either for a given outlay of means the maximum degree of realization of the end is achieved, or that for a given degree of realization of the end the outlay of the means is minimal¹⁹. The first variant of this

¹⁹ Strictly speaking, the full quantification of the end of activity is not necessary for the application of the economic principle. It is sufficient if the degrees of realization of the end form an ordered set so that it is possible to say whether the end is achieved in a greater or lesser degree. It is not necessary that the end should be measurable i.e., that the degrees of realization should form a set which can be brought into a one-to-one correspondence with the set of real numbers or with a sub-set of it (e.g., with the set of rational numbers or the set of natural numbers). In this case it would be possible to say that a certain degree of the realization of the end is a given number of times (e.g., 3 times, 5 times) larger than another. This would be full quantification. In order to maximize the degree of realization of the end it is, however, sufficient to know whether the degree of realization is greater or smaller; measurability is unnecessary here. If the degrees of the realization of the end are measurable they, of course, form an ordered set but not *vice versa*. The reader will find a more detailed discussion of this problem in the appendix at the end of the chapter. Some use the term "magnitude" to denote any phenomenon whose different degrees of realization form an ordered set, and the term "quantity" to denote the case where different degrees of realization form a set which can be brought into a one-to-one correspondence with the set of real numbers or with a sub-set of it. Every quantity is a magnitude, because the set of real numbers is ordered; but not every magnitude is a quantity. The scale of hardness of minerals is an example of a magnitude which is not a quantity. Minerals are ordered according to their hardness but there is no meaning in the assertion that one mineral is three times harder than another. Using this terminology, we can say that in order to apply the economic principle it is sufficient if the end of economic activity is a magnitude, it may (but need not) be a quantity. The profit of an

procedure is called *the principle of greatest effect* or *the principle of greatest efficiency*. The second variant is called *the principle of the minimum outlay of means*, or *the principle of economy of means*²⁰. When applied to an enterprise where all outlays of means are part of a uniform category of cost, the second variant may also be termed the principle of minimum cost.

Both variants lead to the same result. Proceeding according to the first variant we take as a starting point the outlay of all the means at our disposal and immediately obtain the maximum degree of the realization of the end which is possible with the means at our disposal. Proceeding according to the second variant we take as a starting point a certain degree of realization of the end which we obtain with a minimum outlay of means, while we use the economized means in order to raise the degree of realization of the end; this leads to the maximum realization of the end possible with the means at our disposal. These are thus two equivalent variants of the principle of economic rationality²¹.

enterprise is a quantity and so the quantification of the aim of activity in capitalist enterprise is more than is necessary for the application of the economic principle.

²⁰ Kotarbiński clearly distinguishes between these two variants. Kotarbiński talks about the "economic quality" of behaviour and distinguishes two kinds of it: "productivity" and "economy". He defines them in the following way: "The more valuable the product for a given expenditure the more productive is behaviour, and on the other hand, the less the outlay in the achievement of a given aim, the more economical is behaviour" (*Treatise on Good Work* [in Polish] ed. cit., p. 124). Kotarbiński draws attention to the vagueness of terms like "value of the product" and "quantity of outlay" and states (*ibid.*, p. 126) that "as far as productivity is concerned, a particularly happy situation is when all the values of the product can be given commercial exchange values, measurable in terms of money, and if the same can be done for all outlays". (*Ibid.* See also *A Logic Course for Lawyers*, (in Polish), ed. cit., pp. 159–160). Some also use the expression "the principle of the least effort" to describe the second variant. This is a rather narrow definition since effort is only one of the means alongside with physical resources. Moreover, in capitalist enterprise, effort is only reckoned with in so far as it appears as the expenditure of money, i.e., in so far as it is embodied in material objects.

²¹ Sometimes both these variants are joined together in the form:

The use of means in accordance with the principle of rational economy is called the *optimum use of means*. The use of means other than optimum is called *waste*. Waste is a symptom of irrational action; it means that the aim of activity to the maximum degree possible for the means possessed is not attained. It can thus be said that the application of the principle of economic rationality consists in the optimum use of means, in the elimination of waste.

Principle of economic rationality as historical product of capitalist enterprise

The most important case of the application of the principle of economic rationality is that of the capitalist enterprise. This principle shows itself here in full for the first time in the history of the development of human economic activity. It could not show itself earlier, i.e., in natural economy. For in natural economy there is a multiplicity of aims of economic activity, quantified in various degrees and not commensurable with each other, nor are the means commensurable either. In these conditions activity follows the customary and traditional paths, traditionally established aims are realized with the aid of traditional means. The development of commodity production and

the attainment of the maximum effect for the minimum outlay of means. This, however, leads to a contradiction. Let us suppose that the first variant is satisfied, i.e., the maximum degree of realization of the aim for a given outlay of means is reached. Then the outlay of means cannot be reduced because this would lead to a reduction in the degree of the realization of the end. Or vice versa: let us suppose that the second variant is satisfied, i.e., a particular degree of realization of the end is obtained for the minimum outlay of means. It is then impossible to increase the degree of realization of the end because this would demand an increase in the outlay of the means. The variants are alternatives: their combination leads to a logical absurdity. Here, as in all reasoning dealing with the economic principle, it is assumed that the connection between the outlay of means and the degree of realization of the end is positive, i.e., the greater the amount of means employed the greater the degree of realization of the aim, and vice versa: a greater degree of realization of the end requires a greater amount of means. A more detailed explanation will be found in the appendix to this chapter.

commodity-money exchange gives birth to gainful activity with its uniform quantified end. The development of capitalist trade and the capitalist mode of production produces the capitalist enterprise where all elements of activity are quantified and subject to calculation, and where there is one single end—the maximization of profit. In the activity of the enterprise the principle of economic rationality is evolved together with the two variants of this principle—the principle of greatest efficiency and the principle of economy of means. This takes place gradually in the course of the development of the capitalist mode of production.

In the earlier period of capitalism, the enterprise is still connected with household activity or with other forms of natural economy. Apart from money profit the owner of the enterprise has other aims which he can realize within the framework of natural economy; this hampers his striving for the maximization of profit²².

However, as the elements of natural economy disappear and the enterprise is completely separated from the household and from all elements of natural economy²³, the maximization

²² Sombart gives examples of this kind of connection between an enterprise and either natural economy or household under early capitalism. In Silesia, as late as the beginning of the 19th century, iron ore mines belonging to land owners were worked in conjunction with agriculture. The amount of ore smelted was determined by the amount of timber the estate could spare for non-agricultural purposes. In Bolzano the great merchants closed their businesses in the summer and went on holiday. Even Benjamin Franklin devoted only six hours daily to his business. Other aims competed with the maximization of profits. (See *Der moderne Kapitalismus*, ed. cit., vol. 2, pt. 1, pp. 53–58).

²³ A pioneer role in the separation of enterprise from the household of the owner was played by trading companies and later by joint stock companies. Trading companies developed in Western Europe in the 16th and 17th centuries mainly in connection with foreign trade and exploitation of colonies. It was against this same background that joint stock companies appeared, at first sporadically, in the 16th and 17th centuries. Capitalist industrial production developed, however, in the form of family enterprise or of company (the latter often being only a family enterprise legally registered). Such were, for example,

of profit together with the application of the principle of economic rationality begin to rule the enterprise undividedly. This is most clearly seen in the application by the enterprise of the second variant of the principle we have discussed, the principle of economy of means; this principle is an obvious and characteristic feature of capitalist enterprise. Marx drew attention to this when he wrote: "The economies realized in the application of constant capital, this method of getting a certain result out of the means of production with the smallest possible expense is regarded more than any other power inherent in labour as a peculiar gift of capital and as a method characteristic of the capitalistic mode of production"²⁴.

The principle of economic rationality is an economic necessity for capitalist enterprise not only because it is the only way to realize the end of the enterprise but also because competition between enterprises ensures its application, threatening bankruptcy to enterprises which do not use it. The race between enterprises to lower costs throws out of the market those which get left behind and are unable to keep up; it forces them into bankruptcy and liquidation. The natural selection carried out by competition allows only those enterprises to survive which have shown themselves able to apply the principles of economic rationality. Thus, for a capitalist enterprise, rationality in economic activity is not only the result of economic stimuli peculiar to capitalist relations of productions and exchange, but is quite simply a vital necessity. There is no room for sentiment, for traditional values not

the typical "firms" of Victorian England, the "firm" about which Alfred Marshall writes, recalling with obvious satisfaction the frequent careers of young men who, in return for good work in the firm, were rewarded with the owner's daughter for a wife. (See *Principles of Economics*, 9th ed., London 1936, p. 301). In spite of the family character of the enterprise, its size and function as a factory formed a barrier separating it from the household of the owner's family. In the second half of the 19th century there was an enormous growth in the number of limited liability companies and joint stock companies—the classical form of contemporary capitalist enterprise.

²⁴ See K. Marx, *Capital*, Calcutta 1946, vol. III, p. 62.

quantified in money, nor for traditional slackness in gainful activity. Everything gives way to the iron necessity of maximizing profits²⁵.

Behaviour guided by the economic principle, the principle of economic rationality, is thus the product of historical development, a feature of a certain historical stage in the development of economic relations. It is not, as is sometimes falsely stated, a universal property of human economic activity (this will be dealt with later). On the contrary, as we have seen, throughout the long period of previous history human economic activity has been customary and traditional. The aims and means of this activity slowly change, and in some periods even change suddenly, but the activity remains traditional in character. Only the development of commodity and monetary relations and the capitalist mode of production created conditions in which part of economic activity, gainful activity, is rationalized and the end of activity is unified and quantified. Complete commensurability of end and means, the calculation of all elements of activity, the maximization of profit as the only end—all these are finally realized in capitalist enterprise. The principle of economic rationality is then applied in its entirety. Its application is enforced by competition which penalizes with bankruptcy any deviation from this principle. Thus in the course of a long process of historical development the practice of proceeding according to the principle of economic rationality has been formed, and with practice has come its conscious realization in human thought²⁶.

²⁵ The problem of the transformations which this economic necessity undergoes in monopoly capitalism demands separate consideration. This will be given later in this book.

²⁶ Quesnay, the founder of the physiocratic school, arrived at a formulation of the economic principle, although it was an imperfect one i.e., he combined the principle of the greatest effect with the principle of economy of means which, as we know, is contradictory. His formulation is as follows: "When the greatest possible increase in pleasure for the greatest possible economy in expenses has been achieved, then economic behaviour has reached perfection". *Sur les Travaux des Artisans, second dialogue. Ouvres économique et philosophiques de Quesnay*, Frankfurt and Paris 1888, p. 535.

Operation of the principle of economic rationality under capitalism restricted to private activity and antagonistic in character

The first historical triumph of the principle of economic rationality thus takes place in the capitalist enterprise, but it is a limited and distorted triumph. It is limited because it covers each enterprise individually and does not embrace the whole of the economic activity of society, the whole social process of production and distribution. The rationality of the activity of a capitalist enterprise is confined to *private economic rationality* and does not mean *social economic rationality*. The rationality of the activity of a capitalist enterprise consists in the application of the economic principle in the realization of a private end, for the maximization of private profit; it does not serve any end embracing the whole of the economic activity of society. It is a result of the private ownership of the means of production and of its consequence—the anarchic character of the capitalist mode of production.

The private ownership of the means of production will admit private economic ends for individual enterprises only; each of them struggles for the maximization of its own profit. There is no common end covering the whole of the social process of production and distribution—an end to which the activity of all enterprises would be subordinated. In other words, within a capitalist enterprise all means are integrated by the end of the enterprise. On the other hand, when the means of production are privately owned, there is and can be no integration of the economic activity of society. For this the social ownership of the means of production is indispensable.

The distortion of the principle of economic rationality is the result of the antagonistic character of capitalist production relations. Within the framework of capitalist production relations, the maximization of profit by an enterprise is effected by the exploitation of the class of wage-labourers; for profit is part of surplus value. The application of the economic principle by capitalist enterprises is the source of a continual pressure by the owners of the enterprises to increase the amount

of surplus value, often at the price of the health, safety—and even the lives of the workers. This is most easily seen when a capitalist enterprise applies the second variant of the economic principle—the principle of the economy of means. The economy of means for a capitalist enterprise is economy in the costs of production, that is, economy in material outlay and economy in expenditure on labour power, that is, economies in wages. The first leads to conditions of labour which neglect the health and safety of workers and their personal needs as workers. The latter results in a constant pressure on wages and a reduction in the number of employees, often leading to mass unemployment.

Discussing the application of the principle of economy to the means of production, Marx states: “In conformity with its contradictory and antagonistic nature, capitalist production proceeds to add to the economies in the use of constant capital²⁷, and thus to the means of increasing the rate of profit, a prodigality in the use of the life and health of the laborer himself... Such economies are: the overcrowding of narrow and unsanitary rooms with laborers, or, in the language of the capitalist, a saving in buildings; a crowding of dangerous machinery into one and the same room without means of protection against this danger; a neglect of precautions in productive processes which are dangerous to health or life, such as mining—etc.; not to mention the absence of all provisions to render the process of production human, agreeable, or even bearable, for the laborer. From the capitalist point of view, such measures would be quite useless and senseless. No matter how economical capitalist production may be in other respects, it is utterly prodigal with human life”²⁸.

²⁷ By constant capital Marx understood the value of the means of production employed.

²⁸ K. Marx, *Capital*, Calcutta 1946, vol. II, pp. 63–64. Kautsky very clearly exposes the antagonistic operation of the principle of economic rationality within the framework of the capitalist mode of production: “To economize is certainly not only a technical but also an economic virtue. There

The effort to keep wages at a minimum needs neither illustration nor commentary. If disregard for the health, safety and lives of workers in the leading capitalist countries has to-day decreased—and if to some extent the effort to keep wages at a minimum has lessened—this is not a result of the principle of economic rationality applied in capitalist enterprises. All this happens in spite of this principle, as a result of the strength of the working class, its trade union and political organization and its ability to use this strength. This is shown by the fact that the phenomena described by Marx still exist in the countries in which the working class is weak, unorganized, and deprived of opportunities for political activity as, for example, in colonies, underdeveloped countries, and in countries under foreign rule or with an undemocratic political system.

Thus, within the capitalist mode of production the principle of economic rationality operates antagonistically.

The restricted, private character and the antagonistic mode of operation of the principle of economic rationality within the framework of the capitalist mode of production means that its application by capitalist enterprises does not guarantee the optimum use of means from the point of view of society as a whole, i.e., the optimum use of the social productive forces. Maximum economy in the use of means in an enterprise is connected with a social waste of means. This shows itself in the waste of human productive forces (of which we have already spoken) as well as in the waste of material produc-

are however economic relations, in which the mighty ones are prodigal with the labour power of those dependent on them—slaves or hired labourers—and who regard this as economy. This prodigality is typical of certain economic relations... In a world of opposed class interests not every economy can be held to be an economy from the point of view of everybody concerned. The capitalist economizes in costs but not in the labour time of his workers. There where no resistance is encountered thoughtless prodigality is allowed—for very economic reasons. Not in economy but only in technique is 'the economic principle' always unequivocal, since there are no opposed interests or classes in technique". (*Die materialistische Geschichtsauffassung*, ed. cit., vol. 1, pp. 726-7).

tive forces. This applies particularly to natural resources, which are often recklessly exploited by capitalist enterprises as is the case, for example, with forests, sea fishing, or the exploitation of land. The tendency to reckless exploitation of the labour force and natural resources is a result of the fact that because of the peculiar nature of capitalist relations of production a capitalist enterprise takes no account of the social need for the reproduction of the labour force and natural resources.

Another symptom of the waste of productive forces is economic crisis—a joint result of the limited, private character and antagonistic operation of the principle of economic rationality when applied in capitalist enterprise. Mention should be made of the waste of productive forces which results from the activities of monopolies and oligopolies²⁹ which limit production in order to maintain a monopolistic structure of prices and capital values as well as the waste connected with the fact that monopoly capitalism is economically incapable of developing the productive forces of backward countries. Thus the principle of economic rationality, applied within the framework of the capitalist mode of production, gives a distorted result and from a general social point of view a result contradictory to its own logic of the optimum use of means. This is a result which, as Marx put it; “loses for society what it gains for the individual capitalist”³⁰.

In spite of these distortions, the rationalization of economic activity within the capitalist enterprise, the practice of proceeding according to the principle of economic rationality, and especially the consciousness of this principle in human thought, all constitute an achievement of historic significance. This is an achievement on a par with the imposing advance in material technique made within the capitalist mode of production, an advance which is itself closely connected with the application of the principle of economic rationality in enterprise. The rationalization of economic activity and the applica-

²⁹ For the meaning of the term oligopoly see below page 305, note 28.

³⁰ K. Marx, *Capital*, ed. cit., vol. II, p. 64.

tion of the principle of economic rationality in order to maximize an enterprise's profit stimulates the development of productive forces. At present, when as a result of the maturity of the productive forces it is possible and at the same time necessary to pass to new production relations based on the social ownership of the means of production—it is at the same time possible and necessary to pass from private rationality to rationality on a social scale, to social economic rationality. This opens a new phase in the history of the application of the principle of economic rationality.

*Planning of social economy—realization of social
economic rationality*

As we have pointed out, social rationality of economic activity demands that the aims of individual enterprises be subordinated to an end which embraces the whole of the social process of production and distribution; in other words, it requires the coordination of the activities of individual enterprises, the integration of their aims by a common end directing the economic activity of society. This coordination is called the *planning of the social economy*. The need to go beyond the bounds of private rationality and the need to coordinate the activities of individual enterprises—a need for planning—appears to a certain extent even under capitalism. It appears within the framework of capitalist industrial organizations like the trusts and cartels which are formed in the period of monopoly capitalism and as a result of the taking over of various fields of economic activity by the state. Since, however, the means of production are still privately owned such plans cannot cover the whole of the social economy. It thus extends the reach of private economic rationality but does not change its limited character or its antagonistic mode of operation. Moreover, since the means of production are privately owned, plans of this kind covering a group of capitalist enterprises have a limited effect on individual enterprises. For reasons which will be discussed later in this book even plans laid down by the state have only a limited effectiveness.

especially with respect to large monopolistic or oligopolistic enterprises, unless these plans form part of their common private economic aims. But even then the rationality of these plans is distorted by the antagonistic character of capitalist relations of production.

Social economic planning, that is, the realization of social rationality in production and distribution, is only possible in the socialist mode of production.

The social ownership of the means of production changes the character of the enterprise, it becomes—a *socialist enterprise*. Maximization of profit is no longer the ultimate end. The activity of a socialist enterprise is subordinated to the general social end, expressed in the plan for the social economy. The social economic plan sets the end in the form of a quantitative measurable target; normally in the shape of national income. The plan also normally determines the more important means serving to realize this end, e.g. the volume and composition of investment, production in various branches of industry and agriculture, employment, distribution, etc., and sets targets for enterprises.

The category of profit is retained in socialist enterprise but ceases to be the ultimate end of its activity and becomes the means of subordination to the general social end of the plan. Profit serves as a stimulus to the completion of the planned targets and as a test of how far the economic principle is observed. Thus in the socialist mode of production the aims of the activity of individual enterprises are integrated in a common social end determined in the social economic plan. The scope of this integration can vary and corresponds to the extension of society³¹. At the moment, in countries in which the socialist mode of production prevails or is developing, this scope coincides with the state organization of society and hence covers the national economy. At a later stage in the development of the socialist mode of production the

³¹ As explained above, by society we mean all people connected with each other by co-operation and the division of labour, that is, people who work together and for one another. See Chapter Two.

scope of social economic planning will undoubtedly become international; to-day the nuclei of this process are already appearing³².

Hierarchic structure of ends as a feature of socialist planning

The subordination of the activity of a socialist enterprise to the end established in the social economic plan may be either direct or indirect. Within the framework of the national economic plan, for example, there may be plans at various lower levels. There may be provincial plans, district plans, etc., as well as plans for particular groups of enterprises, e.g., a plan for the machine industry or a plan for lignite. The activity of enterprises may be subordinated to a plan at a lower level rather than directly to the general social economic plan. All the plans at a lower level, however, are subordinated to the general social economic plan; the aims set in them are means for the realization of the end set in the general social economic plan. Moreover, some socialist enterprises may have no general targets set for them in the plan, and operate according to the principle of the maximization of profit. By laying down the conditions under which the maximization of profit takes place, the plan at the same time determines the result of the activity of such enterprises. This is also a way of indirectly subordinating the activity of an enterprise to the end of the social economic plan.

The integration of the aims of the activity of socialist enterprises by a common end established in the social economic plan leads to a hierarchic structure of ends. At the top of this structure stands the main end, i.e. the end of the social economic plan which we shall call the first order end. The means serving directly to implement that end are second order ends. The means serving directly to the realization of aims of the second order are third order ends, and so on. The aims of the activity

³² A nucleus of this kind is to be found in the Council of Mutual Economic Aid whose members are the Soviet Union and the European People's Democracies; the Chinese People's Republic and other Asiatic socialist states are also taking part in its work.

of various enterprises occupy different levels in this hierarchy of ends. Railways and steel foundries, for example, realize second order ends while a local forge or button factory realizes ends at a lower level in the hierarchy. The place occupied by the aim of the activity of a given enterprise in this hierarchy of ends normally determines whether that enterprise is directly or indirectly connected with the national plan; it also determines the level and character of an indirect connection.

A hierarchic structure of ends is a peculiarity of the socialist mode of production just as a peculiarity of the capitalist mode of production is the existence of independent parallel aims of individual enterprises: their attempts to obtain the maximization of their profits. For the hierarchic structure of ends is the expression of the social economic plan and the integration of the aims of individual socialist enterprises by a chief end laid down in the social economic plan. It is at the same time the expression of the social rationality of the socialist mode of production. This rationality, finding its expression in the hierarchic structure of ends does not appear fully-fledged together with socialist relations of production. It develops slowly and laboriously together with the socialist mode of production.

From the capitalist mode of production the socialist mode of production, apart from productive forces, inherits only the methodology of the private rationality of capitalist enterprises, in particular, calculation and book-keeping, together with the idea of the principle of economic rationality itself. This is a great historical inheritance but it is not sufficient to realize the social rationality of production and distribution. It makes it possible to apply the economic principle in individual enterprises but provides no way of uniting the activity of enterprises with a hierarchic structure of ends subordinated to the realization of the main end. Socialist society has to work out such a way in the course of its own development.

Basic problems in social economic planning

In the initial period of the development of the socialist mode of production the coordination of the various aims of economic

activity and their arrangement in a hierarchic structure of ends, which is the expression of the application on a social scale of the principle of economic rationality, is carried out with difficulty. In the first place, elements left over from earlier modes of production, like the capitalist sector, and sometimes also feudal elements, yield only with difficulty to social economic planning. It is also difficult to plan the activity of small commodity production. There are, moreover, two other difficulties. One consists in the fact that the aims of the social economic plan are not coordinated and are often not quantified and that there is more than one end to which the remaining aims might be subordinated in a hierarchy. Only gradually as practice in planning is acquired is the main end crystallized and all other aims integrated in a hierarchic structure of ends. The second difficulty lies in the fact that methods of carrying out such an integration are not yet developed. These difficulties are overcome by the development of the methodology of social economic planning.

The methodology of social economic planning plays a role in the socialist mode of production analogous to that played by calculation and book-keeping in an enterprise. Calculation and book-keeping also form the historical point of departure for the methodology of social economic planning. Marx noted that under socialism book-keeping, which is a product of capitalist development, will find its application in social economic planning. Marx writes: "After the abolition of the capitalist mode of production but with the preservation of social production... the regulation of the hours of work and the division of social labour among different productive groups, and finally *the book-keeping involved with all this* (my italics, O. L.) will become more essential than they have ever been before"³³. Still earlier, in this connection Marx noted the neces-

³³ K. Marx, *Das Kapital*, ed. cit., vol. 3, p. 907. See also *Capital*, ed. cit., vol. II, p. 100: "Book-keeping as a method of controlling and understanding this process becomes increasingly necessary the more the process reaches a social scale and loses its individuality—it is thus more necessary in capitalist production than in handworkers' and peasant production, more necessary in collective than in capitalist production"

sity of applying the principle of economic rationality: "Economy of time together with the planned division of labour time among various branches of production thus remain the first economic law of common social production (*gemeinschaftliche Produktion*). It becomes a law of even greater importance than before"³⁴. Lenin wrote with especial emphasis of the need to apply book-keeping and economic statistics in the socialist economy. He considered book-keeping, applied on the scale of the whole national economy, to be the essential feature of the socialist mode of production. "Book-keeping at state level, the *recording* of the production and distribution of products at state level is, so to speak, something like the *skeleton* of socialist society"³⁵. Lenin frequently emphasized in his writings and speeches the need for a general national accountancy covering the whole social process of production and distribution.

The method of social economic balances

Social economic planning is developed by appropriating the categories and methods of the book-keeping employed in capitalist enterprise and applying them to the whole social process of production and distribution. The chief methodological device has become the *balance accounting*. The drawing up of a balance for the whole of the social process of production and distribution was first carried out in the Soviet Union, the first country in which the socialist mode of production appeared. The practice of planning the national economy in the Soviet Union requires a whole series of annual balance sheets covering the most important aspects of the national economy. The first balance sheet, covering the whole of the national economy of the USSR for 1923/1924, was published in 1926. At present a balance of output and utilization of materials (material balances), of the requirement and resources available for the various branches of production and distribution, of

³⁴ K. Marx, *Grundrisse der Kritik der politischen Oekonomie*, Berlin 1953, p. 89.

³⁵ V. I. Lenin, *Will the Bolsheviks retain the power of the State? Sochnyanya* (Works), vol. 26, p. 89.

industrial machinery, of foreign trade, of the incomes and expenditure of the population etc., are drawn up each year. Individual balance sheets are combined to form a general balance sheet for the whole of the national economy, which gives a synthetic picture of the social process of production and distribution showing the production and division of the national income and the direction of the appropriate parts for consumption and investment. In the USSR specific balance sheets and the balance sheet for the national economy have become a part of economic statistics which has been adjusted to the needs of national economic planning³⁶.

Balance accounting is an instrument for coordinating the various tasks of the national economic plan, an instrument for integrating all the aims contained in the plan in a hierarchic structure of ends. It is also a method of checking the plan for its agreement with the principle of rational economy, since it makes it possible to ascertain whether and to what degree the various means at the disposal of society are used up. Social economic balance sheets thus play a role in socialist economy similar to that played by calculation in a capitalist enterprise

³⁶ For the history of balance accounting in the Soviet Union see T. Riabushkin, *Iz istorii balansa narodnovo khoziastva SSSR* (History of Balance of National Economy in the USSR). Doklady soviet-skikh uchenykh na XXXI sesyu Mezhdunarodovo Statisticheskovo Instituta, Academy of Sciences of the USSR, Moscow 1958. Every Soviet textbook of economic statistics now contains a list of all the more important kinds of social-economic balances and an account of their preparation. See, for example, *Kurs ekonomicheskoy statistiki* (Course of Economic Statistics), ed. A. Petrov. Moscow 1961, chapter VIII, and A. Gozulov, *Ekonomicheskaya statistika* (Economic Statistics), Moscow 1953, chapter VII. On the balance of national economy see S. Strumilin, *Balans narodnovo khoziastva kak orudiye sotsialisticheskovo planirovaniya* (Balance of National Economy as an Instrument of Socialist Planning) "Voprosy Ekonomiki", 1954, no. 11, and V. Niemchinov, *Statisticheskyye jekonomicheskyye voprosy postroyeniya balansa narodnovo khoziastva. Uchenyye zapiski po statistiky*, (Statistical and Economic Problems of Drawing up a National Economic Balance. Scientific Notes on Statistics), Vol. III, Academy of Sciences of the USSR, Moscow 1957. For Polish literature on the subject see *Statystyka spoleczno-gospodarcza*, (Socio-economic Statistics) ed. Kazimierz Romaniuk, Warsaw 1954, chapter XIII.

with, however, one difference, namely that these balance sheets are instruments for controlling social economic rationality and not private economic rationality like calculation in a capitalist enterprise.

The use of social economic balances has spread to all countries in which the socialist mode of production has appeared and in which planning of the national economy has consequently been introduced. Recently the practice of drawing up balances covering various aspects of the national economy has been introduced in a number of capitalist countries as a result of the evergrowing need to go beyond the bounds of private economic rationality which we have already mentioned, and the consequent increased intervention of the state in economic relations together with the direct economic activity of the state. The second world war especially, together with the post-war needs of economic reconstruction, helped to bring this about. The successes of the national economy of the USSR also played a great part in this as did the desire to make use of the planning methods developed in the USSR in order to rationalize and stabilize capitalist economy³⁷.

The use of balance accounting for the whole of the national economy in capitalist countries is called "*social accounting*" or "*national accounting*"³⁸. A method using balances combined with the mathematical formulation of the conditions necessary for the consistency of the aims of a production plan has acquired especial importance. This method, input-output analysis, arose under direct influence of Marx's analysis

³⁷ On the effect of the successes of planned economy in the USSR on the economic policy of capitalist countries and attempts to adopt certain elements of the Soviet method of planning the national economy see E.H. Carr, *The Soviet Impact on the Western World*, London 1947, pp. 20-42.

³⁸ See R. Stone, *Function and Criteria of Social Accounting*, Income and Wealth, Cambridge, 1951; F. Perroux, *Les comptes de la Nation*, Paris 1949, J. Ohlson, *On National Accounting*, Stockholm 1955. See also Erich Schneider, *Einführung in die Wirtschaftstheorie*, I, 6th ed., Tuebingen 1955, part 1, chapter VI. In capitalist countries national economic balances are sometimes called "national economic budgets".

of the social process of reproduction and the development of the use of social economic balance-sheets in the Soviet Union during the period when the first five-year plan was being prepared³⁹.

Within the framework of the capitalist mode of production the significance of "social accounting" is limited; social rationality in economic activity is, as we have seen, impossible under these conditions. The significance of "social accounting" in capitalist countries consists rather in that it produces an awareness of the necessity of crossing the bounds of the private

³⁹ Input-output analysis was introduced by the American economist Vassily Leontief in his book *The Structure of American Economy, 1919-1930*, New York 1941 (earlier, in 1937, he published an article on the subject in the "Review of Economic Statistics"). This analysis is now employed in many countries and there is a great deal of literature on the subject. Oskar Lange gives an introduction to input-output analysis in *Introduction to Econometrics*, second edition, Warsaw-London 1962, pp. 259-338, as does Paweł Sulmicki in *Przepływy międzygaleziowe* (Inter-industry Flows), Warsaw 1959. The first outline of the basic concepts of his analysis was published by Leontief in 1925, *Balans narodnovo khoziaistva SSSR* (Balance of the National Economy of the USSR), "Planovoye Khoziaistvo" no. 12. This article was written in connection with the discussion on the preparation of the first Soviet five-year plan. At the time Leontief was an employee in the State Economic Planning Commission of the USSR (Gosplan); he continued his work on balances of national economy in the United States. Interest in his work was roused during and after the second world war, when his methods found important practical application. A comparative analysis of input-output analysis and the Soviet method of national economic balances has been made by W.S. Niemchinov *Balansovyyi metod v statistikye. Doklady sovietskikh uchenykh na XXX sesyu Mezhdunarodnovo Statisticheskovo Instituta* (Balance Method in Statistics. Reports of Soviet Scientists for XXX Session of the International Statistical Institute), Academy of Sciences of the USSR, Moscow 1957. Niemchinov comments favourably on Leontief's contribution to the study of national economic balances. See *Nyekotorye voprosy ispolzovaniya balansovovo metoda v statistikye vzaimnosviazannykh ekonomicheskikh system. Doklady sovietskikh uchenykh na XXXI zjezd Mezhdunarodnovo Statisticheskovo Instituta*. (Some Problems of Using the Balance Method in the Statistics of Interrelated Economic Systems. Reports of Soviet Scientists for the XXXI Congress of International Statistical Institute), Moscow 1958, pp. 17-18.

rationality of individual enterprises and ensuring the social rationality of the process of production and distribution. The methods of "social accounting", especially input-output analyses, find their full application only in the planning of a national economy, and hence only within the framework of the socialist mode of production. The scientific procedure of investigation connected with these methods are now employed in national economic planning in socialist countries⁴⁰.

After the adoption by capitalist enterprises of double entry book-keeping and balance accounting, the social economic balance accounting constitutes the second great historic step in the development of methods of rational economic activity. Book-keeping (together with balance accounting) appeared in the initial stages of the development of capitalism as an instrument of commercial calculation—the original basis of the application of the economic principle in capitalist enterprise. The social economic balance or "social accounting", appeared in the initial stages of the development of the socialist mode of production as the instrument of socialist calculation in applying the principle of economic rationality at the level of the national economy.

Different spheres of application of the economic principle

The economic principle, or the principle of economic rationality, evolved with man's economic activity. Hence its name. Its application is not, however, limited to economic activity. The economic principle is applied in many other spheres of human activity, above all in technology. The amount of work done by an engine may vary for a given amount of fuel or, what is the same thing, the amount of fuel used by an engine may vary for the performance of a given amount of work. We speak of a greater or lesser technical efficiency of the engine.

⁴⁰ Input-output analysis is now being employed in the Soviet Union, Poland, Yugoslavia, Hungary and Czechoslovakia. Socialist countries have also started to use linear programming, a point which will be discussed later.

When designing an engine we design one of the greatest possible technical efficiency for a particular cost of construction. Similarly, in planning a power station, we endeavour to obtain the greatest technical efficiency, measured, say, in terms of the number of kilowatts of electric energy produced per ton of coal used, for particular costs of construction. This is procedure according to the economic principle.

Another field in which the economic principle is applied is that of military strategy and tactics. Rational strategy or tactics consists in obtaining the maximum strategic or tactical effect with a given number of forces, or—putting the same thing in the form of the second variant—in obtaining a particular strategic or tactical effect with the minimum number of forces. We find similar examples in all fields of rational activity: the rational method of teaching the piano is that method by which the pupil makes the most progress in a given time (or by which a particular amount of progress is made in the minimum amount of time); the rational method of transporting loads is that by which a given load is transported with the minimum of effort or by which the maximum load is transported for a given effort. The economic principle also finds application in scientific research. It appears most clearly in mathematical statistics when a certain parameter is to be estimated or a statistical hypothesis has to be verified on the basis of the smallest possible number of observations; well-known in this connection is the concept of the efficiency of various statistical methods.

Thus it can be seen that the economic principle is the principle of all rational human behaviour directed to the maximum realization of a given end. Wherever activity is rational and the end is quantitatively measurable, or at least can be expressed in the form of a greater or lesser degree of realization, there the economic principle is at work. Economic activity is the widest field for the application of the economic principle and is the sphere in which the principle first appeared, although not the only one. Moreover, the economic principle has entered and is continually taking over new fields for its application.

In the capitalist mode of production, as we know, quantification of aims and rationalization permeates all fields of economic activity which became the domain of gainful activity and especially of capitalist enterprise. This induces the rationalization and quantification of aims in many other fields of human activity, since these fields are directly connected with gainful activity (e.g., in technology), or indirectly—as a result of the “mental climate” prevailing in the capitalist social formation. Individual and social life, together with culture, are rationalized and in part become a field for the quantification of aims (e.g., the quantitative measurability of results in modern sport). In this way more and more fields of human activity are submitted to the application of the economic principle.

The socialist mode of production makes possible further progress of rationalization—and most likely also of quantification of aims—of various fields of human activity. Social rationality is introduced by the inclusion of the whole social process of production and distribution in a social economic plan thus necessarily strengthening the trend toward rational behaviour in all fields of human activity. Moreover, the superstructure of the socialist social formation has no need of those numerous irrational and even anti-rational constituents which are necessary in social formations based on antagonistic relations of production. On the contrary, in a socialist society these constituents are an obvious hindrance to social development and active attempts are made to get rid of them. Consequently it is to be expected that the economic principle, that is, the principle of economic rationality, will embrace an ever greater area of human activity.

Praxiology—the science of rational activity

In view of the fact that rationality of action is now a feature of many fields of human activity, there arises the problem of discovering what it is that is common to all fields of rational activity. This has led to the general study of rational activity,

praxiology. This is still a very young science; so far the most systematic exposition of its foundations has been made by Tadeusz Kotarbiński⁴¹. Praxiology may be described as the "logic of rational activity". For it deals with the methods of inference employed in rational activity. It formulates the general concepts which arise from rational activity. These are concepts

⁴¹ The first systematic treatment of praxiology is Kotarbiński's book *Traktat o dobrej robocie* (Treatise on Good Work) published in 1955. Kotarbiński however began his work on praxiology much earlier. See *Szkice praktyczne* (Essays on Practice) (1913), *Czyn* (Action) (1934), and *O stosunku sprawstwa* (Causal Action) (1925). All these papers are in *Pisma Wybrane* (Selected Works) vol. 1, Warsaw 1958. A brief outline of the basic concepts of praxiology is contained in *Logic Course for Lawyers* (in Polish) pp. 156-164 and in *Sprawność i błąd* (Efficiency and Error), Warsaw 1957 (especially the last chapter). For the separation of praxiology from the technique of activity see Kotarbiński, *Zdania prakseologiczne* (Praxiological Sentences), "Studia Filozoficzne", no. 4, Warsaw 1960, and *Rodzaje zdań prakseologicznych oraz sposoby ich uzasadniania*, (Types of Praxiological Sentences and their Justification) "Kultura i społeczeństwo", no. 4, Warsaw 1960. According to Mises (*Human Action*, p. 3), the term *praxiology* was first used by the French sociologist Espinas in 1890, in an article on the origins of technology. It appears that the first work on praxiology—using this term—was published in 1926 by the famous Soviet mathematician Eugene Slutsky with the title *Ein Beitrag zur formal-praxeologischen Grundlegung der Oekonomie* in *Academie Oukrainienne des Sciences, Annales de la classe des sciences sociales-economiques*, vol. 4, Kiev 1926 (in German and Ukrainian). Kotarbiński is responsible for the fact that the term has now become more widely known and used. Mises also uses the term in the book which we have already cited (first published in Geneva in 1940 with the title *Nationaloeconomic. Theorie des Handelns und Wirtschaftens*). As we shall see in due course, Mises falsely identifies praxiology with political economy. Kotarbiński's definition also raises some doubts. He describes praxiology as the science of effective activity (*A Logic Course for Lawyers* [in Polish], ed. cit. p. 6; *Efficiency and Error* [in Polish], ed. cit., p. 104); in *Treatise on Good Work* [in Polish], ed. cit., p. 7, he is talking about a general theory of efficient activity, which is not the same thing. It seems to us that praxiology should be defined as the science of *rational* activity, using the word rational in the methodological sense; the effectiveness of an activity is connected with its factual rationality which, however, is not an attribute of activity as a mode of behaviour and is therefore not a question of praxiology but of technology.

like end and means, method, action, plan, effectiveness, efficiency, economy and so on. These concepts are called *praxiological categories*. Praxiology establishes relations between praxiological categories which are called *praxiological principles of behaviour*; principles of this kind appear in every field of rational human activity⁴². The economic principle, or principle of economic rationality, is precisely one of these praxiological principles of behaviour.

Branches of scientific research belonging to praxiology: operations research and the science of programming. Cybernetics—a science auxiliary to praxiology

Kotarbiński's work on praxiology was the result of purely academic interest and derived from the author's studies in the field of logic and the general methodology of science. Parallel to and independent of Kotarbiński's work, two kindred branches

⁴² Formerly praxiological categories and principles of behaviour appeared in only two sciences, in ethics and in political economy. These disciplines were often called *moral sciences* especially in England and France, that is, the study of human behaviour. Treatises on ethics contain a great number of praxiological categories, and in political economy many praxiological principles of behaviour have been developed. As we shall see in due course there is even a tendency in political economy to identify economic science with praxiology. Since science is a field of human activity praxiological principles of behaviour are to be found here as well. For instance, the foundation of mathematical statistics (i.e., the science of the estimation of certain magnitudes and the verification of hypotheses on the basis of statistical observation) consists not only of the calculus of probability but also of certain praxiological principles of behaviour. In statistical estimation there are two rival principles of procedure: R. A. Fisher's principle of the maximum likelihood, and Markov's principle of the least variance (used earlier by Gauss). Recently a general theory of statistical decisions has been developed which derives all the principles of procedure employed in mathematical statistics from the economic principle. See A. Wald, *Statistical Decision Functions*, New York 1960, pp. 8-10. Praxiological principles of procedure in science are dealt with by the general methodology of science. Dialectical materialism treats all cognition as the result of human social activity and bases its theory of cognition on the praxiological principle of proceeding according to "the criterion of practice".

of scientific research have recently developed in direct response to practical requirements. They are *operations research* and the *science of programming*. Both developed from military problems during and immediately after the second world war and very quickly found their application in economic activity in problems like the organization of supplies and transport, the co-ordination of production, the planning of investment and so on⁴³. The science of programming soon absorbed input-output

⁴³ At the beginning of World War II operations research groups were set up in the British armed forces in order to analyze scientifically the methods used in military operations. A notable part was played in this by two physicists, P.M.S. Blackett and J.D. Bernal. These groups, made up of scientists, dealt with problems like the optimum number of ships in a convoy, the optimum size of a bomber squadron, the optimum depth of explosion of depth charges. After the United States' entry into the war, operational research groups were also set up in the American armed forces. They dealt with problems like the optimum route of a ship during an air attack, the optimum disposition of mines at the entrance to an enemy port etc. A brief history of these groups is given by J.F. Closskey and F.N. Treethen in *Operations Research for Management*, 1954; and by J.D. Bernal in *Science in History*, London 1954, pp. 580-581. See also C.W. Churchman, R.L. Ackoff, E.L. Arnoff, *Introduction to Operations Research*, New York 1958, pp. 9-12. Bernal thinks that operations research was an important factor in the superiority of the armed forces of Great Britain and the United States over Nazi Germany's armed forces which employed more intuitive methods. In the United States there currently exist six or seven firms which specialize in operations research for industrial and trading enterprises and some big companies have their own operations research department. In Great Britain operations research institutes have been set up by business organizations and deal with industry, rail and municipal transport, road construction etc. The "Operational Research Quarterly" is published in England, "Operations Research" in America, and "Revue de Recherche Operationelle" in France. The theory of programming was developed in the United States after the Second World War as a continuation of operations research. At first it was used to establish the optimum co-ordination of activities like recruiting, training, equipment, the maintenance and renewal of stores, the construction of airfields etc. Later it found a wide application in economic activity. A brief historical sketch is given by R. Dorfman, P.A. Samuelson and R.M. Solov in *Linear Programming and Economic Analysis*, New York 1958, pp. 1-5. The fundamental concepts of programming had, however, been developed earlier in the Soviet Union in connection with the problems of the organ-

analysis as one of its constituent parts. To-day, operations research and the science of programming are applied in various fields of human activity where a great number of actions intended to achieve a particular aim must be co-ordinated and where the optimum arrangement of these actions must be found, i.e., a system which will ensure the realization of the end in the maximum degree must be worked out. For this reason these fields of enquiry form part of praxiology⁴⁴.

Finally, the third discipline which has developed in recent years, cybernetics, is also linked with praxiology—especially that part of it called the theory of information. Cybernetics is the abstract study of systems composed of elements which mutually interact upon each other⁴⁵. Cybernetics dissects these relations into chains of causes and effects, formulates the mathematical connections between them and studies the causal

ization and planning of production. See L.V. Kantorovich, *Matyematicheskiye metody organizatsii i proizvodstva* (Mathematical Methods of Organization and Production), Leningrad 1939. Kantorovich also published two other papers on the application of programming, *On the Translocation of Masses*, *Doklady Akademii Nauk SSSR*, 1942, nos 7 and 8; *Primyenyeniye matyematicheskikh myetodov v voprosakh analiza gruzopotokov* (Use of Mathematical Methods of Analysis of Transport), in the book *Problemy povisheniya efektivnosti raboty transporta* (Problems of Improving the Efficiency of Transport), Academy of Sciences of the USSR, Moscow-Leningrad 1949. Kantorovich has published a systematic exposition of programming with the title *The Economic Reckoning of the Optimum Use of Resources* (in Russian), Moscow 1959. A good introduction to programming is given by Wiesław Sadowski in *Teoria podejmowania decyzji* (The Theory of Decision), Warsaw 1960.

⁴⁴ An outline of the most important problems and methods of operations research is given in the books listed in note 43. As far as Polish literature is concerned mention should be made of Oskar Lange's *Introduction to Econometrics* (chapter three contains an introduction to programming).

⁴⁵ The term "cybernetics" comes from the Greek "κυβερνήτης", meaning helmsman. The word *gubernator* (governor) is etymologically related to it. Since the first use of this term applied to self-governing machines and devices, and then to self-governing biological processes, cybernetics was called the "science of control". The founder of cybernetics is Norbert Wiener. See his book *Cybernetics. Control and Communication in the Animal and the Machine* first published in Paris and New York in 1948.

chain processes taking place in these systems. Cybernetics has two applications in praxiology. Firstly, when human activity is indirectly aimed at a goal through setting in motion a long chain of interconnected causes and effects. Cybernetics then makes an exact analysis of the processes at work in this chain. Secondly, when external conditions alter in the course of an activity and especially when this alteration is a result of the very activity. In this case, if we want to reach the desired end it is necessary to change the means of action. This gives rise to the sequence: end—means of action—alteration in conditions—new means—new alteration in conditions etc. The basic element in the effectiveness of the activity is rapid, accurate, and sufficient information about the alteration in conditions which takes place in the course of activity and the rapid adjustment of the means to the altering conditions. This can be interpreted as a process “of learning” in the course of activity which takes place in conditions subject to change. Cybernetics analyses the process.

It can be seen that the rationalization of various fields of human activity gives rise to a series of new disciplines dealing with rational activity. These disciplines form constituent parts of praxiology—the general study of rational activity. Furthermore, cybernetics has appeared: a science dealing abstractly with a broad class of very general problems and concerning itself with certain aspects of human behaviour as a special case. The significance of cybernetics for praxiology lies in the fact that praxiology uses the results of cybernetics, applying them in the investigation of particular problems of human activity. Cybernetics is a science auxiliary to praxiology.

The principles of programming

Praxiology is important in political economy chiefly because it deals with the study of programming. The study of programming is concerned with the question of the choice of appropriate means for the realization of a particular end when the means are quantitatively measurable and the end may be real-

ized in Varying degrees. The selection of these means is called programming, and the set of means chosen for the realization of an end is called a programme. Programming is made up of two parts.

The first consists in determining the available means and their possible applications and in establishing the consistency of these various applications. The possible applications are limited by the nature and quantity of the means; not all applications can be carried out. Nor are all applications consistent with each other. Some applications may be contradictory, and may disagree with each other. This is the case when there are insufficient means for all the applications or when one application for some reason renders another application impossible. Thus the various applications must be harmonized, or, as we say, the *internal consistency of the programme* must be established. The instrument by which the internal consistency of the programme is established is balance accounting. It is for this reason that the study of programming has absorbed various kinds of balance analysis, e.g., input-output analysis.

The establishment of the internal consistency of a programme is especially important where the structure of the means is complicated and takes the form of the hierarchy of ends which we have already discussed, where second order ends are the means for the realization of the first order end (chief end), third order ends are the means for the realization of second order ends, etc. The internal consistency of a programme requires that the structure of ends, in which each end is the means for the realization of a higher order end, should itself be internally consistent. The inner consistency of a programme is then a complicated matter and requires the application of special mathematical methods worked out by the science of programming.

The second part of programming consists in the establishment of the optimum set of means to be used, i.e., a set of means leading to the maximum realization of the end. This is called the *choice of the optimum programme*. The optimum programme is chosen only from internally consistent programmes since internally inconsistent programmes cannot be carried out in prac-

tice. As a rule there is a large (most frequently an infinite) number of internally consistent programmes from which the choice of the optimum programme is made. The choice of the optimum programme is quite simply the application of the economic principle to programming. As always, this principle may be applied here in two variants: either as the choice of the maximum realization of the end for a given outlay of means, or else as the choice of the minimum outlay of means for the realization of the end to a given degree.

Programming problems are solved mathematically⁴⁶. The degree of realization of the aim is considered as a mathematical function of the amounts of the various means applied. This is called the *objective function*. The conditions for the internal consistency of a programme are formulated as equations or inequalities, in which the unknowns are the amounts of the means applied. The equations (or inequalities) are called *balance relationships* because they express connections between the amounts of various means which are in fact balance relations. A set of particular amounts of the means is called a programme. An internally consistent programme is a set of amounts of means fulfilling the balance relationships; an optimum programme is a set of amounts of means for which the objective function reaches its maximum. By solving the balance relationships we obtain internally consistent programmes. Since we normally assume that the number of balance relations expressed as equations is less than the number of unknowns (there may be a greater number of inequalities), there are consequently many solutions (usually an infinite number) i.e. there are many internally consistent programmes. The set of internally consistent programmes is called *the domain of feasible solutions* of the programming problem. In the domain of the feasible solutions we pick out the optimum solution (or several such solutions, if there is more than one), i.e., the solution for which the objective function reaches its maximum. This gives us

⁴⁶ The reader will find an introduction to the mathematical methods of programming in the appendix at the end of this Chapter.

optimum programmes of which there may be one or more than one (even an infinite number). This depends on the properties of the objective function and the balance relationships.

It is worth noting that a programming problem can be solved in two ways. One is the method described here of finding the maximum of the objective function for given balance relationships. A second method consists in the construction, on the basis of the balance relationships, of an *outlay function*, in adopting as a balance relation an equation expressing a particular degree of the realization of the end and then in finding the minimum of the outlay function. The solution obtained by the second method is identical with the solution obtained by the first method. The existence of two methods of solving a programming problem is called in the terminology of the science of programming the *duality* of the problem of the selection of the optimum programme. This duality corresponds to the two variants of the application of the economic principle.

The method of determining the maximum of the objective function or the minimum of the outlay function depends on the properties of these functions. In practice we distinguish between two fundamental cases. One of them occurs when either the increment in the objective function caused by the use of an additional unit of a particular means or the decrement in the outlay function caused by a diminution in the use of a particular means by one unit is a variable quantity (or when both are variable quantities). Mathematically, this means that the value of the first derivatives of at least one of these two functions is variable. In this case maximum and minimum values are found in the usual way by the use of differential calculus. The application of differential calculus in programming is called *marginal calculus*. The second case occurs when the increment and decrement mentioned has a constant value, i.e., mathematically speaking, when the values of the first derivatives of both functions are constant. A method called *linear programming* is then used.

Marginal calculus

Marginal calculus consists in comparing the increments in the objective function caused by the use of an additional unit of various means (it is here assumed that all means are commensurable and measured in the same units; the conditions of commensurability are determined by the balance relationships). If an additional unit of one means causes an increment in the objective function smaller than an additional unit of another means, we may then obtain a net increase in the objective function by substituting a unit of one means for a unit of another. As long as we can go on doing this, the objective function has not yet reached its maximum. The maximum is reached when the increments resulting from an additional unit of a means (so-called marginal increments) are the same for all means. It is then impossible to increase the value of the objective function by substituting a unit of one means for a unit of another, i.e., by changing the programme. The programme is optimum. Similarly, the minimum of the outlay function is obtained when decrements in the value of this function resulting from the diminution by one unit of the means used (so-called marginal decrements) are the same for all means. As long as this is not so it is possible to decrease the value of the outlay function by substituting a unit of one means for a unit of another means.

As can be seen, the application of marginal calculus requires that the marginal increments of the objective function or the marginal decrements of the outlay function should change in such a way as to allow marginal increments or decrements to equalize in the process of replacing one means by another. For this purpose the marginal increments or decrements must be variable and must, moreover, vary in a particular way, so as to lead to their equalization. It is sufficient if this occurs either for marginal increments of the objective function or for marginal decrements of the outlay function. For in view of the duality of the problem of selecting the optimum programme, this may be solved by applying marginal

calculus either to the objective function or to the outlay function. Marginal calculus may not be applied, however, when both the marginal increments of the objective function and marginal decrements of the outlay function have constant values. In this case the procedure applied above leading to the equalization of the marginal increments or decrements is not possible. When marginal increments are constant quantities they are either always equal, independent of the amounts of the means applied, or they are never equal and the substitution of one means for another cannot lead to their equalization. The same is true of marginal decrement. In this case linear programming is used. Its name is due to the fact that in this case both the objective function and the outlay function are linear functions, that is, there is a simple proportionality between the additional amount of a means and the increment in the degree of the realization of the end. In this case the balance relationships, on the basis of which the outlay function is defined, are also linear equations or inequalities.

Linear programming

To determine the maximum of the objective function (or the minimum of the outlay function) linear programming uses linear algebra and the geometry of linear manifolds (i.e., geometrical objects formed by the intersection of planes in multi-dimensional space). The praxiological meaning of the procedure employed can be explained as follows. Since the marginal increments (first derivatives) of the objective function are constant they are therefore always all equal or all unequal. In the first case the replacement of a particular amount of one means by a particular amount of another does not alter the value of the objective function. All programmes are then optimum since all give the same value for the objective function. This is the trivial case. If, on the other hand, the marginal increments are not equal, the value of the objective function may be increased by replacing a unit of a means giving a smaller marginal increment by a unit of a means giving a greater marginal increment. Because the marginal increment does

not vary (it is a constant quantity) it is possible to proceed in this way as long as the balance relationships allow. Hence the limits of this procedure are determined by the balance relationships.

Thus, the maximum of the objective function is determined as follows. First, other means are replaced by the means giving the greatest marginal increment. This is done as long as the balance relationships permit. When the possibilities of such a procedure are exhausted, other means are replaced by the means giving the second greatest marginal increment of the objective function. When the balance relationships no longer allow this then the remaining means are replaced by the means giving the third greatest marginal increment, etc. This procedure is carried out as long as the balance relationships allow, or until the available means are exhausted. The objective function then reaches its maximum within the limits of the possibilities determined by the balance relationships.

As a result it can be seen that the optimum programme provides for the application of just as many means as there are effective limitations of the outlay of means in the balance relationships. For individual means are applied successively—in order of the size of the marginal increment of the objective function which they cause—each up to the limit determined by the balance relationships. It is not possible to use a smaller number of means than the number of limiting balance relationships since in that case not all the possibilities of increasing the value of the objective function would be taken advantage of. Nor is it possible to use a greater number since that would mean the partial application of means giving a smaller marginal increment of the objective function in the place of means giving a greater marginal increment.

Since in linear programming the value of the objective function increases in stages of which each (in contrast to marginal calculus) leads to the limit imposed by the balance relationships, therefore the optimum programme is found, as we say, "on the border" of the domain of feasible solutions, that is, the set of internally consistent programmes. This can

be illustrated by certain geometrical analogies⁴⁷. Similarly, the minimum of the outlay function is also determined in stages. First, other means are replaced by the means giving the greatest marginal decrement of the outlay function, etc., carrying each stage as far as the balance relationships will allow. As a result, the optimum programme is also found "on the border" of the domain of internally consistent programmes.

Methodological links between political economy and praxiology

Praxiology, and especially that part of it formed by the study of programming, is a science auxiliary to political economy like logic and mathematics, economic statistics and mathematical statistics, econometrics, economic history, economic geography and so on. It has a methodological significance for political economy since, wherever economic activity is rational, praxiological principles of behaviour form part of economic laws. When economic activity is rational the economic laws of human behaviour are a concretization of the praxiological principles of behaviour adapted to particular conditions. This is especially so where the end and the means of economic activity are expressed quantitatively as in a money economy and particularly in a capitalist enterprise. Then the economic laws of human behaviour express the application in given conditions of the economic principle, that is, the principle of economic rationality. Knowing the conditions in which economic activity takes place it is possible by means of the economic principle to *infer deductively* what laws of economic behaviour operate in these conditions. Knowing the conditions in which the activities of different people are connected and inter-operate, it is equally possible to infer deductively the economic laws of interplay of human activities.

From the fact, for example, that the owner of capital behaves rationally and that the aim of his activity is the maximization of profit, it follows that he places his capital in that

⁴⁷ See the appendix to this Chapter. These geometrical analogies are also set out in Oskar Lange's *Introduction to Econometrics*, pp. 333-7.

field of economic activity in which the rate of profit is the highest. From the fact that the owners of capital have a free choice of the fields in which they wish to place their capital and that competition exists among them it follows that the rates of profit in various branches of economic activity tend toward a common level. From the fact that in a particular field the owners of the capital invested there have a monopoly and do not permit the investment of other capital it follows that in this field the rate of profit is higher than in fields to which there is a free flow of capital.

Certain laws of political economy are conclusions deduced from praxiological principles of behaviour

The significance of praxiology and especially of the science of programming thus lies in the fact that certain laws of political economy can be deduced from praxiological principles of behaviour and especially from the economic principle. In this way the scope of the section of political economy which uses deductive inference, i.e., economic theory, is considerably widened. It also makes the construction and use of theoretic economic models easier. Inductive generalization of the results of comparative observation of the economic process which we referred to above⁴⁸, together with certain praxiological principles of behaviour, form the basis of the axiomatization of the model⁴⁹. The logical and mathematical consequences of praxiological principles as, for instance, the calculi employed in the science of programming, serve as directives of inference in the model⁴⁹. In this way a considerable part of political economy is in fact a system of deductive inference.

This "deductivization" of inference constitutes a considerable methodological simplification in political economy.

⁴⁸ See Chapter Four.

⁴⁹ As we know, a deductive system of inference contains the definitions of terms, axioms (also called postulates), i.e., statements forming the premisses of inference which are not proved in the system, and directives of inference, i.e., rules for the deduction of conclusions from premisses. See, for example, Kotarbiński, *A Logic Course for Lawyers* (in Polish), ed. cit., pp. 128-129.

Many laws of political economy can be easily deduced from the praxiological principles of behaviour, while to arrive at them by inductive generalization would demand a laborious examination of numerous aspects of the economic process and complicated historical and statistical analysis. Moreover, it would be considerably more difficult on the basis of inductive generalization to separate essential from incidental relationships and there would thus remain considerably greater doubt as to whether this isolation had been done well or not. Also the laws of political economy established on this basis would not have the same force of logical necessity as laws which are deductions from the praxiological principles of behaviour. It is for precisely this reason (as well as for the reason that a greater interest exists in this field) that political economy has, up till now, chiefly concerned itself with the economic laws of social formations in which the predominant part of economic activity is rational activity and, hence, with the laws of the capitalist and socialist formations. For in these two social formations it is possible by deduction to understand economic laws to a large extent on the basis of praxiological principles of behaviour, especially the economic principle. Therefore, the economic principle, (often incorrectly formulated—a point which will be discussed later) played a large part in the formation of political economy as a science.

Study of economic laws by deduction dependent on the rationality of economic activity

Thus, deduction from the praxiological principles of behaviour is a short cut to the comprehension of economic laws. Whether or not it may be used as a means of studying economic laws, however, depends on the truth of the assumption that economic activity is rational activity. As we know, not all the economic activity under consideration is rational activity (as some have thought and still think wrongly). In pre-capitalist social formations where natural economy prevailed, economic activity was customary and traditional. Customary and traditional activity still prevails in household

activity in the capitalist and socialist modes of production. Therefore, before a "short cut" to the study of economic laws is taken by deduction from the praxiological principles of behaviour, it is necessary to check whether the economic activity under investigation is rational activity or customary and traditional activity. This is ascertained by reductive inference using historical and statistical verification. It consists in drawing logical and mathematical conclusions from the praxiological principles adopted and in the confrontation of these consequences with actual human economic activity.

If the check gives a negative result it is not possible to use the "short cut" to the study of economic laws. In this case the investigation must be made by induction. As an example of the inductive investigation of economic laws we might note the study—using statistical and monographic analyses—of the laws of human behaviour in individual peasant holdings where, on account of the partly natural character of this kind of economy, economic activity is not directed to the maximization of profit and is largely traditional and customary activity. Another example is provided by the study of the laws of activity in the household on the basis of an analysis of family budgets. This has led, for example, to the discovery of Engel's law which states that the percentage of income spent on food diminishes with an increase of the average income per head of the family.

Inductive methods of this kind are mainly used in the examination of the economic laws of pre-capitalist social formations. This does not mean that deduction plays no part at all in the examination of economic laws where economic activity is customary and traditional. Deductions can be made from this activity as well. Knowing, for example, the forms and customary levels of feudal rent and the productivity of peasant labour, it is possible to draw various conclusions about the standard of living of the peasants, the incomes of land-owners, the rate of surplus labour etc. It is not, however, possible to use the "short cut" referred to above in studying economic laws. The political economy of

pre-capitalist social formations therefore uses deduction to a much lesser degree than the political economy of social formations in which the major part of economic activity is rational activity.

The need to establish empirically the scope of the methodological knowledge applied in practice

For deducing of economic laws from the praxiological principles of behaviour it is not sufficient to be sure that the economic activity under investigation is rational activity. It is also necessary to establish by comparative observation what methodological means are used in a given activity. As we have pointed out, when we speak of rational activity we have methodological rationality of action in mind. Modes of behaviour in methodologically rational activity depend on the methodological knowledge possessed by those engaged in the activity and on the external conditions which decide how much of this methodological knowledge is useful. For example, mathematical methods of programming are not always used in activity directed towards the maximization of a quantified end and employing quantified means. A small business man cannot use them, for example, if he does not possess the necessary mathematical knowledge and has never heard of programming. A large firm, for example, which has a special programming department or employs special consultants, certainly uses them. A small business man, even if he knows about the possibilities of programming, does not take advantage of them because the cost of expert consultants is too high. Furthermore, economic relations may make it impossible to utilize the methodological knowledge available. A considerable proportion of our knowledge of programming is not used in capitalist enterprises or capitalist states because its application demands a co-ordination of the activities of individual enterprises, which is only possible when the means of production are socially owned. In this case the methodological knowledge of rational activity exceeds the possibilities of its application in the capitalist mode of production.

Thus, when applying deduction in political economy on the basis of the praxiological principles of behaviour, it is necessary to take into account the actual methodological knowledge, possessed by people involved in economic activity, and the possibilities of applying this knowledge. This requires comparative observation of the actual economic process and drawing conclusions from this observation by means of induction. The deduction of economic laws from praxiological principles of behaviour must contain an inductive element if it is to lead to correct results conforming with objective reality. This element consists in empirically establishing the extent of the methodological knowledge applied in actual economic activity. Without this the results of the application of the praxiological principles of behaviour might prove to be false.

Many economists, for example, starting from the assumption that a capitalist enterprise maximizes its profit, draw from this the conclusion that it always makes use of marginal calculus. There have even been attempts, as we shall see further on, to make marginal calculus the methodological foundation of the whole of political economy. It has been found, however, that marginal calculus has a limited application in the activity of enterprises⁵⁰. In the first place the book-keeping and balancing methods used in practice are not adapted to the needs of marginal calculus; furthermore, capitalist enterprises have not felt the need to adapt them to these requirements in spite of the widespread theoretical knowledge of the principles of marginal calculus in capitalist countries. Second, because of the properties of production technique the objective function and balance relationships are linear or nearly linear and are not suitable for the application of marginal calculus. It is significant that while in practice capitalist enterprises either

⁵⁰ See R.L. Hall and C.J. Hitch, *Price Theory and Business Behaviour*, Oxford Economic Papers, no. 2, 1939, and W.Y. Baumol, *Marginalism and the Demand for Cash in the Light of Operations Research Experience*, The Review of Economics and Statistics, no. 3, 1958.

disregarded or made little use of marginal calculus⁵¹, linear programming was adopted very rapidly. Thus laws deduced from the principle of the maximization of profit on the basis of the assumption that enterprises always use marginal calculus do not reflect the true economic laws operating in the capitalist economy. A similar error is committed by those economists who suppose that within the framework of the capitalist mode of production such methodological means of rational activity are employed which can be applied only when the means of production are socially owned.

General appraisal of the significance of praxiology in the rationalization of economic activity

The results obtained by praxiology must consequently be used with caution, without ascribing to those engaged in economic activity the employment of methodological means which are known to praxiology as a science but which are not known to those engaged in economic activity or which lie outside the scope of practical possibilities. On the other hand, the popularization of these results leads to an increase in the methodological rationality of economic activity. Especially important in this respect are the new sciences of operations research and programming as well as praxiology's auxiliary science, cybernetics, which quickly find practical application. When employed within the framework of the capitalist mode of production they increase the private rationality of the activity of capitalist enterprise; at the same time, however, they often aggravate the anti-social consequences resulting from the antagonistic nature of capitalist relations of production. In the socialist mode of production they can become a powerful instrument in increasing the social rationality of the social process of production and distribution. Therefore praxiology, especially such branches of it as operations

⁵¹ Marginal calculus has, however, recently found expression in methods of book-keeping used by capitalist enterprises. See J.G. Zieliński, *Szkola marginalna a praktyka "big businessu"* (The Marginal School and the Practice of "Big Business"), "Życie Gospodarcze", 1959, no. 16.

research and programming, have great importance in the planning of the socialist economy. It may be that after double-entry book-keeping and balance accounting and after social economic balances, they will form a third historic stage in the development of the methodological means of rational economic activity.

APPENDIX

THE MATHEMATICAL FOUNDATIONS OF PROGRAMMING

1. *Programming as a mathematical problem.* Let z be the degree of realization of the end, and x_1, x_2, \dots, x_n , the outlays (i.e., the amounts used) of various means, the number of which is n . The objective function is written

$$(1) \quad z = f(x_1, x_2, \dots, x_n).$$

It is supposed that the degree of realization of the end and the outlays of means are non-negative quantities, i.e. that $z \geq 0$ and $x_i \geq 0$, for $i = 1, 2, \dots, n$. To simplify calculation it is also assumed that the objective function has continuous first and second partial derivatives. Finally, it is assumed that the degree of realization of the end is an increasing function of the outlay x_i of any of the means, i.e., that

$$(2) \quad \frac{\partial f}{\partial x_i} > 0 \quad (i = 1, 2, \dots, n).$$

Balance relationships are expressed as m equations¹

$$(3) \quad \Phi_r(x_1, x_2, \dots, x_n) = c_r \quad (r = 1, 2, \dots, m).$$

¹ Balance relationships, some or all of them, can also be inequalities

$$\Phi_r(x_1, x_2, \dots, x_n) \leq c_r.$$

By multiplying where necessary by -1 any inequalities can be reduced to this form. These inequalities may however be changed into equations by adding the auxiliary variable x_{n+r} to the left hand sides. We then get—instead of an inequality—the equation

$$\Phi_r(x_1, x_2, \dots, x_n) + x_{n+r} = 0$$

in which $x_{n+r} \geq 0$. For the sake of symmetry of notation, the auxiliary variables x_{n+r} may also be introduced into the objective function. This function then takes the form

$$z = f(x_1, x_2, \dots, x_n, x_{n+1}, x_{n+2}, \dots)$$

In these equations the right hand sides are constants, i.e., $c_r = \text{const.}$ for $r = 1, 2, \dots, n$. It is also assumed that the functions Φ_r appearing on the left hand side of the balance relationships have continuous first and second partial derivatives, and that

$$(4) \quad \frac{\partial \Phi_r}{\partial x_i} > 0 \quad (r = 1, 2, \dots, m; \quad i = 1, 2, \dots, n).$$

It follows from the assumption (4) that for every balance relationship (3)

$$\frac{\partial x_i}{\partial x_j} = - \frac{\frac{\partial \Phi_r}{\partial x_j}}{\frac{\partial \Phi_r}{\partial x_i}} < 0 \quad (r = 1, 2, \dots, m; \quad i, j = 1, 2, \dots, n; \quad i \neq j).$$

This means that an increase in the outlay of one means requires a decrease in the outlay of some other. The assumption (4) thus indicates that the possibilities of the application of the means are subject to *limiting constraints*; it is not possible to increase the outlay of all the means. The balance relationships express the concrete character of these constraints.

It is also assumed that $m < n$, and that the Jacobian of the balance relationships is not equal to zero². We can then express m of the variables x_1, x_2, \dots, x_n , as functions of the $n-m$ remaining variables. Since the order

in which case, in order not to change the properties of the function it is necessary to assume

$$\frac{\partial f}{\partial x_{n+r}} = 0$$

identically for any values of the auxiliary variables x_{n+r} . In this way balance relationships can always be expressed in the form of equations.

² The Jacobian is a determinant of which the elements are partial derivatives of the functions that form the left hand sides of the equations (3). Since $m < n$, the rows of the determinant contain only m derivatives, e.g.,

$$\begin{array}{ccc} \frac{\partial \Phi_1}{\partial x_1} & \frac{\partial \Phi_1}{\partial x_2} & \dots \frac{\partial \Phi_1}{\partial x_m} \\ \frac{\partial \Phi_2}{\partial x_1} & \frac{\partial \Phi_2}{\partial x_2} & \dots \frac{\partial \Phi_2}{\partial x_m} \\ \dots & \dots & \dots \\ \frac{\partial \Phi_m}{\partial x_1} & \frac{\partial \Phi_m}{\partial x_2} & \dots \frac{\partial \Phi_m}{\partial x_m} \end{array}$$

If the Jacobian is equal to zero, the number of variables which can be expressed as functions of the remaining ones is less than m . In general: if the rank of the matrix, for which the Jacobian is the determinant, is $m-k$, then $m-k$ variables can be expressed as functions of the $n-m+k$ remaining variables. According to the terminology which we use below there are then $n-m+k$ *degrees of freedom*.

of the numeration of variables is arbitrary we express x_1, x_2, \dots, x_n , as functions of $x_{n+1}, x_{n+2}, \dots, x_n$, which is written

$$(5) \quad x_i = \Psi_i(x_{m+1}, x_{m+2}, \dots, x_n) \quad (i = 1, 2, \dots, m).$$

It is seen then, that only the choice of the outlay of $n-m$ means can be made freely. Once such a choice has been made, the outlays of the remaining m means is determined by the functions (5). This is expressed by stating that the choice of the outlays of the means has $n-m$ degrees of freedom.

A set of values of the variables x_1, x_2, \dots, x_n , e.g., $x_1^0, x_2^0, \dots, x_n^0$ —i.e. a set of definite outlays of the various means, is called a *programme*. The set of programmes which satisfies the balance relationships (3) is called the set of *internally consistent* programmes. As we have shown, the set of internally consistent programmes has $n-m$ degrees of freedom, which means that in this set the outlay of $n-m$ means can be freely chosen.

Let us now consider the following geometrical interpretation. Every programme $x_1^0, x_2^0, \dots, x_n^0$ is a point in n -dimensional Euclidean space. Since $x_i \geq 0$ ($i = 1, 2, \dots, n$), all the programmes are contained in that part of space consisting entirely of points with non-negative co-ordinates. The assumptions $x_i \geq 0$ are therefore called *boundary conditions* since they determine the boundaries of the space within which the programmes are contained. The set of internally consistent programmes occupies that part of space which satisfies the conditions of the balance relationships (3). This part of space is *the domain of feasible solutions* of the problem of programming. Programmes outside this domain are not internally consistent and therefore do not constitute feasible solutions. The domain of feasible solutions has only $n-m$ independent co-ordinates corresponding to the $n-m$ degrees of freedom of the set of internally consistent programmes. Thus the domain of feasible solutions is a $(n-m)$ -dimensional geometrical object suspended in n -dimensional space.

The task of programming is to choose the *optimum* programme (or programmes, if there is more than one) from the set of internally consistent programmes. In the geometrical interpretation the problem is to choose the optimum point (or points) in the domain of feasible solutions. The optimum programme is the programme which gives to the objective function the maximum value in the domain of feasible solutions. The task thus reduces itself to the problem of determining the values of the variables x_1, x_2, \dots, x_n , for which the objective function (1) reaches its maximum, while x_1, x_2, \dots, x_n , satisfy the additional conditions of the balance relationships.

The simplest way of solving this problem is by the use of what are called the Lagrange multipliers. This method consists in introducing an auxiliary function, called the Lagrange function, which is defined as follows:

$$(6) \quad L(x_1, x_2, \dots, x_n; \lambda_1, \lambda_2, \dots, \lambda_m) = f(x_1, x_2, \dots, x_n) - \sum_{r=1}^m \lambda_r [\Phi_r(x_1, x_2, \dots, x_n) - c_r].$$

The coefficients $\lambda_1, \lambda_2, \dots, \lambda_m$ are for the moment undetermined; they are the Lagrange multipliers.

We note that when the balance conditions (3) are satisfied—that is, in the domain of feasible solutions—the sum on the right hand side of the expression (6) is equal to zero. This means that in the domain of feasible solutions, the Lagrange function is identical with the objective function $(x_1, x_2, \dots, x_n)^3$. The determination of the maximum value of the objective function which satisfies the constraints (3) may thus be carried out in two stages. We first determine the usual maximum of the Lagrange function for arbitrary values of the multipliers $\lambda_1, \lambda_2, \dots, \lambda_m$, and then we choose values for these multipliers which satisfy the constraints (3). The maximum of the Lagrange function obtained in this way is identical with the maximum of the objective function for the constraints imposed by the balance-relationships.

The condition

$$L(x_1, x_2, \dots, x_n; \lambda_1, \lambda_2, \dots, \lambda_m) = \max.$$

determines the values x_1, x_2, \dots, x_n , (if such a maximum exists). It follows from the expression (6) that these values depend on the values assumed by $\lambda_1, \lambda_2, \dots, \lambda_m$, i.e. they are functions of these multipliers. This is expressed by writing

$$(7) \quad x_i = g_i(\lambda_1, \lambda_2, \dots, \lambda_m) \quad (i = 1, 2, \dots, n).$$

When these functions are substituted for x_1, x_2, \dots, x_n in the balance relationships, these relationships then take the form

$$(8) \quad \Phi(\lambda_1, \lambda_2, \dots, \lambda_m) = c_r \quad (r = 1, 2, \dots, m).$$

This gives m equations with m unknowns.

From these equations (assuming that their Jacobian differs from zero) we find the values of the multipliers $\lambda_1, \lambda_2, \dots, \lambda_m$. If these values are symbolized $\lambda_1^0, \lambda_2^0, \dots, \lambda_m^0$, and substituted in the functions (7), the following values are obtained

$$x_i^0 = g_i(\lambda_1^0, \lambda_2^0, \dots, \lambda_m^0) \quad (i = 1, 2, \dots, n).$$

³ This result may be extended to the case noted in n. 2, when the balance relationships are inequalities. It may then happen that

$$\Phi_r(x_1, x_2, \dots, x_n) - c_r < 0$$

for certain values of the subscript r . We then assume $\lambda_r = 0$ identically and thus the sum appearing on the right hand side of the model (6) is still equal to zero in the domain of feasible solutions.

⁴ As a rule $\lambda_r \neq 0$ since otherwise the sum appearing on the right hand side of the formula (6) would be indeterminate. On the other hand, $\lambda_r^0 = 0$ in the case when the balance relationships are inequalities and

$$\Phi_r(x_1, x_2, \dots, x_n) - c_r < 0.$$

These are the values of the variables x_1, x_2, \dots, x_n , for which the objective function reaches its maximum subject to the constraints imposed by the balance relationships.

Since, if a constant quantity is added to, or subtracted from, a function, the values of the variables for which that function reaches its maximum remain unchanged, we may, instead of the Lagrange function, take the following function

$$L(x_1, x_2, \dots, x_n; \lambda_1, \lambda_2, \dots, \lambda_m) - z_0 = \\ = f(x_1, x_2, \dots, x_n) - z_0 - \sum_{r=1}^m \lambda_r [\Phi_r(x_1, x_2, \dots, x_n) - c_r],$$

where $z_0 = \text{const}$. The maximum of this function is equal to the minimum of the function with the sign changed, i.e., of the function

$$(9) \quad L_1(\lambda_1, \lambda_2, \dots, \lambda_m; x_1, x_2, \dots, x_n) = \\ = \sum_{r=1}^m \lambda_r [\Phi_r(x_1, x_2, \dots, x_n) - c_r] - [f(x_1, x_2, \dots, x_n) - z_0].$$

This function is identical with the function

$$(10) \quad u(\lambda_1, \lambda_2, \dots, \lambda_m; x_1, x_2, \dots, x_n) = \sum_{r=1}^m \lambda_r [\Phi_r(x_1, x_2, \dots, x_n) - c_r],$$

if the condition

$$(11) \quad f(x_1, x_2, \dots, x) = z_0$$

is fulfilled, that is, for a constant degree of realization of the end.

The problem of maximization of the objective function subject to balance relationships can thus be replaced by the problem of finding the minimum of the function (10) (which, as can be seen, is determined by the form of the balance relationships), under condition that the degree of realization of the end is held constant.

The function (10) is a weighted sum, the value of which depends on the outlays of the means x_1, x_2, \dots, x_n ; it assigns to these outlays a single numerical value. Therefore this function may be called *the outlay function*. The function (10) thus establishes the commensurability of the various means. The task of programming can hence be formulated in two ways. One consists in maximizing the objective function subject to given balance relationships; the other in minimizing the outlay function for a given value of the objective function. The existence of two variants of the problem of programming is called the *duality* of this problem.

The second variant of the problem of programming is solved in the following way. In view of the condition (11) we have only $n-1$ independent variables among x_1, x_2, \dots, x_n ; one of them, say x_n , is a function of the remaining variables⁵.

⁵ The expression of one variable as a function of the remaining variables on the basis of the equation (11) is always possible because of our assumption (2).

The condition

$$L_1(\lambda_1, \lambda_2, \dots, \lambda_m; x_1, x_2, \dots, x_n) = \min.$$

thus determines m values $\lambda_1^0, \lambda_2^0, \dots, \lambda_m^0$ and $n-1$ values $x_1^0, x_2^0, \dots, x_{n-1}^0$. The value of x_n^0 is obtained by inserting the last $n-1$ values in the equation (11). The values $\lambda_1^0, \lambda_2^0, \dots, \lambda_m^0$ and $x_1^0, x_2^0, \dots, x_n^0$ determined in this way are the same as those obtained by the application of the first variant. Hence, the values $x_1^0, x_2^0, \dots, x_n^0$ introduced into the balance relationships (3) satisfy the conditions set by those relationships. The outlay function then takes the value zero, as can be immediately seen from the expression (10). This is the lowest value of this function which it is possible to obtain within the limits of the condition (11). The other values of the outlay function must be positive. A positive value of this function is an indication of waste of means and can serve as a measurement of this waste.

The Lagrange multipliers appearing in the outlay function have a praxiological significance. As can be seen from the example (10), the outlay function appears as a weighted sum. The components of this sum

$$\Phi_r(x_1, x_2, \dots, x_n) - c_r \quad (r = 1, 2, \dots, m)$$

express the degrees of non-fulfilment of individual balance relationships, they indicate the extent to which these relationships have been "overstepped". The multipliers $\lambda_1, \lambda_2, \dots, \lambda_m$ are weights attached to the "overstepping" of individual balances. The values $\lambda_1^0, \lambda_2^0, \dots, \lambda_m^0$ of the Lagrange multipliers are these weights in conditions of the optimum use of means when all balance relationships are fulfilled. They are indicators expressing the weight for a given degree of realization of the aim, possessed by the limitation of the possibilities of using the means which results from each balance relationship⁶.

Finally, it should be mentioned that the solution of the problem of programming is invariant under any monotonously increasing transformation of the objective function. If the objective function $f(x_1, x_2, \dots, x_n)$ is replaced by a monotonously increasing function of it $F[f(x_1, x_2, \dots, x_n)]$, chosen arbitrarily, then the function $F(x_1, x_2, \dots, x_n)$ reaches its maximum for the same values of the variables x_1, x_2, \dots, x_n as does the function $f(x_1, x_2, \dots, x_n)$. This follows from the fact that the value of the function F always increases when the value of the function f increases and always

⁶ Assuming $\Phi_r(x_1, x_2, \dots, x_n) - c_r > 0$ for a non-optimum use of the means we always get $\lambda_r > 0$. This is because the outlay function has a positive value for all values of $\Phi_r(x_1, x_2, \dots, x_n) - c_r > 0$ ($r = 1, 2, \dots, m$), which is only possible if $\lambda_r > 0$. An exception is the case when the balance relations are inequalities and when $\Phi_r(x_1, x_2, \dots, x_n) - c_r < 0$ for an optimum use of the means. We then have $\lambda_r = 0$ identically. Here the balance relation does not restrict the use of the means and its weight is zero. All other balance relationships have positive weight.

decreases when the value of the function f decreases. This means that in order to solve the problem of programming it is only necessary to know if the value of the objective function increases or decreases, and it is not necessary to be able to measure its change in value. In other words it is sufficient that the degrees of the realization of the end can be ordered, it is not necessary that they should be measurable.

2. *Marginal calculus.* If the objective function and the balance relationships have the required properties which are discussed later, the programming problem can be solved by the use of differential calculus. The differential calculus used in solving this problem is sometimes called *marginal calculus*.

Applying differential calculus we find the conditions necessary for the maximum of the Lagrange function (6). They are as follows:

$$\frac{\partial L}{\partial x_i} = \frac{\partial f}{\partial x_i} - \sum_{r=1}^m \lambda_r \frac{\partial \Phi_r}{\partial x_i} = 0 \quad (i = 1, 2, \dots, n)$$

or

$$\frac{\partial f}{\partial x_i} = \sum_{r=1}^m \lambda_r \frac{\partial \Phi_r}{\partial x_i} \quad (i = 1, 2, \dots, n).$$

In view of (10) these conditions may be written more simply, namely

$$(12) \quad \frac{\partial f}{\partial x_i} = \frac{\partial u}{\partial x_i} \quad (i = 1, 2, \dots, n).$$

These are also the conditions for the minimum of the Lagrange function (9), as is immediately obvious. Thus both variants of the programming problem lead to the same necessary conditions.

The conditions (12) constitute n equations, by which we determine n values x_1, x_2, \dots, x_n as functions of the multipliers $\lambda_1, \lambda_2, \dots, \lambda_m$ (see (7) above). When these functions are substituted in the balance relationships then m equations with m unknowns $\lambda_1, \lambda_2, \dots, \lambda_m$ are obtained (see (8) above). By means of these equations we determine the values $\lambda_1^0, \lambda_2^0, \lambda_m^0$ which finally makes it possible to determine the values $x_1^0, x_2^0, \dots, x_n^0$, for which the objective function reaches its maximum subject to given balance relations, and for which the outlay function reaches its minimum subject to a given value of the objective function.

The praxiological significance of the equations (12) is simple. The left hand side of these equations represent the *marginal increment of the objective function* caused by the outlay of the given means. The right hand side represents the *marginal increment of the outlay function* caused by the outlay of the given means. The equations (12) state that in the optimum programme for every means the marginal increment of the objective function is equal to the marginal increment of the outlay function.

This condition can be formulated differently. The following equations result from the equations (12).

$$(12a) \quad \frac{\frac{\partial f}{\partial x_1}}{\frac{\partial u}{\partial x_1}} = \frac{\frac{\partial f}{\partial x_2}}{\frac{\partial u}{\partial x_2}} = \dots = \frac{\frac{\partial f}{\partial x_n}}{\frac{\partial u}{\partial x_n}}$$

These equations state that in the optimum programme the marginal increment of the objective function per unit of the marginal outlay of an individual means is equal for all means. If these equations are inverted

$$(12b) \quad \frac{\frac{\partial u}{\partial x_1}}{\frac{\partial f}{\partial x_1}} = \frac{\frac{\partial u}{\partial x_2}}{\frac{\partial f}{\partial x_2}} = \dots = \frac{\frac{\partial u}{\partial x_n}}{\frac{\partial f}{\partial x_n}}$$

we find that the marginal increment outlay of the means necessary to obtain a unit of marginal increment of the objective function (or also, if we wish, the marginal decrement of the outlay function corresponding to a unit of marginal decrement of the objective function) is equal for all means. These two formulations correspond to the two variants of the programming problem.

The conditions (12) are necessary both for the maximum and minimum of the functions under discussion. In order to ascertain whether a maximum or a minimum is involved, it is necessary to find out whether the condition sufficient for a maximum or a minimum is fulfilled. For the maximum or minimum of a function subject to constraints this condition can most readily be formulated by using the Lagrange function.

The condition sufficient for the maximum of the objective function subject to the given balance relationships is

$$(13) \quad d^2L = \sum_{i=1}^n \sum_{j=1}^n \left(\frac{\partial^2 f}{\partial x_i \partial x_j} - \sum_{r=1}^m \lambda_r \frac{\partial^2 \Phi_r}{\partial x_i \partial x_j} \right) dx_i dx_j < 0$$

for the values $x_1^0, x_2^0, \dots, x_n^0$, determined by the equations (12), and for all values of dx_i and dx_j . It is immediately seen from (9) that this condition is equivalent to the condition

$$(14) \quad d^2L_1 > 0,$$

i.e., to the sufficient condition for the minimum of the outlay function subject to a given value of the objective function. This again shows that the two variants of the programming problem are equivalent.

The necessary conditions (12) and the sufficient condition (13) have the following geometrical interpretation. As we know, the domain of feasible solutions is an $(n - m)$ -dimensional geometrical object suspended

in an n -dimensional Euclidean space. The objective function is an n -dimensional hypersurface in an $(n+1)$ -dimensional space. For every given definite value $z_0 = f(x_1, x_2, \dots, x_n)$ there exists a projection of this hypersurface onto an n -dimensional space. This projection is an $(n-1)$ dimensional hypersurface; the greater the value of z_0 , the higher that hypersurface is situated with respect to the origin of the system of co-ordinates, which follows from the assumption (2). The necessary conditions (12) state that the domain of feasible solutions is tangent to one of the projections representing the various values of the objective function, i.e., to the projection corresponding to the smallest or greatest value of the objective function. At the tangential point (or points, if there are more of them), the objective function reaches its greatest or smallest value in the domain of feasible solutions. The sufficient condition (13) states that in the vicinity of the tangential point(s) the $(n-1)$ -dimensional hypersurfaces which are projections of the objective function are convex to the domain of feasible solutions⁷. Because of this convexity, the domain of feasible solutions is tangential to the highest placed of the hypersurfaces mentioned above, i.e., the objective function is maximized.

An analogous geometrical interpretation can be given for the minimum of the outlay function subject to a given value of the objective function. In this case there is only one projection of the objective function onto the n -dimensional space: this projection now constitutes the domain of feasible solutions. There are, on the other hand, many projections of the outlay function, i.e., one projection for every definite value of the function. The minimum of the outlay function subject to a given value of the objective function is determined by the point(s) of the projection of the objective function tangential to one of the projections of the outlay function. The sufficient condition (14) states that in the vicinity of the tangential point(s) the projections of the outlay function are concave to the projection of the objective function. Because of this the projection of the objective function is tangential to the lowest situated projection of the outlay function, i.e., this latter function is minimized.

The geometrical interpretation outlined here can most easily be visualized for $n = 2$ and $m = 1$. The objective function is then

$$z = f(x_1, x_2).$$

The balance relationship is $\Phi(x_1, x_2) = c$.

The necessary conditions (12) assume the form

$$\frac{\partial f}{\partial x_i} = \lambda \frac{\partial \Phi}{\partial x_i} \quad (i = 1, 2).$$

⁷ The geometrical interpretation of the inequalities (13) is such that everywhere outside the tangential point(s), the projection of the objective function is further from the origin of the coordinates than the domain of possible solutions.

The projections of the objective function onto the plane (x_1, x_2) form a family of curves L , each of which corresponds to a definite value of $z = z_i$. This is shown in Fig. 1. The domain of feasible solutions, determined

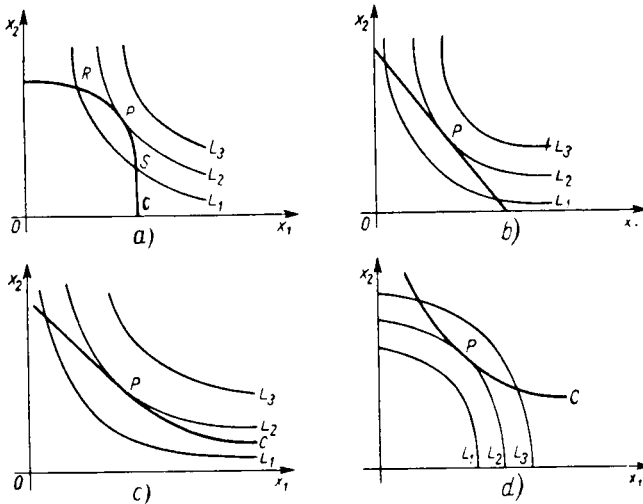


FIG. 1.

by the balance relationships, is represented by the curve C . The tangential point P is that point in the domain of feasible solutions which is situated on the highest of the accessible curves L , that is on L_2 . It is true that the points R and S are also in the domain of feasible solutions, but they are on the curve L_1 , situated lower than the curve L_2 . It is true that the curve L_3 is situated higher than the curve L_2 , but it is inaccessible, given that all its points are outside the domain of feasible solutions. Figure 1 also shows the significance of the convexity of the curves L to the curve C , as implied by the sufficient condition (13). This condition is satisfied in Figs. 1a, 1b and 1c. In Fig. 1d, on the other hand, the curves L are concave to the curve C . As is immediately obvious, in this case the tangential point P is situated on the lowest accessible curve L ; the objective function is minimized.

The case in which the outlay function is minimized may be visualized with the help of Fig. 1d. In this graph the curve C is interpreted as a projection of the objective function whose value is given (i.e., the domain of feasible solutions). The curves L are projections of the outlay function such that each curve corresponds to a definite value of this function. The tangential point P is that point of the curve C which is situated on the lowest accessible curve L . Here the significance of the sufficient condition (14)

which asserts that the curves L are concave to the curve C , is also obvious. This condition guarantees that the outlay function is minimized.

Fig. 1 also shows that it is not necessary to be able to measure the degrees of realization of the end; it is sufficient if their order is known. The monotonously increasing transformations of the objective function $F[f(x_1, x_2)]$ have the same projections on the plane (x_1, x_2) as the function $z = f(x_1, x_2)$. The projections of the function $F[f(x_1, x_2)]$ on the plane (x_1, x_2) are given by the differential equation

$$F' \left(\frac{\partial f}{\partial x_1} dx_1 + \frac{\partial f}{\partial x_2} dx_2 \right) = 0,$$

where F' is the derivative of the function F with respect to the function $f(x_1, x_2)$. Since $F' > 0$, this equation is equivalent with the equation

$$\frac{\partial f}{\partial x_1} dx_1 + \frac{\partial f}{\partial x_2} dx_2 = 0,$$

which is the differential equation of the projection of the function $f(x_1, x_2)$. Hence the maximization of the function $z = f(x_1, x_2)$ is also the maximization of all its monotonously increasing transformations.

This reasoning can be extended to cover any number of variables x_1, x_2, \dots, x_n . All monotonously increasing transformations of the function $z = f(x_1, x_2, \dots, x_n)$ have the same projections onto an n -dimensional space as the function we have dealt with.

3. *Linear Programming.* The application of marginal calculus requires that the objective function and balance relationships possess certain properties. In the first place, the equations (12) must have a solution. In the geometrical interpretation this means that there must be a point (or points) of the projections of the objective function tangential to the domain of feasible solutions. Such tangential point may not exist. Moreover, if condition (13) is not satisfied the objective function may have no maximum (or, if condition (14) is not satisfied, the outlay function may have no minimum). It can be seen that marginal calculus can only be applied to a special kind of objective function and balance relationships possessing properties satisfying the conditions (12) and (13), or (14).

An especially important case in which marginal calculus cannot be applied is *linear programming*, i.e. a programming problem in which the objective function and all the balance relationships are linear. The objective function then takes the form⁸

⁸ This is a so-called linear form. The general form of the linear function is

$$z = a_0 + \sum_{i=1}^n a_i x_i.$$

$$(15) \quad z = \sum_{i=1}^n a_i x_i$$

and the balance relationships take the form

$$(16) \quad \sum_{i=1}^n b_{ri} x_i = c_r \quad (r = 1, 2, \dots, m).$$

In these expressions a_i , b_{ri} and c_r ($i = 1, 2, \dots, n$; $r = 1, 2, \dots, m$) are constants. As before, it is assumed that $m < n$ and that the assumptions (2) and (4) are satisfied. The problem is to find those values of the variables x_1, x_2, \dots, x_n , for which the function (15) reaches its maximum under the constraints (16).

It can easily be seen that marginal calculus cannot be applied here, since the necessary conditions (12) here take the form

$$a_i = \sum_{r=1}^m \lambda_r b_{ri} \quad (i = 1, 2, \dots, n).$$

The variables x_1, x_2, \dots, x_n , do not appear in these equations so that they cannot be used to determine the value of these variables. Furthermore, these equations are self-contradictory for there are more equations than the undetermined multipliers $\lambda_1, \lambda_2, \dots, \lambda_m$; unless the quantities a_i and b_{ri} are chosen in such a way that there are not more than m independent equations. It should also be observed that all the second derivatives of the function (15) and of the expressions (16) are equal to zero. Therefore d^2L or d^2L_1 are also equal to zero and condition (13) or (14) is not satisfied. Thus we can see that marginal calculus is of no use in the solution of linear programming problem.

The solution of the problem of linear programming is most clearly set out with the help of its geometrical interpretation. The individual balance-relationships (16) form $(n-1)$ -dimensional hyperplanes suspended in an n -dimensional Euclidian space. There are m such hyperplanes. The feasible solutions are formed by the points which lie simultaneously on all m hyperplanes (since they satisfy a system of m linear equations (16)). The domain of feasible solutions is the set of points which are common to all m hyperplanes, that is the set of points which lie at the intersection of those hyperplanes. This set forms an $(n-m)$ -dimensional convex polyhedron⁹. Projections of the objective function (16) form a family

This form can always be changed into a linear form by the introduction of a new variable $z' = z - a_0$, i.e., by measuring the value of the function so that at the point $z = a_0$ it is equal to zero.

⁹ The intersection of two straight 1-dimensional lines forms a 0-dimensional point. The intersection of two 2-dimensional planes forms a 1-dimensional straight line, and the intersection of three 2-dimensional

of $(n-1)$ -dimensional hyperplanes. The point(s) of the polyhedron the surface of which constitutes the domain of feasible solutions, tangential to the projection which is situated highest (i.e., is furthest from the origin of the system of co-ordinates) determine(s) the maximum of the objective function. The projections situated lower correspond to lesser values of the objective function, those which are situated higher are inaccessible, since they lie wholly outside the domain of feasible solutions.

Thus, the geometrical interpretation of the linear programming problem is similar to the geometrical interpretation of the marginal calculus. The difference lies in the fact that in this case the domain of feasible solutions is a polyhedron, an "angular" geometrical object, which cannot touch at every point the hyperplane which is a projection of the objective function. This "angularity" means that differential calculus cannot be applied to the determination of the tangential points. The polyhedron is tangent to the hyperplane at its highest vertex, which determines the maximum of the objective function in the domain of feasible solutions.

Apart from the highest vertex, other vertices of the polyhedron may touch a projection of the objective function. If there is only one vertex of the polyhedron tangent to a projection of the objective function, then the solution is unique. If there are two, then the polyhedron touches a projection of the objective function with the whole of one edge, i.e., a straight line joining the two vertices. If there are three, then the polyhedron touches the hyperplane which is a projection of the objective function with the 2-dimensional area of the triangle determined by the three vertices. Generally, if k vertices are tangent to a projection of the objective function, then the polyhedron touches that projection with a $(k-1)$ -dimensional so-called simplex determined by those vertices.

The solution of the linear-programming problem is unique or not according to the number of vertices of the polyhedron which are tangent to a projection of the objective function. If k vertices of the polyhedron are tangent to a projection of the objective function, the solution has $k-1$ degrees of freedom; the values of the variables x_1, x_2, \dots, x_{k-1} , can be chosen arbitrarily, and the remaining variables x_k, x_{k+1}, \dots, x_n are linear functions of the former. The solution thus depends on the shape of the polyhedron constituting the domain of feasible solutions and is determined by the highest vertex of the polyhedron. The position of the projection of the objective function (i.e., the inclination of the hyperplane) determines whether other vertices of the polyhedron are tangential to this projection as well and consequently whether the solution is unique or not and how many degrees of freedom it has.

planes forms a 0-dimensional point. The intersection of two 3-dimensional hyper-planes forms a 2-dimensional plane, the intersection of three 3-dimensional hyperplanes forms a straight line, etc.

This geometrical interpretation can be visualized when $n-m = 2$ or $n-m = 3$. The domain of feasible solutions is then the surface of either a 2-dimensional polygon or a 3-dimensional polyhedron.

For example, let $n = 10$ and $m = 8$. The domain of feasible solutions is then the surface of a polygon on the plane (x_1, x_2) , suspended in 10-dimensional space as shown in Fig. 2.

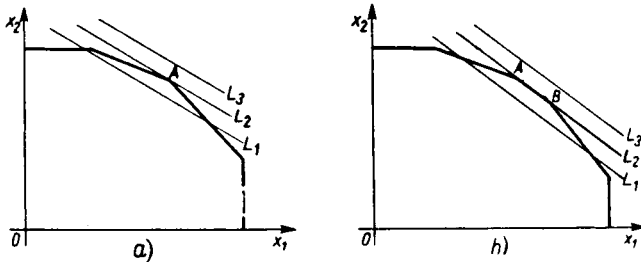


FIG. 2.

In view of the boundary conditions $x_i \geq 0$ ($i = 1, 2$) we are only interested in that part of the polygon which corresponds to the non-negative values of the co-ordinates. The projections of the objective function onto the plane (x_1, x_2) form a family of straight lines L . The maximum of the objective function in the domain of feasible solutions is determined by the highest vertex of the polygon, tangent to one of the straight lines L . Fig. 2a shows a case where there is only one such vertex A . In Fig. 2b there are two such vertices, A and B ; the solution is given by the segment AB and has one degree of freedom.

Taking in turn $n = 10$ and $m = 7$, the domain of feasible solutions is the surface of a 3-dimensional polyhedron, the faces of which are planes. The projections of the objective function are also planes. The polyhedron may touch the highest projection of the objective function with one vertex, with an edge, or with a face. Corresponding to these possibilities we have solutions which are unique, which possess one degree of freedom or which possess two degrees of freedom.

The computation of the solution of the linear programming problem is carried out by the methods of linear algebra. There are several algorithms, which starting from arbitrary values of the variables x_1, x_2, \dots, x_n in the domain of feasible solutions lead by a finite number of successive steps to the values of these variables which maximize the objective function in this domain¹⁰. These algorithms are connected with the geometrical interpretation which we have set out, since they consist in gradually passing,

¹⁰ Algorithms of this kind have been worked out by G.B. Dantzig, *Maximization of Linear Functions subject to Linear Inequalities*, in *Activity Analysis of Production and Allocation*, New York 1951; R. Frisch, *Principles*

from the lower to the higher vertices of the polyhedron. If there are a great number of variables and balance relationships the practical work involved is very great. This is where electronic computers become extremely useful¹¹. The introduction and spread of these machines have had a great deal of influence on the increased practical application of linear programming.

It is worth noting the especial simplicity and symmetry which characterizes the duality of the programming problem when the programming is linear. The problem of maximizing the linear function (15) subject to the linear constraints (16) is equivalent to the problem of minimizing the linear function

$$(17) \quad v = \sum_{r=1}^m c_r \lambda_r$$

subject to the linear conditions

$$(18) \quad \sum_{r=1}^m b_{ri} \lambda_r \geq a_i \quad (i = 1, 2, \dots, n).$$

The same constants a_i, b_{ri}, c_r ($i = 1-2, \dots, n; r = 1, 2, \dots, m$) appear in both problems, but the number of variables changes from n to m , and the number of constraints from m to n , while the coefficients of the function in one variant appear as constants in the constraints of the second variant, and these constraints become inequalities¹².

The proof is simple. Substituting the left side of the equation (16) for c_r in the expression (17) we get

$$v = \sum_{r=1}^m \lambda_r \sum_{i=1}^n b_{ri} x_i = \sum_{i=1}^n x_i \sum_{r=1}^m b_{ri} \lambda_r.$$

In view of (18) we have

$$v \geq \sum_{i=1}^n a_i x_i$$

i.e.,

$$(19) \quad v \geq z.$$

This holds for all values of x_r satisfying the equations (16) and for all values of λ_r satisfying the inequalities (18). Hence it follows that

$$(19a) \quad v_{min} \geq z_{max}$$

of *Linear Programming*, Oslo 1954, and *The Multiplex Method for Linear Programming*, Oslo 1958; R. Dorfman, P.A. Samuelson and R.M. Solow; *Linear Programming and Economic Analysis*, New York 1958. They are described in most textbooks dealing with linear programming.

¹¹ See, for example, J. Leseault, *Programme linéaire et calculateurs électroniques*, *Revue de Recherche Operationelle*, Vol. I, no. 4, Paris 1957.

¹² They must be inequalities because $m < n$, otherwise the number of equations would exceed the number of unknowns. They could be changed into equations by introducing the auxiliary variables $\lambda_{m+1}, \lambda_{m+2}, \dots, \lambda_n$, in a similar way to that given in n. 1 on p. 207.

also holds. There is however a value of the function v and a value of the function z , let us call them v_0 and z_0 , such that

$$v_0 = z_0.$$

This occurs when λ_r satisfies m of the inequalities (18) as equations and

$$x_{m+1} = x_{m+2} \dots = x_n = 0.$$

Then

$$v_0 = \sum_{i=1}^m x_i \sum_{r=1}^m b_{ri} \lambda_r = \sum_{i=1}^m a_i x_i = z_0.$$

In view of the inequality (19a) this is, however, only possible when $v_0 = v_{min}$ and $z_0 = z_{max}$, because otherwise it would be possible to disprove this inequality by decreasing the value of v or increasing the value of z .

We thus get

$$(19b) \quad v_{min} = z_{max}.$$

The minimization of v thus means the maximization of z and vice versa. It is possible to obtain the same result (19) by substituting the left side of the equations (18) for a_i in (15) and taking (16) into account. Both variants of linear programming are thus equivalent.

From this proof it follows that when (19b) is fulfilled, no more than m of the values x_1, x_2, \dots, x_n can be different from zero; they are then, because of the boundary conditions, positive. It is, however, obvious from the equations (16) that at least m of the values x_1, x_2, \dots, x_n , must differ from zero (and thus that they are positive because of the boundary conditions) for otherwise there would be more equations than unknowns and the equations could not be independent. As a result we find that in linear programming the optimum programme embraces exactly m positive outlays of the various means. The number of means used is equal to the number of balance relationships in the first problem.

The weights $\lambda_1, \lambda_2, \dots, \lambda_m$ attached to individual balance relationships may thus be ascribed to individual means used in the optimum programme; they may be regarded as valuations of the significance of these means arising from the existence of the constraints imposed by the balance relationships. The second variant thus consists in the minimization of the joint significance of the means used of which the linear function (17) is the expression¹³. In other words, we could say that this variant consists in choosing such valuations of the various means as to minimize the obnoxiousness of the balance constraints.

¹³ The linear form (17) is connected with the outlay function in the following way. In linear programming the outlay function has the form

$$u = \sum_{r=1}^m \lambda_r \left(\sum_{i=1}^n b_{ri} x_i - c_r \right) = \sum_{r=1}^m \lambda_r \sum_{i=1}^n b_{ri} x_i - \sum_{r=1}^m \lambda_r c_r.$$

The linear form (17) is the subtracted term on the right hand side of this expression. It is the valuation of the joint significance of the balance limitations which appear in the outlay function.

Thus it appears that the problem of linear programming may be set out in the form of the two following equivalent variants. One variant consists in the direct determination of the optimum outlays of the means x_1, x_2, \dots, x_n ; the second variant on the other hand consists in determining the valuations $\lambda_1, \lambda_2, \dots, \lambda_m$ of individual means for which the minimization of the significance of the balance limitations takes place. In linear programming there are two separate problems – the problem of determining the optimum outlay of the means and the problem of determining the optimum valuations of individual means. The separation of these two problems is a specific property of linear programming.

Finally, it should be noted that in linear programming the degrees of realization of the end is always assumed to be measurable. This follows from the assumption that the objective function is linear. Only linear transformations of the objective function preserve its linearity. Therefore, the only possible transformations of the objective function are changes in the unit of measurement and changes in the zero point. In this way the application of linear programming is limited to the case where the degree of the realization of the end is measurable.

4. *The question of the existence of an objective function.* As can be seen marginal calculus does not always serve in solving programming problems. In such cases other methods of maximizing the objective function must be used, e.g., linear programming. There are also situations where although marginal calculus can be formally applied, it does not lead to the maximization of the objective function because such a function does not exist. This purely formal application of marginal calculus for which there is no corresponding maximization of the objective function we shall call *marginal pseudo-calculus*. Here, the symbols of marginal calculus are used but they are empty of objective content.

The symbols

$$\frac{\partial f}{\partial x_i} \quad (i = 1, 2, \dots, n)$$

which appear on the left hand side of the necessary conditions (12), may be interpreted as the coefficients of Pfaff's differential equation

$$(20) \quad \sum_{i=1}^n f_i(x_1, x_2, \dots, x_n) dx_i = 0$$

the solution of which is the objective function $f(x_1, x_2, \dots, x_n)$. The coefficients f_i ($i = 1, 2, \dots, n$) are then partial derivatives of that function, its marginal increments, and we may write accordingly

$$f_i = \frac{\partial f}{\partial x_i}$$

It is known, however, that Pfaff's equation does not always have a solution in the form of a function of all the variables x_1, x_2, \dots, x_n . This depends on the rank of the matrix

$$(21) \quad \begin{pmatrix} f_1 & f_2 & \dots & f_n \\ h_{11} & h_{12} & \dots & h_{1n} \\ h_{21} & h_{22} & \dots & h_{2n} \\ \dots & \dots & \dots & \dots \\ h_{n1} & h_{n2} & \dots & h_{nn} \end{pmatrix}$$

where

$$(22) \quad h_{ij} = \frac{\partial f_i}{\partial x_j} - \frac{\partial f_j}{\partial x_i} \quad (i, j = 1, 2, \dots, n).$$

Such a solution exists when, and only when, the rank of the matrix is not higher than 2. If the matrix is of higher rank, the equation is satisfied by a set of several independent functions, each of which depends on only some of the variables x_1, x_2, \dots, x_n .¹⁴ The number of these independent functions is at least as great as the rank of the matrix (21)¹⁵.

In order to verify whether or not an objective function exists, we take the marginal increments

$$\frac{\partial f}{\partial x_i} \quad (i = 1, 2, \dots, n)$$

determined by the equations (12) and write

$$(23) \quad f_i = \frac{\partial f}{\partial x_i} \quad (i = 1, 2, \dots, n)$$

and

$$(24) \quad h_{ij} = \frac{\partial^2 f}{\partial x_i \partial x_j} - \frac{\partial^2 f}{\partial x_j \partial x_i} \quad (i, j = 1, 2, \dots, n).$$

¹⁴ In order to visualize this result let us take the case $n = 3$. If the rank of the matrix (21) does not exceed 2, the solution of Pfaff's equation is a function of three variables $z = f(x_1, x_2, x_3)$. Its projections onto the space (x_1, x_2, x_3) are a family of surfaces determined by the equation $f(x_1, x_2) = \text{const}$. If, on the other hand, the rank of the matrix (21) is 3, then the solution of Pfaff's equation is a function of two variables, whose projections, determined by the equation $f(x_1, x_2) = \text{const}$. (where the numbering of the variables x_1, x_2, x_3 , is arbitrary), form a family of lines situated on any surface in the space (x_1, x_2, x_3) . When $n = 4$ and the rank of the matrix (22) is greater than 2, the functions satisfying Pfaff's equation may represent, according to the rank of the matrix, lines or surfaces on 3-dimensional objects in the space (x_1, x_2, x_3, x_4) . They are then functions of two or three variables from x_1, x_2, x_3, x_4 .

¹⁵ Or one less if the rank of the matrix is even.

These expressions are inserted in the matrix (21) and we note the rank of the matrix. If the rank of the matrix is such that the differential equation (20) possesses no solution in the form of a function of all the variables x_1, x_2, \dots, x_n , no objective function exists. In such a case there exist only various partial functions, each of which includes only some of the variables x_1, x_2, \dots, x_n . Such functions shall be called *functions of partial effects*. These partial effects are unco-ordinated and are not subordinate to a common objective. In other words there is no integration of the means by a common end.

In such a case the symbols

$$\frac{\partial f}{\partial x_i} \quad (i = 1, 2, \dots, n)$$

represent only the marginal increments of these unco-ordinated partial effects, and not the marginal increments of a common objective to which all the means would be subordinated. The equations (12) are then not the criterion of the maximization of anything. Neither are they the criterion of the minimization of the outlay function, since the condition that the objective function has a definite constant value has no meaning because the objective function does not exist. This is what we call marginal pseudo-calculus.

Those who follow the subjectivist trend in political economy and treat marginal calculus as an instrument for "maximizing utility" make use of marginal pseudo-calculus. This will be discussed in the next chapter.

CHAPTER SIX

THE SUBJECTIVIST AND THE HISTORICAL TREND IN POLITICAL ECONOMY

The Marxist and other trends in political economy. Their relation to classical political economy

THE concept of political economy set out above derives from Karl Marx¹. It defines a subject and method of investigation which, when applied to objective reality, give rise to definite economic theories. The subject matter and method of investigation together with the economic theories resulting from them constitute the *Marxist trend* in political economy. Its characteristic feature is that it conceives the economic process as a *social* process of the production and distribution of the material means of satisfying human needs.

¹ Karl Marx's principal work is *Capital*. The first volume appeared in 1867. The second and third volumes were published posthumously by Engels on the basis of manuscripts left by Marx (Volume Two in 1885, Volume Three in 1894). Apart from *Capital* the earlier works of Marx should be mentioned, i.e., *A Contribution to the Critique of Political Economy* (published in 1859) and the popular works: *Wage Labour and Capital* (1849); *Wages, Price and Profit*, (written and delivered in 1865, published in 1898); the manuscripts left by Marx on the history of political economy which were first published in three volumes by Kautsky 1905-1910 under the title *Theories of Surplus Value*. A new edition of *Theories of Surplus Value* has been prepared by the Marx-Engels-Lenin Institute in Moscow; so far two volumes have appeared. In 1953 the same Institute published Marx's manuscripts containing his preparatory notes for *Capital*. They appeared under the title *Grundrisse der Kritik der politischen Oekonomie*. Apart from Marx's works, the second part of *Anti-Dühring* written by his close collaborator Frederick Engels, dealing with political economy and published in 187, should be mentioned too. Apart from these, all the works of Marx and Engels are source material for the study of the Marxist interpretation of political economy.

It investigates the economic relations between men which appear in the course of this process (relations of production and relations of distribution) and the connection between these relations and the mutual interaction of man and nature which occurs in the social process of labour and leads to the development of man's social productive forces. On this basis the Marxist interpretation establishes economic laws—laws which although resulting from conscious and purposive human activity are none the less objectively necessary, independent of human will and consciousness, because man acts under specific social conditions and because the productive forces which he develops have specific properties. The Marxist trend in political economy further maintains that now it becomes possible to reshape economic relations so that the operation of economic laws ceases to be a spontaneous process and is made ever more effectively to serve the aims which man consciously sets himself.

The Marxist trend is not the only one in modern political economy. Other approaches exist alongside; these may be classified as variations of two main trends: the subjectivist and the historical. Both have something in common with the Marxist conception but the common features which the subjectivist conception shares with the Marxist differ from those which the historical conception shares with the Marxist. This is because all lines of thought in modern political economy derive from various attitudes towards the classical political economy which developed in the eighteenth and at the beginning of the nineteenth century, and which, apart from the physiocrats, constitutes the first scientific system of political economy².

² The now common term "classical political economy" was introduced by Marx. It covers the precursors of classical political economy, i.e. William Petty (1623–1687) in England and Pierre Boisguillebert (1648–1714) in France, as well as its chief representatives—Adam Smith (1723–1790) and David Ricardo (1772–1823) in England, Simone de Sismondi (1773–1842) in France and Switzerland. See Karl Marx, *A Contribution to the Critique of Political Economy*, ed. cit., p. 70.

Marxist political economy is based on classical political economy and has incorporated its most important achievements. At the same time it takes a critical attitude towards classical political economy, stressing its connection with a particular historical stage in social development and emphasizing the historical nature of economic categories and economic laws. The subjectivist conception, instead, is the last link in the development of a line of thought which took over from classical political economy certain elements dealing with aspects of the process of exchange and finally ended in isolating the subject of its investigation from historically shaped economic relations. The historical trend originates from a criticism of classical political economy for its failure properly to take into account the historical character of economic categories. This criticism has finally led either to a denial of the existence of economic laws or to the view that economic laws have their source in mental attitudes characteristic of particular periods of history and not in objective social relations and the properties of productive forces as the Marxist conception maintains.

Classical political economy is the point of departure for all contemporary trends in political economy. The Marxist conception took over the most important achievements of classical political economy and at the same time adopted a critical attitude towards them, stressing their historical conditioning and limitations. A new interpretation of the whole of political economy emerged. The two other trends, on the other hand, have one-sidedly stressed, and consequently distorted, certain elements of classical political economy, either of its achievements (the subjectivist trend) or of its criticism (the historical trend). The Marxist conception contains all the true statements which are to be found in the other two interpretations, that is the real attainments of classical political economy preserved in the subjectivist trend, and the correct criticisms of classical political economy found in the historical trend.

The true elements in the other trends are nevertheless combined in a distorted picture of the economic process as a whole and do not adequately reflect reality. It is therefore necessary to subject these trends to critical analysis. We do not intend here to give a history of the development of political economy, we shall confine ourselves to a discussion of the way in which the subjectivist and historical trends treat the subject-matter and the method of political economy.

Subjectivist trend. Its connection with "vulgar economy"

The subjectivist trend has developed indirectly from classical political economy. The connecting link is formed by the theories of the epigoni of classical political economy which Marx contemptuously called "vulgar economy"³. Vulgar economy isolated the study of the economic process from the analysis of relations of production—the foundation of classical political economy, especially of the economic theory of David Ricardo⁴. Vulgar economy thought that the economic

³ This term covers the epigoni of classical political economy. They include the school of Smith, the chief representatives of which were Jean Baptiste Say (1767–1832) in France and Thomas Robert Malthus (1766–1834) in England (who, however, held different opinions on many matters), and the school of Ricardo, formed by James Mill (1773–1836) and J.R. MacCulloch (1789–1864). William Nassau Senior (1790–1864) in England and Frédéric Bastiat (1801–1850) in France should also be mentioned here. John Stuart Mill (1806–1873) was classified by Marx as a representative of vulgar economy but his views contain more elements of classical political economy. Marx himself admitted this when he wrote: "To avoid misunderstanding, I wish to point out here that, though such men as John Stuart Mill deserve criticism on account of the contradictions between their obsolete economic dogmas and their modern tendencies, it would be utterly unjust to confound them with the ruck of apologists belonging to the school of vulgar economics". (*Capital*, Dent and Dutton, London 1930, vol. II, p. 672 n. 2.)

⁴ Adam Smith was concerned with social labour and especially the division of labour as the source of the wealth of nations as well as with the influence of the social relations within which labour was carried out on this wealth. Ricardo defined the subject matter of political economy as follows "The produce of the earth—all that is derived from its surface by the

relations between men originate in the process of exchange and not in the social process of production. It did not consider the economic process as a social bond emerging among men in the labour process but looked at it from the point of view of the individual entrepreneur buying and selling on the market⁵. Krzywicki described vulgar economy as a theory in which "nothing was taken into account except single individuals made up into simple arithmetical sums... no notice was taken of the fact that the single producer is only a member of a vast and coherent system of the division of social labour in which some are cobblers because others are tailors or agricultural labourers; that exchange, sale and purchase, is only a form peculiar to a particular period for the mutual exchange of effort, and that behind the relations of buyer and seller lie concealed the relations between the various producers, members of a social organism of the division of labour"⁶.

united application of labour, machinery, and capital, is divided among three classes of the community, namely, the proprietor of the land, the owner of the stock or capital necessary for its cultivation, and the labourers by whose industry it is cultivated... To determine the laws which regulate this distribution is the principal problem in Political Economy". *The Principles of Political Economy and Taxation*, J. M. Dent and Sons London 1911, p. 1.

⁵ Marx wrote: "When I speak of the "classical political economy" I mean all the political economy since W. Petty which has been devoted to the study of the *real* interrelations of bourgeois production, in contradistinction to "vulgar economy". The "vulgar economists" are content to elucidate the *semblance* of the interrelations of bourgeois production; like ruminants, they spend their time in chewing the cud of materials provided in days long past by scientific political economy, seeking thence to extract for bourgeois daily food plausible explanations of the most obvious phenomena; and for the rest, they are satisfied with systematising in pedantic fashion, and proclaiming as eternal verities, the most trivial and self-complacent notions which the agents of bourgeois production entertain with regard to their own best of all possible worlds". (*Capital*, ed. cit., vol. 1, pp. 55-6 n.). Bastiat laid special emphasis on the fact that economic relations among men arise in the process of exchange. Exchange of services is the basis of the social bond between men. (See *Harmonies économiques*, Paris 1850, pp. 111-114).

⁶ L. Krzywicki, *Political Economy. A Handbook for the Self-taught* (in Polish) ed. cit.

In vulgar economy the subjective relation of the purchaser and seller to the goods bought or disposed of began to come to the fore; this question eventually became its central problem. Instead of examining the objective social relations appearing in the process of production, attention was devoted to the subjective attitude of man to objects serving to satisfy his needs. The subjectivist trend in political economy was finally formulated systematically in 1871 in the works of Karl Menger and William Stanley Jevons⁷.

Subject matter of political economy according to the subjectivist conception: analysis of man's relation to goods on the basis of the economic principle

The element of classical economy on which the subjectivist conception drew was the economic principle. In classical political economy there was a more or less clear assumption that gainful activity is directed to the maximization of money income, and in particular that the maximization of profit is the chief incentive in the process of production. The original form of this assumption was the assertion that in gainful activity men are guided by their self-interests, that is, they strive to obtain the greatest possible amount of wealth. As Adam Smith writes: "It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from

⁷ K. Menger, *Grundsätze der Volkswirtschaftslehre* and W.S. Jevons, *The Theory of Political Economy*. Leon Walras (*Elements d'économie politique pure*, 1874), and Alfred Marshall (*Principles of Economics*, 1890) and the neo-classical school founded by him, do not really fully represent the subjectivist trend although they are often considered as belonging to it. Walras and Marshall were interested above all in the process of exchange on the market and the question of the subjective relation of man to goods was treated by them as just one of the elements in the market process. They are nearer to the old tradition of vulgar economy than to the subjectivist trend. In Marshall's work the subjective relation to goods plays a larger part than in Walras' work where the basic role is ascribed to the technical conditions of production. Walras' method of analyzing the relations of production, reproduction and accumulation puts him nearer classical political economy.

their regard to their own interest. We address ourselves not to their humanity but to their self-love, and never talk to them of our own necessities but of their advantages"⁸. Similarly, Ricardo remarked that "self-interest guides all speculations in trade"⁹. This assumption, which is quite simply a statement that in a system of commodity production and commodity-money exchange there is a tendency to the maximization of money income, was then erected into a general principle governing all human economic activity. This led to the concept of *economic man* (*homo oeconomicus*) who behaves strictly according to the principle of the maximization of his "economic advantage".

The extension of the principle of the maximization of money income to the maximization of all kinds of loosely defined "economic advantage" was finally given precise expression in the doctrine of *utilitarian psychology*. According to this doctrine all human behaviour is governed by the desire to experience pleasure and avoid pain; man strives for the maximum pleasure and the minimum pain possible in a given situation. Many of those who held the doctrines of vulgar economy were followers of this theory¹⁰. This theory was finally embodied in the subjectivist concepts of Jevons, according to whom all economic behaviour consists in maximizing the surplus of pleasure given by the possession of goods over the pain connected with the effort of obtaining them.

⁸ Adam Smith, *The Wealth of Nations*, Dent and Dutton, London 1910, vol. 1, p. 13.

⁹ *The High Price of Bullion. Appendix. The Works and Correspondence of David Ricardo*, Cambridge 1951, vol. 3, p. 102.

¹⁰ The originator of this theory was Jeremy Bentham (1748-1832). James Mill and John Stuart Mill were his disciples. Ricardo was also influenced by Bentham although Bentham was boasting when he said that "I was the spiritual father of Mill and Mill the spiritual father of Ricardo, Ricardo is therefore my spiritual grandson". See D. Rozenberg *Istoriya politicheskoy ekonomii* (History of Political Economy), pp. 156-157. See also Z.J. Wyrozembski, *Źródła współczesnej burżuazyjnej ekonomii*, (The Origins of Contemporary Bourgeois Economics), "Ekonomista", Warsaw 1958, no. 6, and *David Ricardo*, Warsaw 1959, pt. VI.

According to Jevons, economy is “a calculus of pleasure and pain”. “Pleasure and pain are undoubtedly the ultimate objects of the Calculus of Economics. To satisfy our wants to the utmost with the least effort—to procure the greatest amount of what is desirable at the expense of the least that is undesirable—in other words, *to maximise pleasure*, is the problem of Economics”¹¹. In this way Jevons shifts the point of emphasis to the analysis of the relation of man to the objects satisfying his needs. Here economic science becomes quite simply the study of behaviour governed by the economic principle with the aim of maximizing the pleasure of possessing goods.

Another interpretation of behaviour according to the economic principle, not connected with utilitarian psychology, is closer to the tradition of classical political economy where it was assumed that man strives for the maximization of money income. According to William Nassau Senior “every man desires to obtain additional wealth with as little sacrifice as possible”¹². Maximization of a psychological magnitude, pleasure, is replaced by the maximization of wealth which, in a money economy, is the same as the maximization of money income. John Stuart Mill went even further and treated the maximization of wealth not as an actual fact but as one of the aspects of human activity. Human activity has various aims and wealth is only one of them. According to Mill, political economy examines only one aspect of human activity and leaves the rest to other social sciences. Mill writes: “Political Economy considers mankind as occupied solely in acquiring and consuming wealth, and aims at showing what

¹¹ W.S. Jevons, *The Theory of Political Economy*, 3rd ed., London 1888, p. 37. In the preface (p. vi) Jevons writes, “In the work I have attempted to treat Economy as a Calculus of Pleasure and Pain”. It should be noted that Jevons’ formulation of the economic principle as quoted in the text is wrong, as we have shown in Chapter Five.

¹² Senior seems to have been the first to formulate economic theory in terms of an axiomatized deductive system. The quotation given here is the first axiom of this system. See Joseph A. Schumpeter, *History of Economic Analysis*, New York 1954, p. 576.

is the course of action into which mankind, living in a state of society, would be impelled if that motive ... were absolute ruler of all their actions"¹³. The object of study of political economy is thus behaviour according to the economic principle with the aim of acquiring wealth; however, this behaviour is considered as only one of many kinds of possible behaviour.

The concept of utility according to the subjectivist conception

Both these interpretations come to the same thing. According to the subjectivist conception, political economy ceases to be the study of the social relations arising in the process of production and distribution, i.e., the study of economic relations between men, as in classical political economy; it even ceases to be the study of market exchange, like vulgar economy. Instead, political economy becomes the study of the relation of man to the objects satisfying his needs, to the goods the possession of which causes pleasure or constitutes wealth. In this it is assumed that man's behaviour towards goods is governed by the economic principle: he maximizes what is usually called "utility." Utility is maximized by the use of marginal calculus, which appears here in the form of the calculus of marginal utility. Hence the subjectivist trend came to be called the *marginalist trend* or, more strictly speaking, the *theory of marginal utility*¹⁴.

¹³ J. S. Mill, *Essays on Some Unsettled Questions of Political Economy*, London 1864, p. 138.

¹⁴ Elements of marginal calculus also appear earlier, e.g., in Ricardo and Marx in connection with the analysis of differential rent. Only with the appearance of the subjectivist trend, however, did marginal calculus become a basic methodological instrument of political economy. Marginal calculus is, as we know, quite simply the application of the well-known principles of differential calculus to the determination of the maxima and minima of mathematical functions. Some of the originators of the subjectivist trend like Jevons and Walras realized this. The representatives of the Austrian School, on the other hand, like Karol Menger (1840–1921), Frederick Wieser (1851–1926) and Eugene Böhm-Bawerk (1851–1914), were not familiar with higher mathematics. By introducing and applying marginal calculus they rediscovered differential calculus (two hundred

The subjectivist conception appears in a number of variations depending on the interpretation of the concept of utility and the field in which this concept is applied. The *hedonistic* interpretation (from the Greek ἡδονή—pleasure) derives from utilitarian psychology and treats utility psychologically, as “pleasure”, “satisfaction”, “welfare”, etc. This is an interpretation which appears originally in the subjective school: we meet it in Jevons, Menger, Böhm-Bawerk and Marshall¹⁵. Later another interpretation appears which might be called *praxiological*. This conceives utility as a degree of realization of the aim of economic activity, independent of the nature of the aim. Whether it is a question of pleasure in the psychological sense, or of money income, or of political power or of a particular moral social aim (e.g. a health service)—is a matter of indifference. The praxiological interpretation of utility is something quite separate from the question of the nature of the aim and confines itself to the statement that economic activity has a certain end which may be understood as a magnitude permitting of various degrees of realization. Recently, instead of the term “utility”, “preference” is more and more frequently used in this inter-

years after Newton and Leibniz). This is noted by J. A. Schumpeter (*History of Economic Analysis*, pp. 18, 956). The term “marginalist trend” is inaccurate as a description of the subjectivist interpretation of political economy in that it takes as its criterion the method rather than the content of this doctrine. Marginal calculus was used not only by the subjectivist trend. This calculus is used everywhere where a magnitude is maximized or minimized by differential calculus (as opposed to linear programming). A better term is the “theory of marginal utility”, although, as we shall see, it does not cover some of the modern variations of the subjectivist trend.

¹⁵ Jevons defined the utility of an object as the pleasure which its possession makes it possible to realize (*The Theory of Political Economy*, pp. 38, 45). Menger (*Grundsätze der Volkswirtschaftslehre*, Vienna 1871, p. 81) and Böhm-Bawerk (*Grundzüge der Theorie des wirtschaftlichen Güterwerts*, “Jahrbücher für Nationalökonomie und Statistik” 1886, p. 999) define utility as the significance of an object for welfare (*Wohlfahrt*). Marshall in his *Principles of Economics*, pp 331, 470–476, 851–852) talks about the maximization of satisfaction”.

pretation. In this praxiological interpretation, the subjectivist trend leaves aside all psychological considerations and transforms itself into "a logic of rational choice" aimed at the maximization of preference¹⁶.

Within the subjectivist trend there are also certain differences as to the extent to which the concept of utility is applied. The "Austrian" or "psychological" school (Menger, Wieser, Böhm-Bawerk), considered all economic activity to be a striving for the maximization of utility. The calculus of marginal utility was applied to both gainful activity and to household activity. This was the school of marginal utility *par excellence*. The "Lausanne" school (Walras and Pareto), together with Marshall and the so-called neo-classical school which derives from him, limited the application of the concept of utility and the calculus of marginal utility to household activity. Gainful activity, on the other hand, was regarded as the maximization of money income and here the concept of utility was not introduced (although Marshall tried to associate production costs with a subjective sacrifice interpreted as

¹⁶ The first step towards the praxiological interpretation of utility was taken by Vilfredo Pareto (1848-1923) when he introduced the index function as the object of maximalization. On the other hand, however, he defines utility as the pleasure caused by the possession of an object. (See *Manuel d'économie politique*, 10th ed., Paris 1927, pp. 159, 171, 249 and *passim*). Wieser also tended toward a praxiological interpretation in rejecting utilitarian psychology and defining utility as the property of objects which can be used to satisfy the needs forming the aim of economic activity. See *Theorie der gesellschaftlichen Wirtschaft*, Grundriss der Sozialoekonomie, pt. 1, 2nd ed., Tuebingen 1924, pp. 141, 156. A purely praxiological interpretation was given by R.G.D. Allen and J. R. Hicks, *A Reconsideration of the Theory of Value*, "Economica" London 1954. A consistent praxiological formulation is contained in J. R. Hicks, *A Revision of Demand Theory*, Oxford 1956. Max Weber gave a praxiological interpretation of the theory of marginal utility as early as 1908. He stated that this theory should be formulated, not in the psychological categories of the experience of pleasure, but in the "pragmatic" categories of end and means. By "pragmatic" categories Weber means praxiological categories in our sense (see chapter five above). Cf. Max Weber, *Die Grenznutzenlehre und das "psychophysische Grundgesetz"*. *Gesammelte Abhandlungen zur Wissenschaftslehre*, p. 372.

“disutility”). In the more modern praxiological conception this difference disappears for the maximization of preference includes both the maximization of money income in gainful activity (including the maximization of profit by an enterprise) and also the maximization of utility (however interpreted) in household activity. Gainful activity and household activity are both subject to the same principle of the maximization of preference obtained by the application of marginal calculus.

The tendency of the subjectivist trend to transform political economy into a branch of praxiology

Only one step separates this concept from the transformation of political economy into a branch of praxiology. This consists in separating economic science from any definite object of study. As long as economic science was conceived as concerning itself with the relation of man to the objects satisfying his needs treated concretely as the aims of normal economic activity¹⁷, it still had a definite field of investigation. Separated from this it is changed into a formal science concerned with rational behaviour maximizing any kind of magnitude. John Stuart Mill showed the way when he stated that political economy is not concerned with a particular area of human activity but with a certain aspect of it. Then all that was needed was the assertion that political economy deals with a certain aspect of all rational human activity, that is, behaviour according to the economic principle, regardless of what kind of activity this may be. This conception of the subject of political economy became widespread among subjectivist economists and is considered as the methodologically most advanced interpretation.

The clearest and most consistent exposition of this conception is given by Lionel Robbins: “Economics is the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses”¹⁸. Accord-

¹⁷ Alfred Marshall defined economics as “the study of mankind in the ordinary business of life”. *Principles of Economics*, p. 1.

¹⁸ L. Robbins, *An Essay on the Nature and Significance of Economic*

ing to this definition, economic science is not concerned with a particular field of human activity but with certain aspects of this activity. Robbins puts this quite clearly: "The conception we have adopted may be described as analytical. It does not attempt to pick out certain kinds of behaviour, but focuses attention on a particular aspect of behaviour, the form imposed by the influence of scarcity. It follows from this, therefore, that in so far as it presents this aspect, any kind of human behaviour falls within the scope of economic generalizations. We do not say that the production of potatoes is economic activity and the production of philosophy is not. We say rather that, in so far as either kind of activity involves the relinquishment of other desired alternatives, it has its economic aspect. There are no limitations on the subject matter of Economic Science save this"¹⁹.

Economic science understood in this way is a general study of behaviour governed by the economic principle, a study which has an application in all fields of human behaviour in which the economic principle applies. According to Robbins the economic aspect of human activity consists in the fact that since the limited amount of means available can be applied in a variety of ways it is necessary to choose the ends for the realization of which these scarce means are to be used. A choice of this kind, however, assumes that there is a hierarchic structure of ends, that some ends are more important than others. Without a hierarchy of this kind it is impossible to make a rational choice of ends; on the other hand, the fact that a hierarchy of aims exists, presupposes that particular

Science, 2nd ed., London 1946, p. 16. The same definition of the subject matter of political economy was given somewhat earlier by the last of the great representatives of the Austrian school, Hans Mayer (*Untersuchungen zu dem Grundgesetz der wirtschaftlichen Wertrechnung*, "Zeitschrift für Volkswirtschaft und Sozialpolitik", Neue Folge, Vienna 1922, vol. 2, p. 5).

¹⁹ L. Robbins, *An Essay on the Nature and Significance of Economic Science*, ed. cit., p. 17.

aims are the means to the realization of one principal end²⁰. In this case the choice of ends according to their relative importance is equivalent to the maximization of the principal end i.e., proceeding according to the economic principle. Economic science is thus the science of the use of scarce means guaranteeing the maximum degree of realization of a chosen end of human activity.

Political economy is thus finally transformed into a branch of praxiology, into a science of programming. Ludwig von Mises writes "Out of the political economy of the classical school emerges the general theory of human action... No treatment of economic problems proper can avoid starting from acts of choice; economics becomes a part, although hitherto the best elaborated part, of a more universal science, praxiology"²¹. As a result of this change in character, political economy ceases to be an empirical science dealing with real phenomena and becomes a formal "logic of choice" in which the only criterion of truth is the agreement of theorems with the axioms adopted. When applied to actual human activity this "logic of choice" is empirically true in so far as the activity is governed by the economic principle. The theorems of this kind of political economy do not require empirical verification; all that needs to be shown is whether a particular procedure is governed by the economic principle or not. Some subjectivist economists like Mises go even further and state

²⁰ Hans Mayer draws attention to the necessity of a hierarchy of ends of this kind in *Untersuchungen zu dem Grundgesetz der wirtschaftlichen Wertrechnung*, ed. cit., p. 5. Max Weber also treats the problem of economy as the problem of a choice between ends. In this he distinguishes between technique and economic activity. Technique consists in the choice of means for the realization of a given end while economic activity is the choice of ends which are to be realized. Weber forgets, however, that choice of ends requires the establishment of a hierarchy of ends. But in hierarchy of ends the various ends are means to the realization of a principal end and hence the differentiation between technique and economic activity is meaningless. See *Wirtschaft und Gesellschaft*, pp. 32-35.

²¹ L. Mises, *Human Action, A Treatise on Economics*, New Haven 1949, p. 3.

that economic science praxiologically conceived is knowledge of the laws of actual human activity *a priori*²².

The separation of subjectivist economic theory from the problem of social relations

Consequently, economic science as understood by the subjectivist school is a study having very little in common with classical political economy or its critical continuation, Marxist political economy. The study of economic relations among men is replaced by the study of the relation of man to things; the study of a particular field of human activity is replaced by what is quite simply a branch of praxiology, the study of a particular mode of human behaviour. By concentrating on the relation of man to things subjectivist economic science has lost contact with the problems of social relations. Economic theory, conceived in this way, ceases to be a social science. By concentrating on a formal mode of human behaviour instead of examining a definite field of human activity, subjectivist economic science is cut off from the problems of the actual economic process. It ceases to be an empirical science in which statements are verified by confrontation with reality. The study of the economic laws operating in objective reality is here replaced by the formulation of praxiological principles

²² Mises writes, "The theorems attained by correct praxiological reasoning are not only perfectly certain and incontestable, like the correct mathematical theorems. They refer, moreover, with the full rigidity of their apodictic certainty and incontestability, to the reality of action as it appears in life and history. Praxiology conveys exact and precise knowledge of real things". (*Human Action*, p. 39). Robbins does not go so far and holds that the applicability of economic assumptions in a concrete case requires empirical verification. Of economic theorems he writes "Granted the correspondence of its original assumptions and the facts, its conclusions are inevitable and inescapable". (*An Essay on the Nature and Significance of Economic Science*, p. 122). An excellent critique of attempts to treat economics interpreted praxiologically as an *a priori* study of phenomena in the real world is given by T. W. Hutchison in *The Significance and Basic Postulates of Economic Theory*, London 1938. See also Felix Kaufmann, *Methodology of the Social Sciences*, London 1944, pp. 225-228.

of behaviour. This change in the character of political economy is indicated by the replacement of the old term "political economy" or "social economy" by the new term "economics" widely used by subjectivist economists.

By its transformation into a science dealing with the relation of man to things, political economy, as we have observed, ceases to be a social science. All theorems, whether of the theory of marginal utility or of the more recent praxiological "logic of choice", are applicable in their entirety to an isolated individual living outside all social bonds. For these theorems deal exclusively with the relation of man to things in isolation from any kind of human social relations. For this reason they can be illustrated by reference to Robinson Crusoe, an example very popular among subjectivist economists. Menger refers in his exposition to, "an inhabitant of the virgin forest", "the inhabitant of an island", "an individual on an uninhabited island", "a farmer who works alone" etc.²³ Böhm-Bawerk begins with: "a man sits by a spring of drinkable water" and goes on to give examples like "a traveller in the desert", "a farmer cut off from the world", "a colonist whose cabin is situated in a virgin forest" etc.²⁴

Wieser begins his exposition with the theory of simple economy (*einfache Wirtschaft*), in which the relation of man to thing appears in isolation and undisturbed by social relations. This simple economy can be understood either as the economy of an isolated individual or as the economy of a whole society (Wieser liked to use the example of a communist society) in relation to nature, excluding the problems of inter-human relations. He writes: "the theory of simple economy begins with the idealizing assumption that the economy is that of one person ... Because the whole of mankind, considered as a unity, is opposed to nature, the opposition of interests

²³ K. Menger, *Grundsätze der Volkswirtschaftslehre*, ed. cit., pp. 82, 85, 92, 96.

²⁴ E. Böhm-Bawerk, *Grundzüge der Theorie des wirtschaftlichen Güterwerts*, ed. cit., pp. 9, 30.

and parties and reference to economic legislation are excluded, just as they were in the case of Robinson Crusoe's economy"²⁵. Finally, turning to modern literature, Robbins asserts that in order to explain economic life it is necessary to "turn to the working of the laws of choice, which can best be revealed by considering the behaviour of an isolated individual"²⁶.

The subjectivist trend and economic laws

An interpretation of this kind which eliminates social relations from economic science and which makes it possible to illustrate all its assertions by referring to Robinson Crusoe, would suggest that economic laws are universal; they are not limited in their historical scope, as the Marxist interpretation maintains, but are the same always and everywhere where economic activity takes place. Robbins puts this clearly: "the generalizations of the theory of value are applicable to the behaviour of isolated men or the executive authority of a communist society as are to the behaviour of men in an exchange economy"²⁷. According to this view economic laws are universal laws of economic activity. Historically conditioned social relations may influence the concrete form in which these laws manifest themselves but they cannot change their basic character. For these economic laws are drawn from man's unchanging attitude to things and not from social relations which continually alter over time. Robbins says of economic laws: "It is true that they are based upon experience, that they refer to reality. But it is experience of so wide a degree of generality as to place them in quite a different class from the more properly designated historico-relative assumptions... It is only failure to realize this and a too exclusive preoccupation with the subsidiary assumptions which can lend any countenance to the view that the laws of Economics are limited

²⁵ F. Wieser, *Theorie der gesellschaftlichen Wirtschaft*, p. 137.

²⁶ L. Robbins, *An Essay on the Nature and Significance of Economic Theory*, ed. cit., p. 20.

²⁷ *Ibid.*, p. 20.

to certain conditions of time and space, that they are purely historical in character, and so on"²⁸.

In asserting the universality of economic laws (as well as of the laws of political economy) the subjectivist trend apparently agrees with the attitude of classical political economy to economic laws. Classical political economy held that economic laws are "eternal" and failed to realize their historical nature and their limited historical scope just as it failed to realize that economic categories are also historical. Marx was the first to assert this historicity and based his criticisms of classical political economy on this. But this agreement is only apparent. Classical political economy held that economic laws are laws of nature since it held that the social relations of commodity production and capitalist production of which these laws were the expression were also eternal and natural²⁹. For classical political economy economic laws dealt with objective reality, like the laws of nature. According to the subjectivist trend, on the other hand, the laws of political economy are praxiological principles of behaviour which indicate which procedure guarantees the maximization of utility or preference.

The transformation of economic laws into praxiological principles of behaviour

The earlier representatives of the subjectivist trend assumed that men do actually behave according to the economic principle. They thus considered that praxiological principles of behaviour according to the theory of marginal utility are applied in actual economic activity and that they reflect the regularities which appear in reality. This being so, praxiological principles of behaviour could be considered as actual economic laws. This view had to be modified, however, when economic science began to be considered as a science dealing, not with a particular field of human activity, but with a par-

²⁸ Ibid., pp. 80-81.

²⁹ Pre-capitalist social relations were either regarded as expression of the immaturity of mankind or were quite simply ignored.

ticular aspect of it—when it became a logic of rational choice used in behaviour governed by the economic principle. The “laws” of a science of this kind do not deal with objectively real processes, they are not empirically established and cannot be verified by experience. Such “laws” are principles of inference employed in the maximization of the magnitude which is the aim of activity; thus they are similar in character to mathematical and logical theorems of which, in fact, they are an application. In some circumstances, as we have seen, praxiological principles of behaviour can be useful as premisses from which true economic laws can be deduced (i.e., laws of human behaviour and of the interplay of human activities), but are not themselves economic laws³⁰.

The role of exchange in subjectivist economic theory

The conception of political economy as the study of the relation of man to thing without taking social relations into consideration, however, proves insufficient. Subjectivist economic theory cannot stop at Robinson Crusoe and resist the application of its knowledge to the problems of the economic activity of men living in society. When confronted with the real economic process, subjectivist economic theory has to face social relations and take them into consideration. Human relations are taken into consideration when the problem of exchange is examined. Consequently subjectivist economics is composed of two parts. The first part forms the foundation and deals with the economic activity of an isolated individual (this may be a collective “individual”). Here the basic theorems dealing with the relation of man to thing in behaviour governed by the economic principle are evolved. In the second part the results of the first part are applied in the explanation of the exchange of goods among men.

³⁰ See Chapter Five. T. W. Hutchison shows very clearly that the theorems of the so-called logic of rational choice are not economic laws, in *The Significance and Basic Postulates of Economic Theory*, ed. cit. pp. 58-72.

This "two-storeyed" construction is typical of subjectivist economic theory. This appears very clearly in Wieser who divides economic science into the theory of simple economy (*einfache Wirtschaft*) and the theory of social economy (*gesellschaftliche Wirtschaft*). He sees the relationship between the two as follows: "After showing how an individual calculates and manages his affairs according to the theory of simple economy we then proceed to show how numbers of individuals who, where property is privately owned, meet for exchange—striving for their own economic advantage—establish prices, and on the basis of these prices create a national economy"³¹. Walras, Pareto, and others construct their systems in a similar fashion. First they consider the economic activity of an individual who maximizes utility or preference and then the activity of individuals encountering one another in exchange. This is more or less the standard method of presenting the system of economic theory according to the subjectivist conception³².

In deducing human relations from the phenomena of exchange the subjectivist trend shows its kinship with vulgar economy which holds that social relations originate in the process of exchange and not in production as asserted by classical political economy and subsequently by Marx. The subjectivist trend, however, has a peculiar approach to the human relations which emerge in exchange, as a result of which they cease to be social relations. Separate individuals, engaged in economic activity quite independently, establish relations with each other through the exchange of goods. Exchange consists in the relinquishment by each individual of something he wants less in return for something he wants more. Exchange is here the supplementation of the economic activity of isolated individuals; its effect is simply the resultant

³¹ F. Wieser, *Theorie der gesellschaftlichen Wirtschaft*, p. 137.

³² This does not refer to Marshall and his school (the neo-classical school) which is closely connected with the tradition of English vulgar economy, and beginning from a consideration of market processes only later discusses the behaviour of individuals, seeking in this behaviour an explanation of the regularity of market processes.

of the subjective attitude of various individuals to the objects they buy and sell. The central problem remains that of the relation of man to things—in this case his relation to the goods exchanged. The relations among men which emerge in the process of exchange are purely incidental and have no essential significance. The basic issue is the relation of man to things. As Robbins writes: “The exchange relationship is a technical incident: a technical incident indeed, which gives rise to nearly all the interesting complications, but still, for all that, subsidiary to the main fact of scarcity”³³. Exchange is thus merely a complicating factor in the relation of man to things. Apart from his attitude to his own possessions he also has a relation to the possessions of other men. The relations between men are here only connecting links in man’s relation to things.

This conclusion is the opposite of the Marxist conception. The Marxist conception does not exclude from political economy the examination of the relation of man to things, to goods. Economic relations (relations of production and relations of distribution) are relations which develop between men through the medium of things, relations of the type: man–thing–man³⁴. Their essential feature is that they are social relations, relations between men. The relation of man to things is a mere link in the relation of man to man. It is of interest for political economy only in so far as it constitutes a link of this kind. Then, and only then, does man’s relation to things have social significance, then, and only then, does it become an object of interest for political economy. The subjectivists, on the other hand, look at the problem from a completely different point of view altogether. They are only interested in the relation of man to thing, and relations between men are taken into account only in so far as they constitute a link in the relation of man to thing, a link resulting from the

³³ L. Robbins, *An Essay on the Nature and Significance of Economic Science*, ed. cit., p. 20.

³⁴ See Chapter One.

fact that a desired object is in the possession of another man. Thus the subjectivist trend, even when it is forced to concern itself with exchange, does not investigate social relations but confines itself to the consideration of relations between men as links in the relation of man to things.

Subjectivist trend implies the liquidation of political economy

By consistently avoiding the examination of social relations, the subjectivist trend avoids the consideration of those great issues which were the concern of classical political economy and to-day form the subject of Marxist political economy. These are the problems of economic relations among men—relations of production and relations of distribution. Even vulgar economy in its warped fashion dealt with certain economic relations, the relations emerging in the process of exchange. The subjectivist trend, by devoting itself exclusively to the relation of man to things even in connection with the problem of exchange, turned its back on the proper subject matter of political economy. Rudolf Hilferding put this very clearly when he wrote of the Austrian school of political economy: "Instead of economic and social relations it takes as the starting point of its system the *individual* relation of man to things. It conceives relations from a psychological point of view, as subject to natural invariable laws; it excludes socially determined relations of production, and the concept of the development of the economic process according to definite laws is quite foreign to it. This economic theory is a contradiction of economy: its last word is... *the self-liquidation of political economy*"³⁵. What Hilferding writes here applies to the whole of the subjectivist trend.

The transformation of subjectivist economics into a branch of praxiology is the last step in its liquidation as political economy. When changed in this way subjectivist economics ceases to have anything to do with the examination of a defi-

³⁵ R. Hilferding, *Böhm-Bawerks Marx-Kritik*, in *Marx-Studien*, vol. 1 Vienna 1904, p. 61. An English translation edited by Paul M. Sweezy was published in New York 1949; see p. 196 of it.

nite field of social reality and concerns itself with a particular aspect of behaviour common to all rational human activities directed to the maximization of a given end. Understood as the science of the application of the economic principle, economics becomes a universal science covering the most varied fields of human activity. The economic principle can be applied, as we know from the previous chapter, in many fields: in technology, military strategy and tactics, surgery and medicine, teaching, the art of swimming and horse-riding, chess, the art of painting, the methodology of scientific investigation etc. Every normal man employs the economic principle when he goes every morning to work taking the shortest route or the quickest tram.

Marginal calculus can also be applied in many of these fields. It is used in technology, whenever a particular problem of maximization or minimization (e.g., the maximum permissible load of a beam) is solved by differential calculus. It is applied in military strategy and tactics, e.g., in comparing the effect of committing additional forces in various sectors of a front, i.e., calculating the marginal effect of committing these forces in various sectors of a front. It can be applied in swimming when comparing the marginal effect of various additional movements on the speed of the swimmer. The other method of using the economic principle, the method used in cases where marginal calculus is useless, i.e., linear programming, was developed, as we have already explained, in order to deal with military operations and was only later applied to problems of economic activity.

All this would have to be counted as part of the subject matter of political economy if political economy is the study of behaviour according to the economic principle. Maffeo Pantaleoni was one of the first to conceive political economy in this way. Like Jevons, he interpreted the economic principle hedonistically, as the effort to maximize pleasure. He called this the hedonistic postulate, and economic theory regarded as the science of behaviour governed by the hedonistic postulate) he called "pure economy", i.e., economy uncomplicated

by the social relations among men³⁶. Antonio Gramsci commented as follows on Pantaleoni's "pure economy": "The first part of the book, dealing with the hedonistic postulate would be more suitable as an introduction to a manual of advanced cookery or to a still more advanced manual of postures in the sexual act (*sulle posizioni di amanti*). It is a pity that those who write books about cookery do not study "pure economy"... the same might be said of those engaged in more discreet and esoteric research on the art of erotic enjoyment"³⁷.

It would be difficult to put it more forcibly; the transformation of economic science into a branch of praxiology whether in hedonistic interpretation or in the form of the logic of rational choice implies its liquidation as political economy. For this reason many economists brought up in the subjectivist school are beginning to reject the concept of economic science as the study of behaviour governed by the economic principle and are turning back to the traditional idea of political economy as the study of a particular field of human activity and the social relations which result from this activity³⁸.

³⁶ M. Pantaleoni, *Principi di Economia Pura*, Milan 1931, pp. 7-13. The first edition, of which the edition quoted here is a reprint, appeared in 1889.

³⁷ Antonio Gramsci, *Il materialismo storico e la filosofia di Benedetto Croce. Opere di Antonio Gramsci*, Rome 1955, vol. 2, p. 268.

³⁸ Edward Taylor, for example, rejects the definition of political economy as the study of behaviour according to the economic principle because this would not exclude technique and other disciplines. (*Wstęp do ekonomii, (Introduction to Economics)* 2nd ed., Gdynia 1947, pp. 28-29, 88). Taylor defines political economy as the study of social income understood as the total output of material goods (*ibid.*, pp. 25-27). He thus follows Adam Smith who understood political economy as the study of "the wealth of nations". Another example is provided by J. A. Samuelson's widely used book *Economics. An Introductory Analysis*, New York 1955. Samuelson deals with the social organization of production and exchange, the economic activity of the state, the organization of the labour market, the national income, international trade etc. Undoubtedly the influence of the neo-classical tradition is at work here, which, as we have pointed out, cannot be unreservedly reckoned as part of the subjectivist trend although it is under its influence.

Limited and historically conditioned scope of the economic principle

We know that economic activity is only one of the fields of human activity to which the economic principle can be applied. On the other hand, economic activity is behaviour governed by the economic principle only when it is rational and directed to a single end which admits of various degrees of realization. For this reason the definition of the subject matter of political economy as behaviour according to the economic principle is on the one hand too broad (since it includes activities which are not economic) and on the other hand too narrow (since it excludes a great deal of economic activity to which the economic principle does not apply). As we know, the application of the economic principle in economic activity is the result of a long historical process of development (which was described in the previous chapter).

Before the appearance of commodity production and money economy, economic activity was governed by custom and tradition. Only with commodity production and money economy and the separation of gainful activity from household activity does a uniform and quantitatively measurable end appear—money income. It evolves gradually, together with the slow separation of gainful activity from household activity. Complete separation is only found in capitalist enterprise; moreover it is only here that complete quantification and commensurability of all the elements of economic activity—both degrees of realization of the end and outlay of means—is achieved. The economic category of profit emerges. It is only then that the conditions for the application of the economic principle arise. We have also seen that in the capitalist mode of production rationality of economic activity, finding its expression in the application of the economic principle by the enterprise, is only private rationality of economic activity, and that only in the socialist mode of production is it possible to apply the economic principle to the whole of the social economy, i.e., it is only

under socialism that social economic rationality becomes possible.

The activity of a capitalist enterprise is indisputably governed by the economic principle. Here this activity takes the form of the maximization of profit. Here also, in certain conditions, marginal calculus is applied in order to find the optimum use of means. As we know from the previous chapter marginal calculus is only one way of doing this and it cannot always be used. Apart from this there is another way of determining the optimum use of means, i.e. linear programming. It was stated earlier in this book that the application of both marginal calculus and linear programming require that an enterprise possess the appropriate methodological knowledge and that it should be possible to apply it. In the absence of such knowledge or when it is impossible to apply it, an enterprise will use less accurate methods for maximizing profit, giving poorer approximations and based on simple methods of calculation from the data supplied by book-keeping and balance accounts. Generally these methods are closer to linear programming than marginal calculus since they are mostly based on the assumption that there is simple proportionality between the outlay of means and a rise in profit and that one means can be replaced by another in fixed proportions. These simple methods of calculation might be considered as a primitive version of linear programming, differing from programming worked out mathematically in that it does not deal accurately with the problems of the simultaneous employment of a larger number of means.

The essence of the subjectivist trend, however, consists in the fact that it treats household activity as behaviour according to the economic principle. According to this interpretation, an attempt is made in the household to maximize a definite magnitude, called utility, by the use of marginal calculus. Utility, as we know, can be regarded either hedonistically as pleasure, satisfaction etc., or praxiologically as preference. The Austrian school treats the whole of social economy as one vast household and even in the activity of

an enterprise sees an attempt to maximize utility. The Lausanne and neoclassical schools think that the maximization of utility is only to be found in households and deal with enterprise in terms of money cost and profit. The praxiological interpretation of utility originated by Vilfredo Pareto made it possible to treat the maximization of profit in the enterprise and the maximization of utility in the household as special cases of one praxiological principle, the maximization of preference. The ascription of a desire for the maximization of utility to domestic economic activity, however "utility" is interpreted, is an attempt to extend the principle of maximization, which governs the activity of capitalist enterprise, to household activity—an attempt to interpret household activity as rational activity directed to the maximization of a clearly determined magnitude. Utility plays the same role in household activity as profit in capitalist enterprise³⁹.

Is there a striving for the maximization of utility in household activity?

The question arises as to whether and to what extent the extension of the principle of maximization from enterprise to household is justified by the actual economic process. In capitalist enterprise there is quite clearly a quantitatively measurable uniform aim in the form of profit. This aim, empirically verifiable, measurable in monetary units, is made

³⁹ This had already been remarked by Max Weber who interpreted the theory of marginal utility as follows: "The 'theoretical values', employed by the theory of marginal utility, are to render the course of economic life comprehensible just as the values supplied by book-keeping inform the merchant of the situation of his business and the conditions for its continued profitability. The general principles established by economic theory are only constructions which indicate the consequences which would follow from the activity of a single individual in its interplay with the activity of others, if everybody moulded their relation to their environment exclusively according to the principles of commercial book-keeping, and hence rationally in this sense". *Die Grenznutzenlehre und das "psychophysische Grundgesetz"*, ed.cit. p. 371.

visible in numbers calculated from the data provided by book-keeping and finds its objective expression in the balance of the enterprise. This aim can be directly and empirically observed. The situation is quite different in the household where there is no uniform aim open to direct observation. Indirect observation, on the other hand, indicates the existence of a large number of particular aims corresponding to various needs; various kinds of food, clothing, housing, entertainments, education etc. There are hundreds of these aims and often more. If there is a uniform aim which is the object of maximization then all these aims are integrated by a principal end which is called utility. All the particular aims then form a hierarchic structure of ends arranged according to their importance as means to the realization of the principal end which is utility. Thus the problem as to whether a desire for the maximization of utility exists in household activity reduces itself to the question whether all the individual aims are actually integrated by one principal end.

The problem as to whether there is a uniform aim maximized in household activity—i.e. utility—can be solved only by indirect observation showing whether particular aims are actually integrated. The nature of this observation depends on the interpretation of the concept of utility. If the hedonistic interpretation is adopted such observation can only be internal i.e. introspective. Wieser clearly uses introspection as a proof that men act according to the principles of the theory of marginal utility and that they employ the means at their disposal in such a way as to obtain goods with the greatest marginal utility. This is the so-called psychological method. "The consciousness of every economically active man", writes Wieser, "contains a treasury of experience which every theoretician finds within himself without the necessity of gathering it by the use of special scientific methods"⁴⁰. Thus, whereas the chemist needs a laboratory, the astronomer an observatory, the historian archives and a library, the

⁴⁰ F. Wieser, *Theorie der gesellschaftlichen Wirtschaft*, p. 135.

economist can lay bare the laws of his science while taking a stroll or sitting in an armchair and delving into his inner experience.

The difficulty lies in the fact that this internal experience is not so unequivocal as the advocates of the psychological method maintain. Many people, and among them many economists, are not convinced from their inner experience that they behave according to the principles of the theory of marginal utility⁴¹. They consider rather that household activity is governed by custom and tradition and can also call on their internal experience to bear them out. Introspection does not lead to results which are generally verifiable independently of the person who arrives at them. There is thus no way of telling whether the aim postulated by the hedonistic interpretation of household activity actually exists, and still less of knowing whether it is maximized.

Thus only the praxiological interpretation of utility remains to be considered. In this case the question as to whether particular aims corresponding to various needs are actually integrated by the one principal end of utility can in principle be solved on the basis of objective observation. Observation consists in studying the behaviour of men in the purchase of consumer goods and noting their reactions when market conditions (income and prices) change. The set of goods which a consumer buys when in receipt of a given income and when the goods are at a given price is noted. He is given the possibility of buying, for the same amount of money, two sets of goods made up differently, and the set he buys is noted.

Let us call these sets *A* and *B*. If the consumer chooses, for example, set *B* we say that the utility of set *B* is greater than the utility of set *A*, or, in other words, that the consumer shows greater preference for set *B* than for set *A*. Then the consumer is given the choice between set *B* and a third set

⁴¹ The variety of "inner" experiences undergone by different economists and their obscure nature is shown by T. Hutchison in *The Significance and Basic Postulates of Economic Theory*, ed. cit., pp. 131-143.

costing the same amount of money which we will call *C*. Let us suppose that the consumer chooses set *C*, i.e., he shows a greater preference for set *C* than for set *B*. Finally the consumer is given the choice between set *A* and set *C*. If he chooses set *C* this means that he shows a greater preference for set *C* than for set *A*.

The result of these observations is as follows:

Preference for *B* greater than preference for *A*

Preference for *C* greater than preference for *B*

Preference for *C* greater than preference for *A*

We say then that his preferences are consistent or—using mathematical language—that they are transitive. If, however, the consumer chooses *A* instead of *C* or declares that the choice of *A* or *C* is a matter of indifference to him then we say that his preferences are inconsistent or intransitive. The result of these observations is then as follows:

Preference for *B* greater than preference for *A*

Preference for *C* greater than preference for *B*

Preference for *C* less than or equal to preference for *A*

The consistency or otherwise of preferences can thus in principle be established on the basis of the observation of choices made on the market. By making a greater number of these observations, e.g., by using additional sets *D*, *E*, *F*, etc., it is possible to establish the domain of consistency of preferences, i.e., the range of sets within which preferences are consistent. In this domain preferences form a set ordered according to the magnitude of preference; to individual preferences ordinal numbers can be assigned, e.g., 1, 2, 3 or 1, 5, 12 ... i.e., in such a way that the greater preference has the larger ordinal number. A set of ordinal numbers of this kind is called *the scale of preference*⁴². Since within the domain

⁴² The numbers in which the scale of preferences is expressed are normally called the *indices of preference*. They are ordinal numbers expressing the relationship between the preference for one set as against another, greater, equal, or less. But they do not state that, for example, the prefer-

of the consistency of preferences the consumer always chooses the set with the greatest ordinal number on the scale of preference it follows that preference is a magnitude which is subject to maximization.

If, on the other hand, all preferences are inconsistent so that no domain of consistency can be found, no ordinal numbers can be assigned and it is consequently impossible to establish a scale of preference. The consumer does not maximize his preference for there is no magnitude which can be maximized. We could give as an example the case where preferences form a cyclical set of the type: preference for *D* is greater than preference for *C*, preference for *C* is greater than preference for *B*, which in turn is greater than preference for *A*, but preference for *D* is smaller than preference for *A*. No scale of preference can be established and consequently preference cannot be maximized.

The question as to whether particular aims are in fact integrated by a uniform principal end which is the object of maximization and is called utility or preference thus reduces itself to the question of the consistency of preferences. As we have seen, this is a question which can in principle be solved by the observation of the behaviour of a consumer on

ence for *B* is three times the preference for *A*. The scale of preferences only indicates the order of magnitude and not the numerical value of preferences. In the example given here, we can indicate the preferences for the set *A*, *B*, and *C* by the numbers 1, 2, 3 or 1, 5, 12, or any numbers in increasing order, e.g., 32, 105, 2765. Vilfredo Pareto was the first to draw attention to the fact that the scale of preferences only indicates the order of preference (See *Manuel d'économie politique*, ed. cit., pp. 169–171 and 574–579). Preference is a magnitude and not a quantity; consumer behaviour does not show that preference is measurable. Recently, however, an attempt has been made to show that it is possible to measure preference on the basis of the observation of behaviour in the choice of sets the contents of which are uncertain. The first to do this were J. von Neumann and O. Morgenstern, *Theory of Games and Economic Behaviour*, Princeton 1947, pp. 15–31. See Leonard J. Savage, *The Foundation of Statistics*, New York 1957; R. D. Luce and H. Raiffa, *Games and Decisions*, New York 1957, pp. 13–38 and 371–384. J. Lesourne, *Technique économique et gestion industrielle*, Paris 1958, pp. 37–43.

the market. Paul A. Samuelson and J. R. Hicks have worked out methods of making these observations⁴³. In practice, however, it is very difficult to make these observations. For market statistics do not deal with choices made by individuals but by whole social groups composed of individuals with different incomes and different scales of preferences. It would be necessary to observe either homogeneous groups, which do not exist, or individuals. In the latter case it would be necessary to reckon with the possibility that the preferences of the same individual might be consistent within a limited domain but inconsistent outside this domain. It would be difficult to draw general conclusions. The fact is that so far nobody has carried out systematic observations in this field and it is doubtful whether it is practically possible to make observations of this kind⁴⁴.

So far then, it has not been empirically proved that household activity consists in the maximization of a uniform aim—utility. The alternative view might equally well be adopted, i.e., that there are a great variety of particular aims corresponding to various needs of the household and that these aims do not form an integrated system subordinated to some principal end. Household activity is governed by tradition and custom in which the limited means of the household are allotted to the satisfaction of various individual needs according to custom. The actual allocation of means to particular needs depends on the customary mode of life, the social milieu to which a given household (usually a family) belongs. Empirical studies of family budgets provide a better key to

⁴³ P. A. Samuelson, *Foundations of Economic Analysis*, Cambridge, Mass. 1947, p. 107, and J. R. Hicks, *A Revision of Demand Theory*, Oxford, pp. 47–50 and 107–119.

⁴⁴ See Schumpeter, *History of Economic Analysis*, ed. cit., p. 1067. The difficulty of carrying out these observations by the use of market statistics is shown by Hicks (*A Revision of Demand Theory*, ed. cit., pp. 54–58). He writes, "I feel obliged to conclude that there is in practice no direct test of the preference hypothesis" (p. 58).

the understanding of the basis of this allocation than marginal analysis based on an unproved premiss. This view seems to be much closer to reality than the treatment of household activity on the same basis as the activity of a capitalist enterprise. Household activity is quite simply the continuation of an old mode of activity which covered the whole of human economic activity before the appearance of commodity and monetary relations and capitalist relations of production, i.e., activity based on the habits and traditions of a given social way of life.

As W. C. Mitchell writes: "The psychological categories important to the understanding of consumers' demand are habit, imitation and suggestion—not reflective choice... One reason why spending money is a backward art in comparison with making money was suggested early in this chapter—the family continues to be the dominant unit of organization for spending money, whereas for making money the family has been superseded largely by a more highly organized unit. The housewife, who does a large fraction of the world's shopping, is not selected for her efficiency as a manager, is not dismissed for inefficiency, and has small chance of extending her sway over other households if she proves capable... Above all, she cannot systematize all her planning on the basis of accounting like the business man; for while the dollar is a satisfactory unit for reckoning profits as well as costs, it is not a satisfactory unit for expressing family welfare"⁴⁵.

Recently many economists brought up in the subjectivist tradition, among them some of its former leading theoreticians, have adopted this interpretation of household activity—an interpretation which is closer to the actual behaviour of the consumer on the market and which agrees more closely with the general concept of behaviour according to the economic principle as a product of historical development. Vilfredo Pareto admitted, when his book was criticized by the math-

⁴⁵ W. Mitchell, *Business Cycles. The Problem and its Setting*. National Bureau of Economic Research, New York 1927, pp. 165-166.

ematician Vito Volterra, that preferences might be inconsistent and that there could be situations in which there would be no scale of preferences and in which the maximization of preference would be impossible⁴⁶. He came to the interesting conclusion that the whole theory of the maximization of preference in household activity is unnecessary to explain the behaviour of the consumer in the purchase of goods.

If this idea is pursued further we can see that variations in the demand for consumer goods—e.g., the fact that in general demand falls when the price of a good increases and demand usually (not always) rises when the consumer's income increases—can be explained without resorting to the theory of marginal utility or to any other form of the theory of the maximization of preference in household activity. It is sufficient to assume that the consumer is capable of making a definite choice, i.e., as Schumpeter says, "faced with a given set of prices and a given income, everybody chooses to buy (or sell) in a uniquely determined way"⁴⁷. This may also be the case when household activity is governed by habit and tradition. Thus the improvement of the scientific apparatus of the subjectivist trend finally leads to the rejection of the assumption that utility is maximized in the household and to the discarding of the marginal calculus connected with it as unnecessary and empirically unverified.

Thus the principle of the maximization of a uniform, numerically measurable end, which governs the activity of capitalist enterprise and which is to a large extent at work in other fields of gainful activity (e.g., wage labour, small commodity production, and provision of services)—finds no

⁴⁶ See V. Pareto, *Manuel d'économie politique*, pp. 546–548. The application of marginal calculus in this case results in what we have called marginal pseudo-calculus. See the appendix to the previous chapter *Mathematical Foundations of Programming*.

⁴⁷ J. A. Schumpeter, *History of Economic Analysis*. ed. cit., p. 1067. See also Griffith C. Evans, *Mathematical Introduction to Economics*, New York 1930, pp. 117–122 and R. G. D. Allen, *Mathematical Analysis for Economists*, London 1938, pp. 438–442.

place in household activity. It might, however, be supposed that the general rationalization of individual and social life, the "psychological climate" of the rationalization of various fields of human activity also affects behaviour in the household. Max Weber held the view that the theory of marginal utility, although it does not express a general regularity in economic activity as the subjectivist trend and especially the Austrian school maintain, is nonetheless the expression of the tendency towards the rationalization of all fields of economic activity in the era of capitalism. According to Weber this is a theory which will be better confirmed the more household activity is permeated by the mental climate of capitalism. Weber writes: "The historical peculiarity of the capitalist era and the significance of the theory of marginal utility (and of every theory of value), which follows from it, for the understanding of this epoch consists in the fact that whereas the economic history of some periods has been called, not without reason, "the history of uneconomy", in the conditions prevailing to-day this theory has come closer, is nearer, and as far as it is possible to judge, will tend ever closer to reality and will determine the fate of ever greater numbers of mankind. It is on this *historico-cultural* fact that the heuristic significance of the theory of marginal utility depends"⁴⁸.

Weber's theory might be interpreted to mean that the general mental climate of capitalism, the rationalization of an ever greater number of fields of human activity, means that there is a gradual co-ordination of preferences in the household which become more and more consistent until a scale of preferences emerges. In this way a gradual integration of aims takes place in household activity until that activity is subordinated to the principle of maximization in the same way as capitalist enterprise. To use Weber's favourite phrase, one might say that the "spirit of capitalism" gradually comes to prevail in household activity.

⁴⁸ Max Weber, *Die Grenznutzenlehre und das "psychophysische Grundgesetz"*, ed. cit., p. 371.

Factors working against the rationalization of household activity under capitalism

It is undoubtedly true that the "mental climate" of the capitalist social formation favours the rationalization of a vast range of human activities and also has an influence on household activity. But not only the "mental climate" of rationalization is at work here. Consumer choice is affected by capitalist enterprises who engage in a number of special activities in order to persuade consumers to buy their products. These are activities like advertising, selection of packaging, selection of patterns, the establishment of trade marks, the provision of credit facilities and so on. This activity is called buyers' recruitment or "sales activity". In contemporary capitalism this activity has an ever greater influence on the environment in which people live; people are subjected to its impact from an ever greater number of quarters. In periodicals and newspapers, on the radio, in cinemas and through television, by neon signs and advertisements on streets and highways, in trams, buses and shop-windows, man is daily subjected to the assaults of advertisements which, like other forms of persuasion, affect his decisions as a buyer of consumer goods. It is not possible to-day to talk realistically about rational household activity without taking into account the influence of this constant and intensive recruitment of buyers.

The methods of buyers' recruitment can be classified according to the influence they exercise on rationality of household activity. There are those which appeal to the rational reactions of the buyer and those which attempt to take advantage of the consumer's unconscious desires or quite simply his conditioned reflexes. The first is the "classical method" used in the nineteenth and first half of the twentieth century. This consists in convincing the potential purchaser that the good which is being recommended to him is essential and that it is precisely the product sold by this particular firm which possesses in a particularly high degree the qualities he desires.

This is an appeal to the purchaser as a rational being (although not necessarily maximizing utility) or else an appeal to the buyer's customary behaviour. If this kind of advertising recommends goods which the buyer normally buys anyway, it does not normally change the buyer's behaviour in so far as it is governed by tradition and habit. If, however, advertising recommends a new product, one which was previously unknown or which does not form part of the usual purchases of the consumer, then this tends to change the customary and traditional behaviour of the buyer by reasoning, that is, to rationalize the buyer's behaviour. Since the introduction of more and more new products, formerly unknown or unused, is taking place on a scale unprecedented in the social formations which preceded capitalism, it is to be expected that the sales activity of capitalist enterprises tends to rationalize household activity, although not necessarily to the point of producing consistent preferences and the maximizing of utility.

In the 1950's in the main capitalist countries, at first in the United States, and then in Western Germany and other countries, a new method of buyer's recruitment appeared, based on special psychological studies. It gave rise to a special branch of psychology called the psychology of recruitment⁴⁹. This new method, instead of appealing to the rationality or the habits of the buyers, takes advantage of their conditioned reflexes or subconscious desires. It is based on so-called "motivational research". In the United States there are more than eighty agencies engaged in motivational research for industry and trade. These organizations employ psychologists, psychiatrists, and sociologists. The director of one of these agencies explained the kind of studies that are made: "Motivation is the type of research that seeks to learn what motivates people in making choices. It employs techniques designed to reach the unconscious or subconscious mind because preferen-

⁴⁹ See Peter R. Hofstaetter's article *Werbepsychologie* in "Psychologie", Frankfurt 1957, where he gives a bibliography.

ces generally are determined by factors of which the individual is not conscious... Actually in the buying situation the consumer generally acts emotionally and compulsively, unconsciously reacting to the images and designs which in the subconscious are associated with the product"⁵⁰.

The American writer, Vance Packard, who has made a systematic study of the activities of advertising agencies writes: "Certain of the probers, for example, are systematically feeling out our hidden weaknesses and frailties in the hope that they can the more efficiently influence our behaviour. At one of the largest advertising agencies in America psychologists on the staff are probing human samples in an attempt to find how to identify and beam messages to people of high anxiety, body consciousness, hostility, passiveness, and so on. A Chicago advertising agency has been studying the housewife's menstrual cycle and its psychological concomitants in order to find the appeals that will be more effective in selling her certain food products"⁵¹. The essence of the new methods of buyers' recruitment consists in appealing to the unconscious and irrational sources of human activity. Packard sums up: "All this probing and manipulation has its constructive and its amusing aspects; but also, I think it fair to say it has seriously anti-humanistic implications. Much of it seems to represent regress rather than progress for man in his long struggle for a rational and self-guiding existence"⁵².

The effect of these new methods of promoting sales is to strengthen the irrational element in household activity. There are thus two tendencies in contemporary capitalism. On the one hand, branches of praxiology like operations research, programming, and cybernetics encourage enterprises to develop their methodological rationality. On the other hand, the new methods employed in buyers' recruitment are factors in the *derationalization* of household activity. Increased metho-

⁵⁰ See V. Packard, *The Hidden Persuaders*, New York 1958, p. 5.

⁵¹ *Ibid.*, pp. 2-3.

⁵² *Ibid.*, p. 4.

dological rationality in enterprise and the derationalization of household activity are the two conflicting tendencies which have recently appeared in capitalism. The second of these tendencies is the result of the first since the derationalization of household activity is caused by the activity of enterprises which in this way maximize their profit. "The spirit of capitalism" is taking over households, but quite differently from what Max Weber imagined; it does so as the "spirit of irrationality". Here the limited and socially warped character of private capitalist rationality can be clearly seen.

Final assessment of the subjectivist trend

In summing up, we can say that the subjectivist trend has changed the subject matter of political economy. This amounts to the liquidation of political economy as a social science concerned with the study of the social laws of production and the distribution of material goods. Furthermore, subjectivist economics as a theory of marginal utility or a theory of choice according to a scale of preference extends the principle of maximization employed in capitalist enterprise to all economic activity in all historico-social conditions. There are no grounds for this in economic reality. Subjectivist economists have formulated certain praxiological principles of behaviour which can be applied in various fields of political economy. These principles, however, are not economic laws, i.e., laws operating in objective reality. They are methodological rules of behaviour forming the subject matter of praxiology—a discipline auxiliary to political economy like logic, mathematics, statistics, econometrics and so on. As political economy the subjectivist theory must be reckoned a failure.

Historical trend

Our analysis of the historical trend in political economy will be considerably shorter. The historical trend developed from a criticism of classical political economy. It originated and developed chiefly in Germany where it was connected with the great influence exercised by Hegel's philosophy in

the 1840's. This link with Hegelian philosophy and certain aspects of its criticism of classical political economy connect the historical trend with the Marxist trend in political economy which began about the same time. Hegelian philosophy owed its enormous influence on social science to the fact that it interpreted human history as a process of self-generating development of which its internal dialectic was the driving force. This led to the historical interpretation of law, religion, culture, art etc. Both the Marxist and the historical trend in political economy first appeared in this philosophical climate, each stemming from a different aspect of Hegelian philosophy and drawing different conclusions from it. Marx and Engels drew on the concept of self-generating dialectical development and introduced a new materialist interpretation of the dialectic as a process in which the opposing forces in the material objective world act on each other. This was the starting point of the materialist interpretation of history, the basis for the demonstration of the historical character of economic categories and laws and the foundation of a new political economy which conceived the development of economic relations as a dialectical historical process. The historical trend, on the other hand, drew on Hegel's objective idealism, which in the social sciences resulted in various conceptions of "the collective spirit" (like "the spirit of the nation", "the spirit of a particular epoch" etc.) as the supposed motor power of historical development. Objective idealism influences the whole development of the historical trend in political economy.

The theoretical character of political economy discarded

The historical trend criticized classical political economy's unhistorical interpretation of economic laws, at first hesitantly and then more and more strongly. The first representatives of this trend, *the older historical school*⁵³, casting aside the laws

⁵³ Included in this school are Wilhelm Roscher (1817-1894), Bruno Hildebrandt (1812-1878) and Karl Knies (1821-1898). The reader will find more details in D. Rozenberg, *History of Political Economy* ed. cit., pp. 269-278.

formulated by classical political economy, came to the conclusion that in human society, in contrast to nature, there is no regularity and that therefore political economy cannot be a theoretical but only a historical science. At first Roscher still recognized the laws of classical economy in principle and tried only to supplement them with historical material. Hildebrandt rejected the laws of classical political economy and wanted to replace them with economic laws of the development of nations. He maintained that economic development passes through a series of stages: natural economy, money economy and credit economy. His failure theoretically to elaborate the criteria for this classification of the stages in economic development is particularly striking. His criteria are but a confused mixture of various economic categories and production relations are not to be found among them. Credit economy is merely a form of money economy while the opposite of natural economy is commodity production of which money economy is a manifestation. Knies finally discarded the thesis that there is any regularity at all in social life, stating that there are no 'repetitive elements in the development of human societies. The task of political economy is quite simply to set out the historic development of the economic life of nations. According to this conception political economy is transformed into economic history.

Later representatives of the *younger historical school* in fact concerned themselves with economic history rather than political economy. Their contribution in the field of economic history, accumulation of a great deal of material and the production of a great number of monographs, is very important; but all this is barren of any guiding theoretical ideas. Gustav Schmoller, the leader of this group, tried to synthesize their work⁵⁴. He produced two volumes containing a mass of interesting material from economic history which are devoid, however, of any overall idea. One might just as well, as someone remarked, read this book from the end to

⁵⁴ Gustav Schmoller (1838-1917), *Grundriss der allgemeinen Volkswirtschaftslehre*, 2 vols., Leipzig 1901-1904.

the beginning as from the beginning to the end⁵⁵. Some representatives of the younger historical school tried, like Hildebrandt, to classify historical material into stages of development. Karl Buecher, for example, distinguished domestic economy, urban economy (covering both the city and its surrounding area), and national economy. Schmoller distinguished village economy, urban economy, territorial economy, and national economy. Later an additional stage, world economy, was introduced⁵⁶. This classification, as can be seen, is based on the territorial extent of economic relations, while at the same time relations of production and relations of distribution are confused. It is sufficient to compare this classification with the Marxist classification of social formations according to modes of production to see that the classification offered by the historical school lacks the basis of a scientifically elaborated theory of social development like the materialist interpretation of history which provides the foundation for Marxist political economy.

The views of Werner Sombart and Max Weber on the essence and origins of capitalism

In the younger historical school, however, two economists came up who tried to overcome these deficiencies in the historical interpretation and provide a theory of economic development, especially the economic development of capitalism. They were Werner Sombart and Max Weber. They both turned to Karl Marx and took from his work the historico-social category of capitalism. In principle they defined capitalism in the same way as Marx, describing it as a mode of production based on commodity production and wage labour. They used a somewhat different terminology but in principle their defi-

⁵⁵ See E. Taylor, *Historia rozwoju ekonomiki*, (History of the Development of Economics), Warsaw 1958, vol. 2, p. 23.

⁵⁶ For the classification of the stages of economic development by representatives of the historical school see J. H. Schumpeter, *History of Economic Analysis*, ed. cit., p. 444, and L. J. Zimmerman, *Geschichte der theoretischen Volkswirtschaftslehre*, Cologne 1954, pp. 113-114.

inition agrees with that of Marx⁵⁷. Sombart emphasized his debt to Marx; "Marx's ability to ask questions was his greatest talent. We still live with his questions to-day. By his brilliant questions he showed economic science the path to the fruitful examination of the whole century. All economists who have failed to assimilate the questions put by him have been condemned to sterility, a fact which we can to-day state with certainty"⁵⁸. Weber's work, too, shows that he was trying to give answers to the questions put by Marx.

The questions to which Sombart and Max Weber wanted to give answers dealt with the origin and development of capitalism. The answer which they give is based—unlike the historical materialism of Marx—on an interpretation of economic development drawn from the objective idealism of Hegelian origin. According to Sombart and Weber, every historical epoch has its own "spirit" consisting in a set of human psychological attitudes which give each epoch its own peculiar character. Hence the key of the understanding of economic development is not the mode of production, i.e., the productive forces and relations of production, but the psychological attitudes forming the "spirit" of a historical epoch.

Sombart employs the concepts of economic system and economic epoch. Economic systems differ from one another by virtue of the nature of three elements: economic mentality (*Wirtschaftsgesinnung*), embodied in certain economic principles (*Wirtschaftsprinzipien*), material technique and the

⁵⁷ Sombart wrote that capitalism "is an organization based on exchange economy in which two different groups, connected with each other through the market, usually co-operate with each other—the owners of the means of production, who are at one and the same time the directors, the subjects of economy, and workers, deprived of this property (as economic objects). The organization is governed by the principle of gainful activity and economic rationality" (*Der moderne Kapitalismus*, Munich and Leipzig 1919, vol. 1, p. 319). Max Weber describes capitalism as consisting of six features among which appear market production and wage-labour (*Wirtschaftsgeschichte*, Munich and Leipzig 1928, pp. 239–400).

⁵⁸ W. Sombart, *Das Wirtschaftsleben in Zeitalter des Hochkapitalismus*, Munich and Leipzig 1928, p. xix.

organization of social labour. The character of an economic period is governed by the economic system which prevails within it. The decisive factor for the character of an economic epoch is the economic mentality peculiar to the economic system prevailing in this epoch. This mentality, composed of a set of particular psychological attitudes held by those engaged in economic activity—i.e., the set of values which they recognize, the goals for which they strive, their modes of operation etc.—forms the *spirit* of an economic epoch⁵⁹. This spirit is the main spring of economic development. "I have above all endeavoured", writes Sombart, "to discover the spirit which prevails in various economic epochs, on the basis of which the economic life of a particular period is determined, and to study its operation. The basic idea of my work is that different economic mentalities prevail in different periods and that this spirit takes on its especial form and in this way shapes economic organization"⁶⁰.

Max Weber's concept is similar although he gives no systematic formulation. Economic development is determined not, as historical materialism maintains, by the mutual interaction of the productive forces with the base and superstructure of a social formation but by the internal development of the spirit of particular economic systems and epochs.

The main object of Sombart's and Weber's interest was the problem of the origin of capitalism. According to their theory of economic development, the answer to this problem should be sought not in the growth of contradictions between the development of productive forces and the production relations of feudal society but in a change in the psychological attitudes forming the economic mentality of the feudal system. Both Sombart and Weber emphasize strongly that a change in mentality preceded the appearance of the capitalist mode of production⁶¹. This change consists in the replacement of the

⁵⁹ See W. Sombart, *Der moderne Kapitalismus*, ed. cit., vol. 1, pt. 1, pp. 13, 21-22, 24-25.

⁶⁰ *Ibid.*, pp. 24-25.

⁶¹ *Ibid.*, p. 328.

traditional feudal values of life in the countryside and the customary guild organization of the crafts in the towns by a free striving for money profit, enterprise, economy, and disciplined hard work. "This new spirit", writes Sombart, "infuses economic life. It breaks down the static barriers of the balanced feudal and crafts economy occupied with the satisfaction of limited needs, and hurls man into the whirlpool of gainful activity"⁶². Max Weber, on the other hand, declares that capitalism originated in a new economic ethic which took hold of men and changed their way of life. This ethic broke down the traditional barriers in the path of free gainful activity and the desire for money profit, and at the same time made a virtue out of the economy and hard work necessary for the development of capitalist production⁶³.

Max Weber found the source of this new economic ethic in the Reformation. According to Weber the Reformation transferred the Catholic ascetic ideal from the monastery cell to the daily life of every Christian. It created a new ethic which Weber called *innerworldly asceticism*. The teaching of Luther about the secular vocation as a divine calling and Calvin's advocacy of a vigorous participation in economic activity and an ascetic personal life created a new attitude to life. This new attitude, which found its most consistent expression in English puritanism, produced men who were active and enterprising in economic activity but who at the same time led a hardworking and frugal existence. The economic effect of this was a rise in production and trade and the ploughing back of a considerable part of money income in accumulation of capital. In this way protestantism, and especially puritanism, gave birth to the spirit of capitalism. Capitalism is the child of a revolution in economic mentality resulting from the Reformation. Hence its origin and development in Protestant coun-

⁶² See W. Sombart, *Die Bourgeois*, Munich and Leipzig 1913, pp. 441-456.

⁶³ Max Weber, *Wirtschaftsgeschichte*, ed. cit., pp. 302-304.

tries where Calvinistic influences were strong, as in Holland and England. Such, in brief, is Max Weber's famous theory of the historical causal connection between capitalism and protestantism⁶⁴.

Sombart followed a somewhat different path. At first he found the source of the spirit of capitalism in the economic activity of Jews who, not being bound by the ethic of the mediaeval church which viewed gainful activity with disfavour, engaged freely in trade and provided credit; in this way they formed the spark of the new mental attitude which led to the rise of capitalism⁶⁵. Later, however, Sombart abandoned this theory and considering it to be too one-sided sought the origins of capitalism in a complex of factors which awakened the spirit of enterprise and the spirit of the bourgeois way of life: "From the spirit of enterprise and from the bourgeois spirit emerged, as a uniform whole, that psychic state which we call the spirit of capitalism"⁶⁶.

Max Weber's work in the light of the materialist interpretation of history

As can be seen, the theories of Max Weber and Sombart are quite clearly opposed to the materialist interpretation of social development and in particular the interpretation of the origin and development of capitalism. We are not concerned

⁶⁴ This theory was put forward by Max Weber in *Die protestantische Ethik und der Geist des Kapitalismus. Gesammelte Aufsätze zur Religionssoziologie*, Tuebingen 1922, vol. 1. This work first appeared in 1904-5 in "Archiv für Sozialwissenschaft und Sozialpolitik". It aroused lively discussion and there is a great deal of literature devoted to the subject. A list of the more important works will be found in R. H. Tawney, *Religion and the Rise of Capitalism*, London 1948, p. 282. See also Max Weber, *Wirtschaftsgeschichte*, ed. cit., pp. 300-315 and further: *Protestantism and Capitalism. The Weber Thesis and its Critics*. Edited by R. W. Green, Boston 1959.

⁶⁵ See W. Sombart, *Die Juden und das Wirtschaftsleben*, Munich and Leipzig 1911.

⁶⁶ W. Sombart, *Der Moderne Kapitalismus*, ed. cit., vol. 1, pt. 1, p. 329.

here with merits of these views on the rise of capitalism; we shall return to this problem later in this book. We shall confine ourselves to certain methodological observations. The work of Sombart and Weber brought a great deal of new historical material to bear on the problem of the origins and development of capitalism, but this material could equally well be explained by the materialist interpretation of history. Engels, long before Max Weber, wrote: "The great international centre of feudalism was the Roman Catholic Church... Before profane feudalism could be successfully attacked in each country and in detail, this, its sacred central organisation, had to be destroyed"⁶⁷. Engels goes on to explain: "The first (battle) was what is called the Protestant Reformation in Germany... But where Luther failed, Calvin won the day. Calvin's creed was one fit for the boldest of the bourgeoisie of this time. His predestination doctrine was the religious expression of the fact that in the commercial world of competition success or failure does not depend upon a man's activity or cleverness, but upon circumstances uncontrollable by him... Calvin's church constitution was thoroughly democratic and republican; and where the kingdom of God was republicanized, could the kingdoms of this world remain subject to monarchs, bishops and lords?... In Calvinism, the second great bourgeois upheaval found its doctrine ready cut and dried. This upheaval took place in England"⁶⁸. Thus Engels interpreted Calvinism as the ideology of the early revolutionary bourgeoisie on a considerably broader scale than Max Weber.

The more restricted problem of the connection between the Calvinist puritan economic ethic and the rise of capitalism was also known to the founders of the materialistic interpretation of history. Marx, for example, wrote, "Protestantism by abolishing all the traditional festivals, and transforming them into ordinary working days played an important part in

⁶⁷ F. Engels, *Socialism: Utopian and Scientific*, Introduction to the English Edition. K. Marx and F. Engels, *Selected Works*, ed. cit., vol. II, p. 95.

⁶⁸ *Ibid.*

the genesis of capital⁶⁹. He also drew attention to those features of Calvinistic protestantism which Max Weber emphasized later; "However, in so far as the asceticism of the hoarder is combined with active industry, he is rather a Protestant by religion and still more a Puritan"⁷⁰. Elsewhere Marx writes: "The worship of money has its own asceticism, its own self-denial, its own self-sacrifice—frugality and economy, contempt for the momentary and transient pleasures of the world; pursuit of *eternal* treasure. Hence the connection between English puritanism or Dutch protestantism and the making of money"⁷¹.

A detailed confrontation of Max Weber's theory of the rise of capitalism with the materialist interpretation of history was undertaken by Karl Kautsky. Kautsky also examined the argument to which Weber attached such great importance, that the appearance of a new economic mentality preceded the rise of the capitalist mode of production. He came to the conclusion that the economic mentality which Max Weber considered to be a characteristic of Calvinism was the socio-economic attitude of the plebeian handworking strata in the towns in the period immediately preceding the development of capitalism in industry. This mentality is even older than Calvinism. "The mode of thought which was supposed to appear before industrial capital and make its development possible, which was supposed to be the product of Calvinism, is found both among the Puritans and in the communism of the Anabaptists and their predecessors who were certainly not striving for capitalism. It is the spirit of the rebellion of the craftsmen against the exploitation and waste of feudalism, of the church, of the princes and the usurers; the spirit of sobriety, hard work, economy and productive accumulation..."⁷². These

⁶⁹ K. Marx, *Capital*, ed. cit., vol. 1, p. 281, n. 2.

⁷⁰ K. Marx, *A Contribution to the Critique of Political Economy*, ed. cit., p. 173.

⁷¹ K. Marx, *Grundrisse der Kritik der politischen Oekonomie*, Berlin 1953, p. 143.

⁷² K. Kautsky, *Die materialistische Geschichtsauffassung*, ed. cit., vol. II, p. 408.

mental attitudes did not appear spontaneously; they grew out of contemporary economic and social relations: "this religio-ethical spirit finds its explanation not in the spontaneous development of religion and ethics but in the living conditions of the rising class of craftsmen who had the strength and will to shake off the rule of the feudal nobility and all its appendages: economic, political and ethical"⁷³.

The mental attitudes of the plebeian petty bourgeoisie were then used by industrial capital, says Kautsky, in order to injure the workers to labour discipline. Among those capitalists who came from the ranks of the petty bourgeoisie these attitudes were a stimulus to accumulate capital and invest in industry. Puritanical Calvinism assisted here by giving to this economic mentality its official religious sanction. "The point was", writes Kautsky, "that the Puritans who had grown rich should not invest in the great trading enterprises, in financial operation, in loans to the state and feudal wasters. They should use their money as God pleased. And the God of the handworkers was particularly pleased with industry, especially commodity production... The Puritan period was one of a rapid rise of the proletariat. The Puritan way of thinking of the rising petty bourgeoisie rejected all amusements and in their place highly valued work, the source of its strength, pride and honour. This way of thinking must have encouraged diligence on the part of all workers regardless of whether they were employed in their own workshop or in that of other people"⁷⁴.

The economic mentality of which Max Weber spoke is thus a product of particular socio-economic conditions. It is a part of the historic substratum which facilitated the growth of capitalism; in early capitalist development these ethico-economic attitudes, strengthened and popularized by religion, became a part of the superstructure of the emerging new social formation. Thus the historical material collected by Max Weber can be fitted in its entirety into the picture of the origin and

⁷³ Ibid., p. 415.

⁷⁴ Ibid., p. 413.

development of capitalism based on the materialist interpretation of history. Kautsky concludes quite correctly concerning the connection between Puritanism and the rise of capitalism: "Weber wrote a great deal about this that was important and profound. But he did not destroy the materialist interpretation of history or the picture of the rise of industrial capitalism which Marx gave in *Capital*"⁷⁵.

Unhistorical nature of the methodological basis of the theories of Sombart and Max Weber

While discussing Sombart and Weber's theory of economic development it is worth noting the methodological kinship of this theory with the idea of "economic man" (*homo oeconomicus*), which is found in the work of some classical economists and particularly in the work of their epigoni. According to this conception economic laws result not from definite historico-economic conditions but from "human nature" which continually strives for the realization of the maximum personal economic advantage (money income or wealth). This idea, as we know, was universalized in utilitarian psychology and played a basic role in the development of the subjectivist trend in political economy. The "spirit" of various economic epochs or the "mentality" of particular economic systems are nothing more than the idea of *homo oeconomicus* appropriately modified. As Schumpeter noted, Weber constructed an ideal "Feudal Man" and an ideal "Capitalist Man" but "if... we put the "ideal" Feudal Man face to face with the ideal Capitalist Man, transition from the one to the other will present a problem which has, however, no counterpart in the sphere of historical fact"⁷⁶. The same can be said of Sombart's theoretical historical constructions. Just as *homo oeconomicus* draws the principles of his behaviour from unchanging "human nature" so *homo feudalisticus* or *homo capitalisticus* draw their principles of behaviour from the

⁷⁵ Ibid., p. 416.

⁷⁶ J. Schumpeter, *History of Economic Analysis*, ed. cit., p. 80.

spirit of their economic epoch. In both cases economic laws are based on an abstract concept of the mentality of a man engaged in economic activity and not on the concrete historical formation of economic relations between men. Thus in the work of Sombart and Max Weber the development of the historical trend reaches a point where political economy is interpreted on the basis of unhistorical abstract constructions methodologically similar to the classical and post-classical "economic man". The true historical method of interpreting economic laws is discarded.

Final assessment of the historical trend

In conclusion we can say that the majority of the representatives of the historical trend lack a theory of social development which could be used as an organizing idea for the whole of their collected historical material. On the other hand, when there is such a theory, as with Sombart and Max Weber, it turns out to be based on an unhistorical, abstract concept of the spirit of the economic epoch. In this way, the historical trend in political economy, in spite of its undoubtedly useful contribution in the collection of historical material, does not contribute to understanding the mode of operation of various social formations, the dialectic of their development and the historic process of the transition from one formation to another.

Thus we find that neither the historical trend nor the subjectivist trend fulfils the requirements for the scientific cognition of the economic laws governing the social process of production and distribution. Both trends lead to the liquidation of political economy: the subjectivist trend leads to its dissolution as a social science, the historical trend leads to its dissolution as a theoretical science. The task of political economy as the study of the social laws governing the production and distribution of the material means of satisfying human needs, first clearly set out by classical political economy, is to-day carried on and developed only by Marxism. The Marxist conception of the subject matter and method of political eco-

onomy is so broad that it can make use, as we have shown, of the attainments of the historical trend in the gathering of historical material just as it can make use of praxiology—an auxiliary discipline to the development of which the subjectivist trend has to a certain extent indirectly contributed. While making use of certain aspects of other conceptions when possible and necessary, Marxism consistently develops political economy both as a theoretical and historical science, a science whose task is to study objective economic laws and their historical conditioning in order consciously to direct the economic development of society.

CHAPTER SEVEN

THE SOCIAL CONDITIONING AND THE SOCIAL ROLE OF ECONOMIC SCIENCE

Two factors causing differences of opinion in science: internal dialectic of cognition and social conditions of development of science

THE existence of various trends differing basically in their conception of the subject matter and method of political economy, and reaching basically different conclusions in their researches, calls for a fuller explanation.

Differences of opinion and interpretation are quite natural in the development of science. They stem from the dialectic nature of cognition in which human thought is shaped through the mutual interaction of man and surrounding reality. Scientific knowledge develops from the conflicts between the results of new observations and experiments and the scientific ideas and theories already in existence. These ideas and theories influence the direction of scientific research and indicate the paths to be followed by new observations and experiments; the results of this new research in turn call for a change in scientific ideas and theories and demand an adjustment to the newly discovered facts. New scientific concepts and theories indicate the paths to be followed by further observations and experiments, which again make it necessary to adapt scientific ideas and theories, etc. This dialectic process does not, however, take place smoothly. The scope of newly discovered facts varies and it is not at first easy to evaluate their significance; old concepts and theories may be clung to with varying degrees of stubbornness. All this gives rise to different opinions and interpretations in science.

These divergences, the result of the dialectic nature of the process of scientific cognition, are usually resolved in the course of the further development of science. The issues are clarified by further research and a *communis opinio doctorum* is established which lasts until new facts require its revision. In the course of this revision new differences of opinion often emerge which in turn give way to a new *communis opinio*. A cognitive process of this kind is found in those sciences where the development and reconciliation of differences of opinion takes place under the paramount influence of the dialectic of scientific cognition, as in the majority of the natural sciences, e.g. physics, chemistry, anatomy, physiology. The law of falling bodies, the law of the conservation of energy and the theory of relativity were dealt with in this way in physics, as were the problems of the existence of "phlogiston" and the transformation of one element into another in chemistry and the questions of the circulation of the blood, the functions of endocrine glands, etc. in physiology.

The fact that in political economy as in certain other disciplines, especially the disciplines of social science, fundamental differences in opinion and interpretation are stubbornly maintained, suggests that other factors are at work here besides the dialectic of scientific cognition. Every science, be it natural science or social science, develops in historically determined social conditions. Scientific research always has a certain practical significance, either for the development of the productive forces of society or for the shaping of the social relations between men. This significance is sometimes indirect and not evident at a first glance, but none the less always exists. Thus not only the dialectic of scientific cognition, but also the social conditions in which a science is studied and the social significance of its conclusions influence the course of scientific research.

The great development of natural science (and of the mathematics connected with it) which begins in the sixteenth century and is particularly vigorous in the nineteenth and

twentieth centuries, is closely connected, at first with capitalist trade and navigation, and then with the development of capitalist production. Commercial capital and later the industrial bourgeoisie created an interest in the practical applications of the natural sciences and made it possible to use them in industrial technique, agriculture, transport and communications. Moreover, in this period the development of capitalism created an intellectual climate free from mediaeval theological prejudices and scholastic habits of thought—a climate in which empirical methods of scientific research gained general acceptance, verifying the truth of scientific statements by confronting them with experience. These conditions made possible the development of natural science. Finally, especially in the nineteenth and twentieth centuries, the bourgeoisie set up scientific research centres—universities and institutes—equipped with laboratories, experimental stations, clinics, etc.; centres for the dissemination of scientific knowledge like teaching centres and publishing houses were established—without these the development of natural science would have been impossible. At the same time the development of industry, agriculture, transport, communications and the technological needs connected with them decisively influenced the direction of scientific research. They confronted science with problems demanding solution—directly or indirectly they provided “orders” to science.

Thus the enormous development of natural science, especially in the last two hundred years, is not only the result of the dialectic of scientific cognition. The development of the economic relations connected with the appearance and development of capitalism had its part to play as well. The fact that in precapitalist social formations there was no such development in natural science shows that development of economic relations here played a more important role than the dialectic of scientific cognition alone. The development of capitalist economic relations aroused an interest in the laws governing nature and provided the material means necessary for carrying out these investigations, thus creating

conditions in which the study of natural laws could fully develop.

Interest, material means and freedom from prejudice — social basis of scientific development

The history of natural science shows that scientific development is dependent on historical social conditions. The dialectic of scientific cognition consists in the mutual interaction of human thought and practical experience and requires for its full development the *interest* of society, or of certain parts of it, in the study of the laws governing the reality which surrounds it, it requires the *material means* necessary for scientific research and the dissemination of its results, and finally it requires that research should be *unhampered* by superstitions, prejudices, traditions and habits of thought inherited from pre-scientific modes of thought¹. Interest, material means and freedom from prejudice thus form the social basis of scientific development. The way and degree to which these conditions, forming the social basis of scientific development, are fulfilled, depends on the social milieu in which science develops and on the position of this milieu in the social relations of a historic social formation. It depends especially on the historic position of the classes and social strata whose interests and needs are expressed by science. In antagonistic social formations where there are opposed class interests and some social strata also have especial interests in the preservation of, or change in, the existing superstructure, a whole complex of conditions which both favour and impede the development of science emerges.

¹ Engels describes these superstitions and pre-scientific conceptions as "a pre-historic stock, found already in existence by, and taken over in, the historic period, of what we should to-day call bunk". He goes on to say that "These various false conceptions of nature, of man's own being, of spirits, magic forces, etc., have for the most part only a negative economic basis; the low economic development of the prehistoric period is supplemented and also partially conditioned and even caused by the false conceptions of nature... The history of science is the history of the gradual clearing away of this nonsense or of its replacement by fresh but

The struggle of the bourgeoisie and lay intellectuals for the development of the natural sciences

This complex is especially clear in the case of natural science. Commercial capital, and later the industrial bourgeoisie, were practically interested in the progress of natural science. There was a use for it in navigation and maritime trade as well as in industrial production, transport, communications and later also in agriculture. The new group of lay intellectuals which issued from the bourgeoisie, or was in some way connected with it, quickly freed itself from old prejudices and modes of thought. All this, together with the material means provided by the bourgeoisie, enabled the natural sciences to develop quickly. This interest in the study of the laws of nature, however, was not shared by the class of feudal landowners (with the exception of those among them who themselves took up navigation, maritime trade and industry), while the holder of the key position in the superstructure of feudal society, the clergy, looked on this study either distrustfully or with open enmity. At first the development of natural science was fiercely opposed by the majority of the clergy which saw in it a threat to its theological doctrines and to its position in society. It is only necessary to recall Copernicus, whose work was placed on the Index (and there remained until 1835) and Galileo's trial by the inquisition in 1633². Another example is provided by clerical opposition

always less absurd nonsense". F. Engels, letter to C. Schmidt, October 27, 1890, K. Marx and F. Engels, *Selected Works*, Lawrence and Wishart, London 1959, vol. II, pp. 448-449.

² The Church had good reason to regard the teaching of Copernicus as dangerous. When Giordano Bruno deduced from it that there are a great number of solar systems and inhabited planets, it gave rise to a serious theological problem. The mathematician and philosopher Herman Weyl writes: "This is the reason why the book of Copernicus became a turning point of world conception, and in this direction Bruno drew the conclusions with stormy enthusiasm. The supreme act of redemption by the Son of God, crucifixion and resurrection, no longer the unique pivot of world history but the hurried small-town performance of a road show repeated from star to star—this blasphemy displays

to Darwin's theory of the origin and evolution of the species, an opposition which, as far as the Catholic Church is concerned, even to-day has not entirely been relinquished³.

More subtle was the opposition of the lay and clerical intellectuals concerned with the education of pupils for service in the state apparatus of absolute and aristocratic monarchies. They were opposed to the teaching of natural science in the name of the supposedly higher cultural value of so-called "humanistic education" i.e., education based on classical philology, theology and idealistic philosophy⁴. In

perhaps in the most poignant manner the religiously precarious aspect of a theory which dislodges the earth from the center of the world. (Bruno had to pay for it at the stake)". *Philosophy of Mathematics and Natural Science*, Princeton 1949, p. 98.

³ See, for example, Joseph Pohle, *Lehrbuch der Dogmatik*, 7th ed., Paderborn 1929, p. 370, where the thesis that man did not originate through evolution is rigorously maintained. Father Marc Dalbard (*Exposé de la doctrine chrétienne*, Fribourg 1942, pp. 142-143) writes that the evolutionary descent of man "has not been scientifically demonstrated" and can only be accepted with certain reservations. Among the reservations he numbers the fact that God made "the body of the first woman from organic matter belonging to the body of the first man"; "Saint Paul based on this the subordination of woman to man". Father W. Kalinowski and Father J. Rychlicki (*Dogmatyka katolicka*, (Catholic Dogmatics), Cracow 1947, p. 47) state that "the overwhelming majority of the so-called proofs of evolution do not stand up to criticism based on the most recent scientific views on the essence of life". Recently a more cautious position was taken up by Pius XII in the encyclical *Humani Generis* (*False Trends in Modern Teaching*, Catholic Truth Society, London 1950). There we read: "Thus the teaching of the Church leaves the doctrine of evolution an open question, as long as it confines its speculations to the development, from other living matter already in existence, of the human body... In the present state of scientific and theological opinion, this question may be legitimately canvassed by research, and by discussion between experts on both sides. At the same time the reasons for and against either view must be weighed and adjudged with all seriousness, fairness, and restraint..." (p. 20).

⁴ The struggle between the advocates of the humanities and those of the natural sciences began in England and France in the seventeenth and eighteenth centuries. In Germany, where the development of capitalism was delayed, the controversy was at its fiercest in the middle of the nine-

the early and middle nineteenth century in England new colleges and universities were set up with the active financial support of the bourgeoisie to teach and study natural sciences in London and the great industrial centres like Manchester and Birmingham. The old universities of Oxford and Cambridge maintaining their established tradition initially kept aloof from the study of the new natural science as being unworthy of interest for a "gentleman".

The development of capitalism and the practical interest of the bourgeoisie in the progress of natural science broke down this opposition. The history of capitalism is the history of the triumph and development of the natural sciences and their practical application in spite of the resistance of the social classes, strata and groups which occupied a dominant position in feudal society, or—in the early period of capitalism—in those parts of the state, church or educational apparatus inherited from feudal society. In short, it can be said that the bourgeoisie supported the development of natural sciences while the classes, strata and groups which have pre-capitalist origins impeded it. This support was, however, not equally intense in all branches of knowledge. It was strongest in physics and chemistry which are sciences having a direct

teenth century. At the end of the seventeenth century in France there sprang up the quarrel between "the ancients and the moderns" which gave rise to a whole literature on the relative merits of philologico-humanistic education and training in the natural sciences. In England, Jonathan Swift, an Anglican cleric, attacked the natural sciences with satire in *The Battle of the Books*, published in 1704, and in the description of the natural science professors of the Balnibarbi academy in *Gulliver's Travels* (1726). Half a century later Adam Smith wrote: "The greater part of universities have not even been very forward to adopt those improvements after they were made; and several of those learned societies have chosen to remain for a long time the sanctuaries in which exploded systems and obsolete prejudices found shelter and protection after they had been hunted out of every other corner of the world. In general, the richest and best endowed universities have been the slowest in adopting those improvements, and the most averse to permit any considerable change in the established plan of education". (*The Wealth of Nations*, Dent, London 1910, vol. II, p. 256).

importance for the technology of industrial production. It was weaker in the biological sciences which are not so closely connected with industrial technology. It was here that the resistance of the Church and other groups connected with the traditions of pre-scientific modes of thought lasted the longest.

Factors impeding natural sciences in the last phase of capitalism

The need to defend the position of the bourgeoisie in the face of mounting criticism from the labour movement and, in a still greater degree, the requirements of colonial policy and the development of imperialism at the end of the nineteenth century, produced in certain sections of the bourgeoisie resistance to the uninhibited investigation of natural laws. One manifestation of this resistance was the rehabilitation of philosophical trends and ideas based on pre-scientific, theological and scholastic modes of thought among the bourgeoisie, the very ideas the lay bourgeois intelligentsia had fought with such intensity in the dawn of capitalism. This found its expression in the revival of interest in religion among the intelligentsia and a flowering of idealistic philosophical trends like neo-kantianism, neo-hegelianism, pragmatism, etc. The common features of these trends were the assertion that the cognitive significance of empirical knowledge is limited, the pursuit of sources of knowledge other than scientific experience or an agnostic attitude towards the results of scientific experience. This led to the depreciation of the scientific methods developed by natural science. Another form taken by this opposition was an attempt in bourgeois circles to use biology and anthropology for peculiar ends—to establish the supposed “higher biological quality” of the wealthy classes of society and the supposed superiority of certain human races, especially the Nordic. Various pseudoscientific doctrines dealing with heredity were developed together with connected doctrines of eugenics and of the biological and historical role of particular races, especially the Nordic.

The significance of this kind of teaching grew as imperialism developed until in Nazi Germany it became the official state doctrine serving to justify the policy of the conquest and genocide of millions of people as being "of low racial value"⁵. Even to-day doctrines of this kind are the official inspiration of state policy in South Africa, and less openly the basis of various kinds of colonial policy. It is also worth remembering the pressures exerted to prevent the close examination of the biological effects of radiation caused by nuclear explosions; these investigations are opposed by the circles interested in the continuation of experiments with nuclear weapons. Thus in contemporary capitalism there are not only conditions favouring but also some which impede the development of natural science.

The origin and development of political economy connected with the capitalist mode of production

Political economy, like the natural sciences, originated and developed in close connection with the rise and growth of capitalism. Pre-capitalist economic thought was ethical and normative; in the Middle Ages it was closely connected with theology and did not concern itself with the study of the laws governing the process of production and distribution. The first signs of scientific interest appear in the mercantilist lit-

⁵ The author of the theory of the supposed superiority of the nordic race was the French aristocrat Arthur de Gobineau who published *Essai sur l'inégalité des races humaines* (Paris 1853-1855). In Germany the theory was widely publicized by Houston Stewart Chamberlain, an Englishman and the son-in-law of Richard Wagner. His book *Die Grundlagen des XIX Jahrhunderts* was published in 1899. This theory was very popular in German nationalist circles and under the Nazi régime it became the official doctrine taught in the universities. At the same time in the United States, partly under the influence of German writing, a theory of the supposed inferiority of the black race was developed. See Melville J. Herskovits, *Cultural Anthropology*, New York 1955, pp. 91-93. The study of eugenics was founded by Francis Galton (1822-1911), who, besides his valuable scientific research on heredity, also attempted to demonstrate the biological inferiority of Negroes.

erature of the sixteenth and seventeenth centuries dealing with the problems of the development of commercial capital and the finances of absolute monarchies—problems arising from what came later to be called primitive capital accumulation. The first systematic examination of the economic laws of the early capitalist mode of production was undertaken by William Petty (1627–1687), later by the physiocrats (in the eighteenth century) and then by the founders of classical political economy, Adam Smith (1723–1790) and David Ricardo (1772–1823). A favourable intellectual climate had been produced by the development of the natural sciences which had discarded the mediaeval mode of thought in favour of scientific research based on reasoning and the observation of empirical reality. The later development of political economy took the forms discussed in the previous chapter—vulgar economy, Marxist political economy, the subjectivist trend and the historical trend. The development of these trends is connected with the history of the capitalist social formation. Some classes and social strata in the capitalist formation were interested in the scientific study of economic laws while there were others which did not share this interest or for whom the study of the laws of the capitalist mode of production became quite inconvenient; the attitude of some classes underwent a change in the course of time.

Thus, in principle, the natural sciences developed with the support of the whole bourgeoisie, while it was opposed by the classes, social strata and groups which had their origins in pre-capitalist social formations, or their remnants. It was only in the last imperialistic phase of capitalist development that a tendency to hinder the development of natural science appeared among the bourgeoisie. It can thus be said that, with the exception of the last imperialistic phase of capitalism, the development of the natural sciences was intimately connected with the development of the capitalist mode of production; resistance and objection were offered by those classes, strata or groups which originated in pre-capitalist formations.

Change in bourgeois attitude after the appearance of class conflict between proletariat and bourgeoisie

The development of political economy, in which the antagonistic nature of the capitalist social formation played a special part, followed a different course. The development of political economy is directly related to the development of the capitalist mode of production, only in its early stages covering the mercantilists, physiocrats, and the predecessors and founders of classical political economy. Later, after David Ricardo, its development becomes complicated and splits up into the different trends discussed in the previous chapter. This is so because the subject matter of political economy are the social relations arising from the process of production and distribution. In the capitalist formation these social relations develop in the form of opposed class interests, and are thus antagonistic. The development of political economy was directly related to the development of the capitalist mode of production—like natural science—only as long as the opposition of social classes in the capitalist social formation had not fully matured or as long as this class conflict was concealed behind the opposition of the whole of the emerging capitalist social formation to the old feudal formation. When the class conflicts peculiar to the capitalist social formation matured into the opposition of proletariat to bourgeoisie, the social conditions of the development of political economy, as of all other social sciences, were changed.

These new conditions were described by Marx: “In the domain of Political Economy, free scientific enquiry meets not merely the same enemies as in all other domains. The peculiar nature of the material it deals with summons as foes into the field of battle the most violent, mean and malignant passions of the human breast, the Furies of private interest. The English Established Church, e.g., will more readily pardon an attack on 38 of its 39 articles than on 1/39 of its income. Nowadays atheism itself is *culpa levis*, as com-

pared with criticism of existing property relations”⁶. These words, written in 1867, show that the further development of political economy was not in the interest of the bourgeoisie.

Eight years later Marx dealt with the problem in more detail. Comparing the social conditions in which political economy developed in Germany with the conditions of its development in England and in France, he wrote: “To the present moment Political Economy, in Germany, is a foreign science. Gustav von Gülich... has examined at length the historical circumstances that prevented, in Germany, the development of the capitalist mode of production, and consequently the development, in that country, of modern bourgeois society. Thus the soil whence Political Economy springs was wanting. This “science” had to be imported from England and France as a ready-made article; its German professors remained schoolboys... Since 1848 capitalist production has developed rapidly in Germany, and at the present time it is in the full bloom of speculation and swindling. But fate is still unpropitious to our professional economists. At the time when they were able to deal with Political Economy in a straightforward fashion, modern economic conditions did not actually exist in Germany. And as soon as these conditions did come into existence, they did so under circumstances that no longer allowed of their being really and impartially investigated within the bounds of the bourgeois horizon. In so far as Political Economy remains within that horizon, in so far, i.e., as the capitalist regime is looked upon as the absolutely final form of social production, instead of as a passing historical phase of its evolution, Political Economy can remain a science only so long as the class-struggle is latent or manifests itself only in isolated and sporadic phenomena. Let us take England. Its political economy belongs to the period in which the class-struggle was as yet undeveloped... The succeeding period, from 1820 to 1830, was notable in England for scientific activity in the domain of Political Eco-

⁶ K. Marx and F. Engels, *Selected Works*, vol. I, p. 451. Preface to the first German edition of *Capital*.

nomy... The unprejudiced character of this polemic—although the theory of Ricardo already serves, in exceptional cases, as a weapon of attack upon bourgeois economy—is explained by the circumstances of the time. On the one hand, modern industry itself was only just emerging from the age of childhood... On the other hand, the class struggle between capital and labour is forced into the background, politically by the discord between the governments and the feudal aristocracy gathered around the Holy Alliance on the one hand, and by the popular masses, led by the bourgeoisie on the other; economically by the quarrel between industrial capital and aristocratic landed property”⁷.

After 1830, Marx states, these conditions changed fundamentally: “In France and in England the bourgeoisie had conquered political power. Thenceforth, the class struggle, practically as well as theoretically, took on more and more outspoken and threatening forms. It sounded the knell of scientific bourgeois economy. It was thenceforth no longer a question, whether this theorem or that was true, but whether it was useful to capital or harmful, expedient or inexpedient, politically dangerous or not. In place of disinterested enquirers, there were hired prize-fighters; in place of genuine scientific research, the bad conscience and the evil intent of apologetic”⁸.

The attitude of the bourgeoisie to political economy in the early period of capitalist development

Thus the bourgeoisie was interested in the development of political economy only in the early stages of the development of the capitalist mode of production. It was in this period that the study of the economic laws peculiar to this mode of production discovered its potentialities for development. The study of these laws showed that feudal and guild institutions and the policy of mercantilism hampered the economic initiative of the bourgeoisie and were harmful to economic development. At the same time it showed that the bourgeoisie,

⁷ *Capital*, ed. Dona Torr, Allen and Unwin, London 1946, (Reprint of ed. of 1889), pp. xxi-xxiii.

⁸ *Ibid.*, p. xxiii.

which accumulates capital and develops trade and industry is the progressive social class whose activity is identical with the interest of economic development while the old feudal class and the strata connected with it were unproductive consumers of part of the social product. William Petty described the class of feudal lords and the strata connected with it as "such as do nothing at all, but eat and drink, sing, play, and dance; nay such as study the Metaphysicks"⁹.

Adam Smith writes: "The labour of some of the most respectable orders in the society is, like that of menial servants, unproductive of any value, and does not fix or realize itself in any permanent subject, or vendible commodity... The sovereign, for example, with all the officers both of justice and war who serve under him, the whole army and navy, are unproductive labourers... In the same class must be ranked, some both of the gravest and most important, and some of the most frivolous professions: churchmen, lawyers, physicians, men of letters of all kinds; players, buffoons, musicians, opera singers, opera dancers, etc."¹⁰.

Political economy, like the natural sciences, became a *science of the bourgeoisie* and of the intellectuals connected with it. The natural sciences afforded the bourgeoisie a tool for the development of the productive forces on which the income and social position of the bourgeoisie depended. Political economy served the bourgeoisie as a weapon in the struggle for the cutting of the old bonds tying down its initiative and economic activity. At the same time both the bourgeoisie and the broad masses of the people, whose support the bourgeoisie were seeking to win, were made conscious of the role of the bourgeoisie as a progressive economically creative class.

The situation changed once the bourgeoisie had achieved and consolidated its position as the ruling class and when the working class, rapidly growing conscious of its own economic position and interests, began to oppose the bourgeoisie. In this period political economy began to ask whether the unimpeded economic activity of the bourgeoisie was consistent with the interest of the mass of the people, especially the working class. It also began to question the interpretation

⁹ Quoted by Marx in *A Contribution to Political Economy*, ed. cit. p. 59.

¹⁰ Adam Smith, *The Wealth of Nations*, ed. cit., vol. I, p. 295.

of the economic laws of the capitalist mode of production as unchanging laws of nature and the role of the bourgeoisie as a progressive class representing the interests of social development. These questions were asked by Simonde de Sismondi (1773–1842)¹¹ who worked out his theory from the basis of classical political economy. In England, a series of writers, known as “Ricardian socialists”, drew from the principles of classical political economy, and especially from Ricardo’s theory, conclusions in which doubt was cast upon the social position and role of the bourgeoisie—conclusions clearly socialist in nature. One of these writers, Thomas Hodgskin (1787–1869), published a book under the unequivocal title: *Labour defended against the Claims of Capital*¹². In this book is found the famous statement: “We need capital, not capitalists”. As Engels says, these writers “fought the bourgeoisie with their own weapons”¹³, i.e., with classical political economy. For the bourgeoisie political economy became a more and more embarrassing study.

Change in the social base of political economy

Finally, Karl Marx, after critically analysing the scientific achievements of classical political economy, combined them in his own theory of social development based on the materialist interpretation of history, and developed a new system of political economy. This system deals with economic laws within the framework of successive social formations and demonstrates the historical and temporary nature of the capitalist mode of production. The capitalist formation, Marx asserts, like earlier social formations, will find its historical boundary of development in the growing contradictions between the relations of production and the character of

¹¹ His chief work, *Nouveaux principes d'économie politique*, appeared in 1819.

¹² T. Hodgskin, *Labour Defended against the Claims of Capital*, London 1825. Other representatives of this trend are William Thompson (1785–1833), John Gray (1798–1850), J. F. Bray (1809–1895).

¹³ Engel’s Preface to the Second volume of *Capital*, Calcutta 1946, vol. II, p. 10.

the productive forces; the growing strength of the working class prepares the collapse of this formation. In this way, with the help of Frederick Engels' (1820-1895) outstanding scholarly and publicistic abilities, the Marxist conception of political economy was born.

This new development in political economy quickly found understanding and support in the working class. In 1875, Marx, in writing the remarks quoted above on the social conditions of the development of political economy, wrote: "The understanding quickly won by *Capital* among wide circles of the German working class is the best reward for my work"¹⁴. The economic teaching of Marx and Engels quickly won over the leading sector of the labour movement which, thus aided, developed into a mass social movement with its own social consciousness. In 1866 Engels could say: "*Das Kapital*" is often called, on the Continent, "the Bible of the working class". That the conclusions arrived at in this work are daily more and more becoming the fundamental principles of the great working class movement, not only in Germany and Switzerland, but in France, in Holland and Belgium, in America, and even in Italy and Spain; that everywhere the working class more and more recognizes, in these conclusions, the most adequate expression of its condition and of its aspirations, nobody acquainted with that movement will deny"¹⁵.

Political economy becomes a science of the proletariat

The social basis of the development of political economy was thus shifted. From a science of the bourgeoisie political economy was transformed into a *science of the proletariat*. When the bourgeoisie lost its interest in the further development of political economy the labour movement took it up. Here as intermediary acted progressive bourgeois intellectuals. "Just as, therefore, at an earlier period", states

¹⁴ *Capital*, Allen and Unwin, London 1946, p. 842.

¹⁵ Engels' Preface to the English edition of *Capital*, Allen and Unwin, London 1946, p. xiii.

the *Communist Manifesto*, “a section of the nobility went over to the bourgeoisie, so now a portion of the bourgeoisie goes over to the proletariat, and in particular, a portion of the bourgeois ideologists, who have raised themselves to the level of comprehending theoretically the historical movement as a whole”¹⁶. Kautsky goes into greater detail: “Contemporary socialist consciousness can develop only on the basis of profound scientific knowledge. In fact contemporary economic science is just as much a condition of socialist production as contemporary technique, while the proletariat, even with the best of wills, cannot create either. Science is nurtured, not among the proletariat, but in the *bourgeois intelligentsia*. It was in this group that socialism originated and was passed on to those members of the proletariat who distinguished themselves by the level of their intelligence, who then used it in the class struggle of the proletariat where conditions allowed”¹⁷.

Political economy became the means whereby the proletariat can grasp the laws and see the future development of the capitalist mode of production; it also became the basis of the proletariat’s appreciation of its position in capitalist society, of the conditions and methods of freeing itself from its position as an exploited class, and its historic role as the only progressive class in the mature capitalist formation. Political economy was thus the basis of the development of class consciousness among the proletarian masses. At the same time, political economy, by its analysis of the laws of the operation and development of the capitalist mode of production, supplied the labour movement with the knowledge necessary for effective action—at first within the framework of capitalist society and later in the process of transforming economic relations from capitalist to socialist. By uniting

¹⁶ K. Marx and F. Engels, *The Communist Manifesto, Selected Works*, ed. cit., vol. I, p. 43.

¹⁷ Quoted by Lenin in *What Is to Be Done?, Collected Works*, Martin Lawrence, London 1927, vol. IV, book II, p. 122. Lenin refers to Kautsky’s argument as a “profoundly correct and important statement”.

itself with the labour movement in this way, political economy became part of *scientific socialism*—the historic undertaking aimed at controlling the spontaneity of social development, and to create economic relations in which economic laws would operate as man intends.

Division of political economy into Marxist and bourgeois

In these circumstances—when the labour movement took over the political economy which the bourgeoisie had found increasingly embarrassing—political economy split into different trends: the Marxist trend, connected with the labour movement, and other trends connected with the bourgeoisie and the bourgeois intelligentsia. From then on we distinguish between *Marxist political economy* and *bourgeois political economy*¹⁸. “Bourgeois political economy” comprises several trends some of which are connected not so much with the bourgeoisie as with the petty-bourgeoisie. For, as capitalism developed, petty-bourgeoisie began to realize that its interests were different from those of the upper bourgeoisie; the consciousness of this fact produced various eclectic compromises between Marxist political economy and strictly bourgeois economic theory¹⁹.

¹⁸ The term “bourgeois” to characterize economic theories was introduced by Marx. In his earliest writings Marx referred to “bourgeois economists” or quite simply to “economists”. In *A Contribution to the Critique of Political Economy*, published in 1859, Marx consistently uses the expression “bourgeois economy”. In the afterword to the second edition of the first volume of *Capital* Marx states that the essence of “bourgeois economy” consists in the fact that it “looks upon the capitalist regime as the absolutely final form of social production, instead of as a passing historical phase of its evolution” (*Capital*, ed. cit., p. xxii). Marx qualifies classical political economy as bourgeois.

¹⁹ The father of the trend in political economy connected with the petty bourgeois critique of capitalist development is Sismondi to whom we have already referred. On Sismondi see Lenin, *A Contribution to the Nature of Economic Romanticism. Collected Works*, ed. cit., vol. 2. A later representative of this trend is Joseph Proudhon (1809–1865); Marx’s *The Poverty of Philosophy* (1847) is devoted to a critique of his theories. The first eclectic compromise between bourgeois and proletarian political economy

Achievements and development of the Marxist trend

The Marxist trend in political economy is *the continuation of classical political economy* as the study of the social laws of production and distribution. Its claim to be a continuation rests both on its critique of classical political economy²⁰ and the further development of its concepts and results, and in going far beyond them. Its critical analysis consisted in showing the historical character of the categories and laws of classical political economy and in establishing that these are not unchanging laws of nature but originate from the economic relations among men corresponding to a particular mode of production. It developed the achievements of classical political economy by discovering the exact mode of operation of the law of surplus value—the basic economic law of the capitalist social formation. Marxist political economy went beyond classical political economy by disclosing the laws of the development of economic relations on the basis of the materialist interpretation of history.

After Marx and Engels the Marxist trend in political economy went on to analyse the development of capitalism in individual countries in detail, to study the problems of reproduction and accumulation of capital and the economic crises connected with them, and to investigate the new phenomena and economic laws which accompanied the appearance of monopoly capital and imperialism. The studies of Hilferding and particularly of Lenin on the latter problems, are after the work of Marx and Engels, the most important Marxist contributions to political economy²¹. At the same time the Marxist trend concerned itself with the problems of the polit-

was made by John Stuart Mill (1806–1873), as Marx notes in the afterword to the second edition of the first volume of *Capital*, ed. cit., p. XXIV

²⁰ Marx called his first systematic work on political economy, published in 1859, *Zur Kritik der politischen Oekonomie*. Marx's chief work, however, *Capital*, bears the sub-title *A Critical Analysis of Capitalist Production*.

²¹ R. Hilferding, *Das Finanzkapital*, Berlin 1947. First edition—Vienna 1910. V. I. Lenin, *Imperialism the Highest Stage of Capitalism. Collected Works*, ed. cit., vol. XIX.

ical economy of pre-capitalist social formations, especially feudalism. Recently with the development of the socialist mode of production in the Soviet Union and a number of other countries, Marxist political economy has been laying the foundations of the political economy of socialism²².

Bourgeoisie tends to liquidate political economy

Bourgeois economic theory has developed along quite different lines. The bourgeoisie lost interest in the further development of political economy. As political economy, now used by the labour movement, became inconvenient and even dangerous to the bourgeoisie, there developed a tendency to liquidate it as a science studying the economic relations among men and to substitute for it *apologetics*, i.e. the justification of the capitalist mode of production. The gradual course of this process can be clearly seen in the light of the development of vulgar economy, the subjectivist trend and the historical trend, described in the previous chapter.

Vulgar economy and the subjectivist trend: their basis and social function

As we already know, vulgar economy limits itself to exchange relations and the market processes connected with them. It lost interest in the relations of production which formed the basic interest of classical political economy and which became the core of Marxist political economy. This is a reflection of the position of the triumphant industrial bourgeoisie which, having overcome the obstacles to the development of capitalist relations of production presented by feudalism, guilds and mercantilism, was now only interested in market problems. The victorious bourgeoisie considers the relations of production to be established once for all, a matter quite uncontroversial about which there is no discussion except to justify them. The bourgeoisie is interested only in market problems, especially prices, money and credit.

²² See Chapter Four.

The labour movement, on the other hand, is deeply interested in the relations of production, and therefore, from a bourgeois point of view, the less said about them the better. The bourgeoisie then bases the apologetics of the capitalist mode of production on the analysis of exchange since it is easy to prove that, if it were not advantageous for all who take part in it, it would not take place. This conceals the opposed class interests inherent in capitalist relations of production and presents the capitalist mode of production as a harmonious arrangement of relations of exchange from which all social classes benefit.

The subjectivist trend, as we have shown in the previous chapter, leads to the complete liquidation of political economy as the study of the social relations among men. The subject matter of economic study is changed, which frequently is expressed by a corresponding change in name from "political economy" to "economics". Economic study conceived in this way is concerned with the relation of man to things—the means of satisfying human needs; even the relations of exchange between men are reduced to the indirect relations of man to things. In some interpretations in the subjectivist trend economics is transformed into praxiology, i.e. a general science of rational activity. Economics then ceases to concern itself with social relations; its laws are independent of historical conditioning and can be illustrated with the example of Robinson Crusoe living in isolation from society. Capitalist apologetics appear here in the guise of an approach to the economic categories of the capitalist mode of production which treats them as general praxiological categories, categories of rational human activity independent of social conditions.

In this way the specific features of the capitalist mode of production are presented as the universal requirements of rational economic activity; to change the capitalist mode of production for another would be to give up economic rationality²³. Economic categories like wages, capital, or profit

²³ This appears very clearly in Ludwig von Mises' well-known argument

are treated as universal categories independent of the historical shaping of social conditions. Both Robinson Crusoe and the handworker or small landholder count part of their product as "wages" which is the reward for the productivity of their labour, and part as "profit" which is the result of the "productivity" of the means of production used. It is then implied that the hired labourer, earning wages in the capitalist mode of production, receives a just reward, corresponding to the productivity of his labour, and the capitalist makes a just profit, corresponding to the "productivity" of the means of production, and at the same time that it is precisely this division into wages of labour and the profit from capital which is required by economic rationality. The liquidation of political economy as a social science on the one hand means that the relations of production together with the other economic relations between men are no longer taken into account, and on the other that the economic relations proper to the capitalist mode of production are justified as supposedly resulting from universal principles of economic rationality.

The characteristic feature of the subjectivist trend—which it shares with vulgar economy but possesses in a much higher degree—is its separation of economic categories and laws from the process of production. This was noted by Stanisław Brzozowski who wrote of the Austrian school: "Psychological economics always concerns itself with the relation of man to ready-made things. It is a theory of consumption... The criticism of these theories is to be found in the fact that none of them is apt to be developed into a complete theory of society. Each is based on the fact that there are objects of use which

that rational economic accounting is only possible when the means of production are privately owned and that it is therefore impossible in a socialist economy. (See L. Mises, *Die Gemeinwirtschaft*, Jena 1922). Many economists have supported this argument in various forms; see *Collectivist Economic Planning*, ed. F. A. Hayek, London 1935. These arguments are refuted by Oskar Lange in *On the Economic Theory of Socialism*, in O. Lange and F. Taylor, *The Economic Theory of Socialism*, Minneapolis 1938. See also M. Dobb, *On Economic Theory and Socialism*, London 1955.

have already been prepared; that is, they take as given what is in fact the material which political economy has to examine. Thus to count the work of Böhm-Bawerk or Simmel as political economy is a misunderstanding; they belong entirely to the field of psychological studies of consumption and that mainly of consumption in the capitalist epoch. By comparison with classical political economy they represent an enormous and extremely characteristic step backwards”.

Further on Brzozowski writes: “The development of a psychological theory of consumption is a very significant phenomenon. I would like to say that the whole fiscal character of the black-and-yellow monarchy is reflected in it. The theory of the Austrian school is basically the economics of pensioners and tax-officials. It is sufficient to compare it with the theory of Smith or Ricardo to see in which direction the psychology of the bourgeoisie is developing. The links uniting it with production have weakened so much that it feels most strongly connected with the mass of social goods by consumption. When subtle psychologists derive the law of profit and rent from the theory of marginal value their real motive is to be found in the belief that the bourgeoisie draws the means of its maintenance and enrichment from helping consumers to obtain goods. The bourgeoisie bases its rights on a kind of economic spicing process”²⁴.

Bukharin also drew attention to this phenomenon and tried to connect it with the growing importance of non-productive strata, especially rentiers, in the capitalist social formation. Bukharin called the subjectivist trend the “rentier’s political economy”. Describing its social origins, he wrote: “The initial stage of the development of bourgeois political economy which originated when commercial capital (mercantilism) was

²⁴ S. Brzozowski, *Kultura i życie* (Culture and Life), Lwów 1907, pp. 406–407 and 416. Stanisław Brzozowski (1878–1911), philosopher, literary critic and novelist. He was for some time a supporter of Marxism before turning towards Bergsonism and the syndicalism of Sorel. Georg Simmel mentioned here was a German philosopher with positivist tendencies, who published *Die Philosophie des Geldes* in 1900.

dominant is marked by the fact that it deals with economic phenomena from the point of view of exchange... The next stage corresponded to the period in which capital became the organizer of production; the ideological expression of these relations was the "classical school", which dealt with economic problems from the point of view of production (the "theories of labour" of A. Smith and D. Ricardo) and placed its main emphasis in theoretical research. Proletarian political economy inherited this outlook from classical political economy. On the other hand, the bourgeois rentier sees the problem as consisting above all in solving the question of consumption. It is this precisely which is the basic characteristic and point of view in the theoretical views of the Austrian school and the conceptions related to it"²⁵.

The connection of the subjectivist trend with the class of rentiers is not altogether correct since the home of the Austrian school was not a country in which capitalism was highly developed or in which there was a numerous bourgeoisie living on money and loan capital: Austria was a country of moderately developed industrial capital. The subjectivist trend is the expression of the bourgeoisie's loss of interest in political economy and forms the last stage in its liquidation, eliminating political economy as the study of social relations. The Austrian socialist Otto Bauer said of the subjectivist theory that its "researches are far removed from practical life. Hence students learn nothing about trade unions, labour legislation and other similarly "unnecessary" things"²⁶.

During the development of classical political economy and to some extent during the development of vulgar economy, economic studies and literature were directly and closely connected with bourgeois circles; economists of this period were either themselves business men (like Ricardo) or were

²⁵ N. Bukharin, *Die Politische Oekonomie des Rentiers*, Vienna-Berlin, 1926, pp. 25-26. (Originally published in Russian in Moscow in 1919).

²⁶ O. Bauer, *Einführung in die Volkswirtschaftslehre*, Vienna 1956, p. 289. This is a posthumous edition of notes based on lectures delivered in 1927-1928 at the Workers' University, Vienna.

closely connected with them. They were interested in the bourgeoisie's practical problems. In the second half of the nineteenth century and at the beginning of the twentieth political economy became more and more an academic discipline; it was professionally studied in university circles. The bourgeoisie's lack of interest in political economy favoured the isolation of research from the actual problems of economic life and a withdrawal into the sphere of pure psychology and the logic of rational choice, and thus into a field far removed from the social problems connected with the process of production. It is no accident that this tendency showed itself so clearly in Austria, a country with a none too strong bourgeoisie but possessing a numerous group of university graduates employed in the civil service and thus cut off from the process of production, and a large class of landowners living in the cities, petty rentiers and financial capitalists whose activity spread throughout the territory of the Monarchy. This isolation from the problems of production created conditions favouring the role of justification played by the subjectivist trend, denying the significance of social relations in economic processes. The Marxist critical analysis of the capitalist relations of production was met with the answer that these problems... simply did not exist.

Historical trend —an expression of compromise of the German bourgeoisie with feudal elements and the Prussian monarchy

The social conditions in which the historical trend in political economy developed were somewhat different. When the independent labour movement developed in Germany political power was not in the hands of the bourgeoisie. After the unsuccessful revolution of 1848 the bourgeoisie reached a compromise with the feudal landowners and the state bureaucracy connected with them. This compromise was the result of the weakness of the bourgeoisie in the face of the fear aroused by the rapidly growing and strengthening labour movement. The military-bureaucratic apparatus of the monarchy which had its social base in the landowners, especially the Prussian

Junkers, was supposed to protect it against the revolutionary pressure of the working class. Moreover, not being in a state to realize the national unification of Germany by a bourgeois democratic revolution, the German bourgeoisie looked for unification to the Prussian monarchy which in fact effected this unification in 1871. On the other hand, the development of capitalist relations in Germany drew the old feudal land owners and even the Prussian Junkers into its orbit. These were the social conditions in which the historical trend in political economy developed.

By stressing the historical continuity and organic nature of economic development, the historical trend justified the need to maintain the social position of the feudal landowners in the capitalist social formation in Germany. By stressing the active role of the state in economic development it also tended to guarantee the position of the military-bureaucratic state apparatus rooted in Junker and other landowning circles. This tendency was expressed by Gustav Schmoller, the leader of the younger historical school who said that "German professors form the spiritual bodyguard of the house of Hohenzollern"²⁷. The historical trend in political economy involved apologetics on two sides. On the one hand it defended the capitalist mode of production against the critical analysis by Marxism, and on the other it defended the position of the feudal and bureaucratic elements against the criticism based on classical political economy. This was achieved by denying the existence of economic laws and by substituting economic history for political economy or by idealistic historical constructions like those of Werner Sombart and Max Weber.

Whereas the subjectivist trend denies the social nature of economic laws, the historical trend, although recognizing the social nature of the process of production and distribution, denies the existence of laws governing this process. Both trends imply the liquidation of political economy as the study of the social laws of production and distribution; in the first

²⁷ *Ibid.*, p. 283.

case it is replaced by psychology or the logic of rational choice i.e., by praxiology, and in the second case by economic history.

Need for economic knowledge in the management of capitalist economy

The bourgeoisie's liquidation of political economy, however, cannot be complete. For there are certain economic processes where the knowledge of economic laws is necessary for practical purposes in the implementation of economic policy. The number and scope of these processes increases with the growth of capitalism, especially in its last phase of development. These are market processes (which always directly interest the bourgeoisie), together with the problems of money, credit and customs. Some elements of political economy dealing with the laws of money circulation, credit and the effect of custom tariffs, survive and may even in part be developed further. They are necessary as the basis of the administration of currency, especially the gold standard, and as the basis of tariff policy. It is necessary, for example, to know what effect a change in the discount rate will have on the flow of gold to or from the bank of issue, to know at what points an alteration in the rate of exchange will cause the movement of gold from one country to another, to know what effect a change in tariff policy will have on the balance of trade and payments, etc.

Thus, in spite of a general tendency to do away with political economy and replace it by apologetics based on the subjectivist or historical trends, certain parts of political economy connected with the study of market processes and especially of price formation, business conditions, money circulation and credit, international trade and international payments are maintained and even developed further. In these fields bourgeois economists make real, although fragmentary, scientific progress. This progress is mainly the work of the neo-classical school which connects the subjectivist trend with the traditions of vulgar economy; hence it has a better appreciation of the traditional problems of political economy,

and thus of the reality of capitalist economy, than other branches of the subjectivist trend. Apart from these fragments of political economy economic sciences like economic history and economic statistics are cultivated in bourgeois circles. They supply the bourgeoisie and the bourgeois state apparatus with the information necessary for practical activity. Nonetheless, the lack of a firm basis in political economy allowing a full understanding of the laws governing the economic process limits the scientific achievements of these disciplines.

Practical needs of the bourgeoisie under monopoly capitalism

The amount of true economic knowledge required by the bourgeoisie increases in the monopoly phase of capitalism, because the scope of state economic policy expands and it becomes possible for private capitalist organizations to conduct their own economic policy. Whereas in free competition capitalism an enterprise submits passively to the market process, to the spontaneous action of the laws of supply and demand which determine market conditions, the organizations of big capital make use of their monopolistic or oligopolistic²⁸ positions in attempts to influence the market process. When competition is limited a monopoly or oligopoly can deliberately affect prices of products sold, or of raw materials or half processed products bought, by regulating output or purchases. This requires, however, a knowledge of the economic laws operating in the market as well as the concrete numerical expression of the relations contained in these laws. At the same time the scope of state activity increases, both in the form of direct interference with the economic process (interventionism), and in the form of economic activity based on

²⁸ Oligopoly is the name given to the situation where there is a number of enterprises each sufficiently large to dominate the market to a certain degree, i.e., to influence the price of the goods sold or bought. This is a situation between pure monopoly, when there is only one enterprise in the market, and perfect competition, when the number of enterprises active on the market is so great that each has a negligible effect on the market process and is unable alone to influence market prices.

the state ownership of some of the means of production (state capitalism). This raises the question of the ways in which the state is to influence market processes. Moreover, both the economic activity of the state and of private organizations of big capital raise new problems in the co-ordination of the activities of various economic units (e.g., the individual enterprises of a nationalized industry or of a private capitalist concern) or of individual branches of a large private or public enterprise (e.g., an electric power corporation). This requires knowledge which will make it possible to predict the effects of particular measures in the co-ordination of various economic units.

Development and function of applied economic sciences and auxiliary sciences. Econometrics, social accounting, operations research, programming, cybernetics

These problems mean that the big monopolistic oligarchy which directs the economic policy of the state and the policy of private business organizations needs new economic knowledge. New branches of economic science are developed and existing ones are modified while new auxiliary disciplines appear as well. *Econometrics*, which appeared in the period between the first and second world wars, is a new economic discipline of this type²⁹. It bridges the gap between the branch of economic theory which studies market processes and economic statistics. After the second world war in capitalist countries economic statistics was considerably modified to include what is called *social accounting*, i.e., social economic balance accounting. As we have already pointed out, this was much influenced by the social economic balance accounting applied in the planning of national economy in the Soviet

²⁹ The connection between the growth of econometrics and the development of contemporary monopolistic and state-interventionist capitalism is discussed in Oskar Lange, *Introduction to Econometrics*, 2nd edition, Warsaw-London 1962, pp. 12-16, 206-209. See Chapter Five above.

Union³⁰. Other new studies auxiliary to political economy developed in contemporary capitalism, (after the second world war) are *operations research* and *the science of programming*. As we know, these both form part of praxiology³¹. Finally *cybernetics*, which grew up in connection with the development of self-regulating machines and installations (automation) in modern industry (and in the armed forces) also found application as a science auxiliary to political economy³².

Thus, in spite of the general tendency of the bourgeoisie to liquidate political economy when it became a science of the working class and part of scientific socialism, the practical requirements of economic policy under monopoly and state capitalism include a certain amount of true economic knowledge. Modern bourgeois thought seeks for a way out of the contradiction between the tendency to liquidate political economy by substituting capitalist apologetics for it and the practical need for true economic knowledge. It finds a solution in the development of applied economic disciplines which touch upon the problems of political economy in a limited area as well as in the elaboration of certain auxiliary sciences. Deprived, however, of a comprehensive theoretic basis such as political economy would give, these studies have a limited application. Their application is further limited by the bounds imposed by the private ownership of the means of production. These disciplines, like social accounting and programming, by their very nature deal with those problems which can only be practically solved in a planned socialist economy. In order to make full use of these studies it is necessary to over-step the boundary of the private economic rationality of the

³⁰ See Chapter Five.

³¹ See Chapter Five.

³² See Chapter Five. The application of the cybernetic methods used in the theory of electric circuits to the problems of capitalist economy is discussed by Arnold Tustin in *The Mechanism of Economic Systems*, 2nd ed., London 1957. There is a description of these methods in R.G.D. Allen, *Mathematical Economics*, 2nd edition, London 1959, Chapter 9. See also Oskar Lange, *Teoria rozwoju gospodarczego*. (Theory of Economic Development), University of Warsaw 1958. (lecture notes), Chapter Two.

activity of the individual enterprise. Also the capitalist state is dependent on the needs of private firms and their associations which are the organizational form of the capitalist mode of production. Disciplines like econometrics, programming and cybernetics are beginning to be used in socialist countries where their practical consequences will be able to find full scope for development.

Influence of the Great Depression on bourgeois economic thought

Nonetheless, the practical problems of modern capitalism force bourgeois economic thought, however unwilling, to go outside the circle of applied economic studies, like econometrics and economic statistics, and auxiliary sciences like praxiology and cybernetics. The problem of crises and business cycles and the mass unemployment which they cause have for a long time forced bourgeois economic thought to go beyond the conception of the subjectivist and historical trends and even beyond the old vulgar economy, and to take up the problem of capitalist reproduction and accumulation. This problem—in the form of the problem of the realization of surplus value—had been studied for a long time by Marxist political economy. This problem aroused lively discussion among representatives of the Marxist trend in political economy since it is connected with the problems of the conditions and laws of capitalist development, with the problem of the historic bounds of the development of the capitalist mode of production and with the problem of the strategy and tactics of the labour movement³³. Until quite recently all

³³ We should mention here V. I. Lenin, *In Connection with the so-called Problem of Markets*, (1893). *Collected Works*, ed. cit., vol. 1; H. Cunow, *Zusammenbruchstheorie*, "Die Neue Zeit", XVII, 1898-1899; Karl Kautsky, *Krisentheorien*, "Die Neue Zeit", XX, 1901-1902; R. Hilferding, *Das Finanzkapital*, pt. 4, Vienna 1910; Rosa Luxemburg, *Die Akkumulation des Kapitals*, Berlin 1913; Otto Bauer, *Die Akkumulation des Kapitals*, "Die Neue Zeit", XXXI, 1913; N. Bukharin, *Der Imperialismus und die Akkumulation des Kapitals*, Verlag für Literatur und Politik, Vienna-Berlin 1926 (translated from the Russian); Fritz Sternberg, *Der*

these problems were outside the field of vision of bourgeois economists.

Keynes' theory and theories of the business cycle

It was only by the crisis of 1929–1930 which shook the capitalist economy of the whole world to its very foundations and the long depression following it that bourgeois economists were forced to interest themselves in problems of this kind. Then, John Maynard Keynes produced his famous theory of employment which dealt with mass unemployment and economic stagnation as tendencies inherent in the modern capitalist system which the state ought to counteract by an appropriate policy of intervention³⁴. Partly under the influence of Keynes, partly independently of him, and in some cases even earlier, economic theories betraying similarities to the Marxist theory of reproduction and accumulation began to appear³⁵.

Imperialismus, Leipzig 1926; Heinrich Grossmann, *Das Akkumulations— und Zusammenbruchsgesetz des kapitalistischen Systems*, Leipzig 1929. An important part in this discussion was played by M. Tugan-Baranovsky's attempt to show that, on the basis of the Marxist theory of reproduction and accumulation, the capitalist mode of production has unlimited possibilities of development (*Studien zur Theorie und Geschichte der Handelskrisen in England*, Jena 1901; the first Russian edition was published in 1894). Many of the works given here were answers to Tugan-Baranovsky's arguments. An account and discussion of this controversy will be found in P. M. Sweezy, *The Theory of Capitalist Development*, London 1946.

³⁴ See J. M. Keynes, *General Theory of Employment, Interest, and Money*, London, 1936.

³⁵ There are various mathematical models of the business cycle worked out by R. Frisch, J. Tinbergen, E. Lundberg, F. A. Samuelson, J. R. Hicks, R. M. Goodwin, A. W. Phillips and others. A description of these models is given in R. G. D. Allen, *Mathematical Economics*, Chapters 7 and 9. The model worked out by M. Kalecki is quite different in kind. This model is often wrongly reckoned with those based on Keynes' theory; in fact it is derived from the Marxist theory of reproduction and accumulation. It first appeared in Kalecki's *Próba teorii koniunktury*, (An Essay on the Theory of the Business Cycle), Instytut Badania Koniunktur Gospodarczych i Cen, Warsaw 1933.

Theory of economic growth—historical circumstances of its origin

The increasing effectiveness of the socialist mode of production in rivalry with capitalist economy forced bourgeois thought to deepen its interest in the process of reproduction and accumulation. From the time of the October Revolution in Russia and the development of the socialist mode of production in the Soviet Union capitalism ceased to be the only social formation in the world (apart from pre-capitalist formations, mainly in countries dependent on capitalist countries). After the Second World War a whole camp of socialist countries was set up. The rapid economic development of the Soviet Union and other socialist countries at a speed which capitalism does not equal aroused growing alarm among the bourgeoisie. In these circumstances it became necessary to take an interest in the factors which determine the rate of economic growth. This resulted in the establishment of a new branch of economic study, the *theory of economic growth*³⁶.

A second powerful stimulus to the development of the theory of economic growth which to-day torments the bourgeoisie of the leading capitalist countries—the problem of underdeveloped countries, mainly colonies or countries dependent in some other way on capitalist countries or recently freed from this dependence, at least in the political sphere. The national-liberation movements in these countries, their struggle for complete independence and economic and social advance, have thrust them to the forefront of major international political problems. This has forced bourgeois economic thought to take up the central problem of economic growth—the question of capital accumulation and investment in underdeveloped countries.

The theory of economic growth raises problems which are outside the traditional scope of the subjectivist trend, vulgar economy and the neoclassical school. It is forced to study the

³⁶ See, for example, W. A. Lewis, *Theory of Economic Growth*, 2nd ed. London 1956.

relationship between the development of productive forces and the nature of the relations of production which determine both the possibilities and the incentives of capital accumulation. It must deal with the same questions as Marxist political economy. The theory of economic growth thus needs theoretical instruments for the examination of these problems. Only Marxist political economy has developed instruments of this kind; the traditional trends in bourgeois economic thought do not have them. The theory of economic growth is forced to borrow its theoretical tools from Marxist political economy or else make its own—which look very much like those produced by Marxist political economy³⁷. In the hands of many bourgeois economists of the leading capitalist countries the theory of economic growth becomes a peculiar kind of apologetics directed against an active economic policy in backward countries. They point to the obstacles in the path of such a policy and try to show the inevitability of permanent backwardness; some bourgeois economists even question whether it is right for these countries to strive for economic development³⁸. In underdeveloped countries, however, and also among the more far-sighted for the leading economists of capitalist countries, the theory of economic growth is treated as the scientific basis for the policy of the development of the productive forces in the backward and underdeveloped areas of the world³⁹.

Petty bourgeois critique of capitalism

There is another reason, apart from the needs of economic policy, why the bourgeoisie have not succeeded in the complete

³⁷ See, for example, E. D. Domar, *Essays in the Theory of Economic Growth*, New York 1957, especially Chapters I, III–V, IX.

³⁸ These attempts to demonstrate the impossibility or inadvisability of the industrialization of backward countries are described in Paul A. Baran, *The Political Economy of Growth*, New York 1957, pp. 15–18. Baran's book is so far the only systematic Marxist exposition of the problems of economic theory of growth.

³⁹ A. Lewis, for example, a Negro and author of the book on economic growth mentioned in note 36, was for some time economic adviser to Kwame Nkrumah, the President of the Republic of Ghana.

liquidation of political economy as the study of economic relations among men. This is the contradiction between the interests of the petty bourgeoisie and the interests of the upper bourgeoisie within the framework of the capitalist social formation. This contradiction found its expression in the writings of Sismondi and Proudhon during the period of classical political economy and vulgar economy. They originated the petty bourgeois critique of the capitalist mode of production. This approach is different from the proletarian critique started by some of the Ricardian socialists and later pursued systematically by Marx and Engels; for the petty bourgeois critique is not so much a critique of the capitalist relations of production as a critique of the capitalist relations of distribution. Sismondi still thought in terms of classical political economy and dealt with relations of production, but beginning with Proudhon, the petty bourgeois critique of capitalist relations of distribution loses its connection with the problem of relations of production⁴⁰. This is reflected in John Stuart Mill's view that the laws governing distribution are independent of the laws governing production. For the first are the product of legislation and social customs, while the second result from the material necessity of the process of production⁴¹. This view implies that the relations of distribution may be changed without fundamentally altering capitalist relations of production—a concept which is the leading idea of all projects for socio-economic reform coming from petty bourgeois circles.

Thus, side by side with Marxist political economy (which was the continuation of the inheritance of classical political economy and was associated with the social movement of the working-class) and bourgeois economics *sensu stricto* (which tended to the liquidation of political economy and the substitution of an apologetic for capitalist relations of production in its

⁴⁰ This is criticized by Marx in *The Poverty of Philosophy*.

⁴¹ See J. S. Mill, *Principles of Political Economy*, London 1865, pp. 123–124.

place) a *petty bourgeois critique of capitalism*⁴² makes its appearance. Vigorous in the first half of the nineteenth century when it had such prominent representatives as Sismondi, Proudhon and John Stuart Mill, it declined in the second half of the nineteenth century. In this period the labour movement took the initiative in the scientific analysis of the capitalist mode of production and increasingly developed its own social consciousness on the basis of scientific socialism.

Critique of monopoly capitalism by ideologists of the petty and middle bourgeoisie

At the end of the nineteenth and beginning of the twentieth century, however, the petty bourgeois critique was revived. There were several reasons for this. The most important was the rise and development of monopolistic organizations of big capital—banks, trusts, cartels, etc. The transition of capitalism to a new phase of development, the phase of monopoly capitalism in which the decisive role is played by a new form of capital, finance capital, aroused the resistance among the ranks of the petty bourgeoisie and in many circles of the middle bourgeoisie who struggled to preserve their independence of big capital. This resistance was responsible for the anti-trust legislation in the United States at the end of the nineteenth century and finds expression in the continually repeated campaigns to enforce these normally neglected laws. At the same time the so-called new middle class, composed

⁴² In differentiating between Marxist and bourgeois political economy it is often forgotten that there is a petty bourgeois critique of capitalism. Actually, in capitalist societies, the petty bourgeois critique of capitalism is more or less separate from the bourgeois apologetics for capitalist relations of production. The degree of separation varies with the country, and the stage of development which capitalism has reached. This is very well put in the textbook of political economy published by the Academy of Sciences of the USSR: "There are several political economies: *bourgeois* political economy, *proletarian* political economy, the political economy of the *intermediate classes*—petty bourgeois political economy". *Politicheskaya Ekonomiya. Uchebnik* (Political Economy. Textbook), Academy of Sciences of the USSR, Moscow 1958, p. 15.

of white-collar workers employed in industry, trade, banks, insurance, etc., grew in size. This class—or more precisely, stratum—although consisting of wage labourers, willingly adopts petty bourgeois ideas, especially as it is in large part itself recruited from the ranks of the petty bourgeoisie.

Professionalization of economic science

As we have already pointed out, political economy increasingly becomes the concern of university intellectuals. The focus of political economy is shifted from books and pamphlets written by bourgeois business men and publicists to university faculties and scientific research institutes. Economic science is thus *professionalized*. This favours the spread among economists of a critical attitude to monopoly capital since the large part of university intellectuals studying economic science are drawn from the petty and middle bourgeoisie or are personally connected with the new “middle class”. The professionalization of economic science means that the dialectic process of scientific research itself gains in importance. Engels noted that the professionalization of politics, law, religion, philosophy and so on, “creates special branches of the division of labour”, which become independent of the social milieu which produces them⁴³. Applied to bourgeois economics this means that the dialectic process of scientific research in obtaining a wider field for its activity pushes economic thought beyond the bounds of the views and interests of the social milieu from which it arose.

It was from the universities that the initiative in analysing the economic effects of the activity of capitalist monopolies originated. This analysis showed the harmfulness of this activity for the majority of society—it is thus a critique of monopoly capital. At the same time, however, the economists

⁴³ F. Engels, Letter to G. Schmidt, October 27, 1890, K. Marx and F. Engels, *Selected Works*, ed. cit., vol. II, pp. 446–448. On the significance of professionalism in economic science see Oskar Lange, *Marxizm a ekonomia burżuazyjna* (Marxism and Bourgeois Economics), “Polityka”, nos. 9 and 10, 1958.

who produced this critique idealize the operation of the capitalist mode of production in conditions of free competition which they consider to be the realization of the principle of economic rationality. Thus this critique is the expression of the interests and desires of the middle and petty bourgeoisie. The practical conclusions of this critique issue in the demand for a return to the economic relations of pre-monopoly capitalism, i.e. that the tide of history should be turned back—a demand, which confers upon them a certain utopian quality. This petty and middle bourgeois utopia meets with a response by the representatives of big monopoly capital, mostly working as publicists for industrial associations, chambers of commerce, banks and so on. The ensuing polemic lays bare many aspects of modern capitalism.

As Paul Baran puts it: "Similarly economists socially and mentally anchored in the competitive, petty bourgeois phase (and stratum) of capitalist society have developed a certain degree of clairvoyance with respect to the irrationality, wastefulness, and cultural consequences of monopoly capitalism. Oblivious of the fact that it is liberal, competitive capitalism that inescapably breeds monopoly, they recognize some of the economic, social, and human costs of capitalism's monopolistic phase, discern some of the most obvious manifestations of excess consumption, unproductive activities, the irrationality and brutality of "economic royalism". At the same time the writers who have either liberated themselves from the shackles of an earlier age, or who have grown directly into the "new era", are at times impressively perspicacious when debunking the competitive order of the past—the sacrosanct virtues of capitalism's competitive adolescence"⁴⁴. "This tension within bourgeois thought", as Baran goes on to write, "accords a certain amount of insight (and information) that is often a source of valuable information for scientific analysis"⁴⁵.

⁴⁴ P. A. Baran, *The Political Economy of Growth*, ed. cit., p. 27.

⁴⁵ Ibid.

Petty bourgeois and national bourgeois critique of imperialism

There is a great deal of evidence in support of this assertion. In his book on *Imperialism*, J. A. Hobson, the English economist, for example, analysed imperialism from the point of view of petty bourgeois pacifism and supplied Lenin with a great deal of material for his analysis of imperialism as the highest stage of capitalism⁴⁶. To-day the analysis of imperialist rule by economists connected with the national bourgeoisie of colonial, and semi-colonial countries or countries which have recently obtained their independence also provides much valuable material.

The theory of imperfect competition

The analysis of the results of the activity of capitalist monopolies led, within the neo-classical school—in which petty and middle bourgeois tendencies always played some part⁴⁷—to the establishment of a special theory of *imperfect* (or *monopolistic*) *competition*, together with various theories of monopoly and oligopoly⁴⁸. The theory of imperfect competition shows that the mode of operation of modern capitalism is far removed from the idealized picture painted by the traditional text books of the subjectivist trend. This theory also reveals the waste of the productive forces of society which results from the operation of monopolies, oligopolies and various forms of monopolistic competition. At the same time, however, being captive of the concepts, tools and outlook of the theoretical tradition of the neo-classical school and the

⁴⁶ See V. I. Lenin, *Imperialism the Highest Stage of Capitalism. Collected Works*, ed. cit., vol. XIX, p. 83, and the frequent quotations from J. A. Hobson in the text.

⁴⁷ This is particularly true of Marshall; a mental outlook typical of the middle bourgeoisie will be found in many places in his *Principles of Economics* (e.g., the evaluation of the negative influence of monopoly on the national income, p. 60).

⁴⁸ See Edward H. Chamberlain, *The Theory of Monopolistic Competition*, Cambridge Mass. 1933, and Joan Robinson, *The Economics of Imperfect Competition*, London 1933.

still earlier vulgar economy, this theory approaches the analysis of the problem of monopolies and monopolistic competition exclusively from the point of view of the properties of the market. It fails to realize that these properties depend on the specific shaping of the relations of production in the period of monopoly capitalism. By reducing the whole problem to "imperfections of the market" it loses sight of the essential source of the processes under investigation and becomes incapable of drawing any effective practical conclusions.

Welfare economics

The petty and middle bourgeois critique of capitalist monopolies is also expressed in what is known as *welfare economics*⁴⁹. It is a development of some ideas of Marshall, the founder of the neo-classical school. Welfare economics establishes norms of behaviour which satisfy the requirements of social rationality of economic activity. The criterion of social rationality is taken to be the maximization of the social income⁵⁰. The norms of behaviour established by welfare economics are supposed to guarantee the optimum allocation of the economic resources of society. Welfare economics critically analyses the activity of capitalist enterprises and market processes in the light of these norms. It concludes

⁴⁹ The founder of this theory was the successor of Alfred Marshall at Cambridge, A. C. Pigou (*The Economics of Welfare*, London 1920).

⁵⁰ As A. C. Pigou does (*The Economics of Welfare*, ed. cit., Chapters III, VII, VIII). Often the criterion of rationality is considered to be a *sui generis* maximization of utility for all members of society. This maximization consists in the creation of such a situation in which the utility of the income for one person cannot be increased without decreasing the utility of the income for others. This is called "Pareto's criterion of optimality". (see V. Pareto, *Manuel d'économie politique*, pp. 354-364, 617-618). As Pareto shows, when prices are constant this criterion is equivalent to the maximization of the national income. This is so because, as long as the national income has not reached its highest possible level, every increase in the national income makes it possible to increase the utility of the income for certain persons while at the same time compensating those who would thereby lose.

that the phenomena of monopoly and imperfect competition are at odds with the norms of welfare economics and lead to waste of the economic resources of society. Welfare economics regards as ideal the allocation of economic resources taking place under conditions of free competition. In this way welfare economics leads to an idealization of free competition capitalism thus providing a theoretical basis for the attempts of the petty and middle bourgeoisie to turn back the course of history and to re-establish the economic relations of free competition capitalism.

For many representatives of welfare economics these relations are also the basis on which the justice of the distribution of the social income is assessed. "Exploitation" is defined as a deviation of the actual division of the social income from what it would be in free competition capitalism. Monopolistic exploitation is said to consist in the appropriation by monopoly capital of more than is its "due" according to the norms of profit in free competition. Capitalists may also be "exploited" by workers if these obtain more than their labour power is "worth" according to the norms of free competition⁵¹. Here the petty and middle bourgeois nature of the judgements of welfare economics manifests itself very plainly.

The activity of finance capital is also criticized by welfare economics. This is done by the theory of "forced saving" which states that the credit-creating operations of big banks leads to credit inflation which allows the large firms connected with banking capital to intercept part of the capital of smaller enterprises as well as part of the income of the broad masses of people. This happens through a rise in prices which limits

⁵¹ See A. C. Pigou, *The Economics of Welfare*, 3rd edit., London 1932, pp. 556-571, 813-814. Joan Robinson applies the same criteria of social justice in *The Economics of Imperfect Competition*, Book 9. Later, however, she abandoned this position and arrived at a socialist point of view in her evaluation of A. Marshall and the neo-classical school. See Joan Robinson, *Marx, Marshall and Keynes in Collected Economic Papers*, vol. 2, Oxford 1960.

the purchasing power of the smaller capitalists and the community at large⁵².

Impossibility of complete liquidation of political economy by the bourgeoisie

As can be seen, the complete liquidation of political economy as the study of the economic relations between men cannot be carried out even in bourgeois circles. The bourgeoisie has striven for this from the 1830's. Vulgar economy eliminated the relations of production from political economy; later, in the second half of the nineteenth century, the subjectivist trend eliminated all social relations and the historical trend eliminated economic laws. Yet the practical needs of the economic policy of monopolistic organizations of big capital, the increasing intervention of the state in economic relations, the petty and middle bourgeois critique of monopoly, the professionalization of economic science in the universities, and the critique of imperialism by the national bourgeoisie and its associated intelligentsia in colonial, semi-colonial or recently liberated countries—all this makes that the problems of economic relations among men cannot be disregarded. The total liquidation of political economy becomes impossible.

Full development of political economy only possible in connection with the labour movement

Thus certain elements of political economy are continually being revived or developed anew. But these are only fragments. They deal mainly with relations of distribution and market processes, as in the theory of imperfect competition and welfare economics; when they deal with the relations of production as in the theory of economic growth, the problem is not dealt with as a whole. For the problems of the relations of production can only be fully clarified by a class which has

⁵² See D. H. Robertson, *Banking Policy and the Price Level*, London 1926, and A. C. Pigou, *Industrial Fluctuations*, London 1927, Chapters 13 and 14.

no vested interest in the maintenance of the capitalist mode of production—only within the framework of a social movement which is not concerned with this or that reform of the capitalist mode of production but with its complete abolition. This class is the working class, and the movement is the labour movement, operating on the basis of scientific socialism.

Marx, discussing the critique of the economic relations of the capitalist social formation, wrote: "So far as such criticism represents a class, it can only represent the class whose vocation in history is the overthrow of the capitalist mode of production and the final abolition of all classes—the proletariat"⁵³. To-day a systematic political economy dealing with all the economic relations among men, and hence the whole complex of the social laws of production and distribution, which takes account of the connection between all kinds of economic relations and the relations of production, forming the base of every social formation, is possible only as a science linked to the labour movement, as a science being part of scientific socialism.

As we know, the social conditions necessary for the development of a science are: interest, material means, and freedom from prejudice. Obviously the most important of these is interest. From the moment when the bourgeoisie became the ruling class it ceased to be interested in the development of political economy as the study of the whole of economic relations among men and the relations of production in particular. The bourgeoisie provides ample means for economic research in the form of schools, institutes, publications etc., but only for studies in the limited area of the special problems interesting the bourgeoisie and hence mainly economic statistics, econometrics, programming, cybernetics etc., and certain problems of the theory of economic growth. On the other hand no means are provided for scientific studies of the wider problems of political economy. Here, science is replaced by apologetics which offers a pseudo-scientific

⁵³ K. Marx, *Capital*, Allen and Union, London 1946, p. XXV.

system of prejudices, concerning the capitalist mode of production, asserting the supposed harmony of the interests of all social classes and identifying the laws and categories of capitalism with the categories and principles of economic rationality.

This, as Thurman Arnold, a prominent American lawyer, puts it, constitutes the "folklore" of the capitalist social formation. This folklore, he writes, "was expressed principally by the literature of law and economics... Of course, this literature was not called folklore. No one thought of sound principles of law and economics as a religion... This is a characteristic of all vital folklore or religion. The moment the folklore is recognized to be only folklore it ceases to have the effect of folklore. It descends to the place of poetry or fairy tales which affect us only in our romantic moments"⁵⁴.

The folklore of the capitalist social formation thus takes the shape of pseudo-scientific generalizations of bourgeois economics. In the middle ages folklore was chiefly expressed in the form of religion; when the larger part of the old religious folklore was destroyed by the progress of natural science and the ideological consequences of the bourgeois revolutions—folklore transformed itself into apologetics, supposedly based on science, for the economic relations of the capitalist formation. The fact that this is folklore has been revealed by Marxist political economy. But just as the realization that mediaeval religion was the folklore of a particular social formation did not to the same extent reach the consciousness of all classes and social strata, so too not all classes and social strata realize in the same degree that bourgeois economic thought is apologetics and that the petty bourgeois critique of capitalism is utopian. It is only fully realized by the working class which is held down by the folklore of capitalism in an inferior social position and is prevented from shaping the social relations in a manner corresponding to its needs.

⁵⁴ Thurman W. Arnold, *The Folklore of Capitalism*, New Haven 1938, p. 46. Thurman Arnold was one of the chief supporters of Franklin D. Roosevelt's "New Deal". During Roosevelt's presidency Arnold was for some time attorney general of the United States of America.

Social conditions and the truth of scientific cognition

This brief historical review of the connection between the development of natural science and the capitalist mode of production and between the development of political economy and various phases of the capitalist social formation leads to a more general problem. How do the social conditions in which science develops and the social significance of the results of scientific investigation affect the process of scientific cognition itself, the dialectic process which produces in human thought adequate reflection of objective reality? In other words, how does the social significance of science and the conditions in which it develops affect the truth or falsity of its statements?

The fact that scientific views and trends of scientific thought originate in particular historical conditions, in particular social classes or groups, does not in itself decide their truth or falsity. The truth of scientific statements depends exclusively on their agreement with objective reality and this agreement can only be verified in practice, i.e., in activity altering reality. The truth or falsity of the assertions of physics or chemistry is verified in the laboratory and industrial practice. The truth or falsity of the assertions of medical science is verified in medical practice, in hospitals and clinics. The truth or falsity of the assertions of political economy is tested by a confrontation with reality, on the basis of statistical or historical verification; it is also tested by the effectiveness or ineffectiveness of the economic policy based on these assertions. Methods of verifying the laws and theories of political economy were discussed in detail in the chapter on the method of political economy. Thus the truth of scientific statements is tested in the process of the dialectic of scientific cognition. But the social conditions in which science develops and the social significance of its results may favour the attainment of scientific truth or they may hamper it and even make it impossible. This gives rise to certain regularities in the development of science which are explained by the materialist interpretation of history.

Science and ideology

To the extent that scientific ideas directly or indirectly affect social relations they bear upon a social formation's *ideology*, i.e., upon a formation's set of social ideas⁵⁵. In other words scientific ideas bear upon ideology in so far as they contain social ideas, i.e., ideas on the basis of which people directly or indirectly evaluate social relations. The ideas of social science especially are of this kind. Social sciences thus get connected with a social formation's ideology, they are, as we say, *ideological*. Natural sciences, on the other hand, are concerned with man's natural environment, and man as part of nature (e.g., anatomy, physiology), without taking social relations into consideration. Natural sciences nonetheless frequently have an indirect impact on social relations. Copernicus' theory or Darwin's theory of evolution, for example, although they contain no explicit reference to social relations, were socially significant because they undermined the authority of certain generally held views which formed part of the teaching of a social organization, the Church. The work of Copernicus and Darwin indirectly affected social relations because men began to judge the teaching of the Church in the light of their discoveries. These discoveries were ultimately ideologically significant and were made use of by the ideology which played an important part in the origin and development of the capitalist social formation. Social sciences as a whole, and natural sciences, in so far as their assertions indirectly affect social relations, have ideological bearing.

Conservative, progressive and reactionary ideologies
Compromise ideologies

In antagonistic social formations where there are opposing class interests and corresponding socio-psychological attitudes, the social ideas of each class are formed in a different way. When the contradictions between the development of productive forces and the relations of production and between the

⁵⁵ See Chapter Two.

need to change the relations of production and the superstructure of a social formation come to a head, the opposition of class interests turns into a class struggle. The social ideas of each class and the strata and groups connected with it are formed into more or less coherent systems which are in fact ideologies expressing the position of the struggling social classes. The class which wants to maintain the old relations of production, and the social strata and groups connected with the old superstructure defend their position with the aid of the appropriate ideology. The classes struggling for a change in the relations of production and those strata and groups supporting them oppose this ideology with a new ideology from which they derive justification of their aims.

In a social formation torn by class struggle there are two opposed *ideologies*: a *conservative* ideology expressing the aspirations of the class and strata which want to maintain the established social relations and a *progressive ideology* expressing the aspiration of the class (or classes) which want to change social relations to comply with the demands of the new stage in the development of the productive forces. Sometimes there are remnants of a class or stratum connected with an earlier social formation which try to take advantage of the upset internal equilibrium of a social formation in order to re-establish, at least in part, former social relations. These attempts produce a *reactionary ideology*. Sometimes particular social classes or strata like the petty bourgeoisie or the "new middle class" in the capitalist social formation adopt a wavering attitude to the struggle between the principal social classes, and wish only a partial change in the existing social relations. This produces a *compromise ideology* which, however, usually differentiates into a conservative and a progressive wing when the struggle between the principal classes is becoming acute. Thus ideology is always the ideology of particular social classes and social strata.

Social sciences, including political economy, as studies of direct ideological significance, are drawn into the whirlpool of ideological struggle; the natural sciences are drawn in so

far as they contain ideological elements. This is unavoidable since—in spite of the most sincere attempts of an individual scholar to reach objective truth—science as a social process of cognition is developed in particular social conditions and in a particular social milieu. Furthermore, readiness to accept and assimilate scientific statements varies from class to class and from stratum to stratum. As a rule statements conforming with the ideology of a particular class or stratum and strengthening their ideology are readily accepted, while those which contradict and undermine their ideology are resisted.

Social apperception and the mental horizon of social classes and strata

Kazimierz Krauz called this phenomenon *social apperception*⁵⁶. He emphasized the class character of this apperception in antagonistic social formations; here social apperception is *class apperception*. "This gives rise", he writes, "to what might be called social apperception; *a priori* human consciousness tends in a certain direction (positive influence) and at the same time a kind of filter (negative) closes it to prevent from seeing certain modes of thought and behaviour. This social apperception, this filter of thoughts and impulses, explains why the members of a particular society or a particular class, although they always have their own collective interest in view, consider themselves to be absolutely disinterested and that is in fact how they really feel"⁵⁷. Social class apperception decides what scientific statements can be accepted by a particular class or social stratum and absorbed into its consciousness. This apperception deter-

⁵⁶ In psychology, by apperception is meant the incorporation of sensory perception into the consciousness.

⁵⁷ Kazimierz Krauz, *Economic Materialism* (in Polish). ed. cit., p. 23. See also p. 34, where he speaks of the apperception proper to various classes. Krauz' use of the term *a priori* is unfortunate in speaking of a particular social apperception. This expression is here used metaphorically, since apperception is developed during the practical activity of the members of social classes and strata and is not *a priori* in the sense in which it is used in theories of cognition.

mines the limits of the possible social consciousness of a class or social stratum, it decides its *mental horizon*, and at the same time determines the range of scientific statements which a particular class or stratum can assimilate in a particular social situation⁵⁸.

Ludwik Krzywicki, describing the operation of class apperception in political economy, wrote: "At all events, we might say, with some reservations, that the theories of political economy are a more or less systematic and coherent formulation of the impressions received by the human mind from direct experience, and since these impressions vary widely according to the position which a person occupies, therefore his attitude to economic phenomena, his economic aspirations and even his understanding of their essence must vary. For the industrialist in whose books expenditure on labour, machines and raw materials figure as similar entries, and in which the costs of a good are treated identically, profit is calculated in relation to the capital invested regardless of what the capital was spent on. For a factory owner human effort, although it is the only value-creating force, is no different from other items and he does not see that the whole of a firm's income originates from it. On the contrary, everyday experience shows that profit is made on the market and comes from lucky sales and that its rate is determined by a particular relation between demand and supply! If we carefully examine the conditions in which this industrialist lives, and the impressions he receives within his own particular mental horizon, we can see that his experience gives rise to a complex of vague ideas and views which, were they to be systematized, would form the beginning of a corresponding trend in political economy. In fact the trend represented by the Manchester

⁵⁸ Lucien Goldmann (*Sciences humaines et philosophie*, Paris 1952, pp. 119-127) refers to the "*conscience possible*" of social classes, using this term to describe the phenomena which Krauz called class apperception. Goldman, using a series of illustrations from political economy, shows the inability of various social classes to assimilate scientific statements which exceed their "*conscience possible*".

school and even the bourgeois schools in general, with the exception of classical political economy, is nothing but a more or less ingenious and thorough formulation of this kind of mental outlook"⁵⁹.

Further on he writes: "In order to understand the essence of the various trends in political economy we should always remember that they are only a reflection of life in the human mind, a systematization of impressions received by various social groups from their environment. These impressions change with the passage of time as the corresponding environments with their interests and aspirations and the mental outlooks connected with them undergo alteration. In any given period they are also different for different groups of a nation. The history of economic doctrines cannot be treated in isolation from the life which called them into existence. While opposing views in geology are more or less sensible attempts to discover truth, in political economy they are above all the formulation of certain interests"⁶⁰.

Ideologies obscuring and ideologies revealing reality—their importance for scientific cognition

In the light of class (or stratum) apperception of scientific statements—which applies to most statements in the social sciences—we are faced with the problem of how far it is possible in political economy to have genuine scientific knowledge, knowledge which reflects objective reality. This leads to the problem of the connection between ideology and scientific cognition. We must here distinguish between two kinds of ideology—ideologies which *obscure, mystify reality* and ideologies which *lay bare, reveal reality*. The first hinder the scientific cognition of reality. For the social apperception on which an ideology of this kind is based consists in excluding the true picture of reality from the consciousness and in shaping a picture which gives a false reflection of reality. Of these,

⁵⁹ L. Krzywicki, *Political Economy. A Handbook for the Self-taught* (in Polish), ed. cit., vol. III, pp. 92-93.

⁶⁰ *Ibid.*, p. 94.

Engels writes: "Ideology is a process accomplished by the so-called thinker consciously, it is true, but with a false consciousness. The real motive forces impelling him remain unknown to him; otherwise it simply would not be an ideological process"⁶¹.

Ideologies obscuring reality take various forms in historical development. In the earlier social formations their most common forms were religion, folklore and various kinds of mythology; to-day they appear as metaphysical philosophical doctrines or pseudo-scientific theories. The common feature of these ideologies is the *fetishization* of social relations and sociological and economic laws, the search for their sources outside the sphere of concrete historical human activity. As we know, fetishization consists in locating the sources of social relations and the laws which shape them either in the sphere of metaphysics (supernatural fetishization), or in supposed laws of nature (naturalistic fetishization). The source of fetishization is, as we know, to be found in the spontaneity of the operation of sociological and economic laws⁶². Supernatural fetishization appears in political economy in the form of the historical trend's theory of the "spirit of the economic epoch", which supposedly determines economic relations. Naturalistic fetishization is found both in classical political economy in the interpretation of economic laws as the laws of nature, and in the subjectivist trend in the interpretation of economic relations as the expression of universal categories of economic rationality, i.e., categories isolated from historical social conditions.

In contrast to the ideologies obscuring reality, ideologies revealing reality are a stimulus to scientific cognition⁶³.

⁶¹ F. Engels, Letter to F. Mehring, 14 July, 1893, K. Marx and F. Engels, *Selected Works*, ed. cit., vol. II, p. 451. In a letter to C. Schmidt, 27 October, 1890, (*ibid.*, p. 448), Engels writes that the inversion of actual social relations in men's mind is an "inversion, which, so long as it remains unrecognized, forms what we call *ideological conception*".

⁶² See Chapter Three.

⁶³ In their earlier works Marks and Engels used the word "ideology" to mean exclusively an ideology mystifying reality. This is the meaning used

Moreover, the scientific knowledge of reality often forms the essential instrument of these ideologies. Bourgeois ideology, for example, beginning with the Renaissance, through the Enlightenment right up to the end of the period of bourgeois revolutions, strove to lay bare reality and exposed the ideological mystification of precapitalist social formations. It was based upon natural science, which undermined the authority of the doctrines of the Church, and upon classical political economy

in *The German Ideology*, written in 1845. "Ideology" is treated there as a system of illusions, and false ideas forming a distorted mental image of the material conditions of social life. At the same time it is a system of thought created by the ruling class: "The ideas of the ruling class are in every epoch the ruling ideas... The class which has the means of material production at its disposal has control at the same time over the means of mental production, so that thereby, generally speaking, the ideas of those who lack the means of mental production are subject to it". (*The German Ideology*, Parts I and III, London 1938, p. 39). When a new revolutionary class appears which has its own thoughts it exposes ideology as a mystification of reality. Even in 1893 in his letter to Mehring, to which we referred above, Engels defines ideology as "false consciousness". In their later work, however, Marx and Engels use the concept "ideology" in a wider meaning—to denote a system of social ideas. In the Introduction to *A contribution to the Critique of Political Economy*, Marx speaks generally of the ideological forms in which social conflicts appear (see K. Marx and F. Engels, *Selected Works*, ed. cit., vol. I, p. 363). Marx did not, however, use the term "ideology" to describe his own ideas. Only in later Marxist literature is the term "ideology" used in the wide sense of a system of social ideas in a way which also includes the social ideas of the working-class movement and hence scientific socialism. Lenin uses it in this sense: "The only choice is: either Bourgeois, or Socialist ideology... Hence to belittle Socialism in any way, to deviate from it in the slightest degree means strengthening bourgeois ideology. (*What Is to Be Done? Collected Works*, ed. cit., vol. IV, Book 2, p. 123). Antonio Gramsci, whose analysis of the problems of ideology is especially penetrating, also uses the term "ideology" in a wide sense. He defines ideology as meaning in its widest sense "a view of the world which is revealed implicitly in art, law, economic activity, in all aspects of personal and collective life". (See *Il materialismo storico e la filosofia di Benedetto Croce*, ed. cit. p. 7). By "view of the world" Gramsci means a set of social ideas. He goes on to say that ideology interpreted in this way is a "superstructure necessary for a given base", and that ideology "organizes the mass of humanity, shapes the terrain on which men operate, become conscious of their situation, fight etc.," To this concept

which showed how feudal and guild relations of production hampered economic development and showed the significance for progress of the new capitalist relations of production. Adam Smith's book *The Wealth of Nations*, was not only a scientific treatise but also an instrument in the ideological struggle. The ideology of the working class shows the real nature of the capitalist relations of production by means of the scientific analysis developed by Marxist political economy. Marx's *Capital* is both a scientific work and a book with ideological significance showing the economic relations of the capitalist social formation in their true light.

Thus the degree to which the scientific cognition of reality is possible in the social sciences and hence also in political economy depends on the existence of an ideology revealing reality. Conservative ideologies normally obscure it. The class whose social existence is based on the relations of production which are at odds with the requirements of the development of the productive forces, together with the strata whose position is linked with a superstructure which cannot survive if the relations of production are changed, tend to obscure, to mystify reality, trying in this way to weaken the forces demanding the alteration of social relations. This mystification

of "ideology" Gramsci opposes another, according to which every ideology is *ex definitione* "pure delusion, useless, stupid, etc.", (Ibid. p. 48). Today "ideology" in its broad sense is used both in Marxist literature and elsewhere. Hence we must distinguish between ideologies which obscure reality and those which lay it bare. A comprehensive and detailed review of the senses in which the term "ideology" is used in the literature of social science is contained in Arne Naess (with the collaboration of A. Christopherson and K. Kualo), *Democracy, Ideology and Objectivity*, Oslo 1946. The relationship between social science and ideology is stated very clearly in Jerzy J. Wiatr, *Socjologia a ideologia*, (Sociology and Ideology), "Studia filozoficzne", no. 4 (7), 1958. See also Karl Martel, *Ideologia a nauki społeczne* (Ideology and Social Sciences), "Nowe Drogi", no. 5, 1959. A new attempt to probe deeper into these problems is made by Julian Hochfeld in *Socjologia, materializm historyczny, ideologia*, (Sociology, Historical Materialism, Ideology), "Studia Filozoficzne", nr 6, 1960 and "*Ideology and Sociology*", Polish Perspectives, vol. IV, No. 6, Warsaw 1961.

strengthens the self-confidence of the class or strata opposed to changes in social relations and confirms their conviction of the justice of the cause they defend⁴⁴. However, as the history of political economy in capitalism shows, this process of obscuring reality cannot be carried out thoroughly because without a certain minimum of accurate knowledge of social relations and the laws which govern them, effective practical activity on the part of the ruling class would be impossible.

Progressive ideologies, on the other hand, are ideologies revealing reality. They originate and develop in the struggle with conservative ideology and its mystification of reality. They undermine the obscured picture of reality offered by conservative ideology and at the same time mould and organize the consciousness of the class or classes and strata striving for the alteration of social relations. Reactionary ideologies contain elements obscuring reality together with those which

⁴⁴ The essential feature of ideology is that the class whose aspirations it expresses should be convinced of its truth. Baran notes that under monopoly capitalism the ruling oligarchy of big capital employs well organized propaganda to impose cynically on the masses views which they themselves consider to be false. "It is in fact doubtful whether the term "ideology", as conventionally used in the sociology of knowledge, is at all applicable under monopoly capitalism. An entirely different entity is a set of inadequate, partial, biased notions that is consciously implanted in the minds of men by a manipulative effort of a class bent on achieving certain ends by inducing its more or less general acceptance. Thus in the age of monopoly capitalism... the proper study of the subject moves away from the sociology of knowledge into the realm of manipulative opinion research". (P. A. Baran, *The Political Economy of Growth*, ed. cit., p. 97 n.). Vance Packard shows that modern methods of the psychology of buyer recruitment, consisting in the exploitation of unconscious psychological urges and in the moulding of unconscious reflex actions, have found an application in social and political propaganda, especially in publicizing the achievements of so-called free enterprise. See Vance Packard, *The Hidden Persuaders*, pp. 155-207. Adlai Stevenson, who was twice a victim of these methods in electoral campaigns as Democratic candidate for the Presidency of the United States, commented: "The idea that you can merchandise candidates for high office like breakfast cereal... is the ultimate indignity in the democratic process". (Ibid., p. 172).

reveal it. They lay bare reality in so far as it is necessary to do so in order to justify the need to change the existing social relations in which contradictions have developed; they conceal reality in order to justify a return to the social relations of earlier times. Finally, compromise ideologies also contain a mixture of elements which reveal and elements which obscure reality. These ideologies are usually eclectic and try to reconcile the conflicting elements of progressive and conservative ideologies.

Progressive ideologies as a stimulus in the development of political economy

The development of political economy is thus closely connected with the modern history of progressive ideologies. Political economy at first developed within the framework of the progressive ideology of the bourgeoisie and later, when the bourgeoisie became a conservative class, the fate of political economy was thrown in with that of the labour movement in its consistent struggle against the ideological mystification of the capitalist system. The knowledge possessed by political economy has also received contributions from the critical evaluation of capitalist economic relations by reactionary ideologies, which have its sources in the remnants of feudal classes and social strata. Similarly the compromise ideology of the petty bourgeois and the "new middle class" and also—during the period of monopoly capital—of the middle and anti-imperialistic national bourgeoisie also increased political economy's store of knowledge. To some extent the practical needs of the economic policy of the capitalist state and private organizations of big capital have also made their contribution. Nonetheless, the scientific explanation of the whole of the economic relations of modern social formations (i.e., the capitalist and socialist formations), the understanding of the basic economic law of each of these formations and all its consequences, the understanding of the mode of operation and "the economic law of motion" of both formations—all this is only possible when political economy is united

with the only fully and consistently progressive ideology of our times—i.e., the ideology of the working class.

Ludwik Krzywicki, describing the connection between the scientific nature of political economy and the ideology of a progressive class, writes: "Political economy can undoubtedly raise itself above purely class interest and give a profound analysis of the essence of economic phenomena, but it is first necessary for it to understand its own class character and not to deny or ignore it. In order for this to come about there must be a certain stratum whose interests need a conscientious "scientific dissection" of this kind⁶⁵... The trends and schools of political economy are the expression of class interests in various phases of their development. Science only systematizes what is vaguely in the minds of people holding the appropriate position... But this class character, although it seems that it does not assist in the scientific dissection of economic phenomena, at least does not deprive political economy of its scientific character as long as there is a social group interested in making an analysis of this kind. In this case, class interest, instead of holding back scientific advance becomes its most powerful promoter. In fact the whole of the achievements of political economy in the course of the second half of this century [i.e., the nineteenth century—O. L.] are the work of men who clearly and unequivocally adopted a class position"⁶⁶.

This is even more precisely formulated by the authors of the textbook of political economy published by the Academy of Sciences of the USSR: "Is an objective, unbiassed, political economy, fearless of truth, at all possible? Certainly it is possible. An objective political economy of this kind can only be the political economy of the class which is not interested in concealing the contradictions and putrefaction of capitalism, or in preserving the capitalist order, and whose interests lie in the liberation of society from capitalist slavery

⁶⁵ *Political Economy* (in Polish), ed. cit., pp. 94–95.

⁶⁶ *Ibid.* pp. 95–96. Krzywicki here uses the expressions: class, stratum and social group interchangeably. He lacks terminological precision.

and the progressive development of mankind. A class of this kind is to be found in the working class"⁶⁷.

Class conditioning of the development of political economy

The existence and development of scientific economic knowledge is thus dependent on the existence of a social class interested in the true knowledge of economic relations and the laws by which they are governed, and whose aspirations are expressed in a progressive ideology revealing reality. For an ideology of this kind needs a scientific understanding of reality and this understanding comes to form the foundation of the ideology. The working class is to-day the only class of this kind and is at the same time the only class in history which is interested in discovering the *whole truth* about the laws governing the development of economic relations.

Only the working class is interested in full scientific knowledge of economic laws

The bourgeoisie, even in the period when it was a progressive class, was only interested in the understanding of part of this truth, that is, the part dealing with the progressive nature of the capitalist mode of production in relation to pre-capitalist social formations. It was not and could not be interested in understanding more—in understanding the transient nature of the capitalist mode of production, the growing internal contradictions and the decay of the progressive role of the bourgeoisie as a class. The historical social role of the working class, on the other hand, does not contain anything which might hamper the understanding of the truth about the laws governing the development of economic relations⁶⁸, for its class interests demand that the relations

⁶⁷ *Political Economy*. Textbook (in Russian), ed. cit., p. 15.

⁶⁸ From the true premiss that scientific statements are socially apperceived Karl Mannheim, the German sociologist, draws the false conclusion that in a society in which there is a class struggle objective true social knowledge is impossible. He initiated a special branch of study called the sociology of knowledge, which inquires how various social milieus affect

of production should be so moulded that antagonistic classes disappear and that all class divisions in society eventually vanish. Moreover, the working class needs a full understanding of these laws⁶⁹. Its aim—and in many countries this aim is already being realized—is the establishment of economic relations which will allow the spontaneity of the operation of economic laws to be overcome and in which social development will be consciously guided by man. This requires, as we know, a true knowledge of objective economic laws adequately reflecting reality.

scientific knowledge. Every social class, stratum or group can only attain a partial, biased knowledge of reality; a complete knowledge would be a synthesis of the fractional knowledge achieved by each social group. According to Mannheim, this synthesis has to be made by socially unconnected intellectuals (*sozial freischwebende Intelligenz*), i.e., that social stratum which is not connected with any class and is free from their cognitive limitations. (See Karl Mannheim, *Ideologie und Utopie*, Frankfurt 1952, pp. 134–143). Mannheim's erroneous theory results from two mistakes. Mannheim mixes up the social conditions of apprehension of scientific statements with the dialectical process of cognition which is a process of interaction of man and objective reality. From the fact that in social science knowledge is socially conditioned, he comes to the false conclusion that the knowledge of objective truth is impossible. This aspect of Mannheim's theory has been criticized by Jerzy Lande (*O tak zwanej socjologii nauki*, (On the So-called Sociology of Science), "Czasopisma prawnicze i ekonomiczne" XXX, Cracow 1936; pp. 490–494). Furthermore, Mannheim does not see the difference between progressive and conservative classes or strata, nor the fact that the social aspirations of the former are expressed in ideologies which make a true knowledge of reality possible. The intellectuals, on the other hand, to whom Mannheim ascribes a special ability to synthesize the limited mental horizons of different classes, are normally connected with the bourgeoisie or petty bourgeoisie in the capitalist social formation, and thus are not capable of fulfilling the role provided for them by Mannheim. The working class, on the other hand, does have this ability, since on account of its specific social position it is the bearer of the most consistent ideology revealing reality encountered in the course of human history. There is a penetrating criticism of Mannheim in A. Schaff, *Ideologia w ujęciu Mannheima*, (Ideology as Interpreted by Mannheim), Warsaw 1958.

⁶⁹ True social knowledge within the limits of the mental horizon possible for the most progressive class in a particular epoch is a condition of progress at all stages of social development. Thus the striving for

Thus only by linking itself with the labour movement and the historic undertaking of scientific socialism can the science of political economy guarantee itself conditions of full and free development. Only the labour movement and its ideology can guarantee the three conditions necessary for the development of every science—interest, material means, and freedom from superstition and prejudices and other impediments to the understanding of reality.

It is particularly important that the labour movement is interested in the unlimited knowledge of truth and that all attempts to obscure reality are alien to its nature and detrimental to its purpose. For the bourgeoisie and, before that, for the class of feudal landowners or slave owners, the mystification of reality was done in their interests as the exploiting classes. The mystification of reality kept the exploited classes in a mental condition which made them ready to submit passively to the exploiters. The working class, striving to destroy exploitation, could only mystify itself, and this would mean self-deception, which could only lead to failure both in the struggle with capitalism and in the construction and development of socialism. Therefore the labour movement, in order to ensure that its activity is effective, needs an unfettered economic science⁷⁰, and the continual confrontation of its ideas and

true scientific knowledge in spite of the difficulties presented by ideologies which mystify reality deserves a positive moral evaluation. Marx stressed this very strongly, treating with contempt those who had consciously given up the search for scientific truth. Of Malthus he writes: "But the man who tries to *adjust* science to some position, which is not itself deduced from science (be it ever so mistaken), but is taken from *outside*, a position dictated by *external* interests, *foreign* to science—such a man I describe as mean (*gemein*)... For this purpose he *falsifies* his scientific conclusions. In this consists his meanness in relation to science, his sin against science, ...The man who first discovers some idea can err with a clear conscience, he may take it to extremes; the plagiarizer on the other hand, takes an idea to extremes, in order to pursue his own personal interests" Karl Marx, *Theories of Surplus Value*, Russian translation, Moscow 1957 pt. II, pp. 112–113.

⁷⁰ It is worth recalling Engels' words to Bebel when the authorities of the Social Democratic Party of Germany were opposing the publi-

views with objective reality. Self-criticism and a constant check of the objective truth of its ideas is an indispensable condition for the practical success of the working-class movement⁷¹.

The working-class movement's struggle to purge its ideology of all elements obscuring reality

There have been several attempts, during the history of the working-class movement, to obscure reality. These attempts, however, were not the result of the interests of the working class but were in fact in conflict with them. They were usually caused by the immaturity of the working class and its inability to free itself completely from mental habits based on traditions thousands of years old. At the outset of the labour movement there were a great number of such attempts to base its ideology on doctrines containing elements of old ideologies—religious, philosophical, pseudo-scientific and others. The founders of scientific socialism, Marx and Engels, waged an unrelenting battle against all such mystification in the ideology of the labour movement⁷². With the maturity of the working class and the development of its consciousness, all these obscurations were eliminated from its ideology so

cation of the *Critique of the Gotha Programme* by Marx. Engels wrote then: "What is the difference between you and Puttkamer if you introduce into your own ranks a law against socialism? For me, personally, this may be of no importance. No party in any country can compel me to silence when I have decided to speak. But I would like you to consider whether it would not be better if you were a little less sensitive and if you did not behave so much like—Prussians? You, the Party, need socialist science, and that cannot exist without freedom of movement (*Freiheit der Bewegung*)". Letter to August Bebel 1–2 May 1891. (K. Marx and F. Engels, *Sochinyenya*, vol. XXVIII, The Marx–Engels–Lenin Institute, Moscow 1940, p. 316).

⁷¹ It is only necessary to remember the importance which Lenin attached to constant self-criticism within the labour movement.

⁷² *The Communist Manifesto*, for example, contains a whole chapter critically assessing the various socialist ideas competing for influence in the labour movement. It is also worth remembering Marx's controversy with Weitling (1808–1871), a German handworker, whose ideas were typical of the immaturity of the working class of the period. Engels' controversy with Eugène Dühring (1833–1921) played a large part in overcoming mystification in the ideology of the labour movement.

that finally scientific socialism became the dominant ideology of the working-class movement.

Later, when the working-class movement was joined by many people from the petty bourgeoisie and the intelligentsia connected with it, and especially with the transition of capitalism into its imperialist phase and the participation by some sections of the working class in the profits of the imperialistic exploitation of colonies and dependencies—mystifications concerning the role of capitalist monopolies, the policy of intervention in the economy of the capitalist state and certain manifestations of imperialism, began to appear. They appeared as various currents in the labour movement such as revisionism, social-imperialism, etc. Illusions of this kind show themselves in the working-class movement even to-day and will continue to show themselves as long as the movement is subject to the ideological influence of capitalism and the penetration of petty bourgeois ideas which are carried in with the influx of increasing numbers of peasants and petty bourgeoisie together with their intelligentsia. Hence the constant rebirth of various forms of revisionism in the working class movement. Scientific socialism consistently struggled in the past with this kind of attempt to introduce elements of ideologies which obscure reality into the labour movement, and will continue to do so in the future⁷³.

At one period in the building of socialism political economy was fettered by dogmatism and by a tendency to transform science into apologetics. This was connected with Stalin's system of the "cult of personality". An attempt was made to change the Marxist analysis of the operation of economic laws into an idealistic voluntarist conception of the economic process in which the dialectic of social forces was replaced by the actions of outstanding personalities and their subordin-

⁷³ See Lenin, *Marxism and Revisionism* (1908), *The Historic Fate of Karl Marx's Science*, (1913), *Imperialism and the Split in Socialism*, (1916) in *Marx, Engels, Marxism*, ed. cit. See also Rosa Luxemburg, *Sozialreform oder Revolution?* (1899), and articles written by Plekhanov in the years 1898–1906, recently published under the title *Przeciw rewizjonizmowi*, (Against Revisionism), Warsaw 1958.

ate bureaucratic apparatus. Political economy was to constitute the apologetics for the alleged superior wisdom of the acts taken by these leaders and for their specific methods of managing the national economy which did not keep in step with the rapid development of the productive forces within the framework of the socialist mode of production⁷⁴.

This dogmatism and the attempt to transform political economy into apologetics did not emerge from the working class nor from the social conditions of the socialist mode of production. They were the expression of an immaturity associated with the construction of socialism in countries formerly backward in which the working class formed a comparatively small part of a society consisting mainly of peasants and petty bourgeoisie, while surrounded by the hostile forces of imperialism⁷⁵. Certain contradictions appeared, of which the "cult of personality" was a temporary expression, together with dogmatism and tendencies to transform political economy into apologetics.

⁷⁴ "Dogmatism and schematism were the ideological reflections of these social processes, the result of a reluctance to face up openly to reality, and to the criticism which might result from this. Another ideological reflection of this was the reluctance to submit to Marxist criticism the concrete processes of the building of socialism, and the cultivation of a subjective-voluntaristic and legal-administrative, in a word, idealistic interpretation of these processes... It was not an apologetic for socialism... for socialism does not need apologetics—apologetic is foreign to the needs of socialism and to the very nature of Marxism. On the other hand, it was an apologetic for the phenomena connected with "the cult of personality", phenomena contradictory to the idea of socialism and constituting a brake on further social advance". Oskar Lange, *Aktualne problemy nauk ekonomicznych w Polsce*, (Current Problems of the Economic Sciences in Poland), "Nowe Drogi", June 1956, pp. 30-31.

⁷⁵ "The cult of personality is a rotten survival of the long history of mankind. The cult of personality has its roots not only in the exploiting class but also among small producers. It is generally recognized that paternalism is a product of small commodity production. After the establishment of the dictatorship of the proletariat, even after the elimination of the exploiting class, after the replacement of small commodity production by collective production and after the construction of a socialist society, putrid and poisonous remnants of the ideology of the old society can sur-

These phenomena stood out particularly sharply when the rapid development of productive forces and the corresponding increase in the numbers, the consciousness and activity of the working class, the progressive socialization of the peasant economy, the creative role of the intelligentsia as the bearer of science and technical progress, the general spread of education and of the scientific state of mind, made it necessary to alter the superstructure of the recently born socialist formation. The contradiction between the swiftly maturing base of socialist society and the methods of management developed in the specific conditions of a transitory period deepened and widened. Thus precisely those forces which had developed from the socialist base of the new social formation started to demand the removal of the distortions connected with the "cult of personality", dogmatism and the tendency to transform political economy into apologetics for methods of managing the national economy which were no longer appropriate to the existing conditions.

The path to the correction of these distortions was opened by the XX Congress of the Communist Party of the Soviet Union in February 1956, and in Poland by the VIII Plenary Session of the Central Committee of the Polish United Workers Party in October 1956. The XXII Congress of the Communist Party of the Soviet Union in October 1961 proves that the process of correction is effectively in progress.

Union with scientific socialism as the indispensable basis of the further development of economic science

The working-class movement and the historical process of the construction and development of the socialist social formation need a complete unfettered scientific understanding of real-

vive for a long time in men's minds. "The force of habit of millions and tens of millions is the most terrible force" (Lenin). The cult of personality is also the force of habit of millions and tens of millions... The cult of personality is the reflection of social phenomena in men's minds". *Historic Experiences of the Dictatorship of the Proletariat*, Jen Ming Ji Pao, April 1956, reprinted in "Trybuna Ludu", 8 April, 1956.

ity in all fields of nature and of all the processes taking place in human society. The ideology of this movement lays reality bare without any reservations, declares the complete knowability of reality⁷⁶, and bases itself on the scientific knowledge of the laws of nature and social development—a knowledge which disregards old superstitions and prejudices, which makes no concession to the conservatism of any class, group or social stratum. The working class and socialist society are free from conservatism and are interested only in the full and unlimited development of economy and culture. Attempts to restrict the scientific cognition of reality in the working-class movement can only be the manifestation of its immaturity, the result of the remnants of old traditional ideologies from which the young working class like the working class of the period before the rise of scientific socialism had not yet freed itself. Ideological influences alien to the working class like revisionism may also be at work. Finally, these attempts may be the result of distortions appearing in particular historical circumstances, like those at the time of the “cult of personality” and which were also an expression of the immaturity of the social situation. In all these cases the working-class movement sooner or later rids itself of whatever fetters its struggle for the full and true understanding of social reality. It is forced to do so by its own dialectic of development for which the full disclosure of reality and the scientific understanding of the objective laws which operate in the world are indispensable. The development of productive forces and socialist relations of production overcome the inheritance of the past and, sooner or later, force the superstructure to adapt itself to the new requirements of further social de-

⁷⁶ Dialectical materialism asserts that objective reality is fully knowable and opposes all doctrines which hold that the knowledge of reality by science has limited unpassable boundaries. Dialectical materialism does not recognize the existence of mysteries which are in principle inaccessible to science. There are only things unknown; there is nothing which in principle is unknowable to science.

velopment⁷⁷. In this way the working-class movement and the historical process of the construction and development of socialism themselves overcome any conservative tendencies hampering the scientific understanding of the laws of social development which may arise within them.

Thus to-day the future of political economy is inseparably linked with the working-class movement and with the construction and development of socialist society. The separation of political economy from this social base is impossible—it would lead it to paralysis and extinction. The working-class movement and the process of the construction and development of socialism face political economy with ever new problems for research, and make it the indispensable instrument for the shaping of social relations and the conscious and purposeful direction of social development on the basis of scientific knowledge. To the science of political economy a great and responsible historical role is assigned. It will be able to fulfil this role only by supplying true knowledge, without fear of prejudices or interests standing in the way of social progress.

The words used by Karl Marx over a hundred years ago when for the first time the science of political economy was consciously united with the social emancipation of the working class are as appropriate as ever:

“At the entrance to science, as at the entrance to hell, the demand must be posted:

*Qui si convien lasciare ogni sospetto;
Ogni viltà convien che qui sia morta*”⁷⁸

⁷⁷ These are what Mao-Tse-Tung calls “contradictions among the people” which find their resolution in the development of the labour movement and in the process of building and realizing socialism. See Mao-Tse-Tung, *On the Correct Handling of Contradictions among the People*, Foreign Languages Press, Peking 1957.

⁷⁸ “Here all mistrust must be abandoned; And here must perish every craven thought”. These are the concluding words of the preface to *A Contribution to a Critique of Political Economy*, Marx’s first systematic work on political economy published in 1859.

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