

*Alexander
Spirkin*



DIALECTICAL MATERIALISM

Fondo documental **EHK** Dokumentu fondoa

Euskal Herriko Komunistak

Alexander Spirkin

Dialectical Materialism

First Published: © 1983 by Progress Publishers;

Transcribed: by Robert Cymbala.

Table of Contents

3	Introduction
1. Philosophy As A World-View And A Methodology	
6	What Is Philosophy?
19	Philosophy as a World-View
33	Philosophy as Methodology
42	Philosophy and Science
53	Philosophy and Art
2. The System of Categories in Philosophical Thought	
61	The Categories of Dialectics
64	Matter as the Substance of Everything That Exists
76	The Motion of Matter
80	Space and Time
85	The Principle of Universal Connection and Development
90	The Principle of Causality
101	System and Structure
110	Essence and Phenomenon
135	Quality and Quantity
142	Negation and Continuity
149	Contradiction and Harmony
3. Consciousness of the World and the World of Consciousness	
156	The General Concept of Consciousness and Mental Activity
174	The Material and the Spiritual
186	Consciousness and Language
4. The Theory of Knowledge and Creativity	
200	General Concept of Cognition
209	Cognition and Practice
216	What Is Truth?
226	The Sensuous Image of the World
229	Thought

5. On the Human Being and Being Human

259	What Is a Human Being?
263	The Human as the Biosocial
270	Man in the Realm of Nature
278	Man and Society
284	Man as a Personality
303	Man the Doer
318	Destiny, Freedom and Responsibility
338	Man and culture

A. Request to Readers

B. Front Matter

Colophon

Introduction

This book is a consideration of the essence of Marxist-Leninist philosophy, its central propositions and problems, its historical role and significance in the complex world of today.

We are witnessing, and participating in, enormous changes, changes that affect the very foundations of human existence, that have drawn into the revolutionary process peoples who one after the other are freeing themselves from centuries of social and national oppression and attaining high levels of national and class consciousness. These revolutionary changes in society are moving in step with ever more frequent and breath-taking discoveries in various spheres of science and technology. Contemporary science has become a powerful and direct transforming force in production and spurred into life a great scientific and technological revolution.

Socialist society, free from exploitation of man by man, is being built in accordance with a strictly scientific social theory—Marxism-Leninism, whose philosophical basis is dialectical materialism. Marxist-Leninist philosophy has throughout its history been inseparably and openly connected with the revolutionary struggle of the working class, of all working people for their intellectual, social and national emancipation—in this sense it is a committed philosophy. The philosophy of Marx was a turning-point in the development of world philosophical thought. Its great innovation was to make philosophy into a science, to remould the very purpose of philosophical knowledge, which as it became established not only explained but helped to transform the world. Marxist philosophy, as Lenin put it, has the integrity of something forged out of a single piece of steel. It is a harmonious, consistent system of materialist views on nature, society and the mind, on the general laws of their development.

This system was formed by generalising the greatest achievements of human thought and the practice of the oppressed classes' revolutionary struggle against their oppressors as an effective instrument for establishing the highest ideals to which humanity had aspired throughout the ages.

The foundations were laid by the great thinkers Karl Marx and Frederick Engels. It was they who formulated the basic propositions of the theory which was to become the banner of the struggle for

socialism, for true humanism, for the free development of every individual as a condition for the free development of all members of society.

In the new historical conditions, when capitalism had entered the stage of imperialism, the scientific feat of the founders of Marxism was continued by Lenin, who, proceeding from the creative principles of their theory, analysed hitherto unknown processes, drew general conclusions concerning their future course, and thus delineated the road into the future. Lenin's work signalled a new stage in the development of Marxist philosophy as an eternally living and creative theory.

Marxist-Leninist philosophy, though essentially partisan, committed, is at the same time consistently objective. Subjectivism, voluntarism and dogmatism are entirely alien to it. Its propositions are based on analysis of the objective laws of world development, of the essence and dialectics of social processes. It defends the highest human values in the interests of the progressive forces. The invincibility of its conclusions is implicit in objective social development.

Communism's ideological opponents, expressing the class interests of the bourgeoisie, have tried to discredit Marxist-Leninist philosophy by presenting it as an obsolete, dogmatic and therefore allegedly impotent theory when faced with the crucial problems confronting modern man. In the final analysis these attacks are orchestrated to win space for a reactionary world-view justifying and defending the world of capitalism. Many of its ideologists, however, acknowledge that they are compelled to battle with an adversary armed with one of the greatest of world philosophies, derived from the deepest sources of contemporary life and thought. Today, when the struggle for democracy and socialism, for the peaceful coexistence of different social systems stands in the forefront of the confrontation between irreconcilable ideologies, a mastery of the scientific world-view helps us to gain an understanding of the complex and contradictory processes that are shaking the modern world, without which the basic practical problems facing mankind cannot conceivably be overcome.

The significance of Marxist-Leninist philosophy further increases in a situation where the very existence of man, of mankind as a whole, of all civilisation is threatened. The 26th Congress of the CPSU proclaimed, "to safeguard peace— no task is more important now on the international plane for our Party, for our people and, for that matter, for all the

peoples of the world".¹ The Congress formulated a concrete programme for the defence of peace, which expressed the essential needs of contemporary social development and which can be realised only on the basis of the creative application and development of the principles of Marxist-Leninist theory and its philosophy by the communist and workers' parties, by all the progressive forces.

At various international forums, in outspoken dialogues between representatives of various spheres of knowledge and trends in philosophy advocates of dialectical materialism speak from obviously more advantageous positions when discussing the fundamental scientific and social problems, the global problems of the struggle for peace and for overcoming the ecological, energy, demographic and other crises that threaten humanity.

The realistic ways and means of establishing a just social order revealed by Marxist-Leninist philosophy make it a profoundly humane philosophy. It elevates the dignity and rights of man, uncovers the objective conditions, ways and factors that have to be considered to achieve his social emancipation and all-round, harmonious development. It defends humane ideals and provides a theoretical substantiation for the peoples' struggle for peace and for the peaceful coexistence of different social systems.

The present book is an attempt to expound the basic principles and ideas of this philosophy in a compressed form. Its range encompasses philosophy and art, man and his existence in the world, the creative power of human reason, man and culture and many other problems that are not usually examined in similar courses on Marxist-Leninist philosophy.

¹ *Documents and Resolutions. The 26th Congress of the Communist Party of the Soviet Union.* Novosti Press Agency Publishing House, Moscow, 1981, p. 40.

Chapter 1. Philosophy As A World-View And A Methodology

Table of Contents

What Is Philosophy?

Philosophy as a World-View

Philosophy as Methodology

Philosophy and Science

Philosophy and Art

What Is Philosophy?

The subject-matter of philosophy. When we set out to study philosophy, we enter the fascinating realm of the theoretically thinking mind, of wisdom that has been accumulated over the centuries. The oldest definition of philosophy is attributed by legend to the famous Pythagoras. Too modest to wish to be called wise, he said that he was not a wise man, but only a lover of wisdom —a philosopher (from the Greek "philos"— loving and "sophia" —wisdom. From time immemorial philosophy in the true sense has been understood as a desire for the highest knowledge and wisdom, as distinct from everyday and other forms of applied knowledge, and also from religious or mythological forms of thinking. The thinkers of ancient times sought an understanding of the world that would replace the obsolete picture produced by myth and legend. Philosophical thought has traditionally been distinguished by its orientation on understanding the foundations of existence at the limits of our mental powers, the mechanisms of human cognitive activity, the essence not only of the phenomena of nature but also of social life, man and culture. This has always had very great practical as well as theoretical significance; it is essential for an understanding of the meaning and goals of life. Philosophy's aim from the beginning has been to give a general understanding of the universe that could provide a basis for the understanding of life, something on which to build a rational art of the existence of man and society.

Consideration of the subject-matter of philosophy involves an investigation of the place this sphere of knowledge occupies in the

What is Philosophy?

system of culture as a whole, alongside science, art, politics, religion, morality, and so on. This investigation presupposes two approaches. According to one approach, in ancient times all man's knowledge of the world and himself was considered to be wisdom and was called philosophy. Subsequently, as this knowledge became differentiated and was broken down into separate disciplines, one science after another developed out of philosophy regarded as the totality of human knowledge. In this way mathematics, physics, medicine and other sciences appeared. Philosophy is thus regarded as the mother of all the sciences. This idea was aptly expressed by Descartes, who compared philosophy to a tree with metaphysics as its roots, physics as its trunk and all the other sciences comprised in the three main disciplines of medicine, mechanics and ethics as its branches. This broad notion of philosophy, not only in ancient times but even in the last century, led to its being identified with theoretical mechanics, biology and other sciences. We know, for example, that Newton's main work was called *Philosophiae naturalis principia mathematica*, while Linnaeus' book bore the title *Philosophia botanica*. Lamarck called his work *Philosophie zoologique*, and Laplace, *Essai philosophique sur les probabilités*. This is one approach to the subject-matter of philosophy. The other and, in our view, the more reliable, is that in the historically early stages of the development of culture within the framework of general, only slightly differentiated knowledge, spontaneous notions of the specific subject of philosophical knowledge as such took shape. At first, these were natural philosophical views oriented on nature, on the universe, on the origin and ultimate destination of all things. The ancient thinkers were keenly interested in cosmogonic problems. This afterwards came to be called ontology—the study of the nature of being. Later they turned to the problems of cognition and this gave rise to the theory of knowledge, epistemology, and to logic. The philosophical disciplines proper comprise ethics—the study of moral problems, and aesthetics—the study of the aesthetic attitude to reality and of artistic creativity. Until recent times the psychological questions involved in understanding the essence of mental activity, consciousness and the individual personality were treated as philosophical problems. In short, philosophy has for centuries been interested in the problems of human existence, of man's value orientations, his spiritual world with all its various planes, and also his socio-political and religious positions. Year after year, century after century philosophy has steadily absorbed, in a generalised form, not only the achievements of science and art but the overall experience of all humanity, the wisdom comprised in the

What is Philosophy?

thought and life of nations, and has passed all this on from generation to generation.

To answer the question, "What is the subject-matter of philosophy?", let us first consider the sphere of human knowledge in general. Scientists investigate the motion of celestial bodies, the world of physical and chemical phenomena, the realm of animate nature, the sphere of mental activity, the spirit or intellect and, finally, the world of social phenomena. All these things make up the subject-matter of the sciences: astronomy, physics, chemistry, biology, psychology, sociology, and history. And since all our knowledge is contained in such phenomena and all the content of our knowledge is broken down into the afore-mentioned sciences, it would seem that there is no place there for philosophy. If a philosopher decided to study mental phenomena, a psychologist would say to him, "This is my province." If he wished to undertake an investigation of the world of animate creatures, he would encounter similar objections from the biologist. So, it turns out that since the sciences have taken over the investigation of all the separate spheres of existence, there is nothing left for philosophy. Apparently it shares the fate of Shakespeare's King Lear, who in old age gave away all his possessions to his daughters and was then turned out like a beggar into the street. But if we look a little deeper, we find that there are some questions that have never formed part of the subject-matter of the separate sciences. For example, Thales set himself the task of discovering the origin of everything that exists, the first principles of such being and what it would all ultimately become. His conclusion was that everything arose from water and would return to water, that water was the foundation of all existence. Democritus asked what everything, material and spiritual, was composed of and replied that it was all composed of atoms. We should note that the questions posed by Thales and Democritus were not questions of biology or psychology. These thinkers did not ask what vegetable and animal organisms were made of, what formed the substance of the world of mental activity; they were interested in the world in general, both material and spiritual, so it is clear that philosophers must have been thinking about the first principle of the existence of the universe —celestial bodies, crystals, organisms, and mental processes. Since it concerned not any separate part of existence, but existence in general, it could not form the subject-matter of any specific science. It was the subject matter of philosophy—the science of the initial principles of the existence of the world, humanity and cognition. Admittedly in ancient times when philosophy had only just come into being, it was "omnivorous", in the sense that

philosophers then took an interest in all or many fields of knowledge, and from a professional point of view. It is no accident that works on the history of philosophy, particularly as we go back into the centuries, are full of a great deal of non-philosophical facts and reflections that refer rather to specific scientific, literary, artistic or socio-political subjects. But this is another question. Today, too, the philosopher may engage in research in some specific field of knowledge, let us say, physics, and a physicist may be professionally interested in philosophy. But this does not mean that the specific problems of physics are the subject-matter of philosophy and vice versa. It was exactly the same in ancient times. Of course, this does not imply that, say, in physics or some other sphere of knowledge there has never been any philosophy. But philosophers, past and present, have always had to know the general principles of all the sciences.

To sum up then, the subject-matter of philosophical cognition is not only the universe and its most general laws as they exist in themselves, but also and more particularly the relationship between man and the universe. Thus, it may be said that the basic question of philosophy, that is, the question of the relationship of thinking to being, became a part of its subject-matter at the early stages of the formation of philosophical thought.

Unlike everyday, socio-political, and artistic thinking, philosophical reasoning characteristically seeks to single out the "frontier" foundations or principles of existence and cognition, to discover the general logic of universal motion, the history of society and human life, the principles of the rational relationship between the individual and the world, which can be found only in knowledge of the laws of the life of the universe itself, for the logic of human thought and rational action can be deduced only from the logic of life in the fullest sense.

Naturally, the subject of philosophy has never remained static. It has developed historically and taken its own shape along with the development of human culture, including the culture of thought itself, its ever deeper and universal penetration into the "pores" of existence. Moreover, at various periods one or another philosophical school or individual thinker has given preference to questions of ontology, the theory of being, or to questions of the theory of knowledge and logic, or to problems of morality, philosophical anthropology, and so on.

If we considered the history of philosophy and what this or that thinker regarded as the basic subject of philosophical reflection, the answers would be many and various. Socrates, for example, urged that

philosophy should stop pondering the first principles of existence and concentrate on knowing about human affairs, particularly the problems of morality. According to Plato, the purpose of philosophy was to know the essence, the eternal and the intransient, and according to Aristotle, philosophy should understand the causes and principles of things. Francis Bacon described philosophy as the universal science, from which all other sciences grew like the branches of a tree. According to Descartes, it was the highest wisdom that could be achieved by logic; it taught the reason how to set about obtaining knowledge of as yet unknown truths. Locke and Hume saw the task of philosophy in elaborating a theory of knowledge and theory of morality. Helvetius thought the main question was the nature of human happiness, and Rousseau, social inequality and the ways of overcoming it. Hegel defined philosophy as the highest stage of theoretical thought, the self-cognition of the absolute idea, and called philosophy the epoch embodied in thought. Pisarev believed that the aim of philosophy was to solve, once and for all, the inevitable problem of the hungry and the naked. But Camus, for example, considered that the fundamental problem of philosophy was the question of whether life was worth living at all.

The subject-matter of philosophy acquired its fullest and richest exposition in the system of Marxist philosophy, in dialectical materialism, which does not stand aside from the main channel of development of human philosophical thought but synthesises all its greatest achievements. Dialectical materialism is the creative development of the worldwide history of philosophical thought on the basis of generalisation of social practice, science, art and culture as a whole. It is the study of the universal connections and laws of the motion and development of natural, social, and spiritual reality, of the forms and methods of cognising the world, of man and his existence in the world. This philosophy aims at evolving an integral system of views of the world and man's place in it, of the relationship between consciousness and matter, the spiritual and the material. It investigates man's cognitive and value-defining, moral, aesthetic and religious, and also socio-political relationship to the events of natural and social life. Moreover, it is oriented on the highest principles of humanism.

Historical materialism is an inseparable component of Marxist philosophy, which is also a field for the development of ethics and aesthetics and philosophy's cognition of itself in its historical development.

Philosophy is thus a unity of world-view and methodology. No specific science, no art, no socio-political or any other such theory can

perform the highest role of creating a world-view and methodology. This is an ancient and specifically philosophical historical mission, the fulfilment of which presupposes possession not simply of an overall view of the world, of the relationships between man and the universe, but of an extremely generalised, integral system of universal concepts, that is to say, principles, categories, and laws revealing man's place in the world and his relation to the world. World-view and methodology are not parts but functions of philosophy.

The specific nature of philosophical cognition. Philosophical cognition of reality is as ancient as the socially developed and rationally thinking human being himself. This is understandable enough, for the very fact of man's existence in remotest times presupposes a fairly well developed curiosity, an ability to state and solve not just the purely practical questions of everyday life but also problems involving a view of the world. The original form of world-view was mythology, the imaginal and basically fantastic, generalised reflection of phenomena in which a certain general idea is thought of in personified, symbolical, sensuously concrete, plastically vivid and hyper-trophied form, as in the fairy-tale. But whereas the fairy-tale is accepted as pure invention, the myth is regarded as something real. Mythological images were credited with superhuman and generally supernatural properties and the relationships of the deified elements were understood by analogy with human relationships. Thus, the goddess Demeter generalised everything connected with field work, the harvest and fertility. Beauty — male and female — was personified and generalised in the plastic images of Eros and the sumptuous Aphrodite. Wisdom in its general form was personified by the goddess Pallas Athena.

The whole essence of the mythological consciousness consists in generalised images being thought of substantially, that is, as something animately material, corporeal. The mythological consciousness, which was characteristic of all peoples of the world at the tribal stage, was syncretic, it synthesised all spiritual culture — the first gleams of science, the artistic understanding of existence, and religious and philosophical views.

The foundation of this consciousness was laid by the Orient, which throughout its subsequent history was to be characterised by this all-embracing, intuitively integral and often exceptionally penetrating thought, which attained the highest peaks of wisdom. World civilisation was cradled in the Orient, but its European branch stems from ancient Greece, where the history of European philosophy began.

Philosophy arose in the epoch of the formation of the slave society possessing a state and legal framework. It grew out of mythology and in conflict with it, and this was reflected in the development of rational, theoretical thought resting on a system of concepts in contrast to mythology as a system of images. The starting point of philosophical thought was spontaneous materialism, as expressed in such assertions as, "everything is from water" or "everything is from air", or from earth, fire, atoms, that is to say, from certain material or energetic first principles of existence. This idea of primeval sensuously reliable essences may look childishly naive from the standpoint of modern knowledge, but from the historical point of view it is very profound. Here we have the first attempt to discredit the gods as the creators of existence. This natural philosophical standpoint contains the notion that everything arises not as a result of miraculous creation out of nothing but through the natural transformation of one form of matter into another.

Philosophy was at first interested in the same problems as mythology: the secrets of the universe, the origin of the world, the nature of the soul and how it was related to the body, how man got to know the world, what was goodness, truth and beauty. Philosophy, however, took a different approach to these problems. Whereas the mythological consciousness tended to see any form of action in terms of fantasy images of supernatural forces, philosophy evolved such a concept as Logos, the idea of a universal cosmic reason as the law, that is, the real logic of things and events, the regulating principle of all existence. The categories of "dao", "karma", and so on, reflected an analogous principle in the systems of Oriental philosophy. Although philosophy contested with mythology from the outset, it was for a long time, and in some systems of idealism it still remains, a prisoner of the mythological forms of thought.

In its early stages philosophy was guided mainly by nature and emerged as natural philosophy seeking to understand the world as a unified whole. The turning point in the history, for example, of Greek philosophy was the philosophy of Socrates, who centred his theory on the problems of man, on the moral foundations of life, on analysis of the general concepts of truth, goodness and beauty.

As we have said, the task of philosophy is to elucidate the universal principles of existence and thought in their development. But in what way can such cognition take place? An astronomer studies the celestial bodies, a biologist, living organisms. Both are guided by experience, observation and experiment. But how is the philosopher to study his

subject? The most natural assumption is that in order to know the material and spiritual world in its general principles, in man's relation to the world, the philosopher must use his synthesising mental power to digest the data that are provided by each science separately and culture as a whole, that is to say, the total experience of life, his own personal life and that of society.

But if we allow that the task of philosophy is to know the general principles of existence and thought and that the building of such a system involves summarising the entire history of scientific, artistic and everyday knowledge, we are immediately confronted with a number of objections which are usually raised against philosophy and to which we shall try to reply in the most general outline. The first objection is as follows: If you maintain that philosophy summarises the history of human knowledge, you are saying that it sets itself an impossible task. But why? Because the human mind is historically and individually limited. It cannot embrace all knowledge. This could be done in the times of, say, Democritus or Aristotle, but now with the enormous specialisation of the sciences no man, however gifted, even if he studied the sciences for 24 hours a day and had a superhuman memory, could assimilate enough science to feel at home in any sphere of knowledge, let alone summarise the history of the development of all culture and foresee its future destiny. Who then would dare to claim the title of philosopher?! To this we can offer the following answer. When we say that to build a system of philosophical knowledge one must summarise all human experience, this does not imply that a philosopher must know all the sciences, all literature and art in all their professional detail, as the specialist in any given field of knowledge, or some narrow branch of that field, knows it. To work out a system of philosophical knowledge it is enough to have a serious grasp of the basic principles of the separate sciences. And such an understanding is quite within the scope of the creative mind with a capacity for broad synthesising. History tells us that the outstanding philosophers were thoroughly acquainted with the basic principles of the science and culture of their day. Even if they lacked a knowledge of some of the details, for which they were often reproached by the professionals in this or that field, this had no serious significance for the integrity and depth of their philosophical schemes. Take, for example, Kant or Hegel. They kept abreast of the scientific achievements of their day, although they were criticised for incorrect formulations of certain propositions of individual sciences. These brilliant thinkers, and many others besides them, nourished generations of scientists and

cultural workers with their profound views of the world and ideas on methodology.

A scientist of such encyclopaedic knowledge as Darwin was able on the basis of his massive accumulation of facts to evolve the famous law of natural selection and discover the driving forces of development of living organisms, but this does not, of course, rule out the possibility that there were some facts and propositions in biology with which he was not acquainted. And yet Darwin was a genius. What then can one say of the average research scientist, especially with the kind of differentiation of biology which we have today and which has turned it into a whole complex of sciences?!

Let us consider how philosophical cognition differs from the form of knowledge that is considered to be scientific. Most people know that there are differences of opinion in all sciences. But in each of them, despite contradictory views and opinions, there is a relative consensus on most propositions and particularly the basic principles of the given discipline. It is a different matter with philosophy, which for centuries has been divided by numerous completely incompatible and contradictory points of view. Can one speak of the scientific nature of philosophical cognition with such fundamental differences of approach to the same problem?! Moreover, philosophers constantly argue about things that have long since been proved and decided. Since ancient times this has been used as an argument against considering philosophy a science at all. Sometimes it is claimed that human reason can absorb only partial knowledge obtained through experience, observation and experiment, that our reason can be relied upon, say, in mathematics and in the concrete sciences, but that it becomes totally unreliable as soon as it goes beyond the bounds of experience and plunges into the deep waters of eternal and universal problems —the underlying basis of existence, the knowability of the world, good and evil, man's essential nature and destination, free will, and so on.

In defining the specific nature of philosophical cognition and contrasting it with scientific knowledge many contemporary Western scientists assume that philosophy does not stand up to genuine scientific testing of its principles by means of experiment, let alone its ability to make effective forecasts. It also suggested that the task of the philosopher, unlike that of the scientist, is not to consider problems but only mysteries; philosophy should concern itself with the mysterious and give people the opportunity to live in the sphere of the mysterious, to fill their hearts with a sense of the sacramental, the unknowable. Hence the conclusion that philosophy is not a science, that what

distinguishes it from science is in fact its very essence. By entering the field of what is fundamentally unknowable philosophy supposedly discards scientific method and seeks other, irrational, emotional-intuitive roads to the truth and in the final analysis resorts like religion to faith in the supernatural or adopts an intermediate position between science and religion. "Philosophy, as I shall understand the word, is something intermediate between theology and science. Like theology, it consists of speculations on matters as to which definite knowledge has, so far, been unascertainable; but like science, it appeals to human reason rather than to authority; whether that of tradition or that of revelation. All *definite* knowledge—so I should contend—belongs to science. But between theology and science there is a No Man's Land, exposed to attack from both sides; this No Man's Land is philosophy."¹ These words belong to the eminent British philosopher Bertrand Russell, who was widely versed both in philosophy and in the specialised sciences, and was both a writer and active in public affairs. He could have been given the following answer. There are various philosophical theories, some of which are indeed close to religion and provide its theoretical foundation. These are the idealist philosophical doctrines. But there are also philosophical systems that are built on scientific principles, that generalise the achievements of sciences and are themselves scientific both in their theoretical principles and in their method. Dialectical materialism is precisely such a philosophical system. The concept of scientificity can also be applied to other philosophical systems to the extent that they have a rational, objective content which truly reflects material and spiritual reality and the trends of its development. It should be said that the measure of scientificity varies in philosophy. The content of this or that philosophical theory, despite some errors, may contain much that is scientific in so far as it is theoretically and practically provable and rests on scientific discovery, on overall human experience, and in so far as it has beneficially influenced the formation of people's spiritual world, their world-view, has tended to evolve heuristic methods of cognising the world and helped nations to transform nature and social reality in the interests of mankind and society. Consequently the question should not be stated in the abstract. Is philosophy scientific or unscientific in general? When speaking of the scientific nature of philosophical cognition and its varying degrees of scientificity it should be stressed that philosophy

¹ Bertrand Russell, *History of Western Philosophy and Its Connection with Political and Social Circumstances from the Earliest Times to the Present Day*, George Allen and Unwin Ltd., London, 1962, p. 13.

is not simply a science but a different science, distinct from the concrete sciences, an extremely generalised and, moreover, higher, universally synthetic form of theoretical knowledge of the world—knowledge of the world at its key points, in its relationship to man and the relationship of man to the world. And it is this distinction that constitutes the specific nature of philosophical knowledge as such, while keeping it in a generally scientific framework.

Philosophical cognition —and this is its specific feature— is not directly aimed at producing empirical research programmes and does not experiment with the help of technical apparatus. In fact, the idea of the infinite nature of space and time, the admissibility of human free will, the nature of consciousness or conscience as ideal phenomena — can such things be tested by means of experiment? It is often claimed that philosophy possesses only one means of obtaining the truth— pure speculation or speculative thought. The extreme expression of this point of view was Plato's advice that in order to understand the essence of things we should close our ears and eyes and sink into reflection. This detachment from sensuous impressions is permissible and may even be extremely effective but only on the basis of experience that has already been acquired by perceptive observation and profound thought.

Philosophical cognition presupposes the development of a synthesising power of the mind. This fruitful gift is a characteristic in some degree not only of the real philosophers, the professionals, but also of thinkers in various other fields of knowledge and creative work who are usually given the general title of "thinker". These are exceptional people with deeply generalising and penetrating minds. Such, for example, were Leonardo da Vinci, Galileo, Descartes, Leibnitz, Lomonosov, Goethe, Sechenov, Leo Tolstoy, Dostoyevsky, Einstein. Even if one has favourable natural gifts, the ability to think philosophically requires long and persistent study, perhaps even more than any other science. Why is this so? Because the truly philosophical mind is formed on the basis of a vast experience of life, a mature personality with a broad horizon, a profound and comprehensive knowledge of science and art, whereas in other fields in which encyclopaedic knowledge is not so essential, highly gifted people often achieve striking scientific results in early youth, especially, for example, in mathematics.

True philosophical cognition is then the scientific cognition of the world. It theoretically substantiates, proves its principles and with equal thoroughness refutes other, untenable positions. And in this respect, it differs substantially, for example, from religious consciousness, based on faith and revelation.

The thinking of, for example, the physicist, the biologist or the mathematician has its own specific nature dictated by the nature of his subject. The specific nature of philosophical cognition is likewise determined by the special features of its own subject. This specific nature, however, does not put philosophical cognition outside the realm of science, as long as it keeps to the plane of rational theoretically and factually provable argument. By the very nature of their professional thinking the major philosophers have always been theoreticians with versatile minds, developed, of course, to different degrees, depending on a multiplicity of natural, psychological and social factors.

Philosophical cognition as a historically evolved means of knowing the world requires not only a well-practised style of integral, systemic thinking based on the whole history of culture. It also requires a certain level of both innate and educated, or self-educated, mental abilities and a special, universally oriented frame of mind, including its emotional aspect, in which a person is immersed during creative inspiration or meditation on what constitutes the subject-matter of this special field of human knowledge, which has generalised the experience of scientific and social revolutions, and of gigantic socio-political movements —the whole vast "laboratory" known as world history. Philosophical cognition draws its principles from reality itself both directly and through the prism of the whole culture, of everything amassed by the people, by scientists, artists, politicians, teachers, doctors, and technologists. Today, without a profound, encyclopaedic grasp of human culture as a whole, it is impossible to make an effective investigation of socially significant philosophical problems. But for this encyclopaedic knowledge is not enough. There must also be a special gift for integrative thinking, which must be developed by uniting natural-scientific, mathematical and technical knowledge with knowledge of the humanities, art, history and philosophy. Amid this virtually unencompassable ocean of knowledge stands philosophical culture, which plays a tremendous role in forming man's intellectual world, raising him to the level of an independently thinking individual, to civic self-consciousness. The philosophical dimension of the human mind cannot be ignored.

In the modern world, very great significance belongs to the axiological function of philosophical knowledge —the correlation or comparison of the aims and means of cognition and action with humanitarian ideals, their social, ethical appraisal. A narrow "scientism" in the interpretation of philosophy, that is to say, restriction of its field of generalisation by reliance mainly on natural-scientific experiment, drastically reduces a person's actual relationship to reality to a cognitive,

What is Philosophy?

and narrowly cognitive at that, relationship. But this does not correspond to the actual state of affairs or to the interests of man himself and society. Philosophical cognition steers a course composed of many vectors, and interacts with all forms of culture.

Philosophy as a World-View

The meaning of the term "world-view" and its significance in life. At first glance the term "world-view" suggests a general view of the world—and no more. But the appearance of the word does not reveal the full meaning of this complex intellectual phenomenon. A world-view, as we understand it, is a system of generalised views of the surrounding world and man's place in it, of man's relationship to the world and himself, and also the basic positions that people derive from this general picture of the world, their beliefs, socio-political, moral and aesthetic ideals, the principles by which they know and appraise material and spiritual events.

While it possesses a relatively independent existence in the sphere of social consciousness, the world-view also functions as something individual. A person becomes an individual when he forms a definite world-view. This process of formation indicates the maturity not only of an individual but also of any given social group, social class or its party. The concept of world-view, which was first encountered among the Greek sceptics, is substantially broader in meaning than the concept of philosophy, moreover it has several different meanings.

We speak of the philosophical, the socio-political, the natural-scientific, the artistic, the religious, and even the ordinary man's world-view. And this is quite natural. If we picture the various types of world-view in the geometrical form of circles, the central position should be given to the circle of the philosophical world-view. And this circle will intersect with all the others and form their nucleus. In this way we find that the meaning people and social groups attach to the term "world-view" is extremely diverse. But despite this diversity, every world-view reveals a certain unity in the sense that it embraces a certain range of questions. For example, what is the world that exists outside us? What is the relationship between spirit and matter? What is man? What is his place in the universal interconnection of phenomena? How does man come to know reality? What are good and evil? What is beautiful in life and in art? What laws guide the development of society? The totality of the natural sciences forms a natural-scientific picture of the world, and that of the social sciences yields a socio-historical picture of reality. What is a picture of the world? It is a picture of how matter moves and how in the shape of the human being it feels, thinks and poses goals. The creation of a general picture of the world is the task of all fields of knowledge, including philosophy. In compressed form, general pictures

of the world are presented in universal encyclopaedias compiled at various historical stages to reflect the intellectual achievements of mankind.

The world-view is by no means all the views and notions of the surrounding world, that is to say, it is not simply a picture of the world taken in its integral form. Not a single specific science can be identified with a world-view, although each science does contain a world-view principle. For example, Darwin discovered the laws of the origin of species. This caused a revolution in biology and evoked universal interest. Did these laws evoke such interest because they were merely biological laws? Of course, not. They awakened such interest because they helped us to understand various philosophical questions, the question of purpose in living nature, the origin of man, and so on. The name of Einstein was made immortal by his discovery. But was this discovery purely physical, a solution to some particular scientific problem? No, Einstein's theory provided a key to the philosophical problem of the essence of space and time, their unity with matter. Why did the ideas of Sechenov on cerebral reflexes create such a furore among intellectuals? Not because they were merely physiological ideas, but because they solved certain philosophical problems of the relationship between consciousness and the brain. We know what a broad impact the principles of cybernetics have had. But cybernetics is not just a specific scientific theory. Cybernetics, and also genetics, raise profound philosophical problems.

The world-view contains something more than scientific information. It is a crucial regulative principle of all the vital relationships between man and social groups in their historical development. With its roots in the whole system of the individual and society's spiritual needs and interests, determined by human practice, by all man's accumulated experience, the world-view in its turn exerts a tremendous influence on the life of society and the individual.

The world-view is usually compared with ideology and these two concepts are sometimes treated as synonyms. But they intersect rather than coincide. Ideology embraces that part of the world-view that is oriented on social, class relationships, on the interests of certain social groups and, above all, on the phenomena of political power. The world-view, on the other hand, is oriented on the world as a whole, on the "man-universe" system.

The world-view may exist on the ordinary, everyday level generated by the empirical conditions of life and experience handed down from

generation to generation. It may also be scientific, integrating the achievements of modern science concerning nature, society and humanity itself.

The world-view is not only the content, but also the mode of thinking about reality, and also the principles of life itself. An important component of the world-view is the ideals, the cherished and decisive aims of life. The character of a person's notion of the world, his world-view, facilitates the posing of certain goals which, when generalised, form a broad plan of life, ideals, notions of wellbeing, good and evil, beauty, and progress, which give the world-view tremendous power to inspire action. Knowledge becomes a world-view when it acquires the character of conviction, of complete and unshakable confidence in the rightness of certain ideas, views, principles, ideals, which take command of a person's soul, subordinate his actions, and rule his conscience or, in other words, form bonds that cannot be escaped without betraying oneself, set free "demons" that a person can conquer only by submitting to them and acting in accordance with their overwhelming power. The world-view influences standards of behaviour, a person's attitude to his work, to other people, the character of his aspirations in life, his everyday existence, tastes and interests. It is a kind of spiritual prism through which everything around us is perceived, felt and transformed.

As most people would agree, it is ideological conviction, that is to say, a certain view of the world, that enables a person at a moment of mortal danger to overcome the instinct of self-preservation, to sacrifice his own life, to perform feats of daring in the name of freedom from oppression, in the name of scientific, moral, socio-political and other principles and ideals. The world-view does not exist by itself, apart from specific historical individuals, social groups, classes and parties. In one way or another, by reflecting certain phenomena of reality it expresses their value orientations, their relationship to events of social life. Philosophy, too, as the theoretical nucleus of the world-view, basically defends the interests of certain social groups and thus has a class and, in this sense, a party character. Depending on whether the socio-political interests of a given class coincide with the objective trend of history, its philosophical positions are either progressive or reactionary. They may be optimistic or pessimistic, religious or atheistic, idealist or materialist, humane or misanthropic. The whole history of philosophical thought is, in fact, a struggle between various world-views, a struggle which has often raged so fiercely that people preferred to be burnt at the stake, thrown into prison or condemned to penal servitude rather than betray their chosen cause. So it is fundamentally wrong to imagine that

philosophers have always stood above earthly matters, above people's practical and political interests, the interests of classes and parties, and accumulated knowledge merely for the sake of knowledge, isolated themselves, like Diogenes in his tub, in the seclusion of their studies from the stormy events of real life. Philosophy has by no means set itself apart, hovering somewhere in the blue expanses of the heavens; it has performed a definite socio-political function and constantly been at the centre of political events. Genuine philosophy is full of civic courage and least of all can be accused of social indifference. Philosophy is political in its very essence, in its social mission. Politics, as we know, is the core of all associations and dissociations, integrations and disintegrations, alliances and conflicts. Science, art, philosophy, and religion are all drawn into the vortex of political struggle. It is a political question whether scientific discoveries or technical inventions aid the cause of peace or war. It is also a political question what aims and actions are inspired by certain works of art, what feelings and urges they awaken. And it is also a political question whether philosophy gives the people a scientific world-view, whether or not it orientates them on high ideals and a rational and just order of society.

Hegel ironically remarked that philosophy claims to teach the world but always arrives too late to do so. Its very appearance on the historical scene with the required message indicates that the sun has already set. "When philosophy begins to paint in grey upon grey, it shows that a certain form of life has grown old and with grey upon grey philosophy cannot rejuvenate but only understand it; the owl of Minerva begins its flight only in the gathering dusk."¹

This is a splendid metaphor. But though it impresses, it does not convince. If we look back into the past, we see that philosophy has emerged not only as an owl flying amid the twilight of obsolete forms of life, but also as a lark, joyously heralding the spring floods that will sweep away the very foundations of an obsolete way of life, the swelling buds and forms and colours to be born anew. According to the ancient myth, Minerva, the goddess of wisdom, sprang from the head of Zeus, fully armed, carrying a shield and spear. This mythological image is profoundly symbolic: wisdom comes into the world not to rest on its laurels and passively contemplate existence, indifferently perceiving good and evil, but to fight for the truth, for justice, for the triumph of reason in life and to shield us from the onslaughts of the dark forces of

¹ Grundlinien der Philosophie des Rechts von D. Georg Wilhelm Friedrich Hegel. Nicolaischen Buchhandlung, Berlin, 1821. S. XXIV.

evil, untruth and error. Only reactionary philosophy, steeped in dogmatism, is doomed to trail behind swiftly moving life. Progressive philosophical thought is always in the vanguard, theoretically substantiating the people's right to overthrow their oppressors, to create higher forms of life. It usually emerges as the stormy petrel of the approaching revolutionary struggle in all spheres of human existence.

All socio-political movements in the history of mankind, from the smallest to the great transitions from previous forms of social life to new societies, have been heralded and accompanied by certain forms of philosophical proof, whether in the form of new moral or religious principles, a historical regularity or in the form of such principles as liberty, equality and justice.

Socrates was condemned to death for holding philosophical beliefs that threatened the political principles of the society in which he lived. Plato's numerous attempts to give practical expression to his ideals of state nearly cost him his life. In the age of the Renaissance feudalism was dying and capitalism was born. The death of one social system and the birth of the other were prolonged. This complex process took a zigzag course, it was accompanied by wars and revolutionary explosions that shook the whole social edifice until the old system was destroyed to its foundations. All these processes were vividly expressed in the intense struggle between different philosophical world-views. Voltaire, Rousseau, Diderot and others awakened and stirred the somnolent socio-political consciousness with their rousing works. They inflamed people's hearts and minds and directed the people's anger against the decayed social system. They struck revolutionary sparks from men's hearts, prepared people's minds for revolution and brought about the situation that Karl Marx was later to describe as follows: "The people must be taught to be *terrified* at itself in order to give it *courage*."² Before Bismarck began to unite Germany with an iron hand, there appeared German classical philosophy, which declared the constitutional monarchy to be the highest embodiment of the world spirit in its progressive motion.

Throughout their conscious life Marx, Engels, Lenin and their associates prepared and trained the masses for a socialist revolution organisationally, theoretically, and also philosophically.

² Karl Marx, "Contribution to the Critique of Hegel's Philosophy of Law. Introduction," in: K. Marx. F. Engels, Collected Works. Vol. 3, Progress Publishers, Moscow, 1975, p. 178.

Philosophy therefore cannot be indifferent to the contest between the old and new in social life, in politics, science and art. "Recent philosophy is as partisan as was philosophy two thousand years ago."³

Some bourgeois philosophers maintain that they represent "pure science", that they are unaffected by earthly passions and class struggles. This is either deception or self-deception, or simply a deliberate call for desertion from the field of ideological battle. The so-called deideologising of philosophy actually seeks to popularise the worst ideology, an ideology born of the fact that in a class-divided society the ruling classes, parties, various groups and sometimes gangs of impostors present their selfish interests as the interests of the whole of society, of the people, and portray them as the only reasonable and generally significant interests in existence.

Some bourgeois ideologists maintain that partisanship of a world-view is incompatible with objectivity, with science. It is true that partisanship does not always coincide with science. When a world-view expresses and defends the position and interests of decaying social groups that are departing from the historical scene, it diverges from the truth of life, from its scientific assessment for the sake of narrow partisan interests. On the other hand, a world-view is scientific if it truly reflects and anticipates life in its dynamic development, expresses the position and interests of the advanced forces of society, teaches people to strive honestly and directly for the truth, for all that is truly reasonable.

The unity between the partisanship and scientificity of Marxist philosophy rests on the coincidence of the working people's interests with the objective course of history. Only an unbiased study of reality furthers the interests of working people, enables them to place their practical and political activity on a sound scientific basis. The concern that the Communist Party of the Soviet Union shows for the observance and practical application of the principle of partisanship is in fact concern for the preservation and development of a truthful attitude to life. Truth always has been and will be revolutionary. It is the reflection of life in its forward development.

The basic question of philosophy. Materialism and idealism. No matter from what direction the thinker is proceeding along the "philosophical road", he must cross the bridge known as "the basic question of philosophy". As he does so he must, whether he likes it or

³ V. I. Lenin, "Materialism and Empirio-Criticism", Collected Works, Vol. 14, Progress Publishers, Moscow, 1977, p. 358.

not, decide on which side of the river of philosophical thought he will remain —the materialist or the idealist side. But he may find himself in mid-stream, in the position of dualism, that is to say, recognition of two equal and independent substances in the universe —material and spiritual. The basic question of philosophy is that of the relationship of thinking to being. It presupposes acknowledgement of the existence of an objective, i.e., independent of human consciousness, reality and a subjective, spiritual reality —representations, thoughts, ideas— and a certain relationship between them. Which comes first—matter or consciousness? Which generates which? Does matter at a certain stage of development generate its finest flower—the reason? Or does the world spirit create the material world? Or perhaps they have coexisted eternally as equal substances in their own right and are in some way interacting?

Such is the first aspect of the basic question of philosophy. Its second aspect comes down to the following. Can man and mankind in general know the objective laws of the world by the power of their own consciousness? Or is the world unknowable? In examining the first aspect implied in the basic question of philosophy the thinker inevitably finds himself in one of two camps, materialism or idealism (or dualism), while in examining the second aspect of the question he takes a stand either in favour of the fundamental possibility of knowing the world or in favour of agnosticism, that is, denial of this possibility.

Why is the question of the relation of thinking to being —a seemingly very abstract question— considered to be the basic philosophical question? Because from the nature of the answer we give, as from the source of a great river, there flow not only directly contrasting interpretations of all other philosophical problems but also the general theoretical, world-view questions posed by any science, moral phenomena, standards of law and responsibility, phenomena of art, political events, problems of education, and so on.

We cannot consider any philosophical question unless we first solve the basic question of philosophy. To illustrate, let us take the example of the concept of causality. Materialism presumes that this concept reflects an objective, i.e., independent of human consciousness, process of generation of some phenomena by others. But Hume, for example, denied the existence of causality in nature. He believed that it was habit that taught people to see certain phenomena as the causes of others, for instance, the blow of an axe and the falling of a tree. We have indeed become accustomed to see the result follow the action that causes it. But this habit is based on the continuous consideration of the

objective connection of phenomena and did not arise by itself. According to the materialist principle, all authentically proved concepts, categories, propositions, inferences, laws and theories have a substantially objective character and do not depend on the whim of man. Idealism, on the other hand, is inclined to regard them merely as mental constructions. For example, the materialist scholar of literature studying the work of Shakespeare begins by sorting out what objective social conditions predetermined the character and inspiration of the dramatist's work. The idealists, on the other hand, are inclined to attribute his work to the depth of the individual spirit of this genius and ignore the social conditions in which he lived and wrote. If one takes the moral sphere, it is immediately obvious how contrasting the solutions to the basic question of philosophy may be. Are man's moral qualities innate or given by God, or are they formed by life, by upbringing. As applied to history, the basic question of philosophy appears as a relationship between social being and social consciousness. On how this relationship is interpreted depends the answer to the question: what determines man's destiny, what guides history—ideas, the rational powers of historic individuals, or the material production carried on by the people of a given society and the economic relationships that arise from this process. Consequently, the basic question of philosophy is not simply the question of the relation between thinking and being in general, but more specifically, that of the relation between social consciousness and social being, that is to say, the objective relations between people formed on the basis of their production of material goods. The materialist understanding of the basic question of philosophy as applied to history is expressed fully and simply: social being ultimately determines social consciousness and social consciousness, derivatively, has an active influence on this being.

Consideration of the basic question shows that in approaching any question of either theory or practice it is extremely important to distinguish the primary from the secondary, the objective from the subjective, the real processes of life from their interpretation in various theories, the material driving forces of society from the ideal motivations, the material interests of people, social groups from their reflections in the mind. Materialism teaches our thinking to see in our mental constructions, in our artistic, political and other ideas and images the objective content determined by the external world, by life. Idealism, on the other hand, hypertrophies the spiritual principle, treats it as absolute. In politics, for example, this attitude may have dangerous consequences for the people; idealism sometimes results in political

adventurism. This happens when a politician ignores the objective laws of history, the will of the masses, the existing economic relations, and tries by the power of his own volition to impose his own ideas, which run counter to the real, law-governed current of events.

The main trends in philosophical thought were and have remained materialism and idealism. Why? Because there are only two paths. Either we must take the material world as our starting point and deduce from it consciousness and connect everything spiritual with the material or, on the other hand, taking consciousness as the starting point, we must deduce from it the material world and separate the spiritual from the material and oppose spirit to matter. Philosophers are divided into two great camps according to how they have decided this basic question. Those who assume that spirit existed before nature, who believe ultimately in the creation of the world by the power of the spirit, make up the idealist camp. Those who recognise matter as the basic principle, that is to say, the substance of everything that exists, form the various schools of materialism. Materialism understands the world as it is in fact, without attributing to it any supernatural qualities and principles. Explanation of the world from the world itself is the methodological principle of materialism. It maintains that the connections between ideas in people's heads reflect and transform the connections between phenomena in the world. Matter at its highest level of organisation is the "mother" and consciousness is its spiritual "child". And just as children cannot come into the world and exist apart from or before their parents, so consciousness could not appear or exist before matter: consciousness is a function of matter and an image of what exists.

To the extent that people in living their lives cannot help considering the fact of the objective existence of the world, so they act as materialists: some spontaneously, others consciously, on a philosophical basis. Certain scientists sometimes dissociate themselves from materialism while spontaneously working on its principles. On the other hand, the supporters of philosophically conscious materialism not only consistently advocate such a solution of the basic question of philosophy but also substantiate and uphold it.

Idealism is in general related to the desire to elevate the spirit to the maximum degree. In speaking with such veneration of the spiritual, of the idea, Hegel assumed that even the criminal thought of the evil-doer was greater and more to be marvelled at than all the wonders of the world. In the ordinary sense idealism is associated with remoteness from earthly interests, constant immersion in pure thought, and

dedication to unrealisable dreams. Such "practical idealism" is contrasted to "practical materialism", which its opponents, wishing to belittle it, present as a greedy desire for material goods, avarice, acquisitiveness, and so on.

Idealism is divided into two basic forms: objective and subjective. The objective idealists, beginning from the ancients and ending with those of the present day, recognise the existence of a real world outside man, but believe that the world is based on reason, that it is ruled by certain omnipotent ideas which guide everything. Consciousness is hypertrophied, separated from man, from matter, and converted into a supra-individual, all-embracing reality. Reality is considered to be rational and the reason is interpreted as the substance, the basis of the universe. All things and processes are thus spiritualised. Such a notion of the superhuman and supernatural spiritual essence, the world reason, the world will, the absolute idea, is essentially a religious notion. For example, in Hegel the "absolute idea" is quite often called simply god, an impersonal, objective, logical process, while nature and the history of society are its guided other-being. Reason is the soul of the world. It resides in the universe; it is its immanent essence.

This implies that reason exists by itself in the world, apart from rational beings. The universe knows what it is, and from where, to where and how it is moving.

The idealist answer to the basic question of philosophy need not essentially be that reason must be taken as primary. This is characteristic only of rationalist idealism. Irrationalist forms of idealism take as their starting-point the blind will, the unconscious "vital urge": everything in the world is wound up, programmed, as it were, striving towards some thing.

From the standpoint of subjective idealism, it is only through inadequate knowledge that we take the world as we see it to be the actually existing world. According to this conception, the world does not exist apart from us, apart from our sense perceptions: to exist is to exist in perception! And what we consider to be different from our sensations and existing apart from them is composed of the diversity of our subjective sensuality: colour, sound, forms and other qualities are only sensations and sets of such sensations form things. This implies that the world is, so to speak, woven out of the same subjective material of which human dreams are composed.

To the subjective idealists it appears that our efforts to reach beyond consciousness are futile and it is therefore impossible to acknowledge

the existence of any external world that is independent of consciousness. It is a fact that we know the world only as it is given to man, to the extent to which it is reflected in our consciousness through sensations. But this certainly does not mean that the world when reflected in consciousness somehow dissolves in it like sugar in water. All the experience of humanity, the history of science and practice show that the objects of perception continue to exist even when we do not perceive them, i.e., before perception, during perception and after perception. In short, their existence is not dependent on the act of their perception.

The reader may legitimately ask: have there really been any philosophers who maintain such a strange philosophy as subjective idealism, a philosophy that for so many centuries was subjected not merely to criticism but to sarcastic ridicule? On the ordinary empirical level, surely it is only madmen, and only a few of them, who can deny the independent existence of the world. In practice, the subjective idealists (Berkeley, Fichte, Mach) probably did not behave as if they believed there was no external world. These ideas were strictly reserved for the sphere of theoretical thought.

It must be stressed that materialism and idealism are two extreme, polarised trends. Between them there are infinite gradations. In the work of many idealists one finds certain materialist propositions and, conversely, all pre-Marxist materialists were idealists in the interpretation of the phenomena of social life. They believed that opinions rule history. One of the most convinced materialists, Democritus, did not deny the existence of gods and demons, but believed that they, too, were made out of atoms. In primitive idealism—mythology— even the gods are composed of matter. They are material and sensuously tangible. The history of philosophy has recorded many materialists who even believed that the world had been created by god. These were the so-called deists. There are philosophers who, like Aristotle, wavered between materialism and idealism to such an extent that it is often hard to decide which trend they should belong to. Idealism cannot be interpreted as a mere whim of erring philosophers, brilliant though some of them were. It has its (epistemological and social roots. The point is that cognition of the world is a complex and extremely contradictory, by no means straightforward process, which usually takes a zigzag or circuitous course and moves in spirals. It involves bursts of imagination, cool common sense, cunning, power of logic, and various plausible and implausible assumptions. In this riotous flood of creative, investigatory

thought, ranging first in one direction and then in another and sometimes running into blank walls, there is, as the whole experience of man's intellectual life testifies, an unavoidable risk of mistakes and misinterpretations. As Lenin aptly and laconically expressed it, only the person who does nothing makes no mistakes.

Consequently, we have to face the fact that the process of knowing contains the built-in possibility of thought becoming separated from reality and wandering into the sphere of fantasy, when purely abstract assumptions are accepted as a kind of reality. Take, for example, subjective idealism, what is its basic epistemological assumption? Things, their proper ties are directly given to us in the form of sensations and their subjective images are understood as existing where their objects are located. Is this true? Yes, it is. For example, the image of a green leaf relates to the leaf itself and we perceive this "greenness" as belonging to the leaf itself, just as we perceive the "blueness" of the sky as belonging to our own "firmament". But any biophysicist will tell us that "greenness" and "blueness" are merely sensations reflecting the visible spectrum of electromagnetic oscillations of certain frequencies and wavelengths and that in themselves the waves are "not green" and "not blue". The materialist separates the subjective form, in which the object is given to us, from its objective source, which exists by itself. The mistake of subjective idealism lies in the fact that it interprets this subjective form of the givenness of the object as the object itself, that is to say, reduces things to sensations and sensations to things.

The objective idealists elevate human thought and its products — concepts, ideas and culture in general— to the status of the absolute. The historically formed standards of morality, law, the rules of thinking and language, the whole spiritual life of society tower above the reason of the individual, as if they were something stable and relatively independent. People experience the continual influence of this supra-individual existence of spirit and submit to its commands often with no less obedience than, say, to the laws of gravity. Suffice it to recall the overwhelming impact of such feelings as shame, conscience, honour, and justice.

In ancient times people measured their actions according to the unwritten rules of their ancestors that had been retained in the memory and handed down from generation to generation. The individual consciousness grew accustomed to being dominated by certain supra-individual ideas, social standards retained in human memory and in the form of the "social memory", in language. This relative independence of the spiritual life of society was elevated by imagination into something

absolutely independent, into Reason divorced not only from living and thinking people but also from society, from matter in general, so that thinking and its products were elevated to a special spiritual realm, the immanent essence of the universe. And this was objective idealism. Its epistemological roots go down deep into history, when the progress of cognitive activity and the penetration of reason into the essence of things triggered the process of formation of abstract concepts. The problem arose of relating the universal and the particular, the essence and its manifestations. It was not easy for man to understand how the universal reflected in, for example, the concept of beauty was related to the individual form of its existence in a given individual. A beautiful person lives and dies but the idea of beauty survives him and proves to be indestructible. A wise man departs this life but wisdom, as something universal, common to all wise men who ever lived, live or will live in the future, survives in the system of culture as something existing above the individual. This universal, reflected in the concepts (beauty, wisdom, reason, law and so on), came to be identified with the concept itself. The universal features in things and the concept of the universal became merged in the consciousness, forming an objective-idealist alloy, in which the universal was divorced from its individual existence, apart from which it could not exist at all, and acquired the status of an independent essence. Objective idealism begins when the idea of a thing is conceived not as a reflection of the thing but as something eternally existing before the thing, embodied in the thing and determining the thing in its structure, properties and relationships and continuing to exist after the destruction of the thing. Thus Pythagoras thought of numbers as independent essences ruling the world, and Plato regarded general concepts as a special realm of pure thought and beauty that had engendered the world of visible reality. The idea of a thing created by man precedes the existence of the thing itself. The thing in its given form is derived from the aim, the intention of its creator, let us say, a carpenter. The greater part of the things that surround us are the result of man's creative activity, they are something created by man. The idea of creation has become for man a kind of prism through which he regards the whole world. This idea is so deeply rooted that he does not find it easy to set it aside and think of the world as something not created by anybody and existing eternally. The idea of the eternity of existence contradicts all the facts of our life, in which nearly everything is created, one might say, before our very eyes. So the eternal, uncreated existence of the world simply did not fit into people's heads and still does not fit in with many people's thinking. The level of science was very low and this gave rise to the assumption that there

must be some universal creator and lord of all things. This idea was strengthened also by the fact that so much in the world was strikingly harmonious and purposeful.

Application of the principle of rationality to everything is, in fact, idealism. Reason is regarded as the spiritual centre of the universe, and its influence as the thing that makes the world go round. Everything is illuminated by its all-pervasive rays. This is world-guiding reason. For the objective idealist Hegel, just as for Plato, the whole universe is a living, thinking creature whose parts bear the invisible traces of the whole.

Such are the epistemological and psychological roots of idealism. Its social roots lie in the separation of mental from physical labour and the counterposing of the first to the second and also in the appearance of exploitation. There arose a social elite, which conceived the notion that ideas, reason should have priority in the life of society while physical labour should be considered the lot of slaves. These tendencies towards overrating the intellectual principle in life were extended to the whole universe. Such an approach was reinforced by the class interests of the ruling elite. Idealist propositions interlock and sometimes even coincide with religion that urges people to submit.

Idealism is linked with religion and, directly or indirectly, provides its theoretical expression and substantiation. Over idealism there always hovers the idea of a god. Subjective idealism, compelled to be inconsistent in defending its principles, allows the objective existence of a god. The universal reason of the objective idealists is essentially a philosophical pseudonym for god: the supreme reason conceives itself in its creations. At the same time it would be a vulgarisation to identify idealism with religion. Philosophical idealism is not a religion but the road to religion through one of the forms of the complex process of human knowledge. They are different ways of being aware of the world and forming an attitude to it.

Philosophy as Methodology

The general concept of methodology. The world presents us with a picture of an infinite diversity of properties, connections and events. This kaleidoscope of impressions must be permeated by an organising principle, a certain method, that is to say, by certain regulative techniques and means of the practical and theoretical mastering of reality. Practical and theoretical activities follow different methods. The former indicates the ways of doing things and corresponding human skills that have been historically formed and socially established in the instruments of labour. The latter characterise the modes of activity of the mind resulting in the finding truth and the correct, rational solution of problems.

A methodology is a system of principles and general ways of organising and structuring theoretical and practical activity, and also the theory of this system. Genetically methods go back far into the past, when our distant ancestors were acquiring, generalising and handing down to new generations their skills and means of influencing nature, the forms of organising labour and communication. As philosophy emerged, methodology became a special target of cognition and could be defined as a system of socially approved rules and standards of intellectual and practical activity. These rules and standards had to be aligned with the objective logic of events, with the properties and laws of phenomena. The problems of accumulating and transmitting experience called for a certain formalisation of the principles and precepts, the techniques and operations involved in activity itself. For example, in ancient Egypt geometry emerged in the form of methodologically significant precepts concerning the measuring procedure for the division of land. An important role in this process was played by training for labour operations, their sequence, and the choice of the most effective ways of doing things.

With the development of production, technology, art, and the elements of science and culture, methodology becomes the target of theoretical thought, whose specific form is the Philosophical comprehension of the principles of organisation and regulation of cognitive activity, its conditions, structure and content. For example, in the work of Heraclitus "knowledge of many things" is contrasted to reason, the latter being a Particularly reliable means of understanding the dialectics of the universe —the universal Logos— and to be distinguished from the diversity of the "opinions" and legends acquired

by unreliable means. The rules of reasoning, of effective proof, the role of language as a means of cognition were the subject of special inquiry in the philosophy of the Greek Sophists (Protagoras and others). Socrates, Plato and Aristotle occupy a special place in discussion of the problems of methodology. Socrates, for example, gave priority to the dialogical nature of thinking as the joint attainment of truth through collation of different notions and concepts, their comparison, analysis, definition and so on. He regarded his theory of Proceeding by means of induction from vague notions to clearly defined general concepts as a method of Perfecting the art of living, of achieving virtue; logical operations were subordinated to ethical aims. According to Socrates, the acquisition of true knowledge should serve action with a moral purpose. The purpose should be determined by means of appropriately organised work of the intellect. This Socratic principle had a deep influence on various trends in the evolution of methodology, especially on the teaching of Plato, who developed a dialectic of concepts and categories the purpose of which was to find the principle in everything. In order to achieve this, our thoughts should move according to the objective logic of the objects under consideration as the embodiments of incorporeal essences. The world of these essences, or ideas, was also regarded as a realm of beauty, of the good which the soul could attain through strenuous effort.

Assuming like Plato that the object of true knowledge was the universal, Aristotle taught that this universal was to be discovered by investigating individual, empirically given things. The methodology of such research is set forth in Aristotle's logic, which closely analyses the principles for defining a term or constructing a statement, the rules of inference and proof, the role of induction and deduction in attaining truth, and so on. Aristotle's aesthetics expounds the principles of creativity and analysis in works of art. He also gives us a methodologically important elaboration of the theory of categories as the organising forms of cognition and their dialectics.

Until modern times, however, the problems of methodology had no independent place in the system of knowledge and arose only in the context of logical and natural philosophical arguments. Scientific progress is not limited to the accumulation of knowledge. It is also a process of evolving new means of seeking knowledge. The rapid advance of natural science called for radical changes in methodology. This need was reflected in new principles of methodology and corresponding philosophical ideas, both rationalistic and empirical, directed against scholasticism. The principles of mechanics marked a

breakthrough in methodology. According to Galileo, scientific knowledge, by uniting the inductive and deductive methods, should be based on planned, accurate mental and practical experiment.

In Descartes the problem of methodology is central. Methodology is required to establish on what basis and by what methods new knowledge may be obtained. Descartes worked out the rules of the rationalistic method, the first rule being the demand that only propositions that are clearly and distinctly comprehensible may be accepted as true. The first principles are axiomatic knowledge, that is, ideas perceived intuitively by reason, without any proof. From these immediately perceived propositions new knowledge is deduced by means of deductive proof. This assumes the breaking down of complex problems into more specific and comprehensible problems and a strictly logical advance from the known to the unknown.

Another line in methodology was represented at this time by English empiricism, which sought to devise modes of thought that would help to build a strictly experimental science guided by proofs of scientific truths arrived at through induction.

The limitations of both trends were revealed by German classical philosophy, which produced a searching analysis of the conditions of cognition, its forms and organising principles. In contrast to mechanistic methodology, which metaphysically interpreted the ways and means of cognition, classical German Philosophy developed a dialectical methodology in idealistic forms.

Kant produced a critical analysis of the structure and types of man's cognitive abilities and defined the constructive and regulative principles of cognition and the relationship between its form and content. Whereas Descartes' initial methodological principle was to subject everything to doubt in order to obtain sound and unquestionably authentic knowledge and Hume had doubted the very fact of the existence of the world, for Kant a critical attitude to present knowledge was the methodological basis for overcoming dogmatic and metaphysical views of the world. His work was aimed against both dogmatism and scepticism and sought to defend the principle of the authenticity and general significance of knowledge. Dualism and apriorism however, prevented consistent realisation of this principle.

In Kant's analysis of the process of cognition there were elements of dialectics. These were developed on a higher plane by Hegel, whose philosophy took the form of a universal method of cognition and of intellectual activity in general. The categories and laws of dialectics

evolved by Hegel provided a system of thought that made it possible to investigate the interconnection and contradictions between being and thinking, the dialectics of the development of human culture, from a new standpoint based on the principle of historicism. Foremost in Hegel's methodology is the principle of ascent from the abstract to the concrete, that is, from the general and limited forms of sensuality and rational judgements to analytical and highly meaningful concepts, and thence to a system of concepts revealing the object to the full extent of its essential and, in this sense, concrete characteristics.

The achievements of the methodologies of Preceding periods were generalised and reviewed on a consistently materialist basis in Marxist Philosophy, enriched by the latest advances in science and social practice. The dialectical method was radically revised. From being a method and analysis of forms of knowledge in themselves, regardless of reality and the objective laws of its development, it became a method of the fullest and most meaningful investigation of this development, an instrument not only of theoretical cognition but also of revolutionary transformation of reality. In the methodology of Marxism spontaneously dialectical methods of thought, which had stimulated progress in the natural and social sciences, acquired their theoretical substantiation. This methodology clarifies the nature of the relationship between theoretical and empirical knowledge, and also the role of practice in organising both forms of cognition.

The relationship between theory and method. Whereas theory is the result of a process of cognition that reproduces a certain fragment of existence, methodology is a way of obtaining and building up such knowledge. Theory characterises knowledge itself, its structure, content and the degree to which it corresponds to the object; method characterises the activity involved in acquiring knowledge. It characterises the conditions for obtaining true knowledge. In practice, the distinction between theory and method may sometimes be functional: having taken shape as a theoretical result of past inquiry, method acts as the point of departure and condition for further investigation. Thus the law of the conservation of matter and energy as a theoretical principle expressing the fundamental condition for the existence of the world is simultaneously a methodological requirement for the investigation of any phenomenon. The methodological principle of the determinist explanation of the world is the organising principle of the corresponding physical, biological and social theories. After being tested by social practice, these theories in their turn may perform a

methodological function, that is, serve as a guiding principle in further research.

The methodology of Marxism has a universal character and may be concretised when applied to various spheres of human activity according to their conditions and aims. Whereas the concept of methodology was at one time mainly concerned with cognitive activity (with the result that the methodology of science was better developed), the new approach to methodology established by Marxism has made it possible to expand its sphere of application and provide a philosophical substantiation for the ways and means of organising the whole gamut of forms of human activity. The specific nature of these forms calls for methods corresponding to the objects that are studied and transformed. In the sphere of art, for example, such a method is the realistic method, portraying reality with all its contradictions and perspectives.

The effectiveness of a method is judged mainly by its correspondence to the object concerned. In what way does the truth of a theory differ from that of a method? Theory relates only to its object and is characterised by the degree to which it truly reproduces that object. But a method may be true—in the sense of effective—in one cognitive situation, while leading to false conclusions in another. The methods of physics are applicable to physical reality, including those cases when it is part of biological objects. If there is a diversity of methods there inevitably arises the problem of choosing one and assessing it as a possible way of solving specific theoretical and practical problems. This gives methodology an axiological (value) aspect and prompts us to assess methods from the standpoint of both truth and effectiveness. Though methods may differ in quality they all have a common basis in the integral dialectical-materialist methodology.

Hierarchy of methods. It is important to sort out the relationship between Philosophical methodology and the complex hierarchy of general scientific and specific ways and techniques of activity *in* material and intellectual production organised at various levels. At the philosophical level methodology actually functions not in the form of a rigid system of standards, "prescriptions" and techniques—such an interpretation would inevitably lead to dogmatism—but as a general system of assumptions and guideline of human activity, world-view being most vital of them. Dialectical and historical materialism is such a general system. World-view provides *the* assumption and the basis of methodology. Philosophy cannot, for example, give physics specific methods for studying quantum mechanics. But it is concerned with the general approach to discovery of truth in physics. It deals not with the

"tactics" of the research process, but with the strategy in the battle for truth.

One must first master Universal Philosophical principles, and then the particulars of the various levels are more easily assimilated. If we go about things in the opposite order we cannot Properly master either the one or the other. Philosophical methods "work" in science not directly but mediated by other more specific methods. For example, the principle of historicism as a universal method evolved by philosophy has in biology taken the form of evolution theory —the methodological basis of the modern biological disciplines, and in astronomy this same principle has generated a whole set of cosmogonic hypotheses. In Social research dialectical materialism combined with historical materialism performs the function of a method for all the social sciences Methods that have a general scientific character, such as comparison, analysis and synthesis, abstraction, idealisation generalisation, ascent from the abstract to the concrete, modelling, formalisation, induction and deduction, also have to be concretised in each separate science.

In science, methodology often decides the fate of a research project. Different approaches may lead to opposite conclusions being drawn from one and the same factual material. Describing the role of correct method in scientific cognition, philosophers have compared it to a torch illuminating the road for the traveller in darkness. Even a lame man who chooses the right road will arrive ahead of the aimless wanderer. It goes without saying that method in itself cannot guarantee success in research. Not only a good method but skill in applying it are required.

A characteristic feature of the development of philosophical thought in the 20th century is the rapid growth of methodological research and the increase of its specific share in the general system of scientific knowledge. This is due to the conversion of science into a direct productive force, to the rapid development of science as a special form of intellectual production and to the differential and integrative processes occurring in it, which has led to the specific changes in the classical disciplines and the appearance of many new ones. The development and perfecting of methods is a crucial element in all scientific progress. Contemporary society is confronted with global problems whose solution demands large-scale programmes that can be carried out only through the collaboration of many sciences, programmes designed to cope with the problems of ecology, demography, urbanisation, space exploration, and so on.

The need thus arises not only to pool the efforts of specialists in various fields, but also to combine scientific data in situations where there is in principle no complete or definite information about the object as a whole, as a system. The deepening of the interconnection of the sciences leads to the results, models and methods of some sciences being increasingly widely used by others that are relatively less developed in the methodological sense and more complex in their object of study, for example, the application of physical and chemical methods in biology, psychology, and medicine. This gives rise to the problem of methods of inter-disciplinary research and has led to the evolution of methods that can ensure effective interaction and synthesis of the methods of various sciences and reveal research techniques, a logical apparatus and scientific language for unifying separate concepts and trends and giving them general scientific status. One may cite, for example, the principles of cybernetics with its categories of control, information, feedback, etc.; systems analysis as the further creative development of the principles and categories of dialectics; or the concept of the noosphere of Academician V. I. Vernadsky, which has been developed in the idea of a planetary ergo-information field.

Modern science is becoming more abstract and lends itself more easily to mathematical methods of research. Particularly relevant are the problems of interpreting the results of research performed with an extensive use of formalisation techniques. This has led to the special elaboration of methods interpretation and modelling.

There are several classifications of methodological knowledge. One of the most popular is the division of methodology into substantive and formal methodology. The former includes such problems as the structure of scientific knowledge in general and scientific theory in particular, the laws of the generation, functioning and mutation of scientific theories, the conceptual framework of science and its separate disciplines, the definition of the explanatory patterns accepted in science, the structure and Operational composition of the methods of science, the conditions and criteria of scientificity

The formal aspects of methodology are related to analysis of the language of science, the formal structure of scientific explanation, description and analysis of formal and formalised methods of research, particularly the methods of constructing scientific theories and conditions of their logical truth, the typology of systems of knowledge, and so on. It was the elaboration of this set of problems that raised the question of the logical structure of scientific knowledge and the development of a methodology of science as an independent field of

knowledge. This field embraces the whole diversity of methodological and methodic principles and techniques, operations and forms of constructing scientific knowledge, its highest and definitive level is the philosophical methodology, whose guiding principles organise methodological work both at the general scientific level (including the logico-methodological apparatus applicable to many disciplines) and at the specialised scientific level, where special methods of research and derivative specific methodical systems are devised and applied. Method is concretised methodology. Through the method of the concrete science it reaches the research desk. The concrete sciences, which are specific in relation to philosophy, may in their turn be methodological in relation to the narrower fields of their specific sphere of knowledge. For example, general biology arms botany, zoology and other narrower disciplines with general methods of research. Relying on philosophy, general biology works out the methodological problems related to all the departments of biological science. This principle is to be found in other sciences as well.

The present-day system of methods in science is as diversified as science itself. We talk, for example, of experimental method, the method of processing empirical data, the method of building scientific theories and their verification, the method of expounding scientific results, i.e., the classification of methods based on the classification of stages of research activity.

According to another classification, methods are divided into philosophical, general scientific, and special scientific methods. Yet another classification relies on different methods of qualitative and quantitative study of reality. The distinction between methods depending on the forms of causality —determinist and probability methods— is of considerable importance in modern science. For example, in biology dialectics is seen through the prism of general scientific methods (systems analysis, the principles of self-regulation, etc.), in specific research projects through applying special scientific methods and systems of methods (electronic microscopy, the method of tagged atoms, etc.). One or another method makes it possible to know only separate aspects of the object of research. In order to comprehend all the essential aspects of the object, there must be complementarity of methods. The whole system of methodological knowledge necessarily involves a world-view interpretation of the basis of the research and its results. It should be stressed that general methodology is always at work in the brain of every scientist but, as a rule, it is kept in obscurity, as the intellectual background of a searching mind. This obscurity is sometimes

so complete that the scientist may even deny that he acts according to any philosophical methodology, and insist that he is in general free of any philosophy. But this is merely an illusion of the consciousness.

Philosophy and Science

The touchstone of the value of philosophy as a world-view and methodology is the degree to which it is interconnected with life. This interconnection may be both direct and indirect, through the whole system of culture, through science, art, morality, religion, law, and politics. As a special form of social consciousness, constantly interacting with all its other forms, philosophy is their general theoretical substantiation and interpretation.

Can philosophy develop by itself, without the support of science? Can science "work" without philosophy? Some people think that the sciences can stand apart from philosophy, that the scientist should actually avoid philosophising, the latter often being understood as groundless and generally vague theorising. If the term philosophy is given such a poor interpretation, then of course anyone would agree with the warning "Physics, beware of metaphysics!" But no such warning applies to philosophy in the higher sense of the term. The specific sciences cannot and should not break their connections with true philosophy.

Science and philosophy have always learned from each other. Philosophy tirelessly draws from scientific discoveries fresh strength, material for broad generalisations, while to the sciences it imparts the world-view and methodological impulses of its universal principles. Many general guiding ideas that lie at the foundation of modern science were first enunciated by the perceptive force of philosophical thought. One example is the idea of the atomic structure of things voiced by Democritus. Certain conjectures about natural selection were made in ancient times by the philosopher Lucretius and later by the French thinker Diderot. Hypothetically he anticipated what became a scientific fact two centuries later. We may also recall the Cartesian reflex and the philosopher's proposition on the conservation of motion in the universe. On the general philosophical plane Spinoza gave grounds for the universal principle of determinism. The idea of the existence of molecules as complex particles consisting of atoms was developed in the works of the French philosopher Pierre Gassendi and also Russia's Mikhail Lomonosov. Philosophy nurtured the hypothesis of the cellular structure of animal and vegetable organisms and formulated the idea of the development and universal connection of phenomena and the principle of the material unity of the world. Lenin formulated one of the fundamental ideas of contemporary natural science—the principle of

the inexhaustibility of matter—upon which scientists rely as a firm methodological foundation.

The latest theories of the unity of matter, motion, space and time, the unity of the discontinuous and continuous, the principles of the conservation of matter and motion, the ideas of the infinity and inexhaustibility of matter were stated in a general form in philosophy.

Besides influencing the development of the specialised fields of knowledge, philosophy itself has been substantially enriched by progress in the concrete sciences. Every major scientific discovery is at the same time a step forward in the development of the philosophical world-view and methodology. Philosophical statements are based on sets of facts studied by the sciences and also on the system of propositions, principles, concepts and laws discovered through the generalisation of these facts. The achievements of the specialised sciences are summed up in philosophical statements. Euclidian geometry, the mechanics of Galileo and Newton, which have influenced men's minds for centuries, were great achievements of human reason which played 'a significant role in forming world-views and methodology. And what an intellectual revolution was produced by Copernicus' heliocentric system, which changed the whole conception of the structure of the universe, or by Darwin's theory of evolution, which had a profound impact on biological science in general and our whole conception of man's place in nature. Mendeleev's brilliant system of chemical elements deepened our understanding of the structure of matter. Einstein's theory of relativity changed our notion of the relationship between matter, motion, space and time. Quantum mechanics revealed hitherto unknown world of microparticles of matter. The theory of higher nervous activity evolved by Sechenov and Pavlov deepened our understanding of the material foundations of mental activity, of consciousness. Cybernetics revealed new horizons for an understanding of the phenomena of information interactions, the principles of control in living systems, in technological devices and in society, and also the principles of feedback, the man-machine system, and so on. And what philosophically significant pictures have been presented to us by genetics, which deepened our understanding of the relationship between the biological and the social in man, a relationship that has revealed the subtle mechanisms of heredity.

The creation and development by Marx, Engels and Lenin of the science of the laws of development of human society, which has changed people's view of their place in the natural and social vortex of

events, holds a special place in this constellation of achievements of human reason.

If we trace the whole history of natural and social science, we cannot fail to notice that scientists in their specific researches, in constructing hypotheses and theories have constantly applied, sometimes unconsciously, world-views and methodological principles, categories and logical systems evolved by philosophers and absorbed by scientists in the process of their training and self-education. All scientists who think in terms of theory constantly speak of this with a deep feeling of gratitude both in their works and at regional and international conferences and congresses.

So the connection between philosophy and science is mutual and characterised by their ever deepening interaction.

Some people think that science has reached such a level of theoretical thought that it no longer needs philosophy. But any scientist, particularly the theoretician, knows in his heart that his creative activity is closely linked with philosophy and that without serious knowledge of philosophical culture the results of that activity cannot become theoretically effective. All the outstanding theoreticians have themselves been guided by philosophical thought and tried to inspire their pupils with its beneficent influence in order to make them specialists capable of comprehensively and critically analysing all the principles and systems known to science, discovering their internal contradictions and overcoming them by means of new concepts. Real scientists, and by this we usually mean scientists with a powerful theoretical grasp, have never turned their backs on philosophy. Truly scientific thought is philosophical to the core, just as truly philosophical thought is profoundly scientific, rooted in the sum-total of scientific achievements. Philosophical training gives the scientist a breadth and penetration, a wider scope in posing and resolving problems. Sometimes these qualities are brilliantly expressed, as in the work of Marx, particularly in his *Capital*, or in Einstein's wide-ranging natural scientific conceptions.

The common ground of a substantial part of the content of science, its facts and laws has always related it to philosophy, particularly in the field of the theory of knowledge, and today this common ground links it with the problems of the moral and social aspects of scientific discoveries and technical inventions. This is understandable enough. Today too many gifted minds are oriented on destructive goals. In ancient times, as we have seen, nearly every notable scientist was at the

same time a philosopher and every philosopher was to some extent a scientist. The connection between science and philosophy has endured for thousands of years. In present-day conditions it has not only been preserved but is also growing substantially stronger. The scale of the scientific work and the social significance of research have acquired huge proportions. For example, philosophy and physics were at first organically interconnected, particularly in the work of Galileo, Descartes, Kepler, Newton, Lomonosov, Mendeleev and Einstein, and generally in the work of all scientists with a broad outlook. At one time it was commonly held that philosophy was the science of sciences, their supreme ruler. Today physics is regarded as the queen of sciences. Both views contain a certain measure of truth. Physics with its tradition, the specific objects of study and vast range of exact methods of observation and experiment exerts an exceptionally fruitful influence on all or nearly all spheres of knowledge. Philosophy may be called the "science of sciences" probably in the sense that it is, in effect, the self-awareness of the sciences and the source from which all the sciences draw their world-view and methodological principles, which in the course of centuries have been honed down into concise forms. As a whole, philosophy and the sciences are equal partners assisting creative thought in its explorations to attain generalising truth. Philosophy does not replace the specialised sciences and does not command them, but it does arm them with general principles of theoretical thinking, with a method of cognition and world-view. In this sense scientific philosophy legitimately holds one of the key positions in the system of the sciences.

To artificially isolate the specialised sciences from philosophy amounts to condemning scientists to finding for themselves world-view and methodological guidelines for their researches. Ignorance of philosophical culture is bound to have a negative effect on any general theoretical conclusions from a given set of scientific facts. One cannot achieve any real theoretical comprehension, particularly of the global problems of a specialised science, without a broad grasp of interdisciplinary and philosophical views. The specialised scientists who ignore philosophical problems sometimes turn out to be in thrall to completely obsolete or makeshift philosophical ideas without even knowing it themselves. The desire to ignore philosophy is particularly characteristic of such a trend in bourgeois thought as positivism, whose advocates have claimed that science has no need of philosophy. Their ill-considered principle is that "science is in itself philosophy". They work on the assumption that scientific knowledge has developed widely enough to provide answers to all philosophical problems without

resorting to any actual philosophical system. But the "cunning" of philosophy lies in the fact that any form of contempt for it, any rejection of philosophy is in itself a kind of philosophy. It is as impossible to get rid of philosophy as it is to rid oneself of all convictions. Philosophy is the regulative nucleus of the theoretically-minded individual. Philosophy takes its revenge on those who dissociate themselves from it. This can be seen from the example of a number of scientists who after maintaining the positions of crude empiricism and scorning philosophy have eventually fallen into mysticism. So, calls for freedom from any philosophical assumptions are a sign of intellectual narrowness. The positivists, while denying philosophy in words, actually preach the flawed philosophy of agnosticism and deny the possibility of knowing the laws of existence, particularly those of the development of society. This is also a philosophy, but one that is totally misguided and also socially harmful.

It may appear to some scientists that they are using the logical and methodological means evolved strictly within the framework of their particular speciality. But this is a profound delusion. In reality every scientist, whether he realises it or not, even in simple acts of theoretical thought, makes use of the overall results of the development of mankind's cognitive activity enshrined mainly in the philosophical categories, which we absorb as we are absorbing our own natural that no man can put together any theoretical statement language, and later, the special language of theoretical thought. Oversimplifying the question a little, one may say without such concepts as property, cause, law or accident. But these are, in fact, philosophical categories evolved by the whole history of human thought and particularly in the system of philosophical, logical culture based on the experience of all fields of knowledge and practice.

Knowledge of the course and results of the historical development of cognition, of the philosophical views that have been held at various times of the world's universal objective connections is also essential for theoretical thinking because it gives the scientist a reliable yardstick for assessing the hypotheses and theories that he himself produces. Everything is known through comparison. Philosophy plays a tremendous integrating role in scientific knowledge, particularly in the present age, when knowledge has formed an extremely ramified system. Suffice it to say, for example, that medicine alone comprises some 300 specialised branches. Medicine has "scalpelled" man into hundreds of little parts, which have become the targets of independent investigation and treatment.

Sciences have become so ramified that no brain, however versatile can master all their branches, or even one chosen field. No one nowadays can say that he knows the whole of medicine or biology or mathematics, as some people could have said in the past. Like Goethe's Faust, scientists realise that they cannot know everything about everything. So they are trying to know as much as possible about as little as possible and becoming like people digging deeper and deeper into a well and seeing less and less of what is going on around them, or like a chorus of the deaf, in which each member sings his own tune without hearing anyone else. Such narrow specialisation may lead, and has in some cases already led, to professional narrow-mindedness. Here we have a paradox. This process is both harmful and historically necessary and justified. Without narrow specialisation we cannot make progress and at the same time such specialisation must be constantly filled out by a broad inter-disciplinary approach, by the integrative power of philosophical reason. Otherwise a situation may arise when the common front of developing science will move ahead more and more rapidly and humanity's total knowledge will increase while the individual, the scientist, for example, will lag farther and farther behind the general flood of information and become more and more limited as the years go by. Aristotle knew nearly everything that was known to his epoch and constituted the substance of ancient science, but today by the time he leaves school the pupil is expected to know far more than Aristotle. And it would be a lifetime's work even for a gifted person with a phenomenal memory to learn the fundamentals of all the sciences.

What is more, narrow specialisation, deprived of any breadth of vision, inevitably leads to a creeping empiricism, to the endless description of particulars.

What are we to do about assembling integral knowledge? Such an assembly can nevertheless be built by the integrative power of philosophy, which is the highest form of generalisation of all human knowledge and life experience, the sum-total of the development of world history. By means of philosophy the human reason synthesises the results of human knowledge of nature, society, man and his self-awareness, which gives people a sense of freedom, an open-ended view of the world, an understanding of what is to be found beyond the limits of his usual occupation and narrow professional interests. If we take not the hacks of science but scientists on the big scale, with a truly creative cast of mind, who honestly, wisely and responsibly consider what their hands and minds are doing, we find that they do ultimately realise that to get their bearings in their own field they must take into consideration

the results and methods of other fields of knowledge; such scientists range as widely as possible over the history and theory of cognition, building a scientific picture of the world, and absorb philosophical culture through its historically formed system of categories by consciously mastering all the subtleties of logical thought. Max Born, one of the creators of quantum mechanics, provides us with a vivid example of this process. Born had a profound grasp of physical thought illuminated by philosophical understanding of his subject. He was the author of many philosophical works and he himself admitted that the philosophical implications of science had always interested him more than narrow specialised results. After Einstein he was one of the first of the world's leading scientists to realise the futility of positivism's attempts to act as a basis for understanding the external world and science and to deny this role to philosophy.

The philosophical approach enables us to overcome the one-sidedness in research which has a negative effect in modern highly specialised scientific work. For example, natural science today is strongly influenced by integrative trends. It is seeking new generalising theories, such as a unitary field theory, a general theory of elementary particles, a general theory of systems, a general theory of control, information, and so on. Generalisations at such a high level presuppose a high degree of general scientific, natural-humanitarian and also philosophical culture. It is philosophy that safeguards the unity and interconnection of all aspects of knowledge of the vast and diversified world whose substance is matter. As Werner Heisenberg once observed, for our senses the world consists of an infinite variety of things and events, colours and sounds. But in order to understand it we have to introduce some kind of order, and order means to recognise what is equal, it means some sort of unity. From this springs the belief that there is one fundamental principle, and at the same time the difficulty to derive from it the infinite variety of things. The natural point of departure is that there exists a material prime cause of things since the world consists of matter.

The intensive development of modern science, which by its brilliance has tended to eclipse other forms of intellectual activity, the process of its differentiation and integration, gives rise to a vast number of new problems involving world-view and methodology. For example, do any extra terrestrial civilisations exist and is there life in other galaxies? How did the universe arise in its given qualitative determinacy? What is meant by the infinity of space and time? Certain fields of knowledge constantly run into difficulties of a methodological nature. How can one judge the degree to which physical or chemical methods are applicable

to the investigation of animate nature without oversimplifying it? In modern science not only has there been an unusually rapid accumulation of new knowledge; the techniques, methods and style of thinking have also substantially changed and continue to change. The very methods of research attract the scientist's growing interest, as discussion at national and international symposiums and congresses shows. Hence the higher demands on philosophy, on theoretical thought in general. The further scientific knowledge in various fields develops, the stronger is the tendency to study the logical system by which we obtain knowledge, the nature of theory and how it is constructed, to analyse the empirical and theoretical levels of cognition, the initial concepts of science and methods of arriving at the truth. In short, the sciences show an increasing desire to know themselves, the mind is becoming more and more reflective.

Not only are the subject-matter of this or that science and the methods of studying it being verified. We are trying to define the exact social and moral role that this or that science plays or may play in the life of society, what it implies or may imply for the future of mankind — benefit or destruction? This trend towards self-knowledge, of which much is said both by scientists and philosophers, is bound to show itself and should show itself in the relationship between philosophy and science.

The methodological significance of the philosophical principles, categories and laws should not be oversimplified. It is wrong to suggest that not a single specific problem can be solved without them. When we think of the place and role of philosophy in the system of scientific cognition, we have in mind not separate experiments or calculations but the development of science as a whole, the making and substantiation of hypotheses, the battle of opinions, the creation of theory, the solving of inner contradictions in a given theory, the examination in depth of the initial concepts of science, the comprehension of new, pivotal facts and assessment of the conclusions drawn from them, the methods of scientific research, and so on.

Karl Jaspers, the German psychiatrist and philosopher, once made the point that students who became dissatisfied with philosophy often entered the natural scientific faculties to get to grips with "real things", which they then studied enthusiastically. But later, when they began to seek a basis for their own lives in science, the general ruling principles of their actions, they were again disappointed and their search led them back to philosophy. Philosophy, besides all its other functions, goes deep into the personal side of human life. The destiny of the individual,

his inner emotions and desires, in a word, his life and death, have from time immemorial constituted one of the cardinal philosophical problems. The indifference to this "human" set of problems, which is a characteristic feature of neopositivism, is rightly regarded as one-sided scientism, the essence of which is primitively simple: philosophy must be a science like natural science, and strive to reach the same ideal of mathematical precision and authenticity. But while many scientific researchers look only outwards, philosophers look both outwards and inwards, that is to say, at the world around man and man's place in that world. Philosophical consciousness is reflective in its very essence. The degree of precision and the very character of precision and authenticity in science and philosophy must therefore differ. Who, for instance, reflects man's inner world with all its pathological aberrations "more precisely"—the natural scientist with his experimental techniques, mathematical formulae and graphs or, for example, Shakespeare, Tolstoy, Dostoyevsky, in their immortal works that are so highly charged with philosophical meaning?

At this point a huge philosophical problem arises. How are we to overcome the yawning gap between mathematised natural-scientific and technological thinking, on the one hand, and humanitarian, social thought, on the other? How are we to resolve the intense and continuing argument between the so-called "lyricists and physicists", who symbolise these two diverging styles of thought? This is something that has a harmful effect on the human personality, dragged in opposite directions by the two principles. This morbid dichotomy may have negative consequences for the present and future of both the individual and collective human reason. So it is an educational, philosophical, moral and profoundly social problem.

Philosophy, as we have said, is not simply an abstract science. It also possesses an evaluative aspect, its moral principles. Science has given man a lot of things, but ethics or, to put it more bluntly, conscience, is not one of them. The evaluative, axiological and aesthetic aspects are also important for science. And they are not part of it either.

Philosophy helps us to achieve a deeper understanding of the social significance and general prospects of scientific discoveries and their technical applications. The impressive achievements of the scientific and technological revolution, the contradictions and social consequences it has evoked, raise profound philosophical problems. Contemporary philosophical irrationalism gives a pessimistic appraisal of scientific and technological advance and predicts worldwide disaster. But this raises the question of the responsibility of philosophy, since philosophy seeks

to understand the essence of things and here we are dealing with the activity of human reason and its "unreasonable" consequences. Thus the question of the nature of philosophy in our day grows into a question of the historic destinies of humanity and becomes a vitally important social problem. To what extent can society comprehend itself, rationally control its own development, be the master of its own destiny, command the consequences of its own cognitive and practical activity?

There are many questions that the epoch poses before humanity and these questions can be answered by philosophy. For example, what does the future hold for the contesting social systems in the modern world? What are the rational ways of removing the threat of universal annihilation?

In present-day conditions the role not only of natural science and technology, but also of the humane sciences that study "human affairs", the laws of life and development of society, has grown enormously and will continue to do so as time goes on. The results of social research have today assumed not only exceptional theoretical but also exceptional applied, social and political importance. The very structure of social life is becoming more complex, new forms of human activity are appearing, the scientific and technological revolution continues its advance, the role of social and political problems in the life of society, in the development of culture is steadily increasing.

Revolutionary changes have today invaded all spheres of life: the productive forces, science with its gigantic field of practical application, technology, politics, ethnic relationships, intellectual life in general. Man himself is changing. What is the essence, the cause of these changes that are spreading across the world and affecting the most diverse aspects of human life? In what way do the various aspects of the revolutionary process that has gripped the planet interdepend? What consequences will the scientific and technological revolution have for the nations of the world? Are we not witnessing and participating in a profound crisis of our whole civilisation? What are we to do about elevated human ideals when we are confronted with a threat to the very existence of life on earth?

For several centuries people hopefully observed the development of technology on the assumption that taming the forces of nature would bring them happiness and plenty, and that this would be enough to allow human life to be arranged on rational principles. Mankind has achieved a great deal, but we have also made "a great deal of mess". For how long and on what scale can we go on accumulating the waste

products among which modern man has to live? Here we need a clear and philosophical view of history. Why, because of what contradictions, do the forces created and activated by human brains and hands turn against man himself and his mind? Why is the world so constructed that more of its gifted minds are bent on destruction instead of creation? Is this not a profound social and philosophical problem? The advent of the atomic age was marked by horrifying annihilation and mass murder. For how long will the menacing shadow of the atomic bomb hang over all human joys and hopes?

These and other great questions of our time cannot be answered by the supreme science of physics, by mathematics, cybernetics, chemistry, biology, or by natural science as a whole, great though their discoveries have been. These questions, which exercise the minds of all mankind and relate to life today and in the future, must be answered by scientific philosophy.

Naturally, the solution of all the pressing problems of our time depends not only on a rational philosophical orientation. It also depends on the political orientation of nations and statesmen, which in turn is related to the nature of the social structure.

Scientific activity is not only logical, it also has moral and socio-political implications. Knowledge arms man with the means to achieve his ends. There can be no doubt that modern natural science is a powerful "motor" of technical advance.

In a fierce ideological struggle the specialised scientists who lack any scientific world-view or methodology sometimes turn out to be helpless grown-up children in the face of reactionary ideology and some of them fall into its clutches.

Philosophy and Art

Philosophy, science and art differ principally according to their subject-matter and also the means by which they reflect, transform and express it. In a certain sense, art, like philosophy, reflects reality in its relation to man, and depicts man, his spiritual world, and the relations between individuals in their interaction with the world.

We live not in a primevally pure world, but in a world that is known and has been transformed, a world where everything has, as it were, been given a "human angle", a world permeated with our attitudes towards it, our needs, ideas, aims, ideals, joys and sufferings, a world that is part of the vortex of our existence. If we were to remove this "human factor" from the world, its sometimes inexpressible, profoundly intimate relationship with man, we should be confronted by a desert of grey infinity, where everything was indifferent to everything else. Nature, considered in isolation from man, is for man simply nothing, an empty abstraction existing in the shadowy world of dehumanised thought. The whole infinite range of our relationships to the world stems from the sum-total of our interactions with it. We are able to consider our environment rationally through the gigantic historical prism of science, philosophy and art, which are capable of expressing life as a tempestuous flood of contradictions that come into being, develop, are resolved and negated in order to generate new contradictions.

No scientifically, let alone artistically, thinking person can remain deaf to the wise voice of true philosophy, can fail to study it as a vitally necessary sphere of culture, as the source of world-view and method. Equally true is the fact that no thinking and emotionally developed person can remain indifferent to literature, poetry, music, painting, sculpture and architecture. Obviously, one may be to some extent indifferent to some highly specialised science, but it is impossible to live an intellectually full life if one rejects philosophy and art. The person who is indifferent to these spheres deliberately condemns himself to a depressing narrowness of outlook.

Does not the artistic principle in philosophical thought deserve the attention of, and do credit to, the thinking mind, and vice versa? In a certain generalised sense the true philosopher is like the poet. He, too, must possess the aesthetic gift of free associative thinking in integral images. And in general one cannot achieve true perfection of creative thought in any field without developing the ability to perceive reality from the aesthetic standpoint. Without this precious intellectual prism

through which people view the world everything that goes beyond the empirical description of facts, beyond formulae and graphs may look dim and indistinct.

Scientists who lack an aesthetic element in their makeup are dry-as-dust pedants, and artists who have no knowledge of philosophy and science are not very interesting people either, for they have little to offer above elementary common sense. The true artist, on the other hand, constantly refreshes himself with the discoveries of the sciences and philosophy. While philosophy and science tend to draw us into "the forest of abstractions", art smiles upon everything, endowing it with its integrating, colourful imagery.

Life is so structured that for a man to be fully conscious of it he needs all these forms of intellectual activity, which complement each other and build up an integral perception of the world and versatile orientation in it.

The biographies of many scientists and philosophers indicate that the great minds, despite their total dedication to research, were deeply interested in art and themselves wrote poetry and novels, painted pictures, played musical instruments and moulded sculpture. How did Einstein live, for example? He thought, wrote, and also played the violin, from which he was seldom parted no matter where he went or whom he visited. Norbert Wiener, the founder of cybernetics, wrote novels, Darwin was deeply interested in Shakespeare, Milton and Shelley. Niels Bohr venerated Goethe and Shakespeare; Hegel made an exhaustive study of world art and the science of his day. The formation of Marx's philosophical and scientific views was deeply influenced by literature. Aeschylus, Shakespeare, Dante, Cervantes, Milton, Goethe, Balzac and Heine were his favourite authors. He responded sensitively to the appearance of significant works of art and himself wrote poetry and fairy-tales. The radiance of a broad culture shines forth from the work of this genius. Lenin was not only acquainted with art but also wrote specialised articles about it. His philosophical, sociological and economic works are studded with apt literary references. And what a delight he took in music!

In short, the great men of theory were by no means dry rationalists. They were gifted with an aesthetic appreciation of the world. And no wonder, for art is a powerful catalyst for such abilities as power of imagination, keen intuition and the knack of association, abilities needed by both scientists and philosophers.

If we take the history of Oriental culture, we find that its characteristic feature is the organic synthesis of an artistic comprehension of the world with its philosophical and scientific perception. This blending of the philosophical and the artistic is inherent in all peoples, as can be seen from their sayings, proverbs, aphorisms, tales and legends, which abound in vividly expressed wisdom.

If we are to develop effective thinking, we must not exclude any specifically human feature from participation in creative activity. The gift of perception, penetrating observation of reality, mathematical and physical precision, depth of analysis, a free, forward-looking imagination, a joyful love of life —these are all necessary to be able to grasp, comprehend and express phenomena, and this is the only way a true work of art can appear, no matter what its subject may be.

Can one imagine our culture without the jewels of philosophical thought that were contributed to it by human genius? Or without its artistic values? Can one conceive of the development of contemporary culture without the life-giving rays of meditative art embodied in the works of such people as Dante, Goethe, Leo Tolstoy, Balzac, Pushkin, Lermontov, Dostoyevsky, Tchaikovsky, and Beethoven? Culture would have had a very different history but for the brilliant minds that gave us their masterpieces of painting, music, poetry and prose. The whole world of our thoughts and feelings would have been different, and incomparably poorer. And we, as individuals, would also have been flawed. The intellectual atmosphere that surrounds us from childhood, the style of thinking that permeates folk sayings, tales and songs, the books we have read, the paintings and sculptures we have admired, the music we have heard, the view of the world and humanity that we have absorbed thanks to our contact with the treasures of art, has not all this contributed to the formation of our individual self? Did it not teach us to think philosophically and perceive and transform the world aesthetically?

An indispensable feature of art is its ability to convey information in an evaluative aspect. Art is a combination of man's cognitive and evaluative attitudes to reality recorded in words, colours, plastic forms or melodically arranged sounds. Like philosophy, art also has a profoundly communicative function. Through it people communicate to one another their feelings, their most intimate and infinitely varied and poignant thoughts. A common feature of art and philosophy is the wealth they both contain of cognitive, moral and social substance. Science is responsible to society for a true reflection of the world and no more. Its function is to predict events. On the basis of scientific

discoveries one can build various technical devices, control production and social processes, cure the sick and educate the ignorant. The main responsibility of art to society is the formation of a view of the world, a true and large-scale assessment of events, a rational, reasoning orientation of man in the world around him, a true assessment of his own self. But why does art have this function? Because in its great productions it is not only consummately artistic but also profoundly philosophical. How deeply philosophical, for instance, are the verses of Shakespeare, Goethe, Lermontov, Verhaeren! And indeed all the great writers, poets, composers, sculptors, architects, painters, in short, all the most outstanding and brilliant exponents of art were imbued with a sense of the exceptional importance of progressive philosophy and not only kept abreast of but were often responsible for its achievements. How profound were Tolstoy's artistically expressed meditations on the role of the individual and the people in the historical process (for example, Napoleon and Kutuzov, or the Russian people in the war of liberation of 1812, as portrayed in *War and Peace*), on freedom and necessity, on the conscious and the unconscious in human behaviour. Consider the psychological and philosophical depth and the artistic power with which Balzac revealed the social types in the society of his day in all their diversity (the idea of greed and acquisitiveness in the character of Gobseck!). How philosophical are the artistic and publicistic works of Voltaire, Rousseau, Diderot, Thomas Mann, Heine, Herzen, Chernyshevsky and many others. If we turn to science fiction, we find that it is full of scientific and philosophical reflections, of varying visions of the future of science, technology and human existence in general. Quite often its plot is a series of mental experiments. However, neither the scientific nor the philosophical content, no matter how fully expressed in a work of art, constitutes its specific element. We never speak of any work of art, no matter how powerful, as a study, whereas creative work in philosophy is a study, an inquiry, and it is characterised above all not by its artistic but by its scientific qualities, although its artistic aspect is highly valued and has more than purely aesthetic significance. The crown of philosophical inquiry is truth and prediction, whereas in art it is artistic truth, not accuracy of reproduction, in the sense of a copy of what exists, but a lifelike portrayal of typically possible phenomena in either their developed or potential form. If art produced only truths similar to scientific truths, there would be no masterpieces of world art. The immortality of great masterpieces lies in the power of their artistic generalisation, generalisation of the most complex phenomenon in the world—man and his relations with his fellow men.

Some people believe that the specific feature of art is that the artist expresses his own intellectual world, his own intrinsic individuality. But this is not quite true. In any active creativity, any act that reflects and transforms life, a person also expresses himself. And the higher the level of creativity, in this case artistic, the higher the level of generalisation, and hence the universal, despite all the individuality of the form. "Man's individuality or singularity is not a barrier to the universality of the will, but is subordinated to it. A just or moral, in other words, a fine action, although performed by one individual, is nevertheless approved by all. Everyone recognises himself or his own will in this act. Here there occurs the same thing as in a work of art. Even those who could not create such a work find their own essence expressed therein. Such a work is therefore truly universal. The more its individual creator dissolves in it, the more approval it earns."¹

The aesthetic principle is not the specific element in philosophy although it is present there. Naturally, philosophy is distinguished from the other sciences by its being related far more closely to the aesthetic principle, to art. It synthesises the everyday experience of the people and something from the other sciences, and also something from art without confining itself to any of them. The aesthetic element is also present in any science. By some scientists it is even regarded as a criterion of truth: the true is elegant and highly refined in its structure. The beauty, the elegance of an experiment, or of any theoretical construction, especially if it sparkles with wit, does credit to scientific thought, evokes our legitimate admiration and affords us intellectual and aesthetic pleasure. Quite often this elegance shows itself in a meaningful brevity, for genius is usually simply expressed, without superfluous words. So truth and beauty are sisters, although not always.

In philosophy this aesthetic principle is expressed more powerfully and fully. It is not only more synthetic and integrated than science. In its very social purpose it is, or should be, closer and more understandable to the masses of the people. It should not be separated from them by the "barbed wire" of a formalised, let alone a mathematised language.

A considerable number of philosophical works have been written in poetic and artistic form. Actually they are not poetry but philosophical thoughts expressed as poetry. Many brilliant works of philosophy are couched in such fine language that they read like great works of both

¹ Georg Wilhelm F. Hegel, *Sämtliche Werke*, Dritter Band, "Philosophische Propädeutik, Gymnasialreden und Gutachten über den Philosophie-Unterricht", Fr. Frommans Verlag, Stuttgart, 1927, S. 46.

science and art. Inspired by their genius, the great philosophers clothed their profound thoughts in images of astonishing aptness.

Many people draw attention to the fact that the achievements of science, no matter how significant they once were, are constantly being reviewed, whereas the masterpieces of art survive the centuries in all the splendour of their individuality. But have you noticed that something similar happens in philosophy too? The works of the great philosophers retain their inimitable value through the centuries. So in philosophy, just as in art, history is of special importance. Whereas the works of the classical natural scientists are expounded in textbooks and few people read them in the original, the classical works of philosophy must be read in the original in order to gain a full appreciation of philosophical culture. Every great philosopher is unique in his intellectual and moral value; he teaches us to perceive the world and ourselves profoundly and in their most subtle aspects.

What has been said does not, of course, imply that philosophy may ultimately be reduced to a form of art. Philosophical treatises do not become works of art even when they are expressed in the colourful and deeply symbolical language of poetry, as was often the case in ancient times, in the philosophy of the Renaissance and the New Age. Take Plato, for example. He had a colourful world-view, its very form evokes admiration. He is aesthetic all the way through. Or take the philosophical views of the French materialists of the 18th century. They are simultaneously splendid works of art, full of humour, satire and barbed witticisms aimed at religion, scholasticism, and so on. Their works still delight us with the brilliance of their form, which clothes subtle and profound thoughts. Or again, take the philosophical ideas of Tolstoy or Dostoyevsky, in which their masterpieces are steeped. We began by dealing with the aesthetic principle in philosophy. But to a no less degree one can speak also of the philosophical principle in art. Probably the closest thing to philosophy is poetry, which has the power to make laconic but profound generalisations about both social and individual life, moral phenomena, and the relationship between man and the universe.

The metaphorical language of art, far from being alien to philosophy and other sciences, is an essential condition for every new step into the unknown.

The similar and the specific in philosophy and art can also be seen in the nature of generalisation. Philosophy uses generalisations and its generalisations are of an extremely broad, virtually universal character.

Its categories of the general, the particular and the unique are both interconnected and yet separate concepts. In art, on the other hand, the general, the particular and the unique are alloyed in the very fabric of the artistic image. Philosophy is theoretical from beginning to end, whereas art is sensuous and imaginal. Philosophical thought reflects its subject-matter in concepts, in categories; art is characterised, on the other hand, by emotional and imaginal reflection and by transformation of reality. This is not to say, of course, that art, particularly in its verbal form, in *belles lettres*, and even more so in the intellectual type of novel, contains no concepts. Dostoyevsky's novels are three-quarters philosophical. The same applies to the works of Goethe, for example, for whom feeling and a philosophical understanding of nature, expressed in both artistic form and scientific analysis, were his life's work. The scientific, philosophical and artistic approaches were organic in Goethe. His work as a thinker is inseparable from that of the artist. When composing his works of art, he is at the same time a philosopher. He achieves the greatest aesthetic power in those very works (*Prometheus* and *Faust*) where the unity of artist and philosopher is most organic. Can we distinguish clearly between the philosophical and aesthetic principles in *Faust*? All that can be said is that no genius could have created such a work without a synthesis of the philosophical, aesthetic and the scientific.

Without a certain degree of intellect there can be no subtle feelings and from this it follows that art, which aesthetically expresses man's emotional-intellectual world in his relationship to the environment, is bound to feel the impact of philosophy and the other sciences. A world-view may come into art but not as an intrinsic part of it. We can speak of the philosophical content of art, just as we can speak of the philosophical content of science, when the scientist begins to consider the essential nature of his science, its moral value, social responsibility, and so on. These are actually philosophical questions and they do not form part of the specific nature of the given science. Rather they are the self-awareness of the science, just as the artist's reflections on the nature of art, its social meaning, and so on, are the self-awareness of art. And this is in fact philosophy, whose categories permeate all forms of thought, including that of the artist. Without them no artist could generalise, identify the typical in the particular fact, assess the quality of his subject-matter, preserve proportion, the most vital element in aesthetic imagination, or comprehend the contradictions of life in such a way as to give them full expression.

The work of the artist is not spontaneous. It always follows some kind of plan and it is most effective when talent is guided by a world-view, when the artist has something to tell people, much more rarely is it effective when it comes about as a result of the accidental associative play of the imagination, and never is it effective when it is a result of blind instinct. The keen attention that is given to the problems of method is a sign of progress in both modern science and art, a sign of the increasing interaction of all aspects of intellectual life—science, philosophy, and art.

Chapter 2. The System of Categories in Philosophical Thought

Table of Contents

- The Categories of Dialectics
- Matter as the Substance of Everything That Exists
- The Motion of Matter
- Space and Time
- The Principle of Universal Connection and Development
- The Principle of Causality
- System and Structure
- Essence and Phenomenon
- Quality and Quantity
- Negation and Continuity
- Contradiction and Harmony

The Categories of Dialectics

Dialectics and metaphysics. Dialectics is a theory of the most general connections of the universe and its cognition and also the method of thinking based on this theory. Anyone who wants to find a rational orientation in the world and change the world must have a knowledge of the dialectics of life and thought. Dialectical thinking has its roots far back in the past. The most striking example was Heraclitus, who saw the world as being in constant flux, intrinsically contradictory, an eternally living fire blazing up and dying down according to certain laws. The ideas of dialectics run right through the history of the development of human thought. They were profoundly expressed in such great thinkers as Kant and Hegel. In Hegel, dialectics embraces the whole sphere of reality and the life of the mind. Dialectical thought reached its highest peak in the philosophy of Marxism, in which materialist dialectics is expressed in a system of philosophical principles, categories and laws.

Dialectics arose and develops historically in a struggle against the metaphysical method, which is characteristically one-sided and abstract and inclined to absolutise certain elements within the whole. Metaphysical views have taken various historical forms. While Heraclitus stressed one aspect of existence—the changeability of things, which the

Sophists extended to complete relativism, the Eleatic philosophers in their criticism of the Heraclitean principle of flux, concentrated on another aspect, on the stability of existence and went to another extreme in supposing that everything was changeless. Thus, some philosophers dissolved the world in a fiery flux while others crystallised it into immovable rock.

In modern times metaphysics has taken the form of an absolutising of the analysis and classification techniques in the cognition of nature. Because they are constantly repeated in scientific research, the techniques of analysis, experimental isolation and classification have gradually imparted to scientific thinking certain general ideas suggesting that in nature's "workshop" objects exist in isolation, as it were, apart from one another. As philosophy and the specialised sciences have developed the focus of the struggle between dialectics and metaphysics has shifted from attempts to explain the connection of things to interpretation of the principle of development. Here metaphysical thought emerged at first in the form of simple evolutionism, and then in various concepts of "creative evolution". While the former hypertrophies quantitative and gradual changes, ignoring qualitative transitions and breaks in gradualness, the latter absolutise the qualitative, essential changes without perceiving the gradual quantitative "preparatory" processes leading up to them. So metaphysical thought is inclined to "jump" to extremes, to exaggerate some aspect of the object: its stability, recurrence, relative independence, and so on. In cognition this leads to idealism or dogmatism and, in practice, to the justification of stagnation and reaction. The only antidote to metaphysics and dogmatism, which is metaphysics in another form, is dialectics, which will not tolerate stagnation and sets no limits to cognition and its scope. Dissatisfaction with what has been achieved is the element of dialectics, and revolutionary activity is its essence.

Categories. In philosophy, categories are extremely general, fundamental concepts reflecting the most essential, law-governed connections and relationships of reality. Categories are the forms and stable organising principles of the thought process and, as such, they reproduce the properties and relations of existence in global and most concentrated form. Categories are the result of generalisation, of the intellectual synthesis of the achievements of science and socio-historical practice and are, therefore, the key points of cognition, the moments when thought grasps the essence of things. This is the starting-point for

the analysis of the diversity (individual and particular, part and whole, form and content, etc.).

The categories are universal and lasting because they reflect what is most stable in the universe. Moreover, in the process of history the content, role and status of the categories change and new categories (system, structure, for example) arise.

In the present age the rapid and overall development of scientific knowledge goes hand in hand with a process of identification of fundamental concepts which acquire the significance of categories inasmuch as they perform in relation to specific fields of knowledge a function comparable to that of philosophical categories, for example, information, self-regulation, symmetry, and so on, and also constitute the subject-matter of a specific science, that is to say, they are universal and non-variable in relation to a great number of special concepts of such a science (for example, the categories of organism or species in biology, the categories of image, action, motive in psychology, the categories of element in chemistry, of particles and fields in physics, and of commodities and value in political economy). This prompts us to investigate the system of scientific categories as something with its own specifics, something that does not coincide with the system of philosophical categories, although it is closely connected with that system. By tracing the system of scientific categories we can uncover the logic of development of any given science, the law-governed transformation of its conceptual build-up. The categories of philosophy, which constantly accumulate the results of the development of the specialised sciences, help us to identify and synthesise the elements of world-view and methodology in scientific thought.

The categories bear a certain relation to one another and constitute a system. They are so interconnected that each can only be understood as an element of the whole. The initial categories for the whole system are those of matter and consciousness. They provide the trunk from which all the various branches of the other categories stem.

Matter as the Substance of Everything That Exists

The general concept of matter. The first thing that strikes the imagination when a person observes the world around him is the amazing variety of objects, processes, qualities and relationships. We are surrounded by forests, mountains, rivers, seas. We observe stars and planets, we admire the beauties of the Aurora Borealis, the flight of comets. There is no end to the diversity of this world, and to save themselves from drowning in this ocean of diversity people have from time immemorial sought something uniform.

In observing the phenomena of growth and decay, integration and disintegration, the ancient thinkers noticed that certain properties and states survived all transformations. They called this constantly surviving basis of things the primordium. This was the first attempt to achieve philosophical monism. Some philosophers believed that all things consisted of liquid matter (water), others thought it was fire, still others, water, fire, earth and air. This natural view of the origin of the diversity of the world was the starting-point for the scientific explanation of many phenomena of nature and society. The idea of the atomic structure of matter arose in 500 B.C.

At the end of the 19th century the atomistic conception of the structure of matter surprised scientists by reaching beyond the boundaries of its mechanistic interpretation. The atom turned out to be divisible and made up of electrically charged particles. In the atom scientists discovered a whole world of nuclei, electrons, and electromagnetic fields. This marked a huge step forward in the study of matter. Physicists concluded that "matter, of which we and all things around us are made, is not solid and indestructible, but unstable and explosive. Quite literally, we are sitting on a powder keg. To be sure, this keg has rather strong walls, and we required a few thousand years to drill a hole in it. But today we have done it, and we may at any moment blow ourselves sky-high."¹

The discovery of the electron was followed by other discoveries, one of the most crucial being the idea of the electrical nature of matter. The age of electricity had dawned. Maxwell's theory of electro-magnetism developed the conception of the physical field.

¹ Max Born, *My Life and My Views*. Introduced by I. Bernard Cohen Charles Scribners' Sons, N.Y., 1968, p. 67.

While applied science continued its triumphant march, philosophy and natural science sought further clues to the structure of matter.

Taken together, these new discoveries were dialectical in character. The revolution in natural science called for a radical review of former theories and scientific facts, particularly the connection between matter, motion, space and time. The scientific picture of the world that gradually came into focus showed that it was change, transition, transformation and development that required explanation. But scientific thinking was still in bondage to mechanistic tradition. Scientists still tended to think that the particles of the atom, if only their motion could be observed in detail, must obey the same laws of mechanics as the planets, whose position could be predicted for thousands of years ahead. But as research into the structure of the atom advanced, it became increasingly clear that the behaviour of electrons did not obey the classical laws of mechanics.

The new forms of reality were described in mathematical formulae. The age of mechanical models was over. However, thinking possesses a certain inertia: new facts were squeezed into the framework of old concepts. For two centuries Newton's classical mechanics had been considered a perfect picture of the universe. Its limitations, however, were revealed by Einstein's relativity theory and this launched an agonising process of breaking up the old, habitual notions. A good many eminent physicists who had only a mechanistic view of the world, which they identified with materialism in general, were influenced to some degree by idealism. Some physicists and philosophers believed that only sensuously palpable phenomena, things that could be seen, touched, and smelled were material. But microphenomena are beyond the range of direct perception. In this strange world matter appeared in a new light, without colour, smell, solidity, without any of the properties with which people had come to associate the concept of the material. On the basis of the new data of science, new concepts were evolved that contradicted the "obvious" but corresponded to the latest experimental results and scientific thinking. On the other hand, the impossibility of perceiving microphenomena directly suggested that these phenomena were non-material. Matter came to be regarded either as an aggregate of electrons or as a form of energy, or even as any stable set of sensations. Some scientists and philosophers found it difficult to understand that out there in the infinite depths of this world that was diminishing into invisibility there could be any vehicle or measure of materiality.

In the old days, mass had been considered the measure of the quantity of matter. The discovery of the inconstancy of mass, its variability depending on the velocity of bodies, was taken to mean that matter had disappeared and materialism was bankrupt. Forgetting the earthy roots of all mathematical constructions, some scientists began to claim that these constructions were the result of pure thought. "Matter has disappeared and there is nothing left but equations," they declared.

Lenin described the situation in physics as a methodological crisis and called the scientists who had taken up the positions of idealism "physical" idealists.

Philosophers and natural scientists in some countries today tend to identify the concept of matter with that of substance. In this way, while appearing to criticise vulgar materialism, they actually criticise dialectical materialism. Some of them believe, for example, that atoms may be deprived of the status of physical reality on the grounds that no one has ever seen an atom and what cannot be perceived does not exist.

It should not be assumed that such scientists deny the existence of the world. They do not, of course, doubt its empirical reality. The expressions "matter has disappeared" and "matter may be reduced to electricity" are merely philosophically inept expressions of the truth that new forms and types of motion of matter have been discovered.

Matter is everything that surrounds us, that exists outside our consciousness, that does not depend on our consciousness, and that is or may be reflected directly or indirectly in consciousness. All the sciences study certain properties and relations of specific forms of matter, but not matter in its most general sense. The philosophical understanding of matter retains its significance whatever the discoveries of natural science. The concept of matter does not epistemologically mean anything except objective reality existing independently of human consciousness. Moreover, matter is the only existing objective reality: the cause, foundation, content and substance of all the diversity of the world.

It is the substratum, that is to say, the vehicle, the bearer of all properties and relationships of everything that exists. In all the visible changes that occur in things, in all processes, in their properties and relationships there must be some underlying vehicle of these transformations and changes. That which passes into something else and assumes a different form remains unchanged and this underlying, most general vehicle, that is, the substance, of all that exists, is matter.

Every new scientific discovery —of elementary particles, fields, their transmutations, and so on— means another step forward in concretising the concept of matter.

Matter manifests itself in innumerable properties. The most important are objective existence, structure, indestructibility, motion, space, time, reflection and information. These are the attributes of matter, that is to say, its universal, intransient properties without which it could not exist.

According to Lenin's definition, "matter is a philosophical category denoting the objective reality which is given to man by his sensations, and which is copied, photographed and reflected by our sensations, while existing independently of them."² This definition of matter is opposed to both objective and to subjective idealism, which believes that all the objects around us are nothing but aggregate states of consciousness, "sets of sensations".

The oversimplified definition of matter as substance made it impossible to apply the category of matter in explaining the life of society. But the dialectical interpretation of matter embraces not only the natural forms of its existence but also the social forms, human society being the highest form of the motion of intellectualised matter.

One quite often hears people say "all things consist of matter". They do not consist of matter. They are the specific, concrete *forms of its manifestation*. Matter as such is an abstraction. Looking for a uniform matter as the principle of everything is like wanting to eat not cherries but fruit in general. But fruit is also an abstraction. Matter cannot be contrasted to separate things as something immutable to something mutable. Matter in general cannot be seen, touched or tasted. What people see, touch or taste is only a certain form of matter. Matter is not something that exists side by side with other things, inside them or at their basis. All existing formations are matter in its various forms, kinds, properties and relations. There is no such thing as "unspecific" matter. Matter is not simply the real possibility of all material forms, it is their actual existence. The only property that is relatively separate from matter is consciousness as an ideal and not material phenomenon.

The material unity of the world. Any to some extent consistent philosophical theory can infer the unity of the world either from matter or from the spiritual principle. Consequently, the principle of monism is also consistent with idealism. In the first case we are dealing with

² V. I. Lenin, "Materialism and Empirio-Criticism", *Collected Works*, Vol. 14, p. 130.

materialist monism and in the second, with idealist. Fichte, for example, insisted that one of the two must be got rid off: [sic] spirit or nature. From this standpoint the combining of the two is totally impossible and their "apparent" unity is, he alleged, partly hypocrisy, partly a lie, and partly subjective inconsistency.

Some philosophical theories have maintained positions of dualism — acknowledging two parallel but independent worlds, the world of the spirit and the world of matter.

Some philosophers see the unity of objects and processes in their reality, that is, in the fact that they exist. This is indeed the general principle that unites everything in the world. But can the very fact of existence be regarded as a basis for the unity of the world? This depends on how reality itself is interpreted, what is meant by reality: existence may be material or spiritual, imaginary. The theologians, for example, believe that God is real, that he exists but does not possess objective reality. He is unimaginable. Our feelings, thoughts, aspirations and aims are also real —they exist. Yet this is not objective but subjective existence. If existence is the basis of the unity of the world, then it is so only if we are talking about not subjective hut objective existence.

The actual unity of the world lies in its materiality. There can be nothing in the world that does not fit into the concept of matter and its multiform properties and relations. The principle of the material unity of the world signifies not an empirical similarity or identity of concrete material systems, elements and laws, but the universality of matter as substance, as the carrier of multiform properties and relations. There is no mountain supposedly towering above the world that science can climb and from its peak see the world as a whole. It is against logic to simply transfer the principles of the known part of the world to the world as a whole. "Being, indeed, is always an open question beyond the point where our sphere of observation ends."³ At the same time the world is one and indivisible and there is not and cannot be anything supernatural in that sphere of being that is so far beyond our knowledge. The part of the world that we see is interconnected and in a state of continuous interaction with other parts of the world. The known part of the universe is, at least to some extent, related to the universe as a whole; since it is part of this whole, it is not something alien to it.

The unity of the world is expressed in the classification of the sciences, which records the connections between them that have

³ Frederick Engels, *Anti-Dühring*, Progress Publishers, Moscow, 1975, p. 58.

objective content. The infinite universe, both in great things and in small, in the material and the spiritual spheres consistently obeys universal laws that connect every thing in the world and make it a single whole.

The principle of materialist monism also applies to society. Social being determines social consciousness. Materialist monism rejects views that single out consciousness and reason as a special substance contrasted to nature and society. Consciousness is, in fact, cognition of reality and a part of that reality. There is no gulf between the laws that govern the motion of the world, and human consciousness. Consciousness belongs not to any transcendental world but to the material world. It is not a supernatural unicum but a natural attribute of highly organised matter.

Matter is the cause and basis of all the world's diversity. It holds all the secrets of existence and all the ways of knowing them. The category of matter is reality rich in colours and forms. Its cognition begins when we state that an object exists without yet knowing its attributes.

Acknowledgement of matter as the substance of everything that exists is a crucial methodological principle. To the extent that they have any objective content all fields of knowledge and culture rest entirely on the assumptions of the materialist world-view, although by no means all scientists and artists are aware of this indisputable fact. Science is materialist to the core. Anything in it that is not materialist is not scientific either. All creative activity is based on the one axiomatic proposition concerning the reality of the object of study, the reality of the world. No one can think creatively without recognising this proposition. Consistent application of the principle of materialism presupposes that one is able in any inquiry to separate the objective from the subjective, actual processes from their interpretations, the target of research from the means and forms of its cognition.

The structure and indestructibility of matter. Matter has a heterogeneous, "granular", discontinuous structure. It consists of bits that vary in size and quality: elementary particles, atoms, molecules, macromolecules, stars and their systems, galaxies, and so on.

The "discontinuous" forms of matter are indissolubly connected with the "continuous" forms. The latter are different types of fields—gravitation, electromagnetic and nuclear. Some physicists want to retain the concept of ether but at a new level of comprehension, in the form of an all-pervasive vibrating cosmic medium possessing no mass. Physical fields connect the particles of matter, allow them to interact and thus

exist. So without the field of gravitation nothing would connect the stars in the galaxies or substance itself in stars. There would be no solar system, no sun, no planets. All bodies in general would cease to exist. Without electrical and magnetic fields nothing would connect atoms into molecules and electrons and nuclei into atoms.

This universal connection and interaction forms an attributive definition of substance and presupposes the mutual reflection and circulation of information in the universe. The concept of information has gradually expanded to embrace not only human communication but also the communication between living organisms and the various systems in each organism, the mechanisms of heredity, and finally, the physical objects, the entire surrounding world. The phenomenon of information may today be regarded as an all-embracing attribute of matter in motion, as the definition of all the interactions in the world.

The orderliness of matter has its levels, each of which is characterised by a special system of laws and by its own vehicle. This is the submicro-elementary level —the hypothetical form of existence of the matter of fields from which elementary particles are born (micro-elementary level); the next stage is the nucleus (nuclear level), from nuclei and electrons there come atoms (atomic level), and from them molecules (molecular level), from molecules there are aggregates—gaseous, liquid, and solid bodies (macroscopic level). The bodies thus formed make up the stars and their satellites, the planets and their satellites, the stellar systems and the metagalaxies that embrace them, and so on to infinity (cosmic level).

Besides the substance condensed in the form of celestial bodies, there is also diffused matter in the universe. This exists in the form of detached atoms and molecules and also gigantic clouds of gas and dust of varying density. All this taken together with irradiation constitutes the boundless universal ocean of rarefied substance in which the celestial bodies appear to float. The cosmic bodies and systems have not existed since time began in their present form. They take shape as a result of condensation of nebulae that formerly occupied vast spaces. Consequently, cosmic bodies arise from a material environment as a result of the intrinsic laws of the motion of matter itself.

After the material formations had risen from the atomic level to the higher, molecular level, there followed a process of complication of chemical substances that lasted for billions of years. The gradual complication of the molecules of carbon compounds led to the formation of organic compounds (organic level). Little by little

increasingly complex organic compounds were formed. And finally came life (biological level). Life was the necessary, law-governed outcome of the development of all chemical and geological processes on the Earth's crust. The evolution of life proceeded from primitive, pre-cellular forms of protein existence to cellular organisation, to the formation first of the unicellular, and then multicellular organism with increasingly complex structures —the invertebrates, the vertebrates, the mammals, and the primates. The primates were the final stage in the evolution of organic nature and the starting-point for the origin of man. We thus find ourselves standing on the last rung of the majestic ladder of the progressive development of matter (social level). It is also conceivable that there may be gigantic cosmic civilisations created by rational beings (metasocial level) beyond the range of terrestrial civilisation.

It may be assumed that in the present age Earth is the only habitation of conscious life in the Galaxy and perhaps in much larger space-time scales of the universe. Do life and mind exist in outer space? If so, what attribute of what material organisation can they be? If we assume that the universe is infinite, it is scarcely conceivable that life is a pure accident, the possession only of overfavoured Earth. At any rate we have no grounds to feel oppressed by a sense of loneliness in the infinite vastness of the universe.

The concept of structure is applicable not only to the various levels of matter, but to matter as a whole. The stability of the basic structural forms of matter is predicated on the existence of an integral structural organisation of matter, which stems from the close interconnection of all the levels of structural organisation known to us today.

In this sense we can say that every element of matter bears the imprint of the universal whole. The various kinds of particles are not only "elements" of the discontinuous structure of matter, but also "stages", "key points" in its development.

The dialectical conception of matter contests any absolutising of the specific, concrete forms and properties of matter; it orients science on a search for new, as yet unknown forms and properties of the real world. Science, if it is objective, proceeds along this path: discovery of the laws of the structure of the atom, of elementary particles, including electrically neutral particles, investigation of various nuclear reactions. Quite recently science penetrated the structure of elementary particles and came to grips with research into the physical vacuum —a special kind of field that may be regarded as a reservoir, from which elementary particles are born and into which they are transformed. Lenin's

philosophical prediction that the electron is as inexhaustible as the atom, that nature is infinite, is coming true.

The impossibility of reducing one structural level of matter to another. Any object or process in the world arises only from other objects and cannot disappear without giving rise to some other object. This is a fundamental proposition of all forms of materialism. What distinguishes the dialectical conception of matter is its denial of the possibility of reducing matter to one or a few simple forms, as mechanistic materialism does. Physics cannot be reduced to mechanics, chemistry to physics, and biology cannot be reduced to an aggregate of mechanical, physical and chemical phenomena. Nor can society be reduced to all the other forms of organisation of matter. Thus biological organisation has a special meaning which cannot be explained in the framework of the physical picture of the world. In the realm of the animate we are concerned with such specific phenomena as adaptation, metabolism, growth and procreation, the struggle for existence, mutation and heredity. There is none of this in non-organic nature. In the living organism even the purely physical and chemical processes are subordinated to certain biological tasks. We cannot explain by purely physical or chemical laws why the ape can sacrifice its life to save its young, or why a bird will sit for weeks to hatch out its eggs.

While stressing the need to take into consideration the specifics of each structural level of matter, we must at the same time remember certain general laws inherent in all levels and also the connection and interaction between the various levels. This connection shows itself mainly in the fact that simple forms of organisation always go hand in hand with complex forms. The higher level includes the lower as one of its genetic preconditions and at the same time as one of its own elements. The physics of elementary particles has not only "conquered" chemistry. It has begun to tackle living substance —biology. Humanity today stands on the threshold of completely new, extraordinary discoveries which will hand us the master microkeys to processes occurring in animate matter, including man. Biologists have proved that heredity is conditioned by the nucleus of the cell, the chromosomes, which transmit hereditary characteristics. It turns out that the answer to one of the most intimate questions of biology depends to a great extent on chemistry, and that life is the chemistry not only of protein bodies but also of chemical components, particularly the nucleic acids.

Scientific development has shown that progress in physiology and biology depends to a large extent on progress in the physics and

chemistry of organisms, including the physico-chemical investigation of nervous activity.

If we try to reduce the more complex forms of motion to the simple forms we may backtrack into mechanism. Ignoring the unity and connection of the various forms of the motion of matter may lead to attempts to regard motion in isolation from its vehicle, for example, heredity without its material substratum. It is precisely on the molecular level that our ideas of the subtle mechanisms of heredity have materialised.

However, the higher forms of organisation are not included in the lower forms. Life is a form of organisation inherent in protein bodies. There is no life in non-organic bodies. The chemical form of organisation is inherent in chemical elements and their compounds, but it does not exist in such material objects as photons, electrons, and other similar particles.

Since the complex forms of the organisation of matter include the lower forms as subordinate elements, we must take this into consideration and in studying animals and plants, for example, apply not only the leading biological methods but also physico-chemical methods in a secondary capacity.

At the same time the study of biological phenomena enriches chemistry and physics. Knowledge of the lower levels as components of the higher levels helps us to get a deeper insight into the highest level of organisation of matter. Thus, chemistry in studying structures at the molecular level has achieved considerable successes thanks to the appearance of quantum mechanics, which has revealed certain peculiarities in the structure of the atomic level. This is understandable because chemical reactions at the molecular level are connected with intra-atomic processes.

The uncreatability and indestructibility of matter. One of the attributes of matter is its indestructibility, which is displayed in a set of specific laws of the conservation of matter in the process of its transformation. In studying the foundation of matter modern physics has demonstrated the universal transformability of elementary particles. In the continuous process of interchangeability matter is conserved as substance, that is to say, as the base of all change. The cessation of mechanical motion owing to friction leads to an accumulation of internal energy in the body in question and intensification of the heat motion of its molecules. Heat motion in its turn may become chemical or electromagnetic motion. In the microcosm the particles of matter are

transformed into radiation. The law of the conservation and transformation of energy states that no matter what processes of transformation occur in the world, the general quantity of mass and energy remains unchanged. Any material object can exist only in connection with others and through them it is connected with the rest of the world. The destruction of a concrete thing means only that it has turned into something else. The birth of a concrete thing means that it has arisen from something else. For nature the "destruction of the particular" is the performance of the same necessity in the global play of life forces as its emergence. The world as a whole continues to exist only thanks to the continuous and partial destruction of itself. That matter is conserved becomes apparent only in the process of mutation of its forms.

The principle of the indestructibility and uncreatability of matter is of great importance in forming a world-view and a methodology. Guided by this principle science has discovered the laws of the conservation of mass, energy, charge, parity and other fundamental laws that have enabled us to reach a deeper and fuller understanding of the processes at work in various fields of nature. The crucial laws of scientific cognition also aim us against idealist views, such as creationism. Some scientists maintain, for instance, that atoms are from time to time "created" out of nothing, that is to say, at a certain moment certain atoms comprising matter allegedly do not exist but the next moment they exist, having appeared out of nothing.

The indestructibility of matter cannot be understood only in terms of quantity. The laws of conservation also presuppose qualitative indestructibility. Ignoring this aspect of the laws of conservation inevitably leads to mistakes, an example of which is the idea of the heat death of the universe. This theory alleges that all forms of motion must turn into heat, which will ultimately disperse in universal space. The temperature of all bodies will be equalised and all motion will cease. There will be neither light nor heat. Everything will die. And this will be the end of the world! According to this conception the universe lives its life and follows the path from birth to death like all the rest of us; science knows no other change except the transition to senility, and no other process but motion towards final oblivion. We see the stars constantly turning into radiation just as eternally and unceasingly as mountains of ice melt in a warm ocean. Today's sun weighs many billions of tons less than the sun of a month ago. Since other stars are melting in the same way, the universe as a whole is now less substantial. Not only the quantity of matter in the universe is diminishing, but even

what is left is constantly escaping into the icy cold of outer space at colossal and ominously increasing speeds. The universe seems to be running away from us and dissolving like a vision into oblivion.

Research has shown, however, that heat death is impossible. The ceaseless process of conversion of all forms of motion into heat is accompanied by an equally unceasing process of the conversion of heat into other forms of motion. The stars are not only cooling; other stars are being born and growing brighter. There is nowhere for matter to appear from and nowhere for it to go. It is the source, the cause, and the consequence of itself. It owes nothing to anything or anyone for its existence.

The Motion of Matter

Motion and its forms. The world is in constant motion. It has no "days-off". It never gets tired. The billions of stars that we admire on a clear night and that seem motionless to the naked eye are moving at colossal speeds. Every star is a sun with its own ring of planets. The stars and the satellites circling round them also revolve on their own axis and participate in the turning of the whole galaxy around its axis. Moreover, various parts of the galaxy have different cycles. Our galaxy moves in relation to other galaxies. And there is no end to these whimsical courses of the universal round about.

At a certain stage in their evolution some stars explode and flare up like huge cosmic fireworks. Our Sun is a blazing fiery hurricane. Its whole surface is in a state of bubbling, erupting agitation. Colossal fiery waves pass over the turbulent solar surface. Huge fountains of flame—the protuberances — spurt to heights of hundreds of thousands of kilometres. The gigantic streams of internal heat that come to the surface are poured forth into space in the form of radiation. Many thinkers have perceptively noted the astonishing activity of matter, its tremendous internal energy. As Francis Bacon, for example, put it, "matter, surrounded by a sensuous, poetic glamour, seems to attract man's whole entity by winning smiles".¹ In view of this indefatigable activity of matter it would hardly be possible to create an unbridgeable gap between its living and inorganic forms. Apparently they have more in common than is visible to the eye.

Motion is the mode of existence of matter. To be means to be in motion. The world is integrating and disintegrating. It never attains ultimate perfection. Like matter, motion is uncreatable and indestructible. It is not introduced from outside but is included in matter, which is not inert but active. Motion is self-motion in the sense that the tendency, the impulse to change of state is inherent in matter itself: it is its own cause.

The forms and kinds of motion are manifold. They are connected with the levels of the structural organisation of matter. The basic forms are motion of elementary particles, appearance and interaction of atoms and molecules, the chaotic displacement of particles in the form of heat motion, the mechanical motion of macroscopic bodies, the biological motion with all its diverse manifestations, the life of human

¹ See K. Marx and F. Engels, "The Holy Family", *Collected Works*, Vol. 4, Progress Publishers, Moscow, 1975, p. 128.

society and, finally, a quite conceivable metasocial form of motion in the shape of extremely intricate connections between various civilisations on a cosmic scale. Every form of motion has its "vehicle"—substratum. Thus elementary particles are the material vehicles of the diverse processes of intermutations. The elements of the atomic nucleus are the material vehicles of the nuclear form of motion, the elements of the atom, of intra-atomic form of motion, the elements of molecules and molecular compounds, of the chemical form of motion, and so on up to the social form of motion, which is the highest of all known forms.

The motion of any thing occurs only in relation to that of another. The motion of a separate body is an absurdity. Essentially motion is nothing but the interaction of things as a result of which they change. "Is it permissible to consider the motion of only one body in the entire universe? By the motion of a body we always mean its change of position in relation to a second body. It is, therefore, contrary to common sense to speak about the motion of only one body."² In order to study the motion of any object one must find another object in relation to which one can consider the motion that interests us. This other object is known as the system of reference.

Motion is intrinsically contradictory. It is a unity of change and stability, of disturbance and rest. Thus any change in structural elements, properties or relations takes place along side the conservation of certain other elements and every conservation takes place only through motion. In general, in the endless flux of ceaseless motion there are always moments of stability, expressed above all in conservation of the state of motion, and also in the form of equilibrium of phenomena and relative rest. No matter how much an object changes, it retains its own particular character for as long as it exists. A river does not cease to be a river because it flows. Flow is, in fact, the very thing that makes a river what it is. Possessing absolute rest means ceasing to exist. Everything in a state of relative rest is inevitably involved in some kind of motion and ultimately in the infinite forms of its manifestation in the universe. Rest always has only an apparent and relative character. Bodies may rest only in relation to a given system of reference, conventionally regarded as motionless. For example, we are motionless in relation to a given building and it is motionless in relation to the Earth. But we are continuously moving with the Earth and the Earth,

² Albert Einstein and Leopold Infeld, *The Evolution of Physics. The Growth of Ideas from Early Concepts to Relativity and Quanta*, Simon and Schuster, N.Y., 1942, p. 222.

together with its envioning air ocean, is revolving on its own axis and around the Sun.

The unity of matter and motion. Motion was not always regarded as an inseparable attribute of matter. In the history of philosophy and natural science there existed two opposite points of view: one of them, energism, absolutised energy, the other, mechanism, regarded matter as a passive principle with no intrinsic activity. In order to set it in motion there had to be a "divine first push". In various sciences this doctrine took the form of notions of hidden forces, "minor ghosts" (the life force, spirit, etc.). This was a search for non-mechanical causes of various phenomena. The idealists maintained and still maintain that spirit is the active, creative principle, while matter is inert.

The absolutising of energy was expressed in the conception of energism. The German scientist Wilhelm Ostwald believed that there was nothing in the world but energy. What did any person feel when he was struck with a stick —the stick or the energy? Only energy, said Ostwald. And wherever people were accustomed to feeling and seeing matter, according to Ostwald, they were feeling and seeing only "pure energy". The discovery of the law of the conservation and transformation of energy and the successes of thermodynamics as applied to numerous natural phenomena encouraged thinkers to turn "pure" energy into an absolute, the ultimate content of everything that exists. But pure energy is an abstraction. Energy is one of the characteristics of the intensity of the interaction of material objects; energy is motion, which is impossible without a material vehicle, just as thought is impossible without a thinking brain or blueness without something that is blue.

In the process of scientific research one often has to single out the energetic aspect of processes and disregard their vehicles. This is a justifiable abstraction. While the real structure of elementary particles, for example, is unknown one has to confine oneself to an energetic description of interconversion processes. But this absolutisation leads to energy, as a quantity surviving in all these processes, being sometimes interpreted as indestructible, as a stable substance from which elementary particles, as it were, are "made". Sometimes photons are identified with "pure energy". The discovery of light pressure showed that photons (light) are infinitely small accumulations of matter possessing not only energy but also mass. The law connecting the mass and energy of material objects is sometimes interpreted in the spirit of energism. Erroneously identifying mass with matter, the energists assume that matter may turn into a concentration of pure energy. It is

The Motion of Matter

well known, however, that mass is not matter, but only one of its properties. And the meaning of Einstein's energy equation $E=mc^2$ is that as mass increases, so, too, does energy, a material object possesses a certain mass and a corresponding amount of energy. Matter cannot change into any of its properties: it is the vehicle of all their infinite diversity. Mass is the measure of such properties of matter as inertia and gravitation, while energy is the measure of its motion. So the mass-energy law reflects and proves the inseparability of the properties of matter and motion. Motion has both a spatial and temporal character.

Space and Time

The concept of space and time. All material bodies have a certain extension: length, breadth, height. They are variously placed in relation to each other and constitute parts of one or another system. Space is a form of coordination of coexisting objects and states of matter. It consists in the fact that objects are extraposed to one another (alongside, beside, beneath, above, within, behind, in front, etc.) and have certain quantitative relationships. The order of coexistence of these objects and their states forms the structure of space.

Material phenomena are characterised by their duration, the sequence of the stages of their motion, their development. Processes may take place either simultaneously, or precede or succeed one another. Such, for example, is the interrelation between day and night. The dimension of time can be measured only with the help of certain standards (in seconds, minutes, hours, days, years, centuries, etc.), that is to say, motions that are accepted as being even. The perception of time also allows us to assess the sequence and duration of events. Depending on our subjective sensations such as merriment or grief, pleasure or boredom, time seems either short or long. Time is a form of coordination of objects and states of matter in their succession. It consists in the fact that every state is a consecutive link in a process and has certain quantitative relations with other states. The order of succession of these objects and states forms the structure of time.

Space and time are universal forms of the existence of matter, the coordination of objects. The universality of these forms lies in the fact that they are forms of existence of all the objects and processes that have ever existed or will exist in the infinite universe. Not only the events of the external world, but also all feelings and thoughts take place in space and time. In the material world everything has extension and duration. Space and time have their peculiarities. Space has three dimensions: length, breadth and height, but time has only one—from the past through the present to the future. It is inevitable, unrepeatable and irreversible.

Correct understanding of the essence of space and time is closely connected with the scientific picture of the world. Everything is differentiated, broken down into relatively stable extraposed material formations. The processes that occur in them and condition their conservation (reproduction) and at the same time their transformation,

are also differentiated: they constitute the consecutive change of the states of an object.

Space and time exist objectively. Although we may feel how time in its inexorable passage is carrying us away, we can neither halt nor prolong it. We cannot recover a single moment of existence. The flow of time is beyond our control. We are as helpless in it as a chip of wood in a river.

Dialectics proceeds from acknowledgement of the unity of motion, space, time and matter, which is expressed in the principle that various forms of the structural organisation of matter and the levels of this organisation are characterised by their specific motion, space and time. Thus the spatial organisation of a crystal differs from that of a blossoming rose. The time of historical events occurs, is experienced by their participants and is preserved in the memory of mankind and this kind of time differs from the purely physical time of, say, the motion of the celestial bodies. However, metaphysical thought separates matter from motion, and both of them, from space and time. Newton, for example, assumed that space was the empty container of things, that it was incorporeal, absolutely penetrable, never influenced anything and was never affected by any influence.

Universal space was considered to be filled with absolutely motionless ether, and moving bodies were thought to encounter an "ethereal wind" like the wind that resists a running person. Space was allegedly immutable and motionless, its attributes did not depend on anything, even time; nor did they depend on material bodies or their motion. One could remove all bodies from space and space would still exist and retain its attributes. Newton held the same views about time. He believed that time flowed by in the same way throughout the universe and this flow did not depend on anything; time was therefore absolute. Like a river, it flowed on of its own accord, heedless of the existence of material processes.

The idea of absolute space and time corresponded to the physical picture of the world, namely the system of views of matter as a set of atoms separated from each other, possessing immutable volume and inertia (mass), and influencing each other instantaneously either at a distance or through contact. Revision of the physical picture of the world changed the view of space and time. The discovery of the electromagnetic field and the realisation that field could not be reduced to a state of mechanical environment revealed the flaws in the classical picture of the world. It turned out that matter could not be represented

as a set of separate, strictly dissociated elements. The particles of matter are indeed connected with one another in integral systems by fields whose action is transmitted at a finite speed that is equal for any closed system (the speed of light in a vacuum).

It was held previously that if all matter disappeared from the universe, space and time would remain. The theory of relativity, however, maintains that with the disappearance of matter space and time would also disappear.

To sum up, everything in the world is spatial and temporal. Space and time are absolute. But since these are forms of matter in motion, they are not indifferent to their content. When it moves, an object does not leave an empty form behind it, space is not an apartment that can be let out to such a tenant as matter, and time cannot be compared to some monster that gnaws at things and leaves its tooth marks on them. Space and time are conditioned by matter, as a form is conditioned by its content, and every level of the motion of matter possesses its space-time structure. Thus living cells and organisms, in which geometry becomes more complex and the rhythm of time changes, possess special space-time properties. This is biological time. There is also historical time, whose unit may be the replacement of one generation by another, which corresponds to a century. Depending on our practical needs, historical time is counted in centuries and millennia. The reference point may be certain cultural-historical events or even legends.

The finite and the infinite. Whose imagination has not been stirred by a mysterious sense of the vastness of the universe? What man has looked up at the dark sky glittering with its myriads of stars and not been awed by the glamour of outer space? Whose heart has not been moved by the majestic splendour of the nocturnal heavens?

In our everyday lives, our dealings with everything around us, we encounter finite objects, processes. The finite means something that has an end, that is limited in space. In everyday practice we may mean by infinity anything very big or very small, depending on the circumstances. For example, one billion raised to the power of one hundred is in practice an infinite quantity. Our experience is too limited for us to be able to define infinity. Scientists like to joke that they begin to understand infinity only when they think of human folly. One may throw a spear from a certain point in space and from the place where it lands one may repeat the throw. And one may go on doing this again and again, never reaching any boundary. No matter how distant a star may be from us we may still go further than that star. The universe is never

"boarded up". Infinity cannot be traversed to its end. Such infinity would be a "false" infinity. True infinity means constant going beyond the limits of the finite. The universe is not given in any cut-and-dried form, it is constantly reproducing itself; it is a reality that is constantly recreated. The infinite manifests itself in the finite and through the finite. Through the finite we come to an understanding, a knowledge of the infinite. The finite is a constantly appearing and disappearing moment of an infinite process of change. Change in general is associated with an object's going beyond its spatial, temporal, quantitative and qualitative limits. The very fact of the interaction of things is constant going beyond the limits of finite, individual existence. In this constant "going beyond oneself" into outer being, lies the infinite nature of the finite. An object has innumerable relations with other objects. Thereby it acquires an infinite number of properties. And in this sense infinity implies qualitative diversity, realised in space and time.

We have advanced from the scale of the Earth to the expanses of outer space, to time that has no beginning and no end. This is extensive infinity. We ourselves appear to be standing midway between the infinite expanses of the universe with its worlds that are known or unknown to us and the equally infinite depths of the world of the smallest particles of matter, which is intensive infinity. We are the junction, as it were, of roads that lead away into the infinitely large and the infinitely small. We are mere specks of dust in comparison with the stars and at the same time we are giants compared to the tiny microorganisms that swarm in every drop of water.

Thought has penetrated from regions describable only in terms of millions of light years to regions that may be measured in trillionths of a centimetre! And there, too, we find the properties of the finite and the infinite. Thus, many physicists assume the existence of a certain basic length—the spatial quantum. It would, they say, be as pointless to consider any smaller length as it would be to consider, for example, a quantity of gold less than one atom, because such a quantity would not even constitute the given chemical element. So scientists assume the existence of "atoms" of space. From this follows the recognition of minimal time, beyond whose limits the concept of phase, that is to say, changes of state in time, loses all meaning.

At attempt to refute the theory of the infinity of the universe is to be found in the concept of the "expanding" universe. James Jeans, for example, assumed that not only was the quantity of matter in the universe diminishing, but also that any matter that remained was constantly receding into space at colossal and ominously increasing

speed. And yet there are no valid grounds for such conclusions. The metagalaxy in which we observe this centrifugal movement of the galaxies, despite its enormous size as it appears to us, is only a tiny particle in the infinite universe, so it cannot be assumed that the whole universe is "expanding".

To sum up, all objects and processes in the world are finite. But the totality of finite things and processes is infinite. The universe had no beginning, has no end and is inexhaustible. Beyond the most distant stellar systems that modern science and technology have permitted us to observe there are still other gigantic celestial bodies. And so on ad infinitum. There are no limits beyond which there might be something that cannot be embraced by the concept of objective reality and there is nothing above it or outside it. Objective reality is in everything. It is everything. The concept of limit has meaning only when applied to the finite. Neither our distance-bound imagination nor the spacemen of the future can ever encounter some supernatural obstacle such as non-existence. They will never run into something that differs from matter. No matter how much time passes prior to some event, time will go on after it. No matter how long ago a certain event took place, it was preceded by countless other events. The chain of events has never been broken. Its links are numberless. In the universe as a whole there is no initial or culminating point; the universe is equally open at both ends. If time were finite, the world must have had a beginning. To acknowledge the beginning of the world's existence in time would be to acknowledge creation and, consequently, a creator.

The concept of beginning is meaningful when applied not to the universe as a whole but only to separate, specific things and processes, that is to say, to the finite. We can set no limits to the universe as a whole. It categorically forbids us to do so. It is ageless. It is infinitely old and eternally young. Someone once wittily remarked that he could not imagine the universe having lived its life and sadly vegetating for the rest of eternity.

The Principle of Universal Connection and Development

The concept of universal connection. Nothing in the world stands by itself. Every object is a link in an endless chain and is thus connected with all the other links. And this chain of the universe has never been broken; it unites all objects and processes in a single whole and thus has a universal character. We cannot move so much as our little finger without "disturbing" the whole universe. The life of the universe, its history lies in an infinite web of connections.

Whereas the interconnection of things is absolute, their independence is relative. In the sphere of non-organic nature there exist mechanical, physical and chemical connections, which presuppose interaction either through various fields or by means of direct contact. In a crystal, which is an ensemble of atoms, no individual atom can move in complete independence of the others. Its slightest shift has an effect on every other atom. The oscillations of particles in a solid body are, and can only be, collective. In living nature there exist more complex connections —the biological, which are expressed in various relations between and within species and also in their relations with the environment.

In the life of society connections become more complex and we have production, class, family, personal, national, state, international and other relationships.

Connections exist not only between objects within the framework of a given form of motion of matter, but also between all its forms, woven together in a kind of infinitely huge skein. Our consciousness can contain no idea that does not express either imagined or real connections, and in its turn this idea must of necessity be a link in a chain of other ideas and conceptions.

What is a connection? it is a dependence of one phenomenon on another in a certain relationship. The basic forms of connection may be classified as spatial, temporal, causal and consequential, necessary and accidental, law-governed, immediate and mediate, internal and external, dynamic and static, direct and feedback, and so on. Connection does not exist by itself, without that which is connected. Moreover, any connection has its basis, which makes such connection possible. For example, the gravitational properties of material systems condition the force connection of cosmic objects; atomic nuclear charge is a connection in the periodic system of the elements; material production and the community of interests serve as the basis for the connections

between human beings in society. The materiality of the world conditions the connection of everything with everything else, expressed in the philosophical principle of universal connection. In order to realise this or that connection there must be certain conditions. They differ for various systems.

Investigation of the various forms of connections is the primary task of cognition. Connection is the first thing that strikes us when we consider anything. We, of course, do not always think about such things. And this is natural enough, for one cannot think only in terms of universal connections when deciding simple everyday or even specific scientific problems. However, on the philosophical level, when one tries to consider universal problems, one cannot adopt the position of never looking further than one's nose. This brings us to the methodological conclusion that in order to know an object in reality, one must embrace, study all its aspects, all the immediate and mediate connections. This is what drives scientific thought in its search for systematic connections everywhere, both in particulars and in the whole. If we deny the principle of universal connection, and particularly the essential connections, this has a disastrous effect not only on our theory but also on our practice. For example, forest-cutting reduces the bird population and this, in its turn, increases the number of agricultural pests. Destruction of forests sands up rivers, erodes the soil and thus leads to a reduction in harvests. There are no birds or animals in nature that are absolutely harmful. The wolf, for example, because it eats other animals, including the weak and the sick, acts as a regulator of their numbers. Paradoxically, the mass extermination of wolves, far from protecting other species, actually reduces their numbers, due to the spread of disease.

So everything in the world is connected with something else. And this universal interconnection, and also the connection of the elements within the whole at any level, form an essential condition for the dynamic balance of systems.

Interaction. The human individual, for example, is not a lone traveller amid the jungles of existence. He is a part of the world interacting in various ways with that world. Separate cultures are not closed, isolated islands. They are like great waves in the ocean of history, which work upon each other, often merging into even broader waves, often clashing with waves of a different dimension, so that the regular rhythm of the rise and fall of individual waves is broken. Like any other system, an organism or a society lives and functions as long as there is a certain interaction of the elements in these systems or of the systems

themselves with other systems. Everything that happens in the world may be attributed to the interaction of things, one element of which is equilibrium.

Interaction is a process by which various objects influence each other, their mutual conditioning or transmutation and also their generation of one another. Interaction is a kind of immediate or mediate, external or internal relationship or connection. The properties of an object may manifest themselves and be cognised only through its interconnection with other objects.

The category of interaction is extremely versatile and may be used in various senses. In some cases interaction is understood as the general basis or condition for the development of events; in others it has the meaning of a complex causal relationship. But interaction is most widely understood as a special form of causal connection, namely the two-way relationship.

Interaction operates as an integrating factor by which the parts in a certain type of whole are united. For example, electromagnetic interaction between a nucleus and electrons creates the structure of the atom.

The material unity of the world, the interconnection of all the structural levels of existence is achieved through the universality of interaction. The chain of interaction is never broken and has neither beginning nor end. Every phenomenon is a link in the general universal chain of interaction. In the immediate sense interaction is causal. Every cause is simultaneously both active and passive in relation to another cause. The origin and development of objects depend on interaction. Every qualitatively defined system has a special type of interaction. Every kind of interaction is connected with material fields and involves transference of matter, motion and information. Interaction is impossible without a specific material vehicle.

The modern classification of interaction distinguishes between force and informational interactions. Physics knows four basic types of force interaction, which provide the key to our understanding of the infinitely diverse processes of nature. These are the gravitational, the electromagnetic, the so-called strong (nuclear) interactions, and the weak (decay) interactions. Every type of interaction in physics has its own specific measure.

Biology studies interaction at various levels: in molecules, cells, organisms, populations, species, biological communities. The life of society is characterised by even more complex forms of interaction, for

society is a process and product of interaction both between people and between man and nature.

Unless we study interaction in its general and concrete manifestations we cannot understand the properties, structures or laws of reality. Not a single phenomenon in the world can be explained out of itself, without taking into account its interactions with other objects. Interaction is not only the initial point of cognition but also its culminating point.

Development. Any type of connection or interaction must take a certain direction. Nothing in the world is final and complete. Everything is on the way to somewhere else. Development is a definitely oriented, irreversible change of the object, from the old to the new, from the simple to the complex, from a lower level to a higher one. The vector of a developing phenomenon is towards acquisition of the fullness of its essence, towards self-fulfilment in various new forms. The new is an intermediate or final result of development in relation to the old. Changes may involve the composition of the object (its quantity or quality), the type of connection of the elements of the specific whole, its function, or its "behaviour", that is to say, the means by which it interacts with other objects and, finally, all these characteristics taken as a whole.

Development is irreversible. Nothing passes through one and the same state more than once. Development is a dual process: the old is destroyed and replaced by something new, which establishes itself in life not simply by freely evolving its own potential but in conflict with the old.

The crucial feature of development is time. Development takes place in time and only time reveals its direction. Even the history of the concept of development goes back to the formation of the theoretical notions of the direction of time. The ancient cultures had no knowledge of development in the true sense. They saw time as moving in cycles and all events were thought to be predestined. The old way of thinking was that the sun must rise and set and hasten to its destined resting place, the wind would blow where it listeth and return in its courses, what was bound to happen would happen, and what was done would always be done, and there was nothing new under the sun.

The idea of a universe, perfect and complete, on which the whole ancient view of the world rested, precluded any question of oriented change that might give rise to new systems and connections. Any such change was understood as the evolution of certain possibilities that had

been inherent in things from the beginning and had simply been hidden from view. With the rise of Christianity, the notions of time and its linear direction begin to be applied to the intellectual sphere, and, as experimental science takes shape, these notions gradually begin to blaze a trail in the study of nature, giving birth to the ideas of natural history, of oriented and irreversible changes in nature and society. The turning-point here was the creation of cosmology and the theory of evolution in biology and geology. The idea of development then became firmly established in natural science and has since become an object of philosophical investigation.

This orientation of the sciences on the idea of development substantially enriched it with a world-view and methodological principles and played an essential heuristic role. For instance, biology and the history of culture showed that the process of development was neither universal nor homogeneous. If we consider development on a major scale, such as organic evolution, it is quite obvious that certain interactions of processes taking different directions are at work within it. The general line of progressive development is interwoven with changes that give rise to blind alleys of evolution or even paths of regress. Alongside processes of ascending development we find degradation and decay of systems, descents from the higher to the lower, from the more perfect to the less perfect, and a lowering in the level of organisation of systems. An example of degradation is to be found in biological species that die out because of their failure to adapt to new conditions.

Degradation of a system as a whole does not mean that all its elements are beginning to disintegrate. Regress is a contradictory process: the whole falls apart but certain elements in it may progress. What is more, a system as a whole may progress while certain of its elements fall into decay. Thus, the progressive development of biological forms as a whole goes hand in hand with the degradation of certain species.

Cyclical processes such as the transmutation of elementary particles play a significant role in the universe. The branch of progressive development known to science consists of the pre-stellar, the stellar, the planetary, the biological, the social and hypothetical metasocial stages of the structural organisation of matter. On the cosmic scale the processes of progressive and regressive development would appear to be of equal significance.

The Principle of Causality

The concept of causality, determinism. All certainty in our relationships with the world rests on acknowledgement of causality. Causality is a genetic connection of phenomena through which one thing (the cause) under certain conditions gives rise to, causes something else (the effect). The essence of causality is the generation and determination of one phenomenon by another. In this respect causality differs from various other kinds of connection, for example, the simple temporal sequence of phenomena, of the regularities of accompanying processes. For example, a pinprick causes pain. Brain damage causes mental illness. Causality is an active relationship, a relationship which brings to life some thing new, which turns possibility into actuality. A cause is an active and primary thing in relation to the effect. But "after this" does not always mean "because of this". It would be a parody of justice if we were to say that where there is punishment there must have been a crime.

Causality is universal. Nowhere in the world can there be any phenomena that do not give rise to certain consequences and have not been caused by other phenomena. Ours is a world of cause and effect or, figuratively speaking, of progenitors and their progeny. Whenever we seek to retrace the steps of cause and effect and find the first cause, it disappears into the infinite distances of universal interaction. But the concept of cause is not confined to interaction. Causality is only a part of universal connection. The universality of causality is often denied on the grounds of the limited nature of human experience, which prevents us from judging the character of connections beyond what is known to science and practice. And yet we know that no scientist restricts his reasoning to what he can immediately perceive. The whole history of humanity, of all scientific experiment knows no exception to the principle of determinism.

The connection between cause and effect takes place in time. This temporary relation may be defined in various ways. Some people believe that cause always precedes effect, that there is a certain interval between the time when the cause begins to act (for example, the interaction of two systems) and the time the effect appears. For a certain time cause and effect coexist, then the cause dies out and the consequence ultimately becomes the cause of something else. And so on to infinity.

Other thinkers believe that these intervals partially overlap. It is also maintained that cause and effect are always strictly simultaneous. Still others maintain that it is pointless to speak of a cause already existing and therefore taking effect while the effect has not yet entered the sphere of existence. How can there be a "non-effective cause"?

The concepts of "cause" and "effect" are used both for defining simultaneous events, events that are contiguous in time, and events whose effect is born with the cause. In addition, cause and effect are sometimes qualified as phenomena divided by a time interval and connected by means of several intermediate links. For example, a solar flare causes magnetic storms on Earth and a consequent temporary interruption of radio communication. The mediate connection between cause and effect may be expressed in the formula: if A is the cause of B and B is the cause of C, then A may also be regarded as the cause of C. Though it may change, the cause of a phenomenon survives in its result. An effect may have several causes, some of which are necessary and others accidental.

An important feature of causality is the continuity of the cause-effect connection. The chain of causal connections has neither beginning nor end. It is never broken, it extends eternally from one link to another. And no one can say where this chain began or where it ends. It is as infinite as the universe itself. There can be neither any first (that is to say, causeless) cause nor any final (i.e., inconsequential) effect. If we were to admit the existence of a first cause we should break the law of the conservation of matter and motion. And any attempt to find an "absolutely first" or "absolutely final" cause is a futile occupation, which psychologically assumes a belief in miracles.

The internal mechanism of causality is associated with the transference of matter, motion and information.

Effect spreads its "tentacles" not only forwards (as a new cause giving rise to a new effect) but also backwards, to the cause which gave rise to it, thus modifying, exhausting or intensifying its force. This interaction of cause and effect is known as the principle of feedback. It operates everywhere, particularly in all self-organising systems where perception, storing, processing and use of information take place, as for example, in the organism, in a cybernetic device, and in society. The stability, control and progress of a system are inconceivable without feedback.

Any effect is evoked by the interaction of at least two phenomena. Therefore the *interaction phenomenon* is the true cause of the *effect*

phenomenon. In other words, the effect phenomenon is determined by the nature and state of both interacting elements. A word conveying tragically bad news may cause a condition of stress in a sensitive person, whereas it will bounce off an insensitive or phlegmatic individual like "water off a duck's back", leaving only a slight emotional trace. The cause of stress in this case was not the word itself but its information-bearing impact on vulnerable personality.

The cause-effect connection can be conceived as a one-way, one-directional action only in the simplest and most limited cases. The idea of causality as the influence of one thing on another is applied in fields of knowledge where it is possible and necessary to ignore feedback and actually measure the quantitative effect achieved by the cause. Such a situation is mostly characteristic of mechanical causality. For example, the cause of a stone falling to the ground is mutual gravitation, which obeys the law of universal gravitation, and the actual fall of the stone to the ground results from gravitational interaction. However, since the mass of the stone is infinitely small compared with the mass of the earth, one can ignore the stone's effect on the earth. So ultimately we come to the notion of a one-way effect with only one body (the earth) operating as the active element, while the other (the stone) is passive. In most cases, however, such an approach does not work because things are not inert, but charged with internal activity. Therefore, in experiencing effect they in their turn act on their cause and the resulting action is not one-way but an interaction.

In complex cases one cannot ignore the feedback of the vehicle of the action on other interacting bodies. For example, in the chemical interaction of two substances it is impossible to separate the active and passive sides. This is even more true of the transformation of elementary particles. Thus the formation of molecules of water cannot be conceived as the result of a one-way effect of oxygen on hydrogen or vice versa. It results from the interaction of two atoms of hydrogen and one of oxygen. Mental processes are also a result of the interaction of the environment and the cortex.

To sum up, all processes in the world are evoked not by a one-way or one-sided action but are based on the relationship of at least two interacting objects.

Just as various paths may lead to one and the same place, so various causes lead to one and the same effect. And one and the same cause may have different consequences. A cause does not always operate in the same way, because its result depends not only on its own essence

but also on the character of the phenomenon it influences. Thus, the heat of the sun dries out canvas, evokes extremely complex processes of biosynthesis in plants, etc. Intense heat melts wax but tempers steel. At the same time an effect in the form of heat may be the result of various causes: sun rays, friction, a mechanical blow, chemical reaction, electricity, disintegration of an atom, and so on. He would be a bad doctor who did not know that the same diseases may be due to different causes. Headache, for instance, has more than one hundred.

The rule of only one cause for one effect holds good only in elementary cases with causes and effects that cannot be further analysed. In real life there are no phenomena that have only one cause and have not been affected by secondary causes. Otherwise we should be living in a world of pure necessity, ruled by destiny alone.

To understand the cause that engenders a change in the state of an object we should, strictly speaking, analyse the interaction of the object with all other objects surrounding it. But experience shows that not all these interactions are equally significant in changing the state of the object. Some are decisive while others are insignificant. So, in practice, we are able to single out a finite number of decisive interactions and distinguish them from those that are secondary.

In the sciences, particularly the natural sciences, one distinguishes general from specific causes, the main from the secondary, the internal from the external, the material from the spiritual, and the immediate from the mediate, with varying numbers of intervening stages. The general cause is the sum-total of all the events leading up to a certain effect. It is a kind of knot of events with some very tangled threads that stretch far back or forward in space and time. The establishing of a general cause is possible only in very simple events with a relatively small number of elements. Investigation usually aims at revealing the specific causes of an event.

The specific cause is the sum-total of the circumstances whose interaction gives rise to a certain effect. Moreover, specific causes evoke an effect in the presence of many other circumstances that have existed in the given situation even before the effect occurs. These circumstances constitute the conditions for the operation of the cause. The specific cause is made up of those elements of the general cause that are most significant in the given situation. Its other elements are only conditions. Sometimes an event is caused by several circumstances, each of which is necessary but insufficient to bring about the phenomenon in question.

Sometimes we can clearly perceive the phenomenon that gives rise to this or that effect. But more often than not a virtually infinite number of interlocking causes give rise to the consequences we are concerned with. In such cases we have to single out the main cause —the one which plays the decisive role in the whole set of circumstances.

Objective causes operate independently of people's will and consciousness. Subjective causes are rooted in psychological factors, in consciousness, in the actions of man or a social group, in their determination, organisation, experience, knowledge, and so on.

Immediate causes should be distinguished from mediate causes, that is to say, those that evoke and determine an effect through a number of intervening stages. For example, a person gets badly hurt psychologically, but the damage does not take effect at once. Several years may elapse and then in certain circumstances, among which the person's condition at the time has a certain significance, the effect begins to make itself felt in the symptoms of illness. When analysing causality we sometimes speak of a "minor" cause giving rise to major effects. This so-called "minor cause of a major effect" is the cause not of the whole long and ramified chain of phenomena that produces the final result, but only the cause of the first link in the chain. Sometimes the "minor cause" is merely a factor that starts up quite different causal factors. These are "triggering" factors, factors relating to the initial stage of avalanche processes and to a whole system's loss of labile equilibrium.

Any phenomenon depends on a definite diversity of conditions to bring it into existence. While it is only one of the circumstances conducive to a certain effect, the cause is the most active and effective element in this process, it is an interaction that converts necessary and sufficient conditions into a result. We sometimes treat the absence of something as a cause. For example, some illnesses are attributed to lack of resistance in an organism or a lack of vitamins. However, absence should not be regarded as a cause but merely as a condition for disease. For a cause to actually take effect there must be certain conditions, that is to say, phenomena essential for the occurrence of the given event but not in themselves causing it. Conditions cannot in themselves give rise to the effect, but the cause is also powerless without them. No cause can give rise to illness if the organism is not susceptible to it. We know that when a person's organism is infected with certain microbes he may fall ill or he may not. The way a cause takes effect and the nature of the consequence depend on the character of the conditions. Sometimes there is only one direct and immediate cause of death or injury —a

bullet. But more often the causes and conditions are intricately combined, some of them being only secondary circumstances.

When discussing the relationship of cause and condition one must remember that the term "condition" is used in two senses, the narrow and the broad. Apart from what we mean by condition in the narrow sense, conditions in the broad sense comprise such factors as "background" and "environment" and various factors of a causal nature. But there is no strict and consistent dividing line between the two basic senses of the term, just as there is no dividing line between condition and cause. This fact often leads to an incorrect use of the two terms and to wrong definition of the various conditioning factors. Avoidance of incorrect usage is made all the more difficult by the overlapping of the accepted meanings of the two terms "cause" and "condition" and also the term "foundation".

Science is gradually evolving special concepts relating to the categories of "foundation", "condition" and "cause", which, when used together with these categories, make it possible to define genetic links more exactly.

In various fields of knowledge the problem of the relationship between cause and condition is solved in different ways, depending mainly on the complexity of the relationships that are being studied, their uniformity or, on the contrary, the distinctness and comparative importance of separate factors. But the degree of abstraction usually employed in the given science also affects the treatment of this question. So the meaning of the cause and condition categories in the system of concepts of various sciences may also differ considerably. One could scarcely apply the relation of cause and condition that is revealed in studying, for example, physical phenomena, to physiological processes, or vice versa.

Every phenomenon is related to other phenomena by connections of more than one value. It is the result both of certain conditions and certain basic factors that act as its cause. That is why the cause-effect connection has to be artificially isolated from the rest of conditions so that we can see this connection in its "pure form". But this is achieved only by abstraction. In reality we cannot isolate this connection from the whole set of conditions. There is always a closely interwoven mass of extremely diverse secondary conditions, which leave their mark on the form in which the general connection emerges. This means that there can never be two exactly identical phenomena, even if they are generated by the same causes. They have always developed in

empirically different conditions. So there can be no absolute identity in the world.

One and the same cause operating in similar conditions gives rise to similar effects. When we change the conditions we may also change the way the cause operates and the character of the effect. But this principle becomes far more complex when it is applied to such unique events as those of geology and social science. While stressing the close connection between cause and condition, we should never confuse the two. The dividing line between them is mobile but significant.

By creating new conditions we can even preclude the earlier possible causes of a certain event, that is, we can "veto" the manifestation of one cause and allow free play to another. This explains the fact that by no means every cause unfailingly produces the expected effect.

A distinction should be made between cause and occasion, that is to say, the external push or circumstance that sets in motion a train of underlying interconnections. For instance, a head cold may be the occasion for the onset of various diseases. One should never exaggerate the significance of occasions, they are not the cause of events. Nor should one underestimate them because they are a kind of triggering mechanism.

One way of discovering causal connections is to study functional connections. The causes of illness may be revealed by uncovering certain breakdowns in the functioning of the organism. A functional connection is a dependence of phenomena in which a change in one phenomenon is accompanied by a change in another. Whereas, for example, a sociologist may be interested in population growth over a period of time and a physicist may be investigating changes in gas pressure in relation to changes of temperature, a mathematician sees here only a functional dependence of X on Y.

The functional approach is particularly useful when we are studying processes whose intrinsic causal mechanism is unknown to us. But when we wish to explain a phenomenon we have to ask what caused it.

The concept of cause is identical not to the general concept of regularity but to the concept of causal regularity, which expresses the fact that a regular sequence of phenomena and conditions always takes the form of realisation of causal connections.

In science the deterministic approach seeks to explain a process as being determined by certain causes and therefore predictable. Thus determinism is not a mere synonym for causality. It involves the recognition of objective necessity, which in turn implies objective

accidentality. Hence there is a close connection between the category of determinism and that of probability. The relationship between determinism and probability is one of the crucial philosophical problems of modern science. In quantum mechanics it is associated with the indeterminacy relation, and in living nature with that of cause and aim. Determinism should not be contrasted to probability. There is no special "probabilistic causality". But there do exist probability, statistical laws, which are one of the forms of manifestation of determinism.

Determinism proceeds from recognition of the diversity of causal connections, depending on the character of the regularities operating in a given sphere. Every level of the structural organisation of being has its own specific form of interaction of things, including its specific causal relationships. Higher forms of causal relationships should never be reduced to lower forms. From a methodological point of view it is essential to take into account the qualitative peculiarities and level of the structural organisation of being.

The dialectical approach is incompatible with mechanistic determinism, which interprets all the diversity of causes only as mechanical interaction, ignoring the unique qualities of the regularities of various forms of the motion of matter. Determinism was given its classical expression by Laplace, who formulated it as follows: if a mind could exist that knew at any given moment about all the forces of nature and the points of application of those forces, there would be nothing of which it was uncertain and both future and past would be revealed to its mental vision.

Mechanistic determinism identifies cause with necessity and accident is completely ruled out. Such determinism leads to fatalism, to faith in an overruling destiny. The development of science has gradually ousted mechanistic determinism from the study of social life, organic nature, and the sphere of physics. It is applicable only in certain engineering calculations involving machines, bridges and other structures. But this kind of determinism cannot explain biological phenomena, mental activity, or the life of society.

The character of causality is conditioned by the levels of the structural organisation of matter. In nature causality manifests itself in a different way from its manifestation in society. And in human behaviour causality emerges in the form of motivation. In nature determination acts in only one direction, from the present, which is a result of the past, to the future. Because of people's knowledge of the world, human activity is determined not only by present things but also by things,

objects, events that are absent, not only by what surrounds man but also by that which may be far away from him in time and space, not only by the present and the past, but also by the future, which is viewed as an aim and becomes a motivation for men's activity. Determination may thus have a two-way direction. Knowledge introduces the future into the determining principle of the present.

The animal's active relationship with the environment is associated with a new type of determination: the conditioning of its behaviour by the task with which it is confronted. For example, birds build their nests in order to breed their young and protect them.

The principle of determinism involves recognition of the objectivity, the universality of causal connections and has always played a vastly important methodological and heuristic role in scientific cognition. The primary assumption for any scientific research has always been that all events of the natural and intellectual world obey a firm regular connection, known as the law of causality. Any field of knowledge would cease to be scientific if it abandoned the principle of causality.

Causality and purpose. When observing the astonishing adaptation and "rational" organisation of plants and animals, or the "harmony" of the celestial spheres, people even in ancient times asked themselves where this harmonious organisation of all that exists had come from. Thinkers have proceeded from various principles in trying to explain this phenomenon. The teleologists assume that there is an underlying purpose in everything, that at bottom nature has some intrinsic expectation and intention and is full of hidden meaning.

The idea of teleology arises when a spontaneously operating cause comes to be regarded as a consciously acting cause, and even one that acts in a predetermined direction, that is to say, a goal-oriented cause. This implies that the ultimate cause or aim is the future, which determines the process taking place in the present. The doctrine that the universe as a whole is proceeding according to a certain plan cannot be proved empirically. The existence of an ultimate goal assumes that someone must have put it. Teleology therefore leads to theology. Instead of giving a causal explanation of why this or that phenomenon occurred in nature, teleology asks for what purpose it occurred. And to prove his case the teleologist usually refers to the purposeful structure of organisms in nature. One has only to observe the structure of the wing of a butterfly, the behaviour of an ant, a mole, a fish, in order to realise how purposefully everything is constructed. The crudest form of teleology is the claim that nature provides some living creatures for the

sake of others, for example, cats are provided in order to eat mice and mice are there to provide food for cats. The goal of the whole process of evolution of the animal world is man and all the other animals were created to make things comfortable for man.

Heinrich Heine tells the story of the contented bourgeois with a "foolishly knowing" face who tried to teach him the principles of such teleology. He drew my attention, says Heine, "to the purpose and usefulness of everything in nature. The trees were green because the green colour was good for the eyes. I agreed with him and added that God had created cattle because beef tea was good for man's health, that He had created the donkey so that people could make comparisons, and that He had created man himself so that man could eat beef tea and not be a donkey. My companion was delighted at finding a fellow thinker in me, he beamed with joy and was quite sorry to leave me."¹

Heine took the humorous view, but the scientific argument against teleology in nature was provided by Darwin, who not only struck a blow at teleology in the natural sciences but also gave an empirical explanation of its rational meaning. Teleology feeds on the belief that everything revolves around us and has us in mind. Instead of giving a causal explanation why this or that natural phenomenon occurred, teleology offers conjectures about the purpose served by its appearance. But can one ask nature, as though it were a rational being, why it created such a strange world of forms and colours? Can one accuse it of malicious intent when it produces ugliness? Nature is indifferent, it does not care whether it creates a lion or a fly. The relative perfection that allows its creatures to orient themselves in the environment, the adaptation to conditions and the adequacy of their reactions to external stimuli, which is found in all animals and plants, are real facts. The structure, for example, of the stem of a plant can serve as a model for an architect who sets himself the task of designing the strongest possible structure with the smallest quantity of materials and the greatest economy in weight. Spinoza, who provided a splendid criticism of teleology in his day, did not deny purpose in the structure of the human body. He urged us not to gape at it "like a fool" but to seek the true causes of the miracles and consider natural things with the eyes of a scientist. This was exactly what Darwin did, and he revealed the natural mechanism of this amazing adaptiveness of the organism to the conditions of its existence. His theories on natural selection showed that delightful blossoms exist not to please our aesthetic feelings or to

¹ Reisebilder I. 1824-1828. Akademie-Verlag, Berlin. Editions du CNRS, Paris, 1970, S. 29.

demonstrate the refinement of the Almighty's taste, but to satisfy the extremely earthly needs of vegetable organisms, i.e., the normal process of pollination and perpetuation of the species.

Changes in the world of animals and plants come about through interaction with their conditions of life. If these changes benefit the organism, that is to say, help it to adapt to the environment and survive, they are preserved by natural selection, become established by heredity and are passed on from generation to generation, thus building up the purposeful structure of organisms, the adaptiveness to the environment that strike our imagination so forcibly. Brightly coloured flowers attract the insects by means of which pollination takes place. The beautiful plumage of male birds was developed by means of sexual selection. But adaptation is never absolute. It always has a relative character and turns into its opposite when a radical change in conditions occurs, as can be seen, for example, from the existence of rudimentary organs.

To sum up, then, what we have is selection without a selector, self-operating, blind and ruthless, working tirelessly and ceaselessly for countless centuries, choosing vivid external forms and colours and the minutest details of internal structure, but only on one condition, that all these changes should benefit the organism. The cause of the perfection of the organic world is natural selection! Time and death are the regulators of its harmony.

System and Structure

The system and its elements. A system is an internally organised whole where elements are so intimately connected that they operate as one in relation to external conditions and other systems. An element may be defined as the minimal unit performing a definite function in the whole. Systems may be either simple or complex. A complex system is one whose elements may also be regarded as systems or subsystems.

All things, properties and relations that strike us as something independent are essentially parts of some system, which in its turn is part of an even bigger system, and so on ad infinitum. For example, the whole of world civilisation is no more than a large and extremely complex self-developing system, which comprises other systems of varying degrees of complexity.

Every system is something whole. So anything that corresponds to the demands of unity and stability —an atom, a molecule, a crystal, the solar system, the organism, society, a work of art, a theory— may be regarded as a system. Every system forms a whole, but not every whole is a system.

We usually call the parts of a system its *elements*. If in investigating a system we wish to identify its elements we should regard them as elementary objects in themselves. Once we have established them as something relatively indivisible in one system, elements may be regarded in their turn as systems (or subsystems), consisting of elements of a different order, and so on.

The concept of structure. The aim of scientific cognition is to discover law-governed relations between the elements forming a given system. In the process of this research, we identify the structures peculiar to that system. When studying the content of an object, we enumerate its elements such as, for example, the parts of a certain organism. But we do not stop at that, we try to understand how these parts are coordinated and what is made up as a result, thus arriving at the structure of the object. Structure is the type of connection between the elements of a whole. It has its own internal dialectic. Wholeness must be composed in a certain way; its parts are always related to the whole. It is not simply a whole but a whole with internal divisions. Structure is a composite whole, or an internally organised content.

But structure is not enough to make a system. A system consists of something more than structure: it is a structure with certain properties. When a structure is understood from the standpoint of its properties, it

is understood as a system. We speak of the "solar system" and not the solar structure. Structure is an extremely abstract and formal concept.

Structure implies not only the position of its elements in space but also their movement in time, their sequence and rhythm, the law of mutation of a process. So structure is actually the law or set of laws that determine a system's composition and functioning, its properties and stability.

Structure and function. The life of a structure manifests itself in its function, they condition each other. The structures of the organs of the body, for instance, are connected with their functions. Any breakdown in structure, any deformation of an organ leads to a distortion of the function. In the development of organism's changes begin with the reorganisation of an organ's function under the influence of changing conditions of life, while its structure may survive for a time without any substantial modification. However, change of activity sooner or later leads to a change in structure. Functional disturbances in organs precede their morphological distortions. The contradiction between the organism's new mode of life and its structure is resolved by a modification in the latter. All the organs and functions of a bird, for example, are adapted to an aerial mode of life. The amazingly purposeful feather structure protects the bird from cold during the rapid changes of temperature in flight. The fact that a bird can fly is observable even when it is on ground. We can see this from its streamlined body, its fine-boned structure which allows it to pass through the air with minimum expenditure of energy, and from the design of the wings. The whole structure embodies the idea of flight. But a colourful butterfly resembles a flying flower. And this too is understandable because a butterfly feeds on the nectar of a flower and its resemblance to a flower protects it from birds when it is sitting motionless on a blossom. The life of the bird is associated with air and the life of a butterfly is bound up with flowers. Their functions, their ways of life determine their structure.

To sum up, function organises structure. The methods of morphology are subordinate to the methods of physiology. The function of sight organised the eye, while labour was responsible for the structure of the hand. But being an organised function, structure in its turn determines function.

Whole and part. We call something a whole that embraces all its parts in such a way as to create a unity.

The category of part expresses the object not in itself but as something in relation to what it is a part of, to that in which it realises its potentials and prospects. For example, an organ is part of an organism taken as a whole. Consequently, the categories of whole and part express a relationship between objects in which one object, being a complex and integral whole, is a unity of other objects which form its parts. A part is subject to the influence of the whole, which is present, as it were, in all its parts. Every part feels the influence of the whole, which seems to permeate the parts and exist in them. Thus, in a tragic context even a joke becomes tragic; a free atom is distinctly different from an atom that forms part of a molecule or a crystal; a word taken out of context loses much or all of its meaning.

At the same time the parts have an influence on the whole. The organism is a whole and disfunction of one of its organs leads to disbalance of the whole. For example, against a background of rational thinking an obsessive idea may sometimes have a very substantial effect on the general condition of the individual.

The categories of whole and part are relative; they have meaning only in relation to each other. The whole exists thanks to its parts and in them. The parts, in their turn, cannot exist by themselves. No matter how small a particle we name, it is something whole and at the same time a part of another whole. The largest whole that we can conceive of is ultimately only a part of an infinitely greater whole. Everything in nature is a part of the universe.

Various systems are divided into three basic types of wholeness. The simplest type is the unorganised or summative whole, an unsystematic conglomeration of objects (a herd of cattle, for example). This category also includes a mechanical grouping of heterogeneous things, for example, rock consisting of pebbles, sand, gravel, boulders, and so on.

In such a whole the connection between the parts is external and obeys no recognisable law. We simply have a group of unsystematic formations of a purely summative character. The properties of such a whole coincide with the sum of the properties of its component parts. Moreover, when objects become part of an unorganised whole or leave such a whole, they usually undergo no qualitative change. For this type of whole the characteristic feature is the varying lifetime of its components.

The second, more complex type of whole is the organised whole, for example, the atom, the molecule, the crystal. Such a whole may have varying degrees of organisation, depending on the peculiar features of

its parts and the character of the connection between them. In an organised whole the composing elements are in a relatively stable and law-governed interrelationship. Its properties cannot be reduced to the mechanical sum of the properties of its parts. Rivers "lose themselves" in the sea, although they are in it and it would not exist without them. Water possesses the property of being able to extinguish fire, but the parts of which it is composed, taken separately, possess quite different properties: hydrogen is itself flammable and oxygen maintains or boosts combustion. Zero in itself is nothing, but in the composition of a number its role is highly significant, and at times gigantically so, by increasing 100 into 1,000, for instance. A hydrogen atom consists of a proton and an electron. But strictly speaking, this is not true. The statement contains the same error as the phrase "this house is built of pine". The mass of an atom of hydrogen is not equal to the total mass of the proton and the electron. It is less than that mass because in combining into the system of the hydrogen atom the proton and the electron lose something, which escapes into space in the form of radiation.

The third, highest and most complex type of whole is the organic whole, for example, the organism, the biological species, society, science, arts, language, and so on. The characteristic feature of the organic whole is the self-development and self-reproduction of its parts. The parts of an organism if separated from the whole organism, not only lose some of their properties but cannot even exist in the given quality that they have within the whole. The head is only a head because it is capable of thinking. And it can only think as a part not only of the organism, but also of society, history and culture.

An organic whole is formed not (as Empedocles assumed) by joining together ready-made parts, separate organs flying around in the air, such as heads, eyes, ears, hands, legs, hair and hearts. An organic whole arises, is born, and dies together with its parts. It is an integral whole, with distinguishable parts. Sensations, perceptions, representations, concepts, memory, attention do not exist in isolation; they form the synthetic knot which we call consciousness. The elements that make up the whole possess a certain individuality and at the same time they "work for" the whole. The whole is invisibly present, as it were, and guides the process of "assembly" of its elements, that is to say, of its own self.

The point of a case exists, in a sense, before the case itself. For example, harmony in the proper sense of the term is born at the moment when the musician consciously or unconsciously begins to interest himself in a simultaneous combination of sounds, that is to say,

a chord, which thanks to the organisation of its elements has its own definite musical individuality. A harmonic "phrase" acquires its meaning from a certain way of arranging various chords and their interrelationship.

The defining attribute of harmony is a relationship between the elements of the whole in which the development of one of them is a condition for the development of the others or vice versa. In art, harmony may be understood as a form of relationship in which each element, while retaining a relative independence, contributes greater expressiveness to the whole and, at the same time and because of this, more fully expresses its own essence. Beauty may be defined as harmony of all the parts, united by that to which they belong in such a way that nothing can be added or taken away or changed without detriment to the whole.

The parts of a whole may have varying degrees of relative independence. In a whole, there may be parts whose excision will damage or even destroy the whole, but there may also be parts whose loss causes no organic damage. For instance, the extremities or a part of the stomach may be removed, but not the heart. The deeper and more complex the relationship between the parts, the greater is the function of the whole in relation to them and the less their relative independence.

The various parts making up a whole may occupy by no means equal positions. Some of them are less mobile, relatively stable, others are more dynamic; some exist only for a time and are doomed soon to disappear, others have the makings of something more progressive. There are some parts without which the whole cannot be conceived and there are others without which it can carry on quite well although with some loss to itself.

In principle there is no limit to the divisibility of objects, but their division indicates a transition to a qualitatively different whole. When a pot is broken, we are left not with a number of smaller pots but with mere fragments. Even a rock is "defaced" by crushing. But the lumps of rock that are broken off nevertheless retain "their own face".

The highest form of organic whole is society and the various social formations. The general laws of the social whole determine the essence of any of its parts and the direction of its development: the part behaves in accordance with the essence of the whole.

For scientific analysis to be able to move in the right direction, the object must constantly occupy our consciousness as something whole.

When we are investigating a whole, we break it down into its parts and sort out the nature of the relation between them. We can understand a system as a whole only by discovering the nature of its parts. It is not enough to study the parts without studying the relationship between them and the whole. A person who knows only the parts does not yet know the whole. A single frame in a film can be understood only as a part of the film as a whole.

An overabundance of particulars may obscure the whole. This is a characteristic feature of empiricism. Any singular object can be correctly understood only when it is analysed, not separately, but in its relation to the whole. Each organ is determined in its mode of operation not only by its internal structure but by the nature of the organism to which it belongs. The importance of the heart can be discovered only by considering it as part of the organism as a whole. The methodological fault characteristic of mechanistic materialism is that it understands the whole as nothing more than the sum of its parts.

In medicine, exaggeration of the independence of a part in relation to the whole is expressed in the principle of localisationism, which stipulates that every organ is something isolated in itself. This gives rise to the methodological principle of looking for the seat of the illness. This narrow, localised approach is just as harmful as the approach to the organism that ignores the question of which particular organ is sick. In any organism there are no absolutely localised pathological processes or any processes that affect only the whole. The disease of one separate organ is in some degree a manifestation of disease in the whole body and vice versa.

In rejecting the so-called summative approach, which mechanistically reduces the whole to the sum of its parts, we should not make a fetish of wholeness and regard it as something with mystical power. The whole does owe its origin to the synthesis of the parts that compose it. At the same time it is the whole that provides the basis for modification of existing parts and the formation and development of new ones, which, having changed the whole, help to develop it. So, in reality, we have a complex interaction between the whole and its parts.

Wholeness is today becoming a genuinely scientific category. This category has immense methodological importance not only in science but also in the arts. Most artists will tell you that the key to a work of art lies in the correct proportioning of the parts and the whole. When one listens to good music, one feels that every note obeys the overall theme. For all the individuality of each figure the great masterpieces of art are

so harmonious as a whole that nothing can be omitted without detriment to the picture itself. The problem of ensemble in architecture is also linked with the relationship of the whole and its parts.

Content and form. What is content? Let us imagine an object of cognition in the form of a circle. Our thought moves within its limits, taking in one component after another, certain processes after others, and thus learns about every thing that is going on in this circle, without crossing the circumference, but nevertheless coming up against that circumference at every stage. Our thought thus comes to know the content of the object. The content is the identity of all elements and moments of the whole with the whole itself. By content, therefore, we mean the composition of all the elements of the object in their qualitative determinacy, their interaction and functioning, and the unity of the object's properties, intrinsic processes, relations, contradictions and trends of development. Content is not all that is "contained" in an object. For example, it would be pointless to regard the atoms that form the molecules that in turn form the cells of an organism as constituting the content of that organism. One could never discover what a pigeon is if one tried to study every cell of its organism under an electronic microscope, just as one could never understand the beauty of the pictures in the Louvre or the Hermitage by subjecting each of them to chemical analysis. The elements that go to make up content are the parts of a whole, that is to say, the elements beyond which an object cannot be further divided without losing its definitive quality. So we cannot treat the canvas as the content of a picture or machines as the content of social life because canvas does not make a picture and machines do not make a society, although neither a picture nor society would be possible without them. The content of an organism is not simply the sum-total of its organs, but something more, the whole actual process of its life activity taking place in a certain form. The content of any given society is the wealth of the material and spiritual life of the people who make up that society, all the products and instruments of their activity. What do we mean when we speak of expounding the content, of, for example, Shakespeare's *Hamlet*? It means analysing its artistically expressed images, their actions, interrelations, the basic idea and intention of the author.

We have defined content as the identity of the components of the whole with the whole itself. Now let us consider form. The category of form is used in the sense of external appearance, that is to say, the boundaries of the given content, its outward posture, in the sense of structure, and also in the sense of the mode of expression and existence

of the content. Form is often defined in such a way that it coincides with structure, although these are different concepts.

What is form? Take our thought travelling around the content of the circle. It reaches the circumference and follows it from one point to another and finally returns to its initial position. The content of a given object appears to lie on one side of a boundary and beyond that boundary there is a backdrop, something different. The boundary that differentiates the given content as a whole from all the rest is, in fact, the form. The boundary belongs at once both to the circle and to the background. It differs from both the circle and the background. When we perceive and speak of some object and pose the question of its form, we must single out this object from the background. If we do not distinguish it from everything else, we cannot perceive it.

When considering the form of a given whole, we must also be able to identify the given whole with other wholes. The form of the object belongs both to the object itself, without which it cannot exist, and to the background, otherwise we should not be able to distinguish it from that background. The form of the object is its boundary and the boundary is what distinguishes the given object from others and at the same time what identifies it with them. What do we mean by seeing a jug? It means singling it out from the background primarily by distinguishing its form, its shape. Consequently, the dialectics of identity and difference varies for the content of the object and for its form. In the case of the content it is limited only by the object itself and does not go beyond its boundaries, but in the case of form this dialectics shows through in the given object's relation to other objects, it stands out from the background.

Form may be an independent object of study. At the same time form can never be absolutely separated from content. The indifference of "pure forms" to content indicates only that they may refer to completely different contents just as one and the same formula may express laws governing different phenomena. Form and content are different poles of one and the same thing but not its components. Their unity lies in the fact that a certain content is "clothed" in a certain form. Crystal-forming processes are organised in the quaint forms of crystals. Qualitatively different life processes have created the countless forms of plants and animals. Material processes acquire the quality of life when they are organised in corresponding forms: only in a certain form does the content of biochemical, energy and information processes give life to a harmonious organism.

The way something is organised depends on what it is that is organised. One can say that content forms itself and is not formed by some external force. Every form disappears together with its content, to which it corresponds and from which it originates.

The unity of form and content presupposes their relative independence and the active role of the form. The modification of form involves reorganisation of the relations within the object. This process takes place in time and through contradictions. For example, in society it is linked with the struggle against the routine of the old. This process of reorganisation of the content therefore "lags behind" the motion of the content itself. The lagging of the form behind content indicates a breakdown of the correspondence between them. Everyone agrees that form should correspond to content. But there is also a contradiction between them. In the course of development there is bound to be a period when the old form ceases to correspond to the changed content and begins to retard its further development. This gives rise to a conflict, which is resolved by the breakup of the old form and the emergence of a form corresponding to the new content. For example, at the dawn of a given social formation production relations, as a form of society's productive forces, correspond to the tendency of development of the productive forces, but in the formation's period of decline production relations lag behind the productive forces and they retard the development of the content.

Obsolete modes of thinking become stereotypes and lag behind the substance of new ideas. Wisdom is a matter of keeping in view both the content and the form. In art, the relation of content and form is sometimes distorted, usually in the sense that form is divorced from content and absolutised. Hence the extreme cases of formalism and abstractionism. But combatting formalism does not mean contempt for form, which plays a vital role in the organisation and development of content. One must bear this in mind not only in theory but also in practice; for example, in production, where skilful application of the active role of form in the organisation of labour, distribution of manpower, and so on, may decide the outcome of the project. Wisdom in management lies in the ability to choose the necessary form for organising the content of the project.

Essence and Phenomenon

The concept of essence and phenomenon. All thinking people want to get at the essence. They seek it like hidden treasure, which lies at the heart of things and controls them. Essence may be considered in global terms, as the ultimate foundation of the universe, in terms of various categories, such as the essence of the human being, for example, and in the sense of the main thing in an individual object.¹

In the early forms of philosophical thought essence was that from which everything that existed had originated and that to which it would return. The religious consciousness contrasted the "celestial" world and the temporal world. God was the essence of the universe; everything else was his creation.

The essence of any specific individual is that which he is by virtue of his nature. It is the essential principle in a person, the core of his "ego". One could say that it is the special thing in any given person that he cannot lose without ceasing to be himself. Essence is the organising principle of connection between the basic elements or aspects of an object. It is a kind of thread upon which everything hangs; cut it and the whole assembly falls to pieces. Nothing is left but elusive particles and the general order is destroyed.

Essence is closely related to content. In fact, it is content, but not the whole content, only the main, basic part of it. Essence is related to all categories, to quality, for example. But quality does not exhaust essence. It expresses only one of its aspects. To reveal essence one must discover measure or proportion, the unity of quality and quantity. The path to essence lies through the categories of cause and law. Essence is an integral category, which embraces structure, part and whole, individual, particular and general, content and quality, proportion, contradiction, causality and law; it may also be regarded as an interweaving of the laws of the existence and functioning of an object. As the fundamental basis of the existence of an object essence manifests itself fully or partially, in the form of mere appearance—as a phenomenon.

What is a phenomenon? It is a manifestation of essence, which possesses true actuality only as a consequence of certain forms of its self-manifestation. Just as leaves, flowers, branches and fruit express in an external form the essence of a plant, so ethical, aesthetic, political,

¹ denote the first of these senses.— *Trans.*

philosophical and scientific ideas express the essence of a certain social system. The concept of phenomenon may be understood as a manifestation of something underlying, profound. This is similar to the way we use the term "symptom" as the external manifestation of the essence of some disease, a headache, for example. Essence, on the other hand, is the principle and foundation of a certain mode of the external expression of things. Phenomenon as the external aspect is based on the internal essence. It is that in which the principle has expressed itself. What matters for a phenomenon is the result of the functioning of the principle as essence. The categories of essence and phenomenon characterise the interdependence of processes that take place in reality and the level to which thought has penetrated its object, whether we are still only on the surface or have broken through to the essence. A phenomenon usually expresses only some facet of essence, one of its aspects. For example, many manifestations of the essence of a certain type of malignant tumour may have been well researched, but its essence still remains an ominous secret.

The essence is hidden from view while the phenomenon stands out on the surface. If essence is something general, phenomenon is individual, expressing only one element of essence; if essence is something profound, phenomenon is external, richer and more colourful; if essence is something stable and necessary, phenomenon is transient, changing and accidental.

Appearance. A phenomenon may or may not correspond to its essence, and this may happen to varying degrees. For example, mirages in the desert are a phenomenon of nature, not an optical illusion. They can be photographed, they are the result of a distortion of light rays in the atmosphere. As something that is seen, a phenomenon does, of course, depend on the eyes that are looking at it. In the time of Copernicus, and before him, people perceived the apparent rotation of the sun around the earth as a reality. And how much effort and sacrifice were required to prove that this "rotation" was merely an appearance, that in essence the earth rotates around the sun and around its own axis. Appearance is supported by essence but does not always correspond to it. Appearance is essence *in one* of its definitions, aspects, or moments. In art, for example, appearance is the result of one or another form of discrepancy between phenomenon and essence, aim and the means, action and result, a discrepancy between what a person is in fact, and what he wishes to appear, or claims to be; essence reveals the comic side in appearance.

The category of appearance has an objective-subjective character and expresses superficial knowledge. It manifests itself in numerous forms.

To understand any given event we must critically examine the data of direct observation and make a clear distinction between the relations of "being" and "appearing". An indication of whether we have discovered the essence of something is our ability to use it effectively, to guide this or that process in the desired direction, even if that direction is not always the wisest.

The individual, the general and the particular. Consider, for instance, the leaves of a maple-tree. How closely they resemble each other! But no two of them are absolutely identical. And in the world in general there is nothing absolutely identical to something else, or even to itself at different moments of its existence. Things differ from each other and in themselves. We speak of things as being as alike as two drops of water. But look at them through a microscope and those drops turn out to be different. There are no doubles in the world, though its population runs into billions. Every person is unique! Pure identity can exist only in formal terms.

Let us imagine two objects whose structure and other attributes are all absolutely identical. But in this case they would have to occupy one and the same place at one and the same time. And if this were so, we should be confronted not with two objects but with one. Our two objects occupy different positions in space, so they are in different relations with other objects and this, in its turn, is bound to give rise to a difference in their properties at the given moment.

On the same grounds one may assert that things, events are absolutely irrepeatable in time; nothing happens twice. Everything that happens must obey the inexorable principle of the irreversibility of time. The so-called repeated event differs from what it repeats in that it occurs at a different time and therefore in new conditions that leave their ineradicable individualising mark upon it. The individual is an object taken in its distinctness from everything else and in its unique specific. The characteristic thing about the individual is its distinctness from everything else, its qualitative singularity. Here we come up against the concept of "other". "Other" is "not this", it is the background from which the object emerges and from which it differs as from everything else.

Countless unique conditions, a host of accidents take part in the "moulding" of the individual. In the example of the maple leaves we

have the difference in lighting, nutrition, temperature, microclimate, which gives rise to differences in size, colour, shape, weight and so on. Nature abhors the stereotype. It is inexhaustible in its creation of the individual. The individual is a category expressing the relative particularity, discreteness, delimitedness of one thing from another in space and time, the intrinsic peculiarities that make up an object's unique qualitative and quantitative character. As a reflection in our consciousness in the form of a sensuous image or concept, the individual is defined either by a proper noun (Shakespeare, Paris, etc.) or by demonstrative pronouns (this, that, the given) and also by other specific means of communication. The reality of the individual provides the objective basis for the quantitative expression of reality because it is the real prototype of the unit "one", which we use as the basis of counting.

One may treat not only a single object but a whole class of such objects as individual, if it is taken as something integral, relatively independent, existing in the limits of a certain measure. At the same time one object is in itself a certain set of individual parts, which in their turn consist of their own separate parts.

Infinite diversity is only one aspect of existence. Another aspect is the universality of things, their structures, properties and relations. Just as firmly as we stated that there are no two absolutely identical things, we can also say that neither are there two absolutely different things, which have absolutely nothing in common. The notion of the world only as an infinite diversity of individualities is one-sided and therefore false. The individual, the particular and the general, if taken separately, "lose" each other and fall apart. As a unity, however, they do not "dissolve" into one another but retain their specific qualities. Separate phenomena are interconnected, interact, depend upon and condition each other. Consequently, they have something in common. All stars, for example, possess common features distinguishing them from everything else. The same may be said of plants, animals, and so on. The general is the singular in the many. The one-sided analytical view of reality as a multiplicity of singularities is characteristic of narrow empiricism, which regards the individual as primary and the general only as a derived abstraction. For example, the assertion that a certain action is a feat implies acknowledgement of this one action as having a certain general quality. Other actions possessing a similar moral content may be characterised as feats. A person may be writing something. He may write many pages and put his signature on each of them. He may write with a quill pen, a ball-point, or chalk, he may even write with his feet or

mouth—there have been such experiments. And still we shall not find any exact identity in the way the letters are delineated. On the other hand, the author's unique handwriting can be identified in all variations of the signature. It is this unvarying quality that gives our signatures practical importance, their legal force. The same applies to our walk or the timbre of our voice, as stable elements in the whole mass of our unique separate movements and sounds.

The common properties and relations of things are identified on the basis of generalisation in the form of concepts and are denoted by substantive nouns, for example, man, law, cause, etc. In each individual there may be something general, which is its essence. Why is the general intrinsically connected with the individual? Because it is the law of the birth and life of the individual. The general plays a constructive role in the emergence of the individual. The general contains a law which insistently demands that certain processes should follow a certain course in any individual phenomenon of the given class. For example, the information recorded in the molecular structures of the cellular nucleus is a general programme, in accordance with which the organism's processes of individual development occur and its hereditary features are passed on from generation to generation. The human being's generic essence in the general groundwork of heredity is transmitted from generation to generation and in unity with all the natural and social conditions creates individuality. But upon this groundwork that is common to the whole line of descent each descendant draws its own individual, unique pattern. The individual is dominated by the general, which ruthlessly "forces" it as something transient to perish again and again for the sake of preserving the general as something stable: the individual dies but the race lives on.

On the other hand, the individual serves as a prerequisite and substratum of the general. The operation of law, the anonymous power of the general is expressed only in the individual and through the individual, but a new law begins by acting as an exception to the general rule, whether it is the birth of a new biological species, new social relations, or whatever. This was how the standards of morality originated, how fashions appear, and so on. Moreover, individual exceptions which correspond to the new trends of development, to the demands of the whole set of conditions and the nature of the phenomenon itself, gradually become the general. Accidental individual aberrations are sifted out and disappear, cancelling each other out and producing the average, the resultant, that is to say, a regularity or law.

For the individual to exist outside the general would amount to its being an "outlaw". And the general without the individual is simply suspended in mid-air. But objects may possess different degrees of individuality—the generality between a star and a rose (what they have in common) is one thing, but the generality within the different varieties of roses is quite another.

Everything individual is transient. Every individuality passes like a shadow and suffers the fate of all transient forms. The general, on the other hand, is stable, constant, unvarying. The individual cannot arise, survive or change without being connected with a multiplicity of other things. And since various things are interconnected, interact and interdepend, they must have some point of contact, they must possess generality.

In histories of scientific achievement the general usually takes first place and is seen as something principal and determining. But in the process of research the general is revealed by generalisation of individual facts. Scientific treatises that begin with a statement of general principles sometimes create the illusion that the general is independent of the individual and can exist without it. For objective idealism it is characteristic to separate the general and the individual and absolutise the former, thus turning the general into a demiurge, as if it had preceded the individual and created it.

The fact of the matter is that the individual thing owes the concrete form of its existence to the system of regularly formed relations within which it arises. Different things become comparable only because they possess a certain degree of generality.

In reality the individual and the general are so closely united and interacting that one can say that the individual is as general as it is individual. The statement: "Dante is a poet" illustrates how the individual becomes the general.

The particular only partially enters the general and the general cannot embrace all particular objects, or all aspects of a given object. The desire to lump together all the specific features of individual phenomena in a general concept denotes a failure to understand both thinking and science. It puts the theoretician in a situation where he cannot see the wood for the trees.

What is the particular? This category expresses a real object as a whole in the unity and correlation of its opposing elements—the individual and the general, and also the universal. The particular is not

merely an intermediate link between the individual and the general. Rather it is a uniting principle in the framework of the whole.

An object can be conceived only in the categories of either the individual or the general, separated from one another at the empirical or theoretical level. This is an abstraction that is essential to the process of cognition. Such abstractions are not only presupposed but also subsumed in the category of the particular, which expresses the general in its actual embodiment, and the individual in its unity with the general.

Consequently, the particular may be regarded as the realised general. For example, the general plan to build a house is realised in a specific project. And the latter is embodied in a real house. The particular is conceived as something separate, different from everything else and possessing features that other objects do not possess, and at the same time as something that has various connections and relations with them.

The category of the particular is relative and fluid. In one relation the particular may more or less "approximate" to the general and act and be understood as something general in its connection with its own general nature. The particular "stands" midway between the general and the individual, holding them in its "embrace", as it were, and including them in itself.

It is important in both theory and practice to understand the dialectics of the individual, particular and general. Not for nothing does the whole history of philosophy revolve around this question. To understand separate phenomena we must take them out of their general connection and examine them analytically. But the stating of individual facts is not yet knowledge. People sometimes say, "if you know one man you know them all", but this is not true. The individual can be understood only through the general and vice versa. Thanks to its psychophysiological, linguistic and logical machinery of universalisation, scientific thought permeates everything with a spirit of generalisation, in which all that is individual evaporates and is replaced by the impersonal and the generally significant. But to be successful in practice one must know not only the general but also the individual that forms a unity with it.

Science is concerned with generalisations and operates with general concepts. This enables it to establish laws and thus to arm practice with the ability to predict. This is its strong point. But it is also its weakness, which can be compensated by both ordinary and artistic thinking. Everything individual pales in the light of scientific thought. When

scientific thought penetrates reality, all its rich and infinite diversity is stripped away and its splendid colours fade. The living flow chokes in the silence of meditation. The fullness that radiates its warmth upon us and is organised in innumerable attractive and delightful images is broken down into cut-and-dried forms and diagrams.

The individual is richer than the general: the general as a law is narrow and schematic. Only by thoughtful analysis and consideration of the individual and the particular through observation and experiment can the laws of science be extended in depth and made more concrete. The person who has no appetite for the individual fails to perceive true reality. Creative thought permits no stereotypes, no magic wands that can be used everywhere in the same way, without taking into account the individual aspects of events.

If the individual is ignored, our knowledge of the general and the particular falters just where individual features constitute the essential aspect of the given object, whether it be a social revolution, a nation, or a person. Thus the concept "man" fails to reflect the countless individual features that are characteristic of any specific person. The principle of individualisation is important not only in art, which cannot exist without it, but also in science, and particularly in practice. For example, the sciences concerned with humanity cannot ignore the fact that in the details of their anatomical structure and the functioning of various organs, in the chemical composition of their brain, blood, muscles, and skin, in the reactions of the organism to drugs and to countless other influences, in the types of temperature regulation, sensitivity to pain and need for food, people are astonishingly unique.

When determining the average velocity of the molecules of a gas, we do not investigate the behaviour of each separate molecule. No one is worried about depersonalising them. In quantum mechanics, for example, as distinct from classical mechanics, it is fundamentally impossible to trace each particle separately and thus distinguish between them. So there is good reason for us to say that in quantum mechanics particles lose their "individuality". And such individuality is probably of little consequence to either science or practice. But in medicine, for example, it is quite a different matter. The doctor treats not man in general but a person suffering from some specific disease, a person with unique individual features, often astonishing by intricate mental and bodily peculiarities, which are of crucial importance to the essence of the case. One and the same illness is often surprisingly modified in different patients and therefore demands an extremely individualised approach. Everyone gets ill in his own way. So the wisest

doctors have always maintained that one should treat not the disease but the patient himself with his particular organs and energies. Every sick person is, above all, a personality with physiological and psychological peculiarities, with a particular character, mentality, moods, emotions, and so on. How many people suffer, and some times very painfully, from iatrogenic ailments caused by the standardised thinking, by the crudely inflexible approach of a doctor who disregards his patient's often individually delicate and uniquely complex constitution. But the individualised personal approach, so often advocated and so often ignored, is only one aspect of the case, the other being that a doctor cannot prescribe single medicine or any kind of treatment until it has been thoroughly treated under laboratory conditions and thus been proved fit for general use. Medicine is not only the most complex science; to an even greater degree it is an art, and the greatest of all arts at that. And it is acquired through integral knowledge of the general, individual and particular, with the stress on the individual form of their expression.

The conclusions of science are generally significant because the phenomena themselves contain something stable, some thing that is firmly retained and gives them their generally significant character. Although every organism is something unique, the doctor has no doubt that certain organs in a particular patient fulfil the same functions as in other people, that their structure, despite some individual variations, is on the whole similar. And this is what enables him to describe the structure of the brain in general, the heart in general, and so on. If each of us had a unique structure and way of functioning, or malfunctioning, there could be no anatomy, physiology or medicine as a science and no art of healing.

Leo Tolstoy, who ridiculed the impotence of medicine that ignored the principle of individualised approach, wrote: "Doctors came to see her, both singly and in consultation, talked endlessly in French, German and Latin, criticised one another and prescribed every sort of remedy to cure every complaint they had ever heard of. But it never occurred to one of them to make the simple reflection that the disease Natasha was suffering from could not be known to them, just as no complaint afflicting a living being can ever be entirely familiar, for each living being has his own individual peculiarities and whatever his disease it must necessarily be peculiar to himself, a new and complex malady unknown to medicine—not a disease of the lungs, liver, skin, heart, nerves, and so on, as described in medical books, but a disease consisting of one out of

the innumerable combinations of the ailments of those organs."² This passage contains both exaggeration and the profound wisdom of the all-round approach to the personality and its suffering that "interlock" in every possible way.

The principle of individualisation is no less important, say, in judicial practice, and in any other sphere concerning human beings and human relations. A person is not born a criminal. A judge should not restrict himself to establishing the degree of guilt and responsibility of a certain individual for the crime he has committed. He is bound to consider the individual's character, the degree of individual volition in the crime and also the offender's readiness to make amends, which is extremely important when it comes to deciding the measure of punishment within the framework of the existing laws of state.

Science cannot exist without basing itself on the general. Take, for example, such a science as history. If historians confined themselves to recording only the individual, even they in their thousands would be unable to describe one single day in the life of humanity, though they were given a thousand years to do it in. They would be like an author who takes two years to write one year of his autobiography.

There are some thinkers who do not regard history as a science on the grounds that it does not reveal general principles or laws. The concept of law-governed historical development is considered intrinsically contradictory in the same way as one might regard a concept of dry moisture. The field of social experience is regarded as "unique" and "personal". All social relationships are irrepeatable. If some thing happens in history, the same thing can never occur again. And for things that do not repeat themselves no law can be established.

Do these objections stand up? No. Individual events in their specific forms do not repeat themselves. Every war is unique in its individuality. But in this uniqueness of social and psychological tragedy there is always something general: war is war!

There are two roads towards cognition of the general. Theoretical thought proceeds by abstracting from the individual, the accidental, to the formulation of concepts that reflect the essential. There is also another road towards knowledge of the general. This lies through finding the most characteristic individual events which, no matter how unique they are, immediately, as it were, represent the general, the law-governed. These are "typical" individualities. This is the way the

² L. N. Tolstoy, *War and Peace*, Vol. 2, Penguin Books, 1957, pp. 776-77.

generalising, creative force of imaginative thinking operates in the sphere of art, where a truly artistic image expresses the typical through its individualisation. Something synthetic between these two roads occurs in historical science, where the law-governed is expressed both in the form of theoretical principles and also by the splendid artistic descriptions of "living" events sometimes achieved by gifted historians.

Law as a general and essential relation. Life has constantly persuaded human beings that the processes at work in the world are not merely the raging of elemental forces of chaos. The universe has its "code of laws". Everywhere there is a certain order in the world: the planets move in strictly unvarying patterns and no matter how long the night it is always followed by day; the young grows old and departs from this life with inexorable necessity and is replaced by the newborn. Migrating birds fly northwards in the spring and return to the south every autumn. The ewe gives birth to the lamb, the mare to the foal, and so on. There has never been a case of a watermelon growing out of an acorn or of time suddenly flowing backwards and winter following spring. Obeying the same law of gravity, gossamer floats and lead plummets. In short, everything in the world, from the motion of physical fields, of elementary particles, atoms, and crystals, to gigantic cosmic systems, social events and the realm of the mind, obeys certain laws. Everything is committed to a certain framework, like steel in its mould.

According to religious idealistic notions, everything in the world follows the "cruises" chartered by God, the eternal laws that guide everything in accordance with the will of the Almighty. In general, there is a tendency to identify the laws of the universe with God; the world is then seen as being governed by both God and law. This means that laws are personified and come to resemble the rational, order-creating power of God. And indeed, we speak of laws guiding all events, without thinking that some supernatural force, some omnipotent driver, holds the reins of all events in the universe. According to Hegel, natural processes obey certain laws representing rational, non-material relations. This is objective idealism. Other philosophers believe that the laws of science arose only thanks to man's habitual love of order. This is the subjective idealist conception.

The life of the world is regulated not externally, not by forces that stand above it, but by itself. It is an infinitely complex, self-regulating system.

What do we mean when we use the word "law"? Juridical laws are promulgated by the state in order to regulate, to control relations

between the individual members of society. Moral standards rooted in the way people are brought up are also factors in the pattern of human self-control. The phenomena of nature, of society and consciousness, are organised or regulated by laws that no one created. They exist objectively. When we speak of the laws of the universe we have in mind a certain regularity in the coming of events.

Law is not an object, nor one of its properties, but a type of relations between objects. It organises the interconnection of the elements of a system. When speaking of a law we mean stable, repetitive, essential, necessary relations.

Laws may be less general, operating in a limited field, and also more general, such as the law of the conservation of energy.

Alongside the stability of essential relationships expressed by laws we also have the principle of the conservation of the laws themselves with a more or less broad range of changing conditions in which they operate. When there is a change in the conditions under which certain laws operate, the latter are preserved, that is to say, they operate in a different situation, just as they operated previously. Of course, this stability is relative. There are no laws that are independent of conditions. The wider the range of conditions in which a law retains its force, the more general it is.

Some laws express a strict quantitative dependence between phenomena and are recorded in science by mathematical formulae. Others resist quantitative expression, for example, the law of natural selection.

We should distinguish the laws of the structure, functioning and development of a system. In developing systems a law takes the form of a tendency or trend. The concept of law as a tendency is applicable to the social process in the analysis of mass phenomena, their frequent repetition in certain circumstances. Such laws relate to the statistics of, for example, population, trade, or transport. This concept also serves to express the main trend in the development of events. A large proportion of social laws takes the form of trends expressing the main line of development without predetermining the whole infinite diversity of the possible and usually circuitous paths of motion. The summing up of a large number of individual events usually cancels out their accidental deviations on either side and reveals a certain tendency, that is to say, a law. Such regularity is called statistical.

There are also dynamic laws of varying degrees of complexity, from the laws of mechanics to the laws of the development of the organism.

What distinguishes them from statistical laws? They control all the phenomena of a certain class as a whole and each phenomenon in particular. For example, any stone thrown into the air obeys the law of gravity. When the conditions and causes of events are known, science can with a fair degree of accuracy guarantee prediction of events, as in the case of a lunar eclipse, for example.

But there are also events that do not obey the laws of dynamics. From the mere fact of sexual contact it is impossible to predict whether the result will be a boy or a girl. At first sight this appears to be an example of chaos. But if we take a large number of facts over a period of years, it turns out that the ratio of girl babies to boy babies is 100:106. This is an example of statistical law.

The discovery of laws is the basic task of science. Scientists constantly seek to establish regularity, "order", stable tendencies in phenomena, that is to say, laws. Man's power over the forces of the universe is proportional to the volume and depth of his knowledge of its laws.

The law-governed and the accidental. Could something not have happened that did happen? Could the thing that failed to happen have happened? Is it possible to say that what should not happen will not happen? Many thinkers have pondered such questions. Was it a law or accident that made Napoleon head of the French state? Was it an accidental or law-governed event that America was discovered and that this discovery was made by Columbus? Was it accidental or by law that life on earth came about and was followed by the appearance of human beings, by the readers of this book, by you and me? The list of such questions could be continued ad infinitum. Various thinkers have given various answers. No matter what happens in nature or in the life of man and society, fatalistically minded people usually say, "What must be will be". This dictum rests on the notion that everything in the universe and human life is preordained either by fate or God or by the whole system of interaction of phenomena. Everything that we observe is as it is and could not be otherwise. Accident is thus regarded as a purely subjective concept by which we designate something whose cause is unknown to us. As soon as a person discovers the cause of a phenomenon, it ceases to be accidental. It is true that there are no causeless phenomena in the world. Even accidental phenomena are causally conditioned. But this does not make them necessary. According to the concept of absolute necessity, which excludes chance, the final result of any process in the universe is preordained from the very beginning and must come about with inexorable force. Thus the final point of any process of

development exists from the first in reality, like an "embryo" for whose development the process serves only as an external auxiliary factor, a "midwife".

When absolutised, necessity becomes its opposite: everything is a matter of chance and one must leave everything to chance. The offended vanity of an aggressor, the bad mood of a monarch, the whim of a woman, are sufficient cause for going to war, for throwing millions of people into the slaughter, destroying cities and plunging nations into poverty and grief, spreading disaster and despair for many centuries.

We are thus faced with a false alternative. Either the world is ruled only by chance and then there can be no necessity, or else there is no chance and the world is ruled by necessity. In actual fact, both in nature and society, where chance appears to dominate, it is in reality subordinate to certain laws. But not everything that happens does so of necessity. Much occurs by chance. Chance has its share of "right" to existence.

If the world were dominated only by necessity everything would be fatally predetermined and there would be no room for human freedom of action. One and the same phenomenon is composed of the effects of many causes. Everything brought about by secondary causes was defined by Aristotle as accidental, while necessity meant the impossibility of something being otherwise.

It is impossible to predict the sudden onset of certain diseases and the need for urgent medical aid. It is impossible to say how many calls an ambulance service may receive in a given period of time. Here we are confronted with a typical situation in which the emergency call, the time the doctor spends at the bedside, the time taken by the ambulance in travelling from hospital to home and back, all involve chance. A vast series of chance events has to be considered.

The number of examples in which chance phenomena determine the character of a certain process could be carried to infinity. It is much harder to enumerate the processes where chance events have no influence.

What is chance? This category expresses mainly external, contingent, inessential events. These are phenomena that are subjectively unexpected and objectively extraneous. There are phenomena that in certain conditions may or may not occur, that may be of one or another kind, whose existence or non-existence, or existence of one or another kind, is based not in itself but in something else. These are external chance events. Intrinsic chance events, on the other hand, are events

that have been "stirred up" by necessity itself, by variously oriented forms of its manifestation.

External chance is beyond the demands and power of a given necessity. It is determined by extraneous circumstances. A person steps on a banana skin and falls over. Here we have the cause of his fall, but it does not follow from the logic of the victim's actions. He might not have fallen. He is the victim of the sudden intervention of blind chance. In general both necessary and chance consequences arise from people's actions. One can be blamed only for the necessary consequences of action; only they are connected with the nature of the action itself and they alone could be foreseen.

All events that we sometimes lump together under the heading of "bloody-mindedness", such as the slice of bread that falls butter-side down or the bus that comes late just when we are in a great hurry, may be considered examples of external chance. They are so-called "coincidences".

Chance may be favourable or unfavourable to a person. For example, in war more than anywhere else, "things turn out to be different from what we imagine; when we see them close up, they look different from how they appear at a distance. The architect can calmly observe a building going up according to his plan. Or the doctor, although he has to reckon with a great number of chance and unknown influences in his work, does know exactly what effect certain drugs will have. But war is different. The commander of a large military unit is constantly at the mercy of waves of false and true information, of mistakes caused by fear, negligence, haste or obstinacy, due to correct or incorrect notions, evil intent or a false or genuine sense of duty, laziness or exhaustion; he is besieged by chance events that no one could possibly foresee."³

One and the same event may be necessary in one relation and accidental in another. For example, a baby girl is born. Is this a case of necessity? In relation to the final result of the development of the embryo, yes. But from the standpoint of development of the given nation or of world history it is a chance event. Sex mutation is still one of nature's secrets. A single mutation is the expression of necessity of certain physico-chemical processes in the organism. But in relation to the organism and even more to the species, it is a matter of chance. In reality, therefore, any phenomenon at one and the same time but in different relations may be either necessary or accidental.

³ Carl von Clausewitz, *Vom Kriege*, Verlag des Ministerium für National Verteidigung, Berlin, 1957, S. 178.

The necessary carves a road for itself through an infinite number of accidents. Chance introduces an element of instability in law-governed processes and this is expressed in the category of probability. Why does necessity manifest itself in the form of chance? It can come about only through the individual, which is moulded by an infinite number of circumstances, all of which leave their unique stamp on it. Accidents influence the course of a necessary process, accelerating or retarding it. In the course of their development accidents may turn into necessities. For example, the regular attributes of one or another biological species originally appeared as accidental deviations from the attributes of another species. Such accidents give life and perspective to necessity.

The chance phenomenon may strike us as something necessary or even unavoidable, if the space-time dimension in which it occurs is narrowed while we observe it, and if an increasing number of circumstances have to be taken into account. If we tackle certain events from a distance, a road collision, for example, may be regarded as accidental. But let us suppose that there was ice on the road. Two cars were travelling towards each other at high speed. One of them skidded. Neither driver could do anything and the collision was inevitable. Chance is closely related to necessity. To understand whether any event was necessary or accidental, we must consider the whole set of conditions that gave rise to it. And when the given conditions and relations are taken into account, the possible outcomes are often narrowed down from two or more to only one. And then we can say for certain whether an event occurred of necessity or by accident, and what was necessary or accidental in that event.

It is important in practical and theoretical work to take into account the dialectics of chance and necessity. No one should bank on chance, but it is foolish to ignore favourable opportunities. A good many discoveries and inventions have been made thanks to lucky coincidences. No matter how cleverly a bold operation is planned, there must always be something left to chance. Fire escapes, life and property insurance, additional medical personnel at holiday times—all these measures are taken to counteract the effects of chance, of accidents.

Scientific work never ignores the factor of chance events, even when they play a secondary role. The main goal of cognition is to discover laws. But to do so one must analyse the specific form of chance in which the necessary manifests itself. Through the investigation of various individual cases scientific thought moves towards discovery of the underlying, law-governed element.

In science there are laws that reflect necessity almost in "pure" form, the mathematically refined laws of classical mechanics, for example. But there are also propositions that reflect both the necessary and the accidental alternatively. At the same time there are propositions that embrace necessity and chance as a unity. To predict a solar eclipse astronomy abstracts from the accidental and takes only the necessary. But the forecasting of historical events involves both. For example, acceleration or retarding of historical progress sometimes depends to a great degree on subjective factors, including such chance elements as the character, health or talent of the people in charge.

The task of science and particularly philosophy is to detect the necessity disguised as chance; but this should not be taken to mean that chance is merely a figment of our imagination and should therefore be ignored wherever possible so that we can perceive the truth. There are certain general needs, for example, the need for food, drink, clothing, etc., and it appears to be largely a matter of chance how these needs are satisfied. The soil may be more fertile in one place than another; harvests may differ from year to year; one man is diligent, the other idle. But this very chaos produces general principles. And facts that appear to be unconnected and disorderly are guided by necessity, the uncovering of which is the task of political economy. Confronted with a mass of accidents, it reveals their underlying laws.

Probability as the measure of realisation of chance. The concept of probability arose in logic as a means of defining lack of proof. But life has accumulated large numbers of facts that force us to consider probability as a problem in itself. This problem has been scientifically expressed in mathematics, in the theory of probability. Pascal evolved this theory as a means of understanding gambling in which the main role is played by chance. Today probability relations are studied in the most diverse spheres of nature, society, and science. It is recognised that nature is governed by certain laws but lacks precision. Some scientists have suggested that probability may be taken to denote a subjective rather than an objective estimate by the knower. Others believe that this point of view cannot be accepted because the probability of a chance event is always independent of our reasoning about it. For example, our personal view of the chances that a ship will arrive safely exerts no influence on the actual outcome of its voyage.

The theory of probability involves the study of mass phenomena. It can be applied only where large numbers of more or less equivalent factors take part. The classical theory of probability derived from the study of chance in gambling defines probability as the relation of the

number of favourable outcomes to the total number of equally possible results.

The future is not simply predetermined by what exists in the present. Objective possibilities of development may be divided into two groups: the necessary, those that must become reality, and the unnecessary, those that may not occur. A certain event is accidental if its outcome is only a probability and cannot be accurately predicted. If on the other hand there is a subjective factor, if people are taking part in bringing certain events about, the outcome is even more difficult, or strictly speaking, impossible to predict. Human actions are not universally predetermined, they are not programmed once and for all. Events whose occurrence cannot be determined with any degree of probability are called indefinite events. The life of nature is a kind of constant experiment, a kind of game or spinning of the coin, in which some probabilities become reality and others remain unrealised.

Probability is a degree of possibility, the extent to which a given event may be realised in given conditions and under a given law. It characterises the degree to which a certain possibility is grounded, the measure of its ability to become reality, the degree of its approximation to realisation, the ratio of favourable and unfavourable factors. Probability is not simply the measure of our expectation. It is an objective measure of the possibility of chance becoming reality. Probability tells us how likely an event is to happen, what the objective grounds are for its happening. Or whether it may happen at all. More probable means a more justified possibility.

Probability is a property of sets of events. If we spin a coin only a few times or only once it is impossible to say which side up it will land. Here we are in the power of chance. But this power is delegated, as it were, to the statistical law that when a large number of tosses are made, both possibilities occur with an equal degree of necessity. The coin is symmetrical and this is the main cause of the equally probable result. If the probability of an event is very small, we ignore it. We sit at a lecture, for instance, without worrying about the possibility of being struck by a meteorite. Necessity is a one hundred per cent probability. The absence of any probability denotes the complete unlikeliness or impossibility of an event. The concept of impossibility reflects not only the fact that some possibilities do not exist but also what processes do not allow the existence of these possibilities.

Probability relations have two aspects, the internal, connected with the structure of the object in question (in our example, the symmetry of

the coin), and external, connected with the frequency of the event (the number of tosses). The objective link between the internal and external aspects of probability is expressed in the law of large numbers, which states that the total effect of a large number of accidental facts leads in certain extremely general conditions to a result almost independent of chance. Every event is the resultant of necessary and accidental causes. The law of large numbers acts as the law of stable causes overcoming the influence of accidental factors. Constancy, stability appears within the limits of the conditions and causes that produce a certain phenomenon. In the example of spinning a coin the main cause (symmetry of the coin) makes itself felt as the number of experiments increases. This cause operates continuously in one direction and finally leads to the realisation of both possibilities. In a large number of experiments the frequency of a number of chance events remains almost constant. This leads us to assume the existence of laws in phenomena occurrence that do not depend on the experimenter and that reveal themselves in an almost constant frequency.

The stability with which some chance possibilities are realised in the mass captures our imagination, and in some people evokes a mystical feeling of fatal predestination and the inexorable power of numbers. The numbers of marriages, divorces, births, deaths, crimes, of passengers travelling by a certain means of transport over a certain period of time, the frequency of injuries in certain sports (mountain climbing, speedway racing, fencing), all exhibit a surprisingly stable regularity. For example, the number of children born out of wedlock runs at an average of 9 per cent for the same number of people year after year. Decades of observation have yielded another curious law: during and after prolonged wars the birth rate of male babies tends to increase.

Statistical regularity, which exists objectively in a mass of individual phenomena, with its specific relationship between the necessary and the accidental, the individual and the general, the whole and its parts, cause and effect, possible and probable, constitutes the objective basis on which the massive structure of statistical research methods is erected. The methods of probability theory and the directly related statistical methods are becoming increasingly important in all fields of contemporary science. Statistical physics has developed out of classical physics and probability principles have acquired fundamental significance in quantum mechanics. Information theory, the bedrock of cybernetics, is founded on the probability theory. Biologists, economists, sociologists and engineers are making ever wider use of probability

methods. A special branch of logic—probability logic—has emerged and is being intensively developed. No matter how profound and comprehensive our knowledge, it cannot dispense with probability because of the unavoidable fact that probability in knowledge expresses a vital gradation between the possible and the real.

The real and the possible. The process of development is always connected with the passing of the possible into the real. Everything that exists is strictly and continually controlled by the law of the conservation of matter: nothing can come from nothing. The new must have premises in the old. The sources of the future lie both in the past and in the present. The person who exists in reality is preceded by his potential, by that which is given in the embryo. Everything arises from that which exists as a possibility but not as a reality. A child possesses only a capacity or a real possibility of rational thought, but the possibility has not yet been realised. The child is not yet capable of rational action.

By means of the categories of the possible and the real thought encompasses the fact that matter is active, that it constantly acquires more and more new forms of existence, transforming itself from some forms into others, moving from one state to another, that it possesses an infinite number of different potentials. Possibility is not so much "a particular property of the non-existent" as a reality existing in a particular way. For instance, the regrettable possibility of war causes such enormous movements of society's material and spiritual forces that it would be wrong to deprive this possibility of the status of real existence. On the other hand, a bright and hopeful prospect may possess no less (or even more) productive power and hence, existence. Thus, "existence as a possibility" is an independent sphere of reality in its own right.

The material world resembles a boundless field sown with various seeds of possibility, which are not brought into the world by any supernatural forces but arise and exist there, expressing the self-motion and self-development of reality. Consequently, the category of the real embraces all possibilities because there is nowhere else for them to be, except in reality. Everything possible is possible because it exists in reality as the embryo of something else, as its orientation on the future, on change, transformation into something else. When we speak of possibility, we think of some perhaps very small "beginning" of something, which lies within that which possesses the possibility, that is to say, within concrete reality. This beginning also comprises the programme of that which does not yet exist in that which exists. Therefore, by reality in the broad sense we mean both the possible, the

process of creating the new, and its existence at all levels of perfection, that is to say, the action of all the real forces in the universe: nature in all the majesty of its material and information-energy formations, properties and relations, world history with all its countless small- or large-scale events and collisions, man with his sophisticated mind, and the material and spiritual culture of society in their mutual relationship. Reality takes in both the internal and external, the essential and the phenomenal, the law-governed and the accidental, the individual, general and particular, cause and effect, potential, realisation and what has been realised. Reality, to the degree that it has been comprehended by humanity, is expressed in the entire endlessly subtle system of concepts of science, philosophy and culture as a whole.

While stressing the unity of possibility and reality, the former's inclusion in the latter, we should at the same time bear in mind their difference or even their polarity. The possibility of anything is not yet its reality and perhaps is never destined to become anything of the kind. The category of possibility expresses the fact that a phenomenon has already begun to exist but has not yet acquired its perfect form. Hence, possibility is a unity of existence and non existence. Development is a process of generation of possibilities and conversion of one of them into reality. That which is becoming is only heading in the direction of existence and in this sense it does not yet exist. At the same time, having once begun, it already exists. It is as yet only a "prospect" of existence.

Possibilities delight us most of all in child prodigies. Youth is also full of promise. But not for nothing do we sometimes say about prodigies that their future is often left behind in the past. That's the way life is. Only when it grows up does the child reveal to the full its human essence, its possibilities. Only a mature person knows for sure what he is capable of, which of his possibilities have turned out to be real and what lies behind him as vain hopes and fruitless impulses. He stands before the judge that rules the consciousness of every one of us, and must answer for how much of that which was conceived in youth has been achieved in reality. And by no means everyone is satisfied with his achievement. Many of those who looked so promising have turned out to be quite ordinary people. The "makings" alone cannot be regarded as a person's true inner world. So we should never present as reality that which as yet exists only as a possibility. The inspiring possibility of all-embracing knowledge of the world is a far cry from its realisation.

In the narrower and more categorial sense reality is thought of as realised possibility, something that has come about, emerged, been

actualised, that lives and acts. In relation to the possible as potential the reality is a realised possibility and the basis for emergence of new possibilities. Consequently, reality is immeasurably richer than possibility because it comprises not only all forms and stages of its becoming, but also every result of the process. All the influence of the past on the development of this process in the future consists in the state it has achieved at the present moment.

Possibility is a tendency or rather the as yet implicit tendencies of development of actual reality. It is the future in the present, the tomorrow in the today. Reality is a world of possibilities and a world of realisations, and between them lies the process of the conversion of potential into actual reality.

The concept of reality is also used in the sense of full manifestation of some property or attribute. For example, a person who lives a full, creative life and is guided by noble impulses, who brings light, warmth and goodness to others, is often said to be living a real life, and not just vegetating.

Reality is not always the same thing as the existing. Reality is existence justified by the maximum fullness and vividness of the manifestation of its rich essence. In life, therefore, there are various degrees of manifestation of reality. Not everything that exists is real in the highest sense of the term.

The universe contains nothing that does not exist as a possibility or a reality or is not on the way from one to the other. Possibility precedes reality in time. But reality, being the result of previous development, is simultaneously the point of departure for further development. Possibility arises in a given reality and is realised in a new one.

Any historical process contains several possibilities. People strive to realise them but the process ultimately leads to unavoidable, unambiguous necessity. When all the contradictory possibilities are excluded, the circle of conditions completed, and there appears a certain reality which cannot be anything but what it is, then the possibility of being or not being disappears. What has happened and is real also has the nature of impossibility of being otherwise. This is the essence of *necessity*, which can be understood as developed reality or the unity of actual possibility and reality. The conversion of possibility into reality depends on how necessary it was for precisely this possibility to be realised. This necessity may increase or decrease to the point of total exhaustion, depending on changing conditions.

The exponents of mechanistic determinism assume that all that exists is wholly predetermined by the past, just as the future is predetermined by the present. Just as a sapling contains all the nature of the tree, its shape, colour, appearance and the taste of its fruit, so the cloud of gas and dust that generated the Sun, the planets and our Earth already contained the whole subsequent history of the solar system, including blue eyes, pink cheeks, and all the other peculiarities of individual human beings and their destinies. This claim implies that everything is given at once, that the future may be read in the present. From this basis the objective possibility of clairvoyance is deduced. If all possibilities were given once and for all and no new possibilities could arise in the course of development, the universe would be threatened with the inevitable exhaustion of possibilities and it would resemble a certain character in literature, whose days and hours diminished as his every wish was fulfilled.

In actual fact, development is not simply the unfolding of ready-made possibilities. Just as an effect contains something more than its cause, so reality constantly generates new possibilities. The living, for example, arises from premises that do not have the properties of life. A cause can be held to determine only the effect that arises from it directly. It is not responsible for what these effects bring about when they, in their turn, become causes in the remote future. Similarly every condition of things determines not all subsequent conditions but only those that proceed directly from it. The distant future becomes something that the present never dreamed of.

The farther we try to see into the future, the more hazy its contours become. The "mists of the future" do objectively thicken the farther away it is from the present. Possibilities characterise reality from the standpoint of its future. All possibilities are aimed at realisation and have a certain orientation. They are full of urge, effort and "yearning" for realisation. Every specific reality generally contains an infinite number of possibilities of emergence of qualitatively new phenomena.

Two factors are required for possibility to become reality: the operation of a certain law and the availability of appropriate conditions. People are born with exceptional possibilities in the form of their natural potentials. But these potentials can develop only under certain conditions. Any system contains more possibilities than it can actually realise. For example, a living organism has the possibility of producing an enormous progeny: microorganisms could in a few days produce a mass of living substance much greater than the mass of our whole planet. But enormous numbers of possibilities never come to fruition.

And does man himself realise all his physical and spiritual potentials? The paths to the realisation of each of them are littered with obstacles and the possibilities contest with one another. Life selects some and discards others. Everything that exists in reality is the result of this selection. Whether the result is a happy one is another question. No one can tell whether all this was inevitable. Sometimes we have to regret lost opportunities.

Life constantly gives rise to conflicts between what is and what should be. Everything is permeated with contradiction. This is true even of possibilities, which may be either progressive or reactionary. When a social revolution takes place, for example, it contains two possibilities: victory for the progressive forces or for those of reaction. And history records many cases when reaction has won the day. But in the final analysis time works in favour of progress and sooner or later progress triumphs.

Like everything else in the world, possibilities develop: some of them grow, others wither.

In nature the conversion of possibility into reality generally comes about spontaneously. History is made by people. A great deal depends on their will and consciousness. At the present time there is a possibility of preserving peace. Thanks to the active struggle for peace by all peace-loving forces, this possibility exists as a reality. In the life of society, too, events may come about spontaneously; some possibilities are realised when we do nothing or very little about them.

The most essential characteristic of possibility is the measure of its potential. Possibilities can be likely, not very likely or totally unlikely, mere formalities. The real, that is to say, the likely possibility, is a law-governed tendency in the development of the object concerned. A not very likely possibility is an inessential tendency in the development of the object and may come about in reality only due to a great coincidence. Only formal justification can be cited in its favour. It is possible that tonight an artificial satellite will hit a meteorite because all satellites are bodies separated from Earth and may collide with meteorites. This possibility is very remote. But for a real possibility to exist there have to be enough necessary conditions for its conversion into reality. It must have a favourable wind of circumstance.

The formal possibility differs radically from impossibility, i.e., from something that cannot happen under any circumstances. For example, it is impossible to invent perpetual motion. This contradicts the law of the conservation of energy. It is also impossible for us to meet, let us say,

Socrates in the street. We are confronted with a possibility only when the actual presence of that which we claim to be possible does not contain anything impossible. A huge number of formal possibilities never become reality. A perfectly real possibility may be missed or remain objectively unrealised because of certain circumstances. It becomes a formal possibility. Similarly, a formal possibility may become a real one. For example, the possibility of space flight was once only formal but has now become reality. In the time of Hippocrates was there any possibility of transplanting human organs? Of course, not. Before becoming reality, a formal possibility must become a real one. Due to the effect of opposing decisive factors, in conditions of opposing possibilities, a certain real possibility may be excluded. Possibilities sometimes cancel each other out.

The difference between the scientific understanding of the relationship between possibility and reality and the fatalistic notion, which identifies possibility and necessity, lies in the fact that a real possibility is regarded not as an inevitability but as a transformation that presupposes the influence of accidents, deviations, and the struggle of opposing forces. Not everything that is necessary is possible.

Reasonable people usually avoid talking about unlikely possibilities and leave that to the so-called "pub politicians", who comfort themselves with all kinds of pipe dreams. Wisdom does not allow itself to be tempted by unlikely possibilities. It keeps its feet firmly in reality. Reason is, in fact, the ability to set attainable goals. In life there are plenty of sayings that express the common people's contempt for vague possibilities, such as "a bird in the hand is worth two in the bush".

A correct understanding of the categories of possibility and reality, the relation of the real and the unlikely possibility is important both in theory and practice. It is often vital for us to be able to perceive the beginnings of something within something else that possesses potential of further development. The practical person, the politician must draw a clear distinction between the real possibility and the chimera. Knowledge of real possibilities, of opportunities, inspires hope. But when people hope for good weather or a win in the state lottery, such hopes have no effect on the outcome. There are different kinds of hope; there is a kind of hope that encourages and warms the heart and thus becomes an ideal motive force for certain actions that lead to its realisation.

Quality and Quantity

The concepts of quality and property. In his practical activity and search for knowledge man selects from the multiplicity of surrounding phenomena "something" on which he concentrates. Philosophers call this an object. It may be a thing, a phenomenon, an event, a mental condition, a thought, a feeling, an intention and so on. An object can be singled out from the background of reality because it, as a fragment of existence, is delimited from everything else. Its limits may be spatial, temporal, quantitative or qualitative. If, for example, we are confronted with a plot of land of, say 20 sq m, these are quantitative limits. But this plot may also be a meadow as opposed to a forest, and this is its qualitative limit. Quality determines the kind of existence of an object.

The category of quality is an integral definition of the functional unity of an object's essential properties, its internal and external definiteness, its relative stability, its distinction from and resemblance to other objects. Quality is an existing definiteness, as distinct from other definitenesses. It is the expression of the stable unity of an object's elements and structure. Quality is at the same time the limits of an object within which it exists as that object and no other. This means that quality is inseparable from the object. In losing its quality any object ceases to exist as such.

The quality of the object is revealed in the sum-total of its properties. The unity of properties is, in fact, quality. Thus an overall definition of the quality of a thing or phenomenon is a definition of the thing as a system with a certain structure. The nature of a thing is revealed in its properties, which constitute the mode of the object's relationship with other things. It is thanks to their properties that things interact. A thing has the property of evoking one or another action in something else and of manifesting itself in its own way in relation to other things.

A property is the way in which a certain aspect of the quality of an object manifests itself in relation to other objects with which it interacts. A property is that by means of which something manifests its existence in relation to something else. To speak of the properties of a given thing out of connection with other things is to say nothing about these properties. A property of an object thus consists in its being able to produce this or that action in another object and reveal itself in its own way in this action. Moreover, the mode of its manifestation in acting on another object substantially depends on the properties or condition of the latter; a spark falling on a gunpowder store is far more dangerous

than the same spark falling on damp ground, where it dies without a trace.

Properties not only manifest themselves, they may also change or even take shape in these relations. Just as matter cannot be reduced to the sum-total of its properties, so no object dissolves in its properties: it is their vehicle, their substratum. A thing should not be regarded, as it sometimes is, as a kind of hook on which its properties should hang. An object glows, as it were, with various aspects of its properties, depending on the context. For example, a person is seen in different qualitative lights by the doctor, lawyer, writer, sociologist, anatomist or psychiatrist. The properties of an object are conditioned by its structure, the internal and external interactions of its elements. Since an object's interactions with other objects are infinite, the properties of the object are also infinite.

Every property is relative. In relation to wood steel is hard, but it is soft in relation to diamonds. Properties may be universal or specific, essential or inessential, necessary or accidental, internal or external, natural or artificial, and so on. The concept of quality is often used in the sense of an essential property. The higher the level of organisation of matter, the greater the number of qualities it possesses.

Quantity. Every group of homogeneous objects is a set. If it is finite it can be counted. We may have, for example, a herd of 100 cows. To be able to consider each cow as "one", we must ignore all the qualitative peculiarities of these animals and see them as something homogeneous. One and the same number "100" is the quantitative characteristic of any set of 100 objects—cows, sheep, diamonds or whatever. Consequently, any quantity is a set if it can be counted, or a dimension if it can be measured.

Quantity expresses the external, formal relation of objects, their parts, their properties, their connections, number, dimension, set, element (unit), individual, class, degree of manifestation of this or that property.

In order to establish the quantitative aspect of an object we compare its constituent elements— spatial measurements, rate of change, degree of development, using a certain standard as a unit of computation or measurement. The more complex the phenomenon, the more difficult it is to study it by quantitative methods. For example, it is not so simple to count or measure phenomena in the sphere of morality, politics, aesthetic perception of the world, religion and so on. So it is no accident that the process of getting to know the real world

both historically and logically takes place in such a way that knowledge of quality precedes knowledge of quantitative relations. Knowledge of the quantitative aspect of a system is a step towards deepening our knowledge of this system. Before a person can count, for instance, he must know what he is counting. Science proceeds from general qualitative estimates and descriptions of phenomena to exact mathematical laws of quantity.

The basis of quantitative thinking is the objective discreteness of things and processes. Quantity is expressed by number, which has two main meanings: the measure of generality of the elements when put together; the divisibility (real or putative) of an object, its properties and relations, into homogeneous elements relatively independent of its quality. For example, we form the number 5 in the process of counting, thus turning this five into a simple quantity. Five people are not simply a formal unit of five human beings, they are not something singular but a specifically divisible unity of five elements. Any number is a relatively independent, integral assembly of a certain set or a divisible unity of quantity. Moreover, quantity is not identical with number. One and the same quantity as a dimension—length, for example—may be expressed in different scales of measurement (metres, centimetres) and therefore in different numbers.

Besides discreteness, which serves as the real premise for the concepts of quantity and number, it is important for an understanding of the objective basis of mathematics to realise that discrete things, their properties and relations, are united in sets.

Measure. For centuries people have said, "everything has its measure". The reasonable person has a sense of measure in everything: behaviour, dress, eating, taste, and so on. Loss of the sense of measure, of proportion, is a bad sign and takes its revenge by putting the offender in a comic and sometimes tragic situation. Not for nothing do people dislike exaggeration, the superfluous. The perfect is something that has no defects of proportion. The imperfect can never be the measure of anything. Measure is the quantitative limit of a given quality. Quality cannot be more or less than that limit. The whole history of philosophy from ancient times to the present day is permeated with the idea of measure.

Measure is thought of as a perfect whole, a unity of quantity and quality. The concept of measure is used in various senses: as a unit of measurement, volume, as proportion of the parts to the whole, as the limit of the permissible, the legitimate, as law, as unity of quantity and

quality, as their perfect wholeness, integration (a molecule of ordinary water must have two atoms of hydrogen and one of oxygen), and as a self-developing system. Measure is also a certain stage in the historical development of something.

Measure expresses unity of quality and quantity. For example, the atoms of various chemical elements are only distinguished from each other by the fact that their nuclei contain various quantities of protons. If we change the number of protons in the nucleus, we change that element into another. Every colour has its wavelength and corresponding frequency of oscillation. Every drug has its measure: its good or bad effect depends not only on its quality but also its quantity. One and the same chemical substance in various doses may stimulate growth or inhibit it. Measure is proportion. It may embrace certain normative features: in morality a knowledge of measure in everything, moderation, modesty; in aesthetics, symmetry, proportion. Gracefulness, for example, is freely organised harmony, proportion in motion. Rhythm, melody and harmony in music are based on the strict observation of measure. Measure is the zone in whose limits a given quality may be modified or varied by virtue of changes in the quantity of certain inessential properties while retaining its essential ones.

The transformation of quantity into quality and vice versa. The path of development in nature, society and consciousness is not a direct line, but a zigzag. Every turn signifies the appearance of new laws that hold good for that particular leg. The limits of these laws are by no means always clearly fixed, sometimes they are conditional. Who can determine the exact limits showing where childhood ends and adolescence begins, where youth begins and when it enters the quality known as "young person"?

The transition from an old to a new quality involves a leap—a break in the gradualness of development. The process of development combines a unity of the continuous and the discontinuous. Continuity in the development of a system indicates relative stability, its qualitative definiteness. Discontinuity in a system's development indicates its transition to a new quality. Figuratively, one may compare this process with the action of a spring and cogwheels in a clock: the spring operates continuously, but thanks to the regulating effect of the cogwheels the energy transmitted by the spring is converted into rhythmical work. The world is not a steady stream, nor is it a stagnant pond, it is a combination of relatively stable and changing systems. Systems develop rhythmically and every stroke of the "clock of the universe" signifies the birth of the new. This is where the law of the transformation of quantity

into quality and vice versa reveals itself. This law has an objective and universal character admitting no exceptions.

Quantitative changes show themselves in various ways: as changes in the number of elements of an object, the order of their connection, their spatial dimensions, their velocity, degree of development, and so on. In short, any change in quantity amounts to a change in the elements of a system. The degree of difference between an old and a new quality depends on what quantitative changes have taken place in them. For example, water is heated (increase in the speed of its molecules), but it remains water although it is much hotter or perhaps very hot. Only some of its properties have changed. This change is gradual or phased, a movement from one state to another. But then comes the critical boiling point. The agitated water molecules start bubbling to the surface and leave it in the form of steam. From its liquid state water passes into steam. Basically the appearance of a new property means the appearance of a new object with new laws of existence, with a new measure possessing a different quantitative definiteness. Moreover, the degree of qualitative change may differ. It may confine itself to the level of the given form of motion or it may go beyond this level. Thus measure expresses a unity of quality and quantity in relation to objects for which simple transformation is characteristic, that is to say, change within the limits of the given form of motion of matter, as, for example, in the case of the transformation of water into steam or elementary particles into each other. But measure also expresses the limits of transition from one level of a system's organisation to another, for example, the emergence of the animate from the inanimate. On the threshold of the new, measure grows old and this is the sign of the necessity for transition to another measure.

The process of radical change of quality, the breakup of the old and the birth of the new is what we mean by a "leap".

A leap is a spontaneous discharge of mounting tension, a resolving of contradictions. The passage of a phenomenon from one qualitative state to another is essentially contradictory, it is a unity of destruction and renewal, existence and non-existence, negation and affirmation.

A leap includes the moment of cancellation of the previous phenomenon by the new. The transformation of one phenomenon into another is a unity, an interaction of quantitative and qualitative changes, which pass through a number of intermediate phases. Moreover,

different phases of change in a given quality signify changes in the degree of the given quality, in other words a quantitative change.

The big leaps in the development of objective reality were the formation of stars, particularly the solar system and its planets, the origin of life on earth, the origin of man and his consciousness, the formation of new species of animals and plants and the emergence and replacement of socio-economic formations in the history of human society, the great landmarks in the development of science, art, and so on. The social revolution is a special kind of leap, characteristic of social development.

We sometimes use the concept of "evolution" to denote continuous changes, that is to say, gradual changes in quantity and changes of certain properties within the framework of a given quality. However, in the wider sense this term is used to mean development in general, for example, in relation to cosmogony (evolution of stars), and to biology, the evolution of the vegetable and animal worlds.

As a rule, two basic forms of leap take place in the process of development. A leap may be momentary in time, that is to say, a sharp transition from one quality to another, and it may also be a process of a certain duration. A leap may last for a billionth of a second, as in microprocesses, for example, for billions of years, as in cosmic processes, and hundreds of thousands of years, as in the formation of animal species. A distinctive feature of the leap is the fact that the emergence of a new quality puts an end to the former pattern of quantitative changes. Leaps of the first kind have sharply defined frontiers, great intensity, and high velocity in the process of transition; they signify an all-embracing reorganisation of the whole system at a single stroke. Such transformations are to be found in the atomic explosion or the political revolution in society. But political and particularly social revolutions rarely take place in the form of a one-off destruction of the old and construction of the new. The transition may not necessarily be clearly expressed, there may be intermediate stages combining the old and the new.

Assuming the nature of quality as a system of properties, one should distinguish individual or particular leaps associated with the appearance of new particular properties, and general leaps associated with the transformation of the whole system of properties, that is, the quality as a whole.

Changes in quantity and quality are interconnected, a change in quality also involves quantitative change. This is generally expressed in

the fact that as the level of organisation of matter rises the rate of its development accelerates. Every level of organisation of matter has its specific laws of quantity. A new, better adapted animal species yields a progeny whose greater power of survival guarantees wider opportunities for it to spread.

The law of the transformation of quantitative into qualitative changes and vice versa places a number of methodological demands on cognition. It allows and requires us to study an object from the standpoint of quantity as well as quality. Study of the quantitative aspect of things has enormous significance in science, technology, and everyday practice. Access to the deep-going problems of science, including biology and social research, demands extremely refined mathematical methods.

Until quite recently, biology, physiology, linguistics, psychology, and many other sciences made little or no use of mathematics, but now they are forging ahead largely due to the application of mathematical methods. Cybernetics has opened up particularly tempting opportunities for their use in modern science. The degree to which mathematics may be used in the study of this or that science is determined by the degree to which quantity may be abstracted from quality. In every specific case this abstraction has its limits.

In scientific research the application of mathematical methods always presupposes a profound knowledge of the subject. Scientists need mathematics not only for computations and calculations — although, of course, this role of mathematics in science is highly important— but as an effective heuristic technique, and also for developing the rigour and discipline of logical thinking. The followers of Pythagoras assumed that universal order was based on the harmony of numbers. Later thinkers suggested that numbers indicate how the world is governed. The reasonable approach is to make sure that quantitative definitions do not over shadow the qualitative definiteness of facts and laws. We can fully understand the essence of an object only by considering both quantity and quality in their unity, their interconnection.

Negation and Continuity

Justified negation as an element of development. Everything passes! All things are finite, everything is moving towards its end. Everything has its spring and its summer, everything declines into autumn and dies in the frigid cold of its winter. Such is the inexorable logic of life, both natural and human. Everything individual is like the flame of a fire and fire consumes its own source. Time is similar. Like the ancient god Cronus, it eats its own children. This is a sad fact of life. But wisdom reminds us that without negation of the old there could be no birth or maturing of the higher and fuller forces of the new and, therefore, no process of development, no progress. Even when young and still full of energy, things start to change inwardly in the direction of inevitable ageing. This begins even when energy and strength are at their peak. Immortal is the race where the mortal dies.

Everything obsolescent strives to renew itself and hold its ground in regenerated forms. Between the new and the old there is similarity or generality (otherwise we should have only a multiplicity of unconnected states), differences (with out transition to something else there is no development), coexistence, struggle, mutual negation, and the transmutation of the one into the other and vice versa. The new arises in the womb of the old, achieves a level incompatible with the old, and the latter is then negated. Sooner or later the old must die so that the young can live. The eternal play of life is as ruthless as death, as inevitable as birth. In the positive understanding of existence dialectics also includes understanding of its negation, it's inevitable destruction.

The chain of negation of the old and emergence of the new has no beginning and no end. The developing object simultaneously becomes something different and in a certain sense remains the same. For example, youth negates child hood and itself in its turn is negated by maturity, and the latter is negated by old age. But these are all different stages in the development of one and the same person.

Negation understood as the destruction of one thing by another is negative in character. This negation pushes the past into the abyss of "nothingness". Dialectical negation is primarily a creative and conserving negation. The old is not simply thrown aside but is "subsumed", preserved in the new. The development of phenomena moves in cycles. Every cycle consists of three stages: the initial moment of development; the transformation of phenomena into their opposites, that is to say, negation; the transformation of the new opposite into its opposite, that

is to say, the negation of negation. The chain of negations in the process of development has neither beginning nor end. Two different, even opposite types of negation are vividly expressed in Goethe's *Faust*. Whereas Mephistopheles denied everything and saw in this his essence, Faust negated, denied in the name of creation and preserved what was needed for a new beginning. For example, much of the best in past culture survives in progressive contemporary culture. Negation is at the same time affirmation. In destroying something that exists, it preserves its positive elements in subsumed form. Lenin stressed that the essential thing in dialectics is negation as a moment of connection, as a moment of development, with retention of the positive. This "retention", the unity of negation and continuity in development, constitutes an important feature of the dialectics of negation as a universal principle of existence.

Wise criticism, while destroying the obsolete, encourages the creation of the new. It overthrows but creates something new in the process.

Continuity. The concept of development is characterised by continuity, consistency, direction, irreversibility and the preservation of achieved results. Development is not the sum-total of separate successive states. If this were so, processes would have no duration and everything would remain in the present; there would be no continuation of the past in the present, and no development.

The new, which negates and replaces the old as a result of self-development, constantly preserves the connection with the old, absorbs from it everything viable and necessary, and discards everything obsolete, everything that holds up progress. The emergent new cannot affirm itself without negation; nor can it do so without continuity. For example, a biological species survives and asserts itself only through the destruction of individuals, which in the process of procreation exhaust their purpose and, since they have nothing higher, go on to their death.

At every present moment the world is the fruit of its past and the seed of the future. The present "drags" the past in its wake. As Herzen put it in a vivid phrase, the future hovers over the events of the present and plucks from them the threads for its new fabric, from which there will be made a burial robe for the past and the swaddling clothes for the newborn. The past cannot be regarded as disappearing without a trace on the principle that what is past is past and cannot be revived. The past holds us firmly in its grip. It constantly participates in the creation of the present.

The development of life itself, for example, is possible thanks to the subtle mechanisms of heredity. Progeny are never exact replicas of their parents. Change works side by side with heredity in producing new attributes. Some changes are inherited and become a property of the whole species. In the evolutionary process, the negating element is ensured by the influence of the environment and mutation.

Apart from any other reason we make progress in research because there is no need for us to travel the whole road of our predecessors in order to have at our command their accumulated knowledge. By no means all our new ideas come out of our own heads. We can have insight into the future only through knowledge of the past.

What has been achieved by every generation in practical and cultural activity is a precious legacy whose growth is the result of accumulation by all preceding generations.

Continuity plays a specially important role in science and technology. Without knowing their history we cannot understand the development of culture and assess contemporary achievements, or get a grasp of future prospects. When people of each successive generation enter life, they enter a world of objects and relations, a world of signs and symbols created by previous generations. This is how tradition as a social form of the transmission of human experience evolves. Tradition in the general philosophical sense of the term is a certain type of relationship between successive stages of a developing object, including culture. The "old" passes into the new and "works" productively within it. If this productive tradition is capable of adaptation in the context of the socially new and helps its development, it acquires stability. Tradition that hinders the development of society gradually outlives itself, but sometimes because of certain subjective conditions it lingers on and gets in the way of historical progress.

Days, decades, even centuries pass and time —that incorruptible judge— carries away everything secondary and transient into the ocean of oblivion, preserving only the essential. The development of culture is like the flow of a river. While rolling down to the sea it always retains its link with its source. There are eternal values that survive centuries and even millennia, constantly influencing the development of world culture. The relationship of the present to the past is aptly expressed in the saying that we take fire, not cold ashes from the intellectual hearths of our ancestors. History as a rule acts on the principle that what is eternal is always contemporary. The dialectics of the truly great works of culture is such that they outlive by many years or centuries the purpose for

which they were originally designed because they possess a great power of generalisation, which retains its intransient importance.

Far from excluding negation continuity of development presupposes it. Continuity of development is not the same as continuous development. The whole history of scientific research indicates that from ancient times to the present day knowledge has developed through negation: every stage in the development of science finds the strength in itself to ruthlessly overcome what has gone before. Science dies if it stops giving birth to the new. Einstein expressed both respect for tradition and negation of the obsolete in tradition when he said that the concepts created by Newton still dominate our physical thinking, although it is now clear to us that the urge for a deeper understanding of interconnections compels us to replace these concepts by others that stand at a greater distance from the sphere of direct experience.

The idea of progress. The fact of progress is clearly and impressively recorded on the scrolls of history. Knowledge acquired by one generation is passed on to the next. In inorganic nature processes of development take place which do not, however, embrace all changes and cannot be reduced to an ascent from the lower to the higher. The processes of development include the formation of elementary particles, atoms, molecules, cosmic systems. Progressive development is the basic direction of motion for the branch of the universe that includes our planet.

The development of matter follows not one direction but a countless number of directions. Nature's progress cannot be represented as a straight line. In its development nature seems to dart from side to side in all directions and never march straight ahead. This accounts for the endless diversity of forms of existence. For example, the development of organic matter has taken hundreds of thousands of directions, which have produced the great wealth of vegetable and animal species that astonish us by their variety of form and colour. The evolution of man is only one of the lines of progress of the organic world.

Development is not a straight line and not motion in a circle, but a spiral with an infinite series of turns. Forward motion is thus intricately combined with circular motion. If all processes in the world developed only successively, without repeating themselves, such things as life, animal and human behaviour, and the life of society could never have arisen; mental activity, consciousness, material and spiritual culture could never have come into being. The process of development also involves a kind of return to previous stages, when certain features of

obsolete and replaced forms are repeated in new forms. The process of cognition on a new basis often repeats cycles that have already taken place.

The criterion of progress. A general criterion of progress is the perfecting, differentiation and integration of the elements of a system: elementary particles, atoms, molecules, micro-molecules. As matter develops and increasing numbers of highly organised systems are formed, the qualitative diversity of objects increases. Science knows only a few types of stable elementary particles, but has "on its books" more than a hundred chemical elements. At the molecular level tens of thousands of structural formations are known and the known macromolecular formations are practically uncountable. In relation to biological forms the criterion of progress is the level of development of organisation, particularly the nervous system, the wealth of interrelationships between the organism and the environment, the level of development of reflection, of mental activity. Thus the criterion of progress consists in extension of possibilities of further development, its acceleration. As various forms of matter attain higher levels, the velocities of development increase. For example, essential qualitative changes in cosmic systems take place over periods measured in millions and billions of years. The formation of the Sun and its planets, for example, required approximately 5,000 million years. Geological changes on Earth take place much quicker than the formation of the Earth itself. It took approximately a thousand million years for life to appear on Earth. Animate nature develops much quicker. Every succeeding epoch of the Earth's development is shorter than the one before and yet more diverse forms are born and die in the shorter period. In the four or five thousand million years that life has existed on Earth there have appeared thousands of animal and vegetable species, including man's ancestor, which labour turned into a human being in a mere two million years.

Engels compared the progressive development of social life to "...a free hand-drawn spiral, the turns of which are not too precisely executed. History begins its course slowly from an invisible point, languidly making its turns around it, but its circles become ever larger, the flight becomes ever swifter and more lively, until at last history shoots like a flaming comet from star to star, often skimming its old paths, often intersecting them, and with every turn it approaches closer to infinity."¹

¹ F. Engels, "Retrograde Signs of the Time" in: K. Marx, F. Engels, *Collected Works*, Vol. 2,

In social history the pace of development increases as formations proceed from lower to higher levels. Whereas the primitive communal system developed slowly (over 30 to 40 thousand years it hardly reached the stage of the iron plough), the slave system moved ahead much quicker. It achieved a high technological and spiritual culture in about 1,500 years. Feudalism rose to an even higher level in about a thousand years. Capitalism required only about 200 years to establish itself as the dominant form of social life. And in only a few decades socialism has achieved transformations that cannot be compared with any previous period in history.

There is no limit to human development and man can never say to himself, "Stop, I've had enough, there's nowhere else to go!"

Consequently, we arrive at a general principle: the pace of development grows as the forms of organisation of matter move from the lower to the higher. It follows that the pace of development of this or that material organisation in general, and of social forms of life in particular, indicates how far they have gone towards perfection. This law expresses the contradictoriness of the general direction of development: progress is related to regress, irreversibility to circular movement, discontinuity to continuity, negation to succession, return to the old in a new form bearing only a formal resemblance to one of the previous stages, cycle and spiral.

Thus progress takes place not along a straight line of ascent. It puts out side branches, and certain elements of the whole even take a reverse course. The progressive line of development, being realisation of one of many possibilities, at the same time sets a limit on motion in other directions. Every progress is in a sense restriction; it reinforces one-way development and excludes the possibility of development in other directions.

The methodological and practical significance of this principle is important for an understanding of the general tendency of development and the connection between past and present that takes shape in the course of it. If the new arises out of the old and absorbs everything positive therein, it means that in both science and practice we must give due credit to the achievements of the past and critically accept its most valuable results.

Negation is a method of reasonable critical assimilation, based on the principle: "My successors must go ahead of me, contradict me, even

destroy my work while at the same time continuing it. Only from such destructive work can progress be created."²

This principle helps us to understand where development is going, what it consigns to oblivion, and what will grow and develop. The new is irresistible. In the long run, despite certain retreats, zigzags, turns, it overcomes the obsolete. In practical activity, therefore, one should always orient oneself on the new. One must listen attentively to the voice of life, notice and support fresh beginnings, even if they have not yet taken root, for it is to them that the future belongs. This is one of the important conditions for wise policy-making in everything.

In the present age the direction of the development of society is the centre of acute ideological struggle. During the period of ascendant development of capitalism many bourgeois philosophers supported the ideas of social progress. However, as antagonistic contradictions intensify, notes of pessimism and lack of faith in the future have become increasingly audible. Every advance made by humanity is presented as a further step along the road to destruction. But the history of the development of nature and humanity proves that progressive development is an immutable law of life.

² V. Michurin, *Works*, Vol. 4, Moscow, 1948, p. 402 (in Russian).

Contradiction and Harmony

The unity of opposites and contradiction. One of the basic questions of world-view and the methodology of cognition is this: What is the cause of the motion and development of phenomena and is it in the world itself or outside it? Some reply that just as the existence of a clock assumes a clockmaker, so the existence and motion of the world presupposes a creator who steers that world. Just as a clock works when it is wound up by its owner, so the world moves at the will of a higher power. But if the existence and motion of the world presuppose a creator, the existence of the creator himself, by the logic of such thinking, must in its turn presuppose the existence of a creator of an even higher order. And this gets us into false infinity. The scientific world-view does not seek causes of the motion of the universe beyond its boundaries. It finds them in the universe itself, in its contradictions. The scientific approach to an object of research involves skill in perceiving a dynamic essence, a combination in one and the same object of mutually incompatible elements, which negate each other and yet at the same time belong to each other.

The ultimate cause of the development of any concrete system is interaction. Analysis shows that interaction is possible between objects or elements of objects that are not identical to one another but different. Identity and difference have their degrees. Difference, for example, can be inessential or essential. The extreme case of difference is an opposite —one of the mutually presupposed sides of a contradiction. In relation to a developing object difference is the initial stage of division of the object into opposites. When it comes into interaction, an object seeks, as it were, a complement for itself in that with which it is interacting. Where there is no stable interaction there is only a more or less accidental external contact.

It is even more important to remember this point when we are talking about connections between phenomena that are in the process of development. In the whole world there is no developing object in which one cannot find opposite sides, elements or tendencies: stability and change, old and new, and so on. The dialectical principle of contradiction reflects a dualistic relationship within the whole: the unity of opposites and their struggle. Opposites may come into conflict only to the extent that they form a whole in which one element is as necessary as another. This necessity for opposing elements is what constitutes the life of the whole. Moreover, the unity of opposites, expressing the

stability of an object, is relative and transient, while the struggle of opposites is absolute, expressing the infinity of the process of development. This is because contradiction is not only a relationship between 'opposite tendencies in an object or between opposite objects, but also the relationship of the object to itself, that is to say, its constant self-negation. The fabric of all life is woven out of two kinds of thread, positive and negative, new and old, progressive and reactionary. They are constantly in conflict, fighting each other.

The ancients used to say that everything comes about through strife. If a phenomenon contains opposites, it must be in contradiction with itself. The same applies to the expression of this phenomenon in thought. There is an obvious contradiction in the fact that a phenomenon remains the same and at the same time constantly changes, that is, contains opposite tendencies.

The opposite sides, elements and tendencies of a whole whose interaction forms a contradiction are not given in some eternally ready-made form. At the initial stage, while existing only as a possibility, contradiction appears as a unity containing an inessential difference. The next stage is an essential difference within this unity. Though possessing a common basis, certain essential properties or tendencies in the object do not correspond to each other. The essential difference produces opposites, which in negating each other grow into a contradiction. The extreme case of contradiction is an acute conflict. Opposites do not stand around in dismal inactivity; they are not something static, like two wrestlers in a photograph. They interact and are more like a live wrestling match. Every development produces contradictions, resolves them and at the same time gives birth to new ones. Life is an eternal overcoming of obstacles. Everything is interwoven in a network of contradictions.

Contradictions in people's minds and actions have been expressed with brilliant accuracy and vividness in the work of many great artists. The most notable example is, perhaps, Shakespeare, who portrayed man's inner world with such depth of the insight into all the contradictory passions that afflict the soul, the clash of motives, the conflict of emotions, the rivalries between individuals, the critical states of will and mind, the contesting urges of good and evil, the noble and the ignoble, the tragic and the comic. With great skill he traces the development of character right up to the point of its conversion into its own opposite and the contradictions between his characters often amount to individual expression of the contradictions of social forces and interests.

In Dostoyevsky, to take another example, the assertion that all contradictions in life "live together" never loses its force. No matter how nightmarish they may be, no one can escape them; they pursue all men everywhere.

Equilibrium and harmony. Thoughts of contradiction and opposites lead us on to ask whether one may say categorically that contradictions always, simultaneously, presuppose and exclude each other. Life has witnessed cases when opposites, not only exclude but also complement each other, forming a *harmonious whole*. Take, for example, the problem of psychological incompatibility in a work group, in everyday life, in the family. Compatibility necessarily presupposes certain contradictions, which complement each other and, taken together, form a harmonious whole, a symphony, in which a contrary does not exclude but presupposes its opposite. Consequently, opposites may be combined in different ways and the result may be cacophony or symphony. Pythagoreans spoke of harmony as something without which nothing could exist. The Greek physician and thinker Alcmaeon believed that the health of the organism depended on harmonious combination of contrasting qualities and forces, on their equilibrium, while any superiority or domination of one of them could give rise to illness. This principle of harmonious combination was applied to the universe as a whole. If there were no harmony, contradictory and heterogeneous principles could not enter the synthetic whole of the universe. Musical harmony, the agreement of different tones or measures, appears to Pythagoras and his fellow-thinkers as merely an audible form of universal harmony and is determined by quantitative relations. It is harmony that reveals the secret of the intrinsic agreement of opposites. This unity in the heterogeneous, this agreement in difference, which is to be found in musical harmony, is revealed throughout the universe. By harmony we mean a balanced and viable stable combination of elements and their connections, their internal and external interactions, all their motions. Harmony should be thought of as a process. The life of the universe consists in the constant interruption and restoration of harmony, of equilibrium: everything flows and balances out, everything balances out and flows. We could indicate a number of forms of equilibrium connected with internal motion: the preservation of the state of motion, for example, the preservation of the state of luminous radiation, the process of life, the process of material and spiritual (intellectual) production, and so on. An equilibrium is achieved and results in a stable, harmonious state of the interaction of opposites, which make up the given process taken as a whole (for example, the

balanced state of the internal processes of the living organism), the maintenance of interactions between one phenomenon and another (for example, the interaction of an organism and its environment), the stability of a certain form or law (for example, the stability of laws governing physical, organic, social and psychological processes), the equilibrium, the preservation of the basis that generates a given form of motion (for example, the stability of fields of elementary particles as the condition for the origin of atoms, atomic stability, the formation of inorganic and organic compounds, etc). In certain relatively closed systems, the equilibrium of the opposed forces may be prolonged. For purposes of research and use in technology, researchers have agreed to consider certain states of matter as existing in ideally pure form and given them corresponding formulae. Meteorology, for instance, attaches great importance to the study of the relative equilibrium of the atmosphere, thermodynamics studies the relative thermodynamic equilibrium, and nuclear physics, the radioactive equilibrium. Chemistry studies chemical equilibrium.

There is a huge range of so-called statistical equilibria. This is also characteristic of such a highly complex living system as the human being, which is a dynamically balanced system in both its bodily and psychological organisation. When we say of somebody that he is "an unbalanced person", we refer to the pathological excitability of his nervous organisation, a tendency to burst into fits of anger, often for no reason at all.

Contradictions and their resolution. The motion of a contradiction consists in its simultaneously being realised and resolved. Contradictions are constantly subsumed and created, revived in a new form. The resolving of a contradictory system is also a means of moving towards a new system that is historically destined to replace it.

Contradictions are resolved, overcome in struggle. They and their resolution stimulate motion. The interaction of opposites, as a contradiction and its resolution, is what awakens every seed to growth and every bud to unfold as a leaf, a flower, or a juicy fruit. Contradiction and its resolution lend motion to things great and small and are revealed in the regular "reasonable" order of the universe. They account for the unity of life and death, the beating of the pulse, the motion of forces released in crystals, in plants, animals, human beings, society, and in the whole universe. Unless resolved, contradictions do not "spur on" development, they are a necessary but not sufficient condition for development.

There are many ways of resolving contradictions and they depend on various conditions, including the character of the contesting parties in the case of contradictions in the life of human beings and society. In some cases one side of the contradiction perishes and the other triumphs, in others both sides perish, exhausting themselves in the struggle. There may also be a more or less prolonged compromise between the contestants. The resolution of a contradiction may be complete or partial, instantaneous or by stages. Let us take, for example, the present age. It is full of contradictions of every type and variety. On the socio-political plane the situation is dangerously tense because of the unrestrained arms race initiated by imperialism, which forces the socialist countries to take measures to strengthen their defences. Relations between some countries are badly strained. A fierce ideological struggle is going on between the countries of socialism and capitalism. What do the peoples of the world desire? What is their main concern? Everyone knows what it is and it was stated in full at the 26th Congress of the CPSU —to achieve detente. The Soviet leadership has affirmed by positive action that it is seeking not to build up contradictions between the world of socialism and capitalism but to resolve existing contradictions by peaceful political means.

It would be a mistake to imagine that every contradiction leads to development. For instance, conflict between the members of a family can hardly be regarded as a source of development. Various processes evidently have an optimal contradictoriness, which encourages development to the greatest degree.

The character of contradiction depends on the specific nature of the opposed sides and also on the conditions in which their interaction takes place. Internal contradictions are interaction of opposite sides within a given system, for example, within a certain animal species (intraspecific struggle), within a given organism or society. External contradictions are the interaction of opposites related to different systems, for example, between society and nature, the organism and the environment, and so on. In the final analysis, the decisive contradictions in development are the internal ones.

Antagonistic contradictions are interactions between implacably hostile classes, social groups and forces. As a rule, they build up to the point of conflict and are resolved in social and political revolutions. Non-antagonistic contradictions are interactions between classes whose basic interests and aims coincide. The socialist revolution resolved and thus eliminated antagonistic contradictions, but it did not eliminate contradictions in general. Socialism has its contradictions, for example,

those between developing production and increasing demands, between the advanced and the backward, between creative thinking and dogmatism. The main contradiction is the one which in a whole set of contradictions plays the decisive role in development.

Contradictions may be found in nature, society and human thinking literally at every step. The whole history of human culture, of scientific knowledge involves a struggle between new knowledge and hypotheses and obsolete propositions, the clash of different and sometimes completely opposed opinions. The struggle of ideas is one of the vital guarantees against the mummification of thought. Great discoveries always evoke animated discussion and argument and this is where the truth is born. Life is an unceasing struggle — a process of development, in which the winner usually achieves progress in the development of knowledge if for no other reason than the necessity to fight, made ever more urgent by the efforts of the opposing side. This stimulates the thought and intellectual abilities of both sides, thus encouraging general intellectual progress.

The stating of contradictions in science is enormously important for the development of knowledge. One should not fear contradictions, for every contradiction contains the embryo of discovery. Creative thinking not only states antinomies but is seeking to resolve them. Dialectical contradiction in thought is not self-contradiction, not a muddling of concepts, but the interaction of opposed positions, points of view, opinions, concepts. Unlike muddled thinking, dialectical contradictions represent consciously perceived contradictions. Unconscious contradictions in thought are a sign of stupidity or of incorrect reasoning, which are corrected either by the thinker himself or by others. Nor can a theory which is internally contradictory be of any scientific importance. It has to be perfected and become internally uncontradictory. Otherwise dialectics would become a justification for total lack of principle and teach an ability to say one thing today and the opposite tomorrow. When caught in a confusion of opposed conclusions, reason feels extremely uncomfortable. Far from hindering us, the recommendations of formal logic, including the rules that protect us against elementary contradictions, against irresponsible jumping from one assertion to another without any objective grounds, help us to discover and express, consciously point out the actual contradictions and variability of things. By dialectics we mean not a person's contradicting himself, although even this may happen unconsciously in the course of research, when mental associations run riot around some idea; what we mean is the contradiction in an object and the reflection

of this contradiction in thought, where it is consciously registered and resolved. As science progresses the number of possible contradictions, paradoxes and antinomies does not decrease but actually multiplies. Great flights of creative thought and discoveries have been and will be made possible precisely through resolving these contradictions. Contradictions taken to the point of antinomy usually turn out to be landmarks in scientific progress, the points where thought breaks through into what was previously unknown.

At the first stage in the process of cognition, when the object is perceived in its initial wholeness and sensuous concreteness, the contradictory unity of opposites cannot be revealed. The knower must therefore begin from mental analysis of the initial unity, breaking it down into its components. Cognition of the aspects of a contradiction in their separateness and even opposition presupposes the synthesis of previously divided opposites. As a result, the one-sidedness of the initial analytical approach to the object, when all its aspects were studied as isolated phenomena, is overcome.

Antinomies, which have an objective basis, are a specific form of the existence of dialectical contradictions in knowledge. The content that they reflect is ultimately an element of the structure of the developing objective contradiction. Cognitive antinomies serve as a form of theoretical reproduction of contradictions in scientific theories, whose development takes place through the uncovering and resolving of the contradictions discovered in previous theories or levels of research. The most effective way of resolving antinomies that arise in theoretical thought is to go beyond their limits, to discover the underlying basis, to find how one opposite turns into the other and reveal the intermediate links.

The philosophical and methodological importance of being able to identify and resolve contradictions is constantly growing in connection with the increasing diversity of people's social relationships, the progress of science and the increasing complexity of the system of concepts in thought. The educative value of an understanding of the principle of contradiction is that it becomes the core of a person's attitude to the world as a world full of contradictions demanding to be known and resolved. Intellectual thought in science, art or politics must start by assuming that the world is contradictory. Otherwise they can only stagnate.

Chapter 3. Consciousness of the World and the World of Consciousness

Table of Contents

The General Concept of Consciousness and Mental Activity

The Material and the Spiritual

Consciousness and Language

The General Concept of Consciousness and Mental Activity

Definition of consciousness. Human beings possess the most wonderful of all gifts—reason with its keen insight into the remote past and the future, its penetration into the sphere of the unknown, its world of dreams and fantasy, creative solutions to practical and theoretical problems and the realisation of the most daring plans. As the highest level of human mental activity, consciousness is one of the basic concepts of philosophy, psychology and sociology. The unique nature of this activity lies in the fact that the reflection of reality, and its constructive-creative transformation in the form of sensuous and mental images, concepts and ideas, anticipate practical action by individuals and social groups and give them a goal, an orientation.

Humanity's finest minds have from ancient times sought the answer to one of the greatest mysteries of existence. What is the nature of man's spiritual world? All the forces of reason—science, philosophy, art, literature—have combined in the effort to cast light on this mysterious realm known as consciousness. At the early stages in the development of philosophy, psychological phenomena were interpreted with out any strict distinction between the conscious and the unconscious, the ideal and the material. The basis of conscious action was termed Logos, which meant word, idea, essence of things, the logic of existence, and the value of human reason was determined by the degree to which it corresponded to this Logos, the objective universal order. Psychological processes were thus identified with the material (air, the motion of atoms, and so on).

The borderline between man's inherent processes of consciousness and material phenomena was first noted by the Sophists, and later by Socrates, who stressed the uniqueness of acts of consciousness in comparison with the material existence of things. The objective content of consciousness was elevated by Plato into a specific world of ideas, a realm of pure thought and beauty contrasted to everything material. Just as for the whole universe the incorporeal reason was the prime mover, the source of harmony and strength, capable of comprehending itself, so in every individual the mind contemplated itself and at the same time functioned as the active principle regulating behaviour.

The achievements of science and particularly medicine played an important role in shaping philosophical views of consciousness as a specific, higher form of mental activity. They made it possible to delimit consciousness as the human being's ability to have knowledge of his own mental, emotional and volitional acts as distinct from other mental phenomena.

In ancient philosophy, consciousness was closely associated with reason, which was considered to be cosmic, a generalisation of the real world, a synonym for universal law.

In the Middle Ages consciousness was interpreted as a transcendental principle (God), which existed before nature and created nature out of nothing. Reason was understood as an attribute of God, and human beings were granted only a tiny "spark" of the all-pervasive flame of the Divine Reason. At the same time Christianity conceived the idea of the spontaneous activity of the soul, which included consciousness. According to Saint Augustine, all knowledge resided in the soul which lived and moved in God. The truth of this knowledge was rooted in inward experience; the soul turned inwardly upon itself, achieving profound and utterly reliable comprehension of its own activity. As time went on the concept of inward experience became the basis for the so-called introspective conception of consciousness. For Thomas Aquinas inward experience was a means of obtaining deeper knowledge of oneself and communication with the supreme being through conscious reason. The unconscious soul was reserved for plants and animals, while the mental activity of human being, from sensation onwards, was considered to have the attributes of consciousness. The concept of *intentio* was introduced as a special operation of consciousness, expressed in its reference to or orientation on an external object. The materialist traditions that existed during the Middle Ages were developed by the thinkers of the Arab world, particularly Ibn-

Sina (Avicenna), and in Europe, for example, by Duns Scotus, who proposed the theory that matter could think.

The greatest influence on the problem of consciousness in the philosophy of modern times was exerted by Descartes, who in giving precedence to the factor of self-consciousness regarded consciousness as the individual's contemplation of his own internal world, as a substance revealed only to the subject contemplating it and contrasted with the outside world. According to Descartes, the soul only thought and the body only moved. This view had a tremendous influence on all subsequent theories of consciousness, which came to be identified with the subject's ability to have knowledge of his own mental states. Cartesianism was counterbalanced by the theory of unconscious mental activity (Leibnitz). The French materialists of the 18th century (particularly Le Mettrie and Cabanis) based themselves on progress in physiology and medicine and founded the proposition that conscience was a particular function of the brain, distinguished from its other functions by the fact that it enabled man to acquire knowledge of nature and himself.

A new era in interpretation of the origin and structure of consciousness was opened up by German classical idealism, which revealed different levels of the organisation of consciousness, its activity, historicity, the dialectics of the sensuous and the logical, the individual and the social. In their critique of introspective psychology they showed the dependence of the individual's emotions, perceptions and the content of his consciousness on forms and structures of cognition that did not depend on him (Kant's theory of transcendental apperception). Hegel surmised the socio-historical nature of consciousness and asserted the principle of historicity in the understanding of consciousness. He proceeded on the assumption that the consciousness of the individual (the subjective spirit), being necessarily connected with the object, was determined by the historical forms of social life; these, however, he interpreted idealistically, as embodiment of the objective spirit.

Positive knowledge of consciousness was substantially enriched by advances in neurophysiology (specifically, the theories of I. M. Sechenov and his followers on the reflectory activity of the brain) and by experimental psychology.

Dialectical materialism showed that consciousness arises, functions and develops in the process of people's interaction with reality, on the basis of their sensuously objective activity, their socio-historical practice.

Since it reflects the objective world in its content, consciousness is determined by natural and social reality. Objects, their properties and relations, exist in consciousness ideally, in the form of images.

For centuries the idealist and materialist schools have been at war over the essence of consciousness, as the most complex phenomenon in what we know about existence. Idealists interpret consciousness as something rooted in the mysterious depths of the human soul, understood substantially. They take consciousness out of the natural relations of the real world and regard it as the independent and all-creating essence of existence, as something primordial. Not only is it inexplicable by any phenomena of reality; it is in itself the explanation of all that happens in nature, in the history of society, and the behaviour of every individual.

While idealism creates a gulf between reason and the world, materialism tries to discover the unity between the two by inferring the spiritual from the material. In materialism, the interpretation of consciousness is based on its recognition as a function of the human brain, the essence of which lies in the reflection and constructive-creative transformation of the world. Historical-materialist theory maintains that it is impossible to analyse consciousness in isolation from other phenomena of social life. From the very beginning consciousness has been a social product and it will remain so as long as human beings exist. The human brain embraces the potentials evolved by human history, the inherited abilities that are realised through training and education and the whole assembly of social influences, and through exposure to world culture. The brain becomes the organ of consciousness only when a person is drawn into social life and assimilates historically evolved forms of culture. The essential purpose of consciousness is to give people a true orientation in the world, the ability to know and transform it by means of reason. When we say that a person is conscious of something, we mean that he understands the meaning of what he has perceived or remembered and takes into consideration the possible consequences of his actions and can be held responsible for them to society and himself.

Human consciousness is a form of mental activity, the highest form. By mental activity we mean all mental processes, conscious and unconscious, all mental states and qualities of the individual. These are mainly processes of cognition, internal states of the organism, and such attributes of personality as character, temperament, and so on. Mental activity is an attribute of the whole animal world. Consciousness, on the other hand, as the highest form of mental activity, is inherent only in

human beings, and even then not at all times or at all levels. It does not exist in the newborn child, in certain categories of the mentally ill, in people who are asleep or in a coma. And even in the developed, healthy and waking individual not all mental activity forms a part of his consciousness; a great portion of it proceeds outside the bounds of consciousness and belongs to the unconscious phenomena of the mind. The content of the activity of consciousness is recorded in artifacts (including language and other sign systems), thus acquiring the form of ideal existence, existence as knowledge, as historical memory. Consciousness also includes an axiological, that is to say, evaluative aspect, which expresses the selectivity of consciousness, its orientation on values evolved by society and accepted by the individual—philosophical, scientific, political, moral, aesthetic, religious, etc. It includes the individual's relation both to these values and to himself, thus becoming a form of self-consciousness, which is also social in origin. A person's knowledge of himself becomes possible thanks to his ability to relate his principles and orientation to the stand points of other people, his ability to consider these stand points in the process of communication. The very term "consciousness", that is to say, knowledge acquired together with others, points to the dialogical nature of consciousness.

The existence of several planes of consciousness has made it a target of research by many sciences and all art. For philosophy the main question is the relationship of consciousness to being. As a property of highly organised matter (the brain), consciousness is consciously perceived existence, that is to say, a subjective image of the objective world or subjective reality, and on the epistemological plane, as the ideal in contrast to the material and as a unity of the two.

From the sociological standpoint consciousness may be regarded primarily as social consciousness, the reflection of the existence, interests and ideas of various social groups, classes, nations, society, and history as a whole in people's intellectual life. As the reflection of being it takes various relatively independent forms.

In psychology consciousness is interpreted as the highest level of mental organisation of the individual, when he separates himself from his environment and reflects this reality in the form of mental images, which serve as regulators of goal-oriented activity. Consciousness is a highly complicated system consisting of diverse and constantly interacting elements and existing at different levels. This system has as its nucleus the processes of cognition, from elementary sensations and perceptions to the highest manifestations of reason, emotional

refinement and the power of the human will. Sensations and perceptions are the immediate, sensuous forms of consciousness. These are the foundation blocks, as it were, for the edifice of more complex intellectual formations and representations, imagination, intuition, logical and artistic thinking.

Consciousness could not have arisen and could not function without the mechanisms of memory, that is to say, the ability to record, preserve and reproduce sensuous and conceptual images. Consciousness not only reproduces reality in ideal forms, it also regulates the individual's inner mental and practical activities, expressed in attention and efforts of will. Attention and will are also facts of consciousness essential to the setting of goals. Before undertaking anything in reality, a person "does" it ideally, in his imagination.

Human emotions and feelings are a fundamental "layer" of the world of consciousness. In reflecting the world a person experiences its influence and his own relation to it, to things, to other people and himself. Nothing happens in our consciousness without the participation of feelings, which in people with a rich inner world acquire amazing degrees of subtlety, colour and fullness.

Conscious and unconscious phenomena of the mind. The colourful fabric of mental processes is woven out of various "threads", ranging from the supreme clarity of consciousness at moments of creative inspiration, through the dimness of the half-sleeping mind, to the complete darkness of the unconscious, which accounts for a large part of man's mental life. For example, we hardly realise all the consequences of our actions. Not all external impressions are focussed by our consciousness. Many of our actions are automatic or habitual. However, despite the exceptional significance and place of unconscious forms of mental activity, the human being is primarily a conscious being. Awareness, understood as the evaluative aspect of consciousness, is the highest level of regulation of human activity on the basis of accepted values, moral and other social standards. It presupposes that these standards have become an integral component of the individual's life. Having become part of the system of his beliefs, they are realised with a clear and distinct understanding of ultimate aims and the possible consequences of action. Awareness also presupposes a person's ability to analyse the motives of his own behaviour and choose the most rational means of achieving his aims in accordance with the moral standards accepted in society.

As a complex systemic formation consciousness has various levels of relative distinctness or clarity. As a rule these levels are diagnosed in the healthy person by his own accounts and by the degree of his orientation in the environment—in space, time, the logic of events, the people around him and also in relation to himself, his thoughts, feelings and volitional orientation. When consciousness is at a low level, we observe unmotivated swings of concentration from certain objects of thought and actions that are sufficiently known, to unexpected mental targets, unmotivated reorientation of action, and, in various mental disorders, to loss of the "thread" of thought. One may also observe various degrees of clarity of consciousness, from the so-called dawning, half-awake, torpid or simply ordinary perception of things to states of mind achieving brilliant vision, amazingly keen intuitive insight into the essence of things. At the highest peaks of consciousness we have the "superconscious" level of spiritual activity achieved in processes of exceptionally inspired and productive creativity, when a new, original and sometimes huge-scale idea is focussed in the consciousness with astonishing clarity.

Consciousness has a complex relationship with various forms of unconscious mental phenomena. They have their own structure, whose elements are connected with each other and also with consciousness and actions, which influence them and in their turn experience their influence on them selves. We are sensibly aware of everything that influences us, but by no means all sensations are a fact of our consciousness. The majority of them are peripheral or even beyond its borders. Many of our actions, when originally formed, were consciously controlled, but later became mechanical. Conscious activity is possible only when the maximum number of elements of activity are performed automatically. As the child develops, many of his functions gradually become automatic. Consciousness is relieved of the duty of worrying about them. Thanks to this adaptation the unconscious takes care of the body's life-activity, and irritants that would interfere with rational behaviour do not as a rule intrude on the healthy person's consciousness. On the other hand, faced with violent intrusions by the unconscious, the consciousness sometimes fights a desperate and losing battle with these streams of "unbidden guests". This happens in cases of various mental disorders—obsessive or maniacal ideas, states of alarm, of unconquerable, unmotivated fear, etc. Habit, as something mechanical, extends to all forms of activity, including thought, on the principle of "I didn't mean to think of it, it just occurred to me". The paradox lies in the fact that consciousness is present, in a way, in

unconscious forms of mental activity; though it does not keep close watch on everything that happens in these dark recesses of the mind but only grasps the general picture. It may, however, at any moment take control of habitual actions and accelerate, decelerate or even stop them altogether.

Excited by the powerful instinct of mating, the nightingale sings tirelessly through the night, but this wonderful bird does not realise that its splendid trills express something beyond its song, that objectively it expresses the urge to preserve and perpetuate the race. All of us, individually and in our common efforts, sometimes resemble this little grey creature. Do we always realise what response the words and message of our "songs" will bring back? Not always.

Human activity is conscious only in relation to results that initially exist in plan and intention as the goal. But realisation the goal cannot be understood as including all the consequences of actions. The results of people's actions may differ from what was originally intended. They come under the influence of external forces, which sometimes turn out to be quite different from what people thought they were. For example, the ideologists of the French bourgeois revolution (Rousseau, for example, and others) dreamed of the reign of reason, fraternity and justice. The masses and the political parties fought in the name of these principles. The task was enormous, the aims noble. But instead of enjoying the reign of reason France received the dictatorship of Napoleon.

There is much that is both rational and irrational in the life of the individual and in the vortex of history. The unconscious manifests itself in extremely diverse forms, including information accumulated as experience and recorded in the memory of the individual and humanity's social memory, and also in the form of the infinitely varied illusory sphere of dreams, instincts, etc. In the history of science, particularly psychology, medicine and sociology, and also philosophy a great deal of attention has been given to the problem of the unconscious in the life of the individual and society. Freud was particularly concerned with this problem. As a practising psychiatrist, he observed extraordinary manifestations of the unconscious, particularly in the sexual sphere. According to Freud, there is a primordial enmity between the conscious and unconscious principles in man. The unconscious is portrayed as a sly woman whose only aim is to beguile or outwit gullible reason, which is often led astray by its resourceful and irresistible enemy. Freud's conclusions are based mainly on his personal observations of the behaviour and condition of the mentally ill. In

healthy people, however, the dominating principle is the regulative power of reason. This is what ultimately forms the basis for the general movement of human history, notwithstanding the "neuroticism" and "social folly" of specific events and such social formations as fascism, which may be seen as horrible but temporary distortions of social development.

Origin and development of mental activity and consciousness. The consciousness of modern man is a product of world history, the sum-total of the practical and cognitive activity of countless generations throughout the centuries. To understand its essence we must consider how it came into being. But consciousness has not only a social history. It also has a natural pre-history, the development of its biological prerequisites in the form of the evolution of mental activity in animals. Twenty million years were needed to create the conditions for the emergence of rational human beings. Without this evolution the appearance of human consciousness would have been nothing but a miracle. And it would have been no less a miracle for mental activity to have appeared in animal organisms without the properties of reflection inherent in all matter.

The process of reflection in all the diversity of its forms, from the simplest mechanical marks or impressions to the reasoning powers of genius, takes place in the process of interaction of the various systems of the real world. This interaction results in mutual reflection, which in the simplest cases takes the form of mechanical deformation, and in general cases, that of mutual reorganisation of internal states and relations, changes in states of motion, in forms of external reaction, and the mutual transference of energy and information. Reflection is a process whose result is the informational reproduction of the properties of the reflected object. Since everything in the world is in a state of immediate and infinitely mediated interaction, everything carries information about everything else. In this connection one recalls the aphorism of the ancient philosophers: *summa summarum!* The statement presupposes a universal field. But what does this mean? It means that there is a universal form of connection, of interaction and thus a unity of the universe: everything in the universe "remembers" everything else. This is what follows from the principle of reflection as a universal property of matter. Figuratively speaking, one may say that every point in the universal field is a living mirror of the universe.

One of the key aspects of the interaction of living organisms with the environment is their ability to obtain vital information about it. This ability and the ability to use such information to some purpose is so

important for their behavioural acts that it may be classed among the fundamental properties of everything that is alive. Moreover, organisms that have had a more complex evolution possess more diversified information. The living organism acquires a special adaptive activity, which represents a qualitatively higher level of interaction of the organism as a whole with the environment, that is to say, behaviour regulated by mind. This activity allows the organism to detect and relate biologically significant pointers, to anticipate and mediate its behaviour— not only to obtain one thing but also to avoid another. It is possible that the rudiments of mental activity appeared in animals that had no nervous system. There can be no doubt, however, that mental activity later became a function of the brain. An animal regulates its behaviour in accordance with the information received from organs, produced by evolution, for obtaining information about environing things and processes. Mental activity in the form of sensation and perception is a kind of double information, which relates to the properties and relations of external things and also their significance for the life of the particular organism.

The process of development of mental activity involves qualitatively new formations. The essential thing about this process is the genesis of new forms of behaviour arising in the course of an animal's life. These are related to the concept of instinct and the acquired abilities of imitation and learning. Instinct is a purposeful and goal-oriented adaptive activity based on direct reflection of reality. It is conditioned by innate mechanisms and stimulated by biological needs. The important thing about behaviour determined by instincts is that without actually comprehending them the animal performs objectively intelligent actions in relation to stereotype situations that are biologically essential to the survival of the species. From the evolutionary standpoint instinct, as an innate feature of mode of action, is the "informational experience" of previous generations of the given species and of man in satisfying biological needs, experience which is beneficial to the individual of the species and recorded in certain morphological-physiological structures of the organism and also in the structure of its mental activity.

At the common-sense level, in fairy tales and myths, animals have from time immemorial been presented as our little brothers in reason. They have been credited with cunning, initiative, consciousness, conscience, a sense of beauty, all the human characteristics. Everyone has heard of exceptionally intelligent dogs saving human beings and serving them devotedly, of horses carrying their riders out of danger, finding their way in snowstorms, and so on. At the scientific level

scientists have for many years now been investigating the behaviour and mental activity of animals, particularly, such higher species as dolphins and apes, which possess amazing ability to imitate and observe. At a recent international conference which discussed the problem of consciousness in animals, most of the delegates said no in reply to the question, "Do animals think?" But the resolution passed by the conference after much argument contained a rather careful formulation: science has not enough facts to affirm with certainty or to deny the ability of animals to think.

Thinking means solving problems of various degrees of complexity. Both experiments and observation have shown that the higher animals are capable of solving relatively simple problems, whose terms do not go beyond the given situation. They can find devious ways to a goal, construct a biologically significant structure, track down a quarry, improve a stick for obtaining food, crack nuts with a stone, and so on. Monkeys are very interested in anything new. In short, the higher animals have an elementary intellect. But to the concept of consciousness we attribute a very wide meaning, which is possessed only by human beings, and if animals have it, they can be said to have only its biological rudiments or prerequisites.

From the very beginning, consciousness has been a social product and will remain such for as long as human beings in general exist. Whereas animals' mental activity depends on biological laws and regulates their behaviour, human consciousness aspires to creative knowledge and practical transformation of the world.

The development of humankind and human consciousness is associated with the transition from the gathering of ready-made objects to the process of labour, that is, to production of the means of existence with the help of man-made tools. Labour with its necessary transition from life in the conditions of a biological community to the social form of life and, consequently, to communication by means of language, transformed the basically instinctive behaviour of animals and led to the formation of mechanisms for conscious human activity.

Arising and developing in labour, consciousness is also and indeed mainly embodied in labour and creates the world of humanised nature, the world of culture. So the answer to the riddle of the origin of consciousness can be expressed in two words: labour and communication. By sharpening the blade of his stone axe and communicating by means of speech man at the same time sharpened his own intellect. It was labour, the relations formed on its basis, and

also language in the form of gesture, sound and writing, in the form of painting, sculpture and music, that developed the consciousness of our distant ancestor beyond the limits of the individual mind and made possible the formation of supra-individual consciousness — the dawn of various forms of social consciousness as the rudiments of scientific knowledge, art, simple rules of morality, various kinds of magical, mythological and religious notions and rituals. All this would later develop in the course of history and grow into a rich variety of forms of social consciousness — philosophy, science, art, morality, political ideology and law. The world monotheistic religions would arise. All these forms would be either a true or imaginary reflection of more developed forms of people's social existence, their material and intellectual production, the ideals and aspirations of various social groups, classes, nations and humanity as a whole. The power of culture grows like a snowball. It has a complex structure with various levels, from the ordinary mass consciousness to the highest forms of theoretical thought.

Though relatively independent, social consciousness has a feedback effect on the life of society.

Between personal and social consciousness there is a constant interaction. Just as society is not the sum-total of the people whom it includes, social consciousness is not just the sum-total of individuals' consciousness. Just as the general will by no means expresses the will of every individual, so the social consciousness is not the consciousness of every member of society. Social consciousness is a qualitatively specific intellectual system, with a relatively independent existence. Historically evolved standards of consciousness become the personal convictions of the individual, the source of moral rules, aesthetic feelings and ideas. In their turn, personal ideas and beliefs, thanks to the creative activity of those who have them, acquire social value, become socially significant and merge in the general ocean of the social consciousness. Important ideas are thus recorded in words and deeds. That is why they do not die with their creators. On the contrary, it is often after this death that their real life, their unusual destinies and adventures begin. It is above all the great historical personalities who plant the tree of a new trend whose crown reaches out to the future, and whose rich foliage serves many generations and whole peoples, even the whole of humanity.

The fate of the individual consciousness is inseparable from that of the individual himself. It comes into being as the highest form of mental activity. It expresses the unique features of the individual's path in life, the specific features of his education, various political, religious, moral,

scientific, philosophical and other social influences, all the things that diversify and enrich the individual's spiritual world. Every child, when it comes into the world, begins to think, to experience aesthetic pleasures, moral impulses and a desire for knowledge only by becoming involved in culture, by becoming aware of standards that have their roots in the previous history of humankind. The individual becomes a personality to the extent that he commands this wealth and multiplies it. Through comprehending the products of their own material and intellectual activity, by becoming aware of their relations with one another, people have come to comprehend themselves, that is to say, they have attained self-consciousness.

From the very start consciousness developed in two closely related directions, the cognitive and the constructive-creative. Together they express the main reason for and social necessity of its origin and development. The constructive and creative side of consciousness could not have arisen or existed without cognition and cognition alone could never have provided the necessary individual, subjective spur to human development. Consciousness was never a mere luxury, a mere act of contemplation.

While rejecting the idealist explanation of consciousness as the individual's immanent activity arising from the depths of his spirit, science at the same time explodes the concept of metaphysical materialism, which treats consciousness as contemplation divorced from practice. When we speak of the activeness of consciousness, we mean its selectivity, its ability to set itself a goal, its generation of new ideas, acts of creative imagination, its guidance of practical activity. The point of departure for any relationship to the real world is goal-setting activity. The main reason for and historical necessity of the emergence and development of consciousness, which enables man to get an accurate picture of the surrounding world, to foresee the future and on this basis transform the world by his practical activity, is its goal-setting creative activity aimed at changing the world in the interests of man and society. A person's consciousness is not merely a contemplative reflection of objective reality; it creates it. When reality does not satisfy a person, he sets out to change it by means of his labour and various forms of social activity.

Self-consciousness. A human being is aware of the world and his attitude towards it and is thus aware of himself. At this level, the objective and subjective begin to reveal their integral unity. This duality in unity is in fact the "glimmering dawn of self-consciousness". Self-consciousness was the answer to the imperative demand of social

conditions of existence, which from the outset required that a person should be able to assess his actions, words, thoughts and feelings from the standpoint of certain social norms and to comprehend not only the surrounding world but also himself. Like consciousness as a whole, self-consciousness was moulded by labour and intercourse. In all forms of his activity a person constantly encounters not only the external world but also himself, becomes the target of his own thoughts and evaluations. A human being is a reflecting being. He is constantly thinking about his actions, thoughts, ideals, feelings, his moral image, aesthetic tastes and socio-political positions, his relationship to everything that goes on in the world. Human beings have the ability to look at themselves "from the side". In the philosophical sense a self-conscious person is one who is fully aware of his place in life, the inevitability of passing through certain growth stages, the finity of his existence as a passing moment in the flow of events. The personality cannot be deprived of its reflexive dimension. This is one of the essential privileges that distinguish man from the animals. The animals must be given credit for knowing something, for possessing some elementary information about the things going on around them. But unlike man, they are not aware of their own knowledge. Man knows about the actual act of knowledge and the fact that he is the person who knows it, that is to say, a person is aware of himself both as the subject of knowledge, the knower, and also of what he knows. A person understands not only that he knows something but also that he is far from knowing everything, that beyond his own knowledge there stretches a boundless ocean of the unknown. He knows what he does not know and hence the innumerable questions and the groping search for answers.

Can a person possess consciousness without at the same time possessing self-consciousness? Apparently not. Both historically and ontologically the two take shape simultaneously. They are something integral, although inwardly they have a qualitative differentiation. The physiological and psychological mechanisms of self-consciousness would appear to be rather more complex, more subtle and vulnerable. Self-consciousness is not simply consciousness turned inwards. It cannot take place directly. It is always mediated by awareness of other things outside the self. The individual gets to know himself only to the extent that he knows the world. Thus self-consciousness clearly has a "double image"; it consists of both the external object and the subject himself. It is a kind of inner light that illumines both the self and the other thing. Every thinking person understands how difficult it is to separate the

object of thought and the act of observing this thought. There are usually three aspects to a person's reflections: one's own personality as the object, one's ego as the subject, and objective reality, which includes other people. Self-consciousness is born when the subject of consciousness, the knower, turns into an object for himself. At the point of emergence of self-consciousness the individual is identified with himself. This is when man begins to be aware of his own existence in the world, of his needs and desires, and the state of his own organism (physical comfort or discomfort, etc.). He thus becomes able to distinguish the state of wakefulness from that of sleep. As soon as he awakes, a person begins to experience a certain feeling of self, an awareness of his own existence in the world. When he opens his eyes, he sees the world, hears its sounds, is aware of external objects and his own body. He feels both his distinctness from the environment and his organic connection with it.

Self-consciousness is not simply a matter of contemplating one's self admiringly or otherwise. A person cannot find his bearings in the flood of events without some knowledge of himself. He must know what he is capable of and how far his aspirations can reach.

The level of self-consciousness may be extremely varied, from a vague awareness of one's abilities to a profound understanding of one's historic role, sacred sense of duty to one's people and their destiny. At the higher stages of self-consciousness the individual fully appreciates his link with world history, the history of his people, the "thread", embodied in everything he has done, that links both the past and the future. Only rich natures possessing refined self-consciousness are stirred as much by the future as by the present. We know that the particularly gifted personality perceives his own self with a special kind of rational intensity, often from the days of his youth. The knowledge of one's selfhood is felt as a kind of inward revelation. Such intensity and ceaseless activity are particularly characteristic of the self-consciousness of the genius, and this is linked with his vivid perception of his special social significance and consequent great responsibility towards humanity.

Every person has moments when his self-consciousness becomes unusually acute and moments when it subsides completely, when he is self-forgettingly immersed in some external object. Consciousness is focussed in one area, as it were. And the opposite may also happen. A superficial glance at what is around one and a deep immersion in oneself, sometimes with agonising and destructive effects. For instance, when a person is sick, he may be "up to his neck" in his own sickness

and feel that he has nothing else to live for; the whole world is seen through the prism of his sick condition. In such cases he must have some distraction. Usually people's self-consciousness balances between the two extremes. It is difficult at one and the same time to separate and fuse thoughts and act of observation of these thoughts in the act of thinking. When a person does not treat himself as the object of his perceptions and thoughts—both from his own point of view and also from that of other people—he cannot exercise self-control. One may observe substantial individual differences in the ability to exercise self-control. Some people remain self-possessed in the most difficult and sometimes tragic situations, while others lose their grip on themselves at the slightest provocation. Some people even act much more effectively in conditions of danger than in ordinary circumstances.

Every act of becoming aware of the world involves the controlling and guiding force of self-consciousness, from which a person is not free even when he is deeply immersed in studying a real object. The state of complete self-forgetfulness, loss of self-control and ability to direct one's mental processes seldom occurs and usually only in cases of extreme stress or insanity. The norm is constant self-control, at least on the general plane.

Degrees of self-consciousness may vary, from the most general momentary control over the stream of thought directed upon external objects, to profound meditations upon oneself, when the ego is not only the subject but also the main object of consciousness, when the emphasis is on the inner world of mind and body.

Concentration of attention on one's self has its reasonable measure, which is dictated by the vital necessity of preserving a stable harmony of the whole. Overconcentration of attention on the self may cause difficulties of orientation and reduce the effectiveness of practical and theoretical activity. It may degenerate into self-satisfied, selfishly oriented attention on one's own cherished peculiarities. The call to know oneself implies not individual features of character, for example, certain chance inclinations or weaknesses. It urges us to know the genuine in ourselves, our very essence.

An important element of self-consciousness is awareness of the demands of society upon oneself, awareness of one's social duty and purpose in life, one's responsibility for the task with which one has been entrusted, responsibility to the community, the class, the nation, the country and, finally, to mankind as a whole. It is self-consciousness that enables a person to view critically his own actions, practical and

theoretical, real or imaginary. It allows him to separate his internal world from what is going on around him, to analyse it, contrast or compare it with the external and thus study himself, arrive at judgements of himself, or perhaps even condemnations. Self-consciousness is an essential condition of education and self-education. One has to distinguish between trivial egocentrism, passive contemplation of one's own person, and the profound self-consciousness with its subtle fabric of moral principles, which reveals one's place in life and the purpose of one's activity and of one's existence in the world generally. Egocentric reflection, introspection, which links everything with the self, as the egoist's most cherished hub of attention, hinders or even interrupts the living and beneficial process of activity. Such a person does nothing that is of use or benefit to others or himself, for one can help oneself only through helping others. The hypertrophy of the egoistic self-consciousness may even cause pathological health failures and is itself one of their symptoms. On the other hand, a profound self-consciousness implying reasonable attitudes of self-criticism clarifies the purpose of action and fills a person's mind with a sense of being needed by others, by society, and produces a sense of true happiness. Self-criticism is a sign of a highly developed self-consciousness. Looking back on his life, Leo Tolstoy notes that at a very early age he began to analyse everything in his own ego and to root out mercilessly everything he considered to be illusory or unworthy of his true purpose in life. It often seemed to him that this habit might one day destroy the whole. But, he wrote, "I am getting old and I still have quite a lot left that is whole and sound, more than some other people ... people of my own age, who believed in everything when I was destroying everything..."¹ Such reasoned self-criticism, rather than a stolid smugness, preserves and strengthens the harmonious integrity of the human personality, as it likewise strengthens that of any social group, including the nation.

Self-consciousness takes place not only on the individual plane, as a mental form of activity, but also at the level of social consciousness, when knowledge, scientific, artistic or technical creativity, or political activity become a specialised object of theoretical research, when certain social groups rise to the level of self-comprehension, of understanding their place in life, in history, their interests and ideals, their purpose, their real possibilities and responsibility to society and humanity. When a nation rises to such a level of self-consciousness it is

¹ L. N. Tolstoy, *Collected Works* in twenty volumes, Vol. 19, Moscow, 1965, p. 275 (in Russian).

capable of miracles of heroism. For example, the Russian people had to overcome the social and psychological consequences of the three-hundred-year Tatar-Mongol invasion of their country in order to become aware of their strength and win the historic battle of Kulikovo. History furnishes us with many such examples. The same thing happened to the Russian people during the Napoleonic and the Nazi invasions. Such upsurges of social self-consciousness have been experienced by all peoples of the world, when they have had to fight against external or internal oppressors or at times of national liberation and social revolutions. Social self-consciousness is not homogeneous either in its social scale or in its intensity. Its turbulent waves achieve their peak at turning points in history. It may embrace small groups of people and be the self-consciousness of a certain political party, armed with a certain world-view, class or national self-consciousness, or even the self-consciousness of all humankind, particularly today, when the very existence of life on earth is placed at risk by the nuclear sword of Damocles. The theoretical core of social self-consciousness is philosophy, which mirrors, reflects, gives meaning to and evaluates all other forms of social consciousness and social psychology.

The Material and the Spiritual

The brain and consciousness. The human brain is an astonishingly complex formation, a nervous apparatus of tremendous subtlety. As a subsystem of the system of the whole organism it regulates the organism's internal processes and relationships with the external world. By means of the brain we see, hear and think, distinguish the ugly from the beautiful, the bad from the good, the pleasant from the unpleasant. In other words, the brain is the vehicle of what we call our "spiritual life". A normal mentality is impossible without normal functioning of the brain. Its reflective and constructive ability depends on the subtlety and complexity of its organisation. Human consciousness develops as the brain develops. An undeveloped brain results in various forms of mental deficiency, weakness of will, etc. In old age the nerve cells of the brain begin to atrophy, leading to senile decay, loss of memory and total confusion about the sequence of events. The pathological disturbances of the subcortex cause hysterical fits of anger, fear, and so on, accompanied by cries and shrieks. Structural damage to the frontal lobes of the brain renders the victim incapable of having or retaining complex intentional ideas, or perhaps any stable intentions. Such a person is easily distracted. He quickly loses the power of rational self-control of his emotions, thoughts and actions. Initiative and self-discipline are also weakened and there are breakdowns in logical thinking and in the general coordination of behaviour. Lack of emotional restraint takes the form of explosions of laughter, outbursts of irritation and anger. And what strange patterns of images and thought are woven by the sick imagination of the schizophrenic! Absurd fears and overpowering manias and desires torture his clouded reason. He may perform strange and even monstrously absurd actions, dangerous both to himself and to society. Social, psychological, biochemical, biofield and other factors also play a part in mental disorders. But they can disorder the mind only by causing malfunctioning of the brain. There are no purely mental or purely physical disorders of the sections of the brain that are responsible for the condition of a person's mentality, but there are neuropsychological changes. In short, mental disorders are based on changes in the state of the brain, either functional or organic.

Successes in brain anatomy and also physiology, particularly electrophysiology, neurology, neurosurgery, neuropsychology, have shown that the brain is an extremely complex and sophisticated system. The various forms and levels of mental activity are associated with certain units of its elements. At the same time all units and elements of

this system are manifestations of the operation of the system as a whole, the processes of both imaginal and logical thought being effected in the cortex, the brain's highest level. The cortex is the grey matter, a delicate layer of convolutions on the cerebral hemispheres. Different forms of mental activity are distributed between the two lobes. It has been proved, for instance, that in most people the left lobe is responsible for logical thought while the right takes care of images; but in left-handed people, the opposite is the case. The cortex consists of approximately 16,000 million nerve cells or neurons. If strung out in line, they would form a chain 5,000 km long. Every nerve cell by means of appendages of various length is connected and interacts (through the inter-neuron membranes) with all the others, thus forming a lacework structure with outlets through the corresponding nerve fibres to the nerve endings of the organs of sense, the feelers of the brain. When these feelers are excited, they react, and this reaction is transmitted in the form of nervous energy to the cerebral cortex, where certain neurodynamic, biochemical, electrical, electromagnetic, biofield processes arise, irradiate, concentrate, interact and are inducted. And it is on the basis of these processes and in unity with them that our mental conditions, our sensuous and conceptual images and ideas are born.

The cortex operates as a complex system which is incorporated as a subsystem in the life and general system of the organism with all its anatomical and physiological processes —humoral, nervous, and bioenergetic. These processes inform the cortex of their condition and it responds to their signals.

In human activity there are several information systems, which transmit, receive, store and circulate bioinformation, the information required to regulate and guide the activity of the organism. The first of these systems may be termed "genetic", programming the forms of activity peculiar to the species and, to some extent, the individual forms. The next is the "meridional", bioinformation system, which takes part in the distribution of bioenergy, its harmonisation, the self-regulation of the organism, ensuring the "dovetailing" of all its elements, both intellectual (spiritual) and material. An important role in the life of the organism is played by the external sensory information-signal system, which operates in the form of sensuous perception of things, their properties and relations, and this provides a necessary condition of the regulation of the behavioural acts of animals and human beings. The next level is the psycho-bioinformation interaction between people through the subconsciousness, which transmits bioinformation, bypassing the usual sense organs. All his life a person receives

information through historically formed linguistic channels, which may be termed the sign-symbol information system. This system provides the means for the dialogue that proceeds between the individual and world culture as a whole. And finally, very tentatively one may outline the contours of the prognosticatory bioinformation system, which provides knowledge of the distant future by means of various intuitive pictures.

Thus, the material substratum of mental activity is the neurophysiological bioenergetic activity of the brain. This is proved by the fact that beneficial intervention in physiological-bioenergetic processes can restore certain functions of the brain. Normal mental activity presupposes that the brain is waking and active, a condition which is brought about and maintained through afference, that is to say, the brain's reception of countless nervous impulses from the sense organs. If afference is lacking (when the brain is artificially isolated, for instance), the brain does not produce any mental phenomena.

An important role in maintaining the brain's waking state and thus regulating the power and clarity of consciousness is played by the so-called reticular formation, which is connected with the mechanisms of attention, the bioenergetic readiness of the cortex for active responses.

Study of the reflectory nervous mechanism of mental phenomena has shown that mental activity is a system of activity shaped by the influence of the facts of the external world. I. M. Sechenov demonstrated that all acts of conscious and unconscious mental life are, from the mechanical point of view, reflexes. They begin with perception of the irritant, continue with the nervous processes of the cortex, and are completed by various forms of response from the organism, mostly muscular movements. "Whether a child laughs at the sight of a toy, or Garibaldi sneers when he is persecuted for his unbounded patriotism, whether a girl trembles at the first thought of love, or Newton proclaims universal laws and writes them down on paper—everywhere the ultimate factor is muscular motion."¹

The aim of Pavlov's research was to identify "the mechanism and vital function of that which is increasingly attracting man's interest—his consciousness, the pangs of consciousness".² Pavlov showed that conditioned reflexes, that is, temporary neurodynamic connections, are

¹ I. M. Sechenov, *Selected Works*, Moscow, 1953, p. 33 (in Russian).

² I. P. Pavlov, *Collected Works*, Vol. 3. Book 1, Moscow-Leningrad, 1951, p. 39 (in Russian).

formed on the basis of unconditioned reflexes (nutritive, sexual, defensive, etc.) in the process of animal or human experience.

An important principle in the reflectory activity of the brain is the principle of reinforcement. A reflectory activity comes to stay when it is reinforced by the achievement of results, in the form of satisfaction of organic needs: Reflexes are reinforced by means of feedback. When a muscular, glandular or other organic system is set in motion by a reflex, the impulses thus stimulated return to the cerebral cortex, to the central link of the reflex, and report not only on the functioning of the given organ but also its results. This makes it possible to adjust the process and achieve an adequate performance of intention. The purpose of feedback is to keep the brain constantly informed of what is going on in the system it controls. Information about reinforcement lends the conditioned reflex a relative purposefulness by triggering in the brain a mechanism for assessing both the course of the action and its result. The brain's activity is a process of signalling. On the basis of the formation of temporary connections signals from the external and internal environment become precursors of an approaching need—for food, sex, defence, and so on—or its satisfaction. The principle of signalisation is of decisive importance in animal and human life. The effect of the signal prepares the organism for a forthcoming act of satisfaction of some need or for the struggle to survive. This anticipatory reflection of approaching reality takes place in animals in elementary forms of mental activity—sensations, perceptions, representations, and thinking in terms of situations or images. Pavlov called these sense impressions the first signal system. In the human being, anticipatory action takes place, so Pavlov tells us, through the interaction of two signal systems, the second of which, the speech system, is predominant. According to Pavlov's theory the first signal system in man is elevated to a qualitatively different, socially conditioned level.

As a control system of great complexity the brain is designed not only to receive, store and process information but also to prognosticate, to plan action, to exercise active control of behaviour intended to cope with practical or theoretical tasks. Cerebral, bioenergetic processes are determined not only by accumulated experience but also by hereditary programming (including instinctive impulses), not only by the current factors of the internal and external environment, but also by future, forthcoming events, which do not yet exist but which have a determining influence on the brain's activity. The future thus determines present action. The brain performs not only a reactive but also a

probabilistic, prognosticating function, which makes it capable of controlling behaviour.

Such is a brief summary of the material processes that generate mental activity, consciousness, but these material processes should not be identified with the content of consciousness. The world of consciousness is a spiritual, intellectual phenomenon.

Consciousness as an ideal phenomenon. In ancient times the concept of the mental was not yet singled out as something qualitatively different from the material. Some thinkers regarded the soul as a state of fire, others, as the motion of atoms. The concept of the ideal, admittedly in a mystical form, was first enunciated by Plato, who spoke of the soul and an objective realm of pure thought and beauty. The concept of the ideal in absolutised form (as spirit, as god and the soul) then emerged in Christianity, and on the philosophical plane, in Descartes, who treated the spiritual principle as an independent essence.

Mental phenomena are primarily reflective; their idealness is derivative.

The surgeon sees the brain not as a spiritual flame but as grey matter. He is confronted with morphological structures and physiological processes. The mental tends to disappear from his field of vision, just as a word seems to disappear when we ignore its meaning. This is not to say, however, that consciousness is bodiless, incorporeal, ideal: it is something that exists not in objective reality but only in perception, in representation, in imagination and thought. The ideal is fundamentally different from the material. In fact, it may even be regarded as its opposite. If we only think or imagine something, it does not mean that it is already a reality.

The material has an absolutely independent existence and development. The existence and development of the ideal, however, are only relatively independent. This indicates that thought exists not by itself but in close connection with and dependence on its object and subject. The "soul" suffers, but it is the brain that is treated. This does not, of course, rule out the significance of psychiatric therapeutic treatment.

Since not every reflection is mental, the ideal does not characterise every reflection or all mental activity in general. The surface of a mirror reflects light rays. But all such physical or chemical forms of reflection contain absolutely nothing ideal. They are not subjective forms and they are thought of without any concept of the ideal. Ideal phenomena are

the objective content of the neurophysiological, material processes of the brain, reproduced as images or ideas, representing the existence of an object as it is perceived by the subject and allowing him to make free use of them for purposes of thought.

The dualistic world-view regards consciousness as some thing extra-physical, enveloping the brain or filling its "pores", as a mist envelops the earth, or honey fills the comb, or even as an active being that uses the brain as an instrument for the realisation of its aims. Some philosophers say that since no natural scientist has ever discovered in the brain anything but nerve connections, it is time we realised that mind is not to be found in any cell taken separately or in the brain taken as a whole. From this, they say, we should conclude that consciousness is not a property of matter. Otherwise, how are we to explain the fact that a person can know and assess himself, and experience, be aware of his various needs? There must be certain nervous faculties, instruments, which receive messages from another spiritual world. So man's spiritual world is alleged to have no material roots in the activity of the brain and is related to a quite different sphere of existence. This argument closes the door to any objective, scientific cognition of mental phenomena. And, indeed, faced with the fact that certain nerve processes are accompanied by subjective processes, some scientists maintain that the nature of this parallelism is out of range of the natural sciences and, quite possibly, beyond the bounds of any human comprehension.

Such dualism as a way of explaining the mental and physical was opposed by Sechenov, who believed that one should not break up into parts something that is organically connected and forms a unity, that is to say, one should not divorce consciousness, the conscious element from its beginning, from the external impulse, or from its end, the action; one should not take the middle out of the whole, set it apart and oppose it to the rest, as the mental to the material.

Dialectical-materialistic thought aims at overcoming the two extremes of dualism and identification of the mental and the physiological.

Some scientists, carried away by analysis of the physiological processes forming the basis of mental phenomena, are inclined to regard these processes as the ultimate basis and essence of the mental itself. They imagine that the study of consciousness can be limited to analysis of the physiological aspect of the problem. In the history of science numerous attempts have been made to get rid of the category of the ideal. If thought is inseparable from thinking matter, and is its

product, ran the argument of vulgar materialism, then is not thought merely a form of matter? Another school of vulgar materialism regarded the mental as a particularly refined energy that hovers about somewhere in the universe. Some of them have even assumed that all energy is of a mental nature, that the world of the mind with its subjective form of the ego is merely a form of universal energy. This is how some people try to explain "parapsychological" phenomena, not taking into account the fact that although mental activity does possess the element of energy it cannot be reduced to that one element.

One also encounters the argument that the category of the ideal is a left-over from the religious-idealistic way of thinking. Attempts have been made to prove that the existence of consciousness is nothing but an illusion, which arises from the fact of distinguishing and cognising things: what we call consciousness of colour, for example, is in fact nothing more than colour itself. Consciousness thus becomes something entirely fictitious and thoughts, which exist in the concrete, are made of the same substance as things.

The methodological weakness of the vulgar-materialist position lies in its treatment of the brain as a storage tank of ideas and thus separates the functioning of the brain both from objective reflection and from the socio-historical conditions that determine its functioning.

Consciousness is a reality, but it is a subjective reality. Can one tell from the structure of the brain and the character of its physiological processes what a person is thinking about, what intentions arise in his mind, whom he loves and whom he hates? If we study only the structure and physiology of the brain we cannot get anywhere near to explaining why people of tribal society thought differently from those in the Middle Ages and why people of today do not think the same as their ancestors did two centuries ago.

The difference between the material and the ideal is also expressed in the fact that the laws of thought and, in general, of all spiritual processes do not coincide with the laws of the physical, chemical and physiological processes that take place in the brain and constitute the material basis of consciousness. These laws are studied by different sciences. For instance, the logician who studies the techniques and laws of thought may have nothing whatever to do with any of the material mechanisms of thinking.

Consciousness is always connected with neurophysiological processes and does not exist outside these processes. But they are not what constitutes its essence. Science will undoubtedly one day "reduce"

mental phenomena to the biochemical and ergo-informational processes in the brain. But this will not explain the essence of consciousness, although the connection between the spiritual and the material will be understood in greater depth and subtlety. It would appear that the building of sensory and conceptual models in the human brain, when it reflects what exists or constructs what should exist, that is, sets an aim, is connected with bioergo-informational phenomena. In its material fabric mental activity is bioergo-informational and at the same time it is a spiritual image of existing or potential reality. This is why it can perform not only its reflective-constructive but also its regulative role in the system of the organism and in the relations between the organism and the surrounding world.

In relation to the physiological processes of the brain the ideal is their informational and evaluating content. Consciousness is not a special super-refined motion of matter, but a subjective image or picture of the world. The image of an object is the ideal form of the existence of that object in a person's mind. The object, let us say, a tree, as we experience it, is something ideal; our experience cannot be reduced to the tree itself, which exists outside the person who observes it, nor can it be reduced to the physiological processes taking place in the brain and forming the basis of this image. Since the image is subjective (belongs to the subject, observer, knower), it inevitably bears the imprint of an individual or social group, reflects the individuality of their life experience, interests, principles and social positions. It depends on the development of the brain, on the condition of the organism as a whole, on the wealth or poverty of the individual's or society's experience, on the level of human culture.

It would probably be inaccurate to define the ideal as simply a subjective image. The ideal is one of the properties of an image and not the image in the full sense. It also possesses different dimensions of existence, for example, its ergo-informational structure, the degree of fullness to which it reproduces the object, its regulative vital function.

The subjectivity of an image implies incomplete reflection: an image reflects the properties of a thing to a greater or less degree of approximation. Finally, from the psychological point of view, subjectivity also has the negative aspect of being tendentious, biased, exaggerated, purely personal and delusive. Delirious ideas and hallucinations are examples of pathological subjectivity. The image cannot be reduced to the material and as something ideal is even opposed to it. But this opposition is not absolute. It may be conceived only in the limits of the philosophical, epistemological question of what is to be considered

primary and what derivative. Beyond these limits, according to Lenin, it would be a mistake to regard as absolute the opposition between matter and spirit, the physical and the mental. Consciousness is not the substance of matter; it is a function of matter organised in a certain way, and as a function it cannot be opposed to that of which it is a function. The world of the phenomena of the consciousness is something ideal, but "...the ideal is nothing else than the material world reflected by the human mind, and translated into forms of thought".³ Here, of course, "translation" does not mean the moving of the material components of the things themselves into the matter of the brain. It describes merely the fact of the ideal reproduction of the object by the subject, which presupposes creative processing, transformation of external impressions and the building of a certain concept or aim.

When given objective existence in a system of speech symbols, thoughts acquire a relative independence in relation to the individual and circulate in the form of spiritual culture. The brain decays but the thoughts it has evolved may live on for centuries. But all these thoughts, ideas, emotions, acts of will have only a relatively ideal character: they are ideal only in relation to the subjects, the people who decode their meaning.

The ideal may be defined as a presentation of the object to the subject in which the image of the object appears to the subject directly, in what one might call its pure form, separated from its material substratum. In other words, we are directly presented not with the physiological states of our brain but with what they produce as subjective images of the object. A person is influenced by certain things which evolve a storm of electrochemical, energy-informational processes of which he has no suspicion, but as a result of which he sees things that exist outside him. This givenness of an external object to the subject through cerebral processes is, in fact, an image possessing the property of ideality, of subjectivity. The neurophysiological processes are, as it were, hidden from the subject. They are not directly given to him: the ego perceives and knows itself as thought, or feelings, and does not perceive or know itself as brain.

The separation of the ideal from the material substratum is of cardinal importance in life. The subject's activity is guided not by the neurophysiological processes themselves, but by the images and ideas that they convey. Actions are planned, programmed by ideal forces in

³ Karl Marx, *Capital*, Afterword to the Second German Edition, Vol. I, Progress Publishers, Moscow, 1974, p. 29.

unity with material forces. And this sometimes generates the illusion that thought is a force in itself capable of influencing the body and setting its organs in motion.

Mental activity possesses the property of ideality not only at its highest level but also at the lower stages of its biological development, in animals. When an animal sees an object, imagines it or dreams of it, it is given the information content of its neurophysiological cortex processes. And this is in fact an image with the property of ideality.

We are aware of the images in our heads as things existing outside us. This power of intentionality, objectification, reference arose as a result of evolution of the animal world and the socio-historical practice of mankind. The fact is confirmed by observation of those who are born blind, just after they have been given sight by a successful operation. At first they think of what they see as being not where it actually is but as directly "in their eyes". And only later, after practice do they learn to objectify their images correctly. The objectification of images may be astonishingly vivid, for example, in dreams and hallucinations.

It is precisely the relatedness of cerebral processes to the objective world that makes these processes ideal. If a thought arises in a person's head it must be a thought about something. There can be no thoughts "about nothing".

To sum up, the ideal is a special mode of existence of an object, its presentation in the world of the mind.

Dialectical materialism allows us to overcome the narrow limitations of the two approaches to the problem of the ideal that have taken shape in the history of philosophical thought, one elevating the ideal to primordial essence and the other ignoring the uniqueness of the ideal and reducing it to various material phenomena. In the material world regarded as an integral whole the ideal appears not as some special first principle but as a system of real relations between objective phenomena that are independent of consciousness and will, and living beings capable of reproducing these phenomena and transforming them both practically and theoretically. Although derived from the material, the ideal acquires a relative independence and becomes a stimulus of life-activity. It arises at a high level of the organisation of living matter, acting first in the form of a sensory image. This image serves as a necessary factor regulating behaviour in accordance with the conditions of the organism's existence. These conditions are "idealised" in an image, which is by no means a mere duplicate of physical or physiological processes, although without them it cannot exist. It is

thanks to the image that the act of behaviour is formed. It belongs to the subject and is inseparable both from the life of the subject and from the object, as reflected in its other-being.

With the rise of human society this reflection assumes a fundamentally new character thanks to the transforming activity of human beings. By changing nature they change themselves, becoming the subjects, creators of culture. Various forms of the ideal develop in the system of culture and thanks to the products it creates, the instruments of labour and communication, art, religion, science, morality, law, and so on. The sensuous fabric of consciousness is transformed, mental images, plans and operations are created, a wealth of values and ideals take shape. Though assimilated and created by individuals, these forms of the ideal do not depend on individual consciousness, but they cannot exist outside the activity of a human brain that is capable of perceiving and creating them. Arising and developing in social practice, the ideal is not only generated by the material but is also capable of actively transforming it. This is true both of social and historical events and of personal relationships.

The unique thing about the ideal is that it always has a material vehicle, which is not only its substratum of nerves and brain, but also the phenomena of culture, as the embodiment of the ideal, that have been evolved in the process of historical development. Specifically, these are language and other semantic and symbolical systems.

Reality comes to us not directly but in ideal, "transmuted", incomplete, even illusory forms. For example, the real relations between people in society may be comprehended according to class interests, in inadequate ideological forms. At the level of philosophical consciousness one of these forms is idealism, which perceives the ideal as a fundamental principle of thought, thus absolutising the ideal, disuniting it from objective reality, the historical process, people's real activity, and the brain as an organ of this activity.

In the first classical system of idealism created by Plato the ideal took the form of immortal, incorporeal essences, which were the prototypes of all things and had priority over everything material. This view determined the subsequent forms of objective idealism right up to its contemporary versions.

In other idealist conceptions the ideal is identified either with that which is directly given to the consciousness as a special substance (Descartes) or with the activity of an absolute spirit (Hegel), or with the data of sense experience beyond which there is supposedly no reality

(subjective idealism). Inadequate notions of the ideal derived from attempts to understand its dependence on material processes are expressed in various reductionist conceptions, which reduce the ideal to nervous, energetic and informational processes in the brain, to biofields and dynamic codes.

Consciousness and Language

Communication and understanding between people, epochs and cultures. From the very beginning human beings have been involved in social contexts of different degrees of complexity and they remain so, because this is the setting for both their labour and leisure, even when they think of themselves as isolated. Endless invisible threads link them with the life of the socium. The whole essence of the human being, including his consciousness, is communicative by its very nature. And this ability defines the essence of consciousness and also its vehicles, the individual and society. People are constantly afloat in an atmosphere of communication. They are eager to say something to each other, to learn or teach, to show or prove, to agree or reject, to ask or order, console, implore, show affection, and so on. Communication arose and developed with the rise of man and the formation of society in the process of labour. From the very first communication was a part of labour activity and satisfied its needs. As time went on, it was transformed into a relatively independent need to share, to pour out one's soul, either in grief or joy, or for no particular reason, a need that recurred day after day and was of vital moral and psychological importance to the individual. Communication is such a vital factor of existence that without it our animal ancestors would never have become people; without the ability to communicate a child cannot learn about, absorb culture and become a socially developed person. The depression caused by loneliness also indicates the exceptional importance of communication for human beings. Not for nothing is solitary confinement of criminals considered to be one of the severest punishments by most peoples of the world. In a situation where he can communicate a person acquires and sharpens his intellect, but in the opposite case he may even lose his reason.

A person needs communication, whatever state of mind he may be in, joyous or sorrowful. But grief or suffering, which need the consolation, sympathy or merely some distraction, are particularly hard to bear alone. A person may feel lonely and isolated even among his own family and have to make up for the lack of company with pets.

Communication is not only an essential condition of human existence; it is also a means of forming and developing social experience and restraint, which may be felt by the individual even outside the field of immediate communication. Even when isolated, he considers his

thoughts and actions from the standpoint of what reaction they may evoke in others.

Historical progress has substantially changed the means of influencing people's minds and hearts. The speech in the forum or the senate, the conversations of the philosophers with their pupils, the sermon preached in church, the choir singing, the disputes between the Schoolmen, the speech of the lawyer and the public prosecutor, the professor's lecture, love letters, written proclamations, pamphlets, stirring speeches by revolutionaries have been replaced or supplemented by huge editions of printed works, by radio and television, the mass media. Now the streams of information circulate by means of qualitatively different channels all over the planet, gradually integrating the human race by means of information. A great wealth of forms of communication are available to people through the rich language of the arts, through songs, poetry, music, painting, stories and novels. And how infinitely rich are the forms of unspoken, intimate communication. A psychological response or lack of it is obvious in facial expressions, in posture, walk, gesture, voice modulations, the movements of the hands, those extremely mobile instruments for expressing states of mind. In the whole system of "body" language that people, particularly those with artistic natures, use with such success, the crucial role belongs to the eyes, through which we both generate and feel the radiance of the human spirit in all the diversity of its varying intensity and perhaps even depth. What can one read in a face that has no eyes?

Communication ensures continuity in the development of culture. Every new generation begins its work of learning from the point where the previous generation left off.

Thanks to communication the individual's thoughts and aspirations are not obliterated by time. They become embodied in words, in images, they survive in legend and are passed on from century to century. Every person leans on the ancient genealogical tree. The motion of thoughts in people's minds is like waves breaking on the shore; they have the pressure of the whole ocean of world history behind them. Books are the present's passport to all previous culture. In the treasure-house of their native speech, generation after generation stores up the fruits of the deepest movements of thought and the history of events. The whole imprint of man's intellectual life is preserved in words, in written characters, by the invention of which the human mind resolved one of the greatest and most difficult of its problems. It embodied, it registered speech and thus acquired the

ability to make its thoughts immortal. "What is written by the pen cannot be erased by the axe", says the folk proverb. Writing is a marvellous and inexhaustible fountain of knowledge and wisdom, a fountain that never runs dry though it is constantly in use. Communication goes on between specific living individuals and between epochs and also between different cultures.

Any consideration of the problem of communication inevitably raises the question of mutual understanding. When one talks about understanding, one usually thinks of comprehension of real things, cognition of the world around one. But what we are concerned with here is "communicative understanding", how people understand one another by communicating, how the present generation understands its predecessor, how the people of one culture understand other cultures. These are problems that have received little attention and yet are extremely important.

Everyone is surprised by the tricks of the conjuror, by the phenomena of telepathy, and so on. But only a few are surprised by the "miracle" of communication, of understanding achieved by the language of words, gesture, mimicry and various symbols, particularly understanding between present and past, and between cultures. At the common sense level mutual understanding through communication, the understanding of one epoch or culture by another seems to be a mere triviality to be taken for granted. We all understand what we say and what other people, epochs and cultures say to us. And when understanding is not achieved, we often blame language and speak of not being able to find a common language.

Attention was drawn long ago to the big difference between understanding the objects and processes of the external world and understanding human actions and words. To understand human beings and what they do we have to take into consideration their motives, the discrepancy between what they say and what they mean, we have to make allowance for the difficulties of detecting true motivation. One of the stumbling blocks to mutual understanding is the great diversity of individuals. Each of us contains a whole world. And this world is our particular world. In any specific context of communication a person usually uncovers only one aspect of himself. Understanding is further complicated by the generalised way we perceive each other, by our tendency to fit this perception into certain accepted and evolved general standards that ignore the unique in every individual. The individuality of people's experience and frame of reference also makes mutual understanding more difficult. The Sophist Gorgias once

remarked that in the process of being perceived and expressed in words an object of thought disintegrates into a huge number of elements of thought and thus loses its integrity: complete mutual understanding is therefore, in principle, impossible. One often hears and reads, complaints about difficulties of communication between children and parents, between epochs and between cultures, between the healthy and the sick, particularly those who are mentally ill. A foolish person cannot fully express the thoughts of the intelligent. From the content of what he is told he absorbs only as much as he is able to understand. One could say that the degree of mutual understanding between people depends to a great extent on their cultural level, their power of insight. The history of culture offers numerous examples of how the power of genius increases through absorbing the meaning and tendency of the epoch, through tackling and solving the problems raised by the logic of life. Works of genius always embrace possibilities that have not yet been revealed. And the degree to which they are understood depends on the cultural level of the reader, the audience. As it climbs the spirals of history, humanity constantly improves the mechanism of mutual understanding, the content of the dialogue between epochs and cultures. Every new epoch, in acquiring more perfect ideas, also acquires new eyes and sees in the great works of the past more and more that is new, goes deeper into their intrinsic meaning. Many of Shakespeare's contemporaries probably regarded him as, at best, an interesting actor and little more. They did not see in him one of the supreme geniuses that humanity has produced, whose profundity has been consistently, century after century revealed by every new generation.

Intellect alone cannot give us understanding of a person, an epoch or a culture. There must also be shared experience, the ability to empathise with other people, epochs and cultures. Where is the guarantee that modern man fully understands the culture of the ancients, their writings, paintings, sculpture? The mere translation of the ancient Indian writings into Russian, for example, cannot provide it. To fully understand them one must enter into the socio-psychological context of each work, into the life, the everyday round, the culture of the people that created it and the historical epoch in which it was written.

The character of human relations depends to a great extent on this understanding of each other in the process of communication. If this is adequate, the result is an unambiguous relationship, regardless of whether that relationship is one of liking or dislike. Otherwise the relationship is blurred.

Argument or proof is an essential element in understanding. Blank assertion cannot understand itself or make itself understood. Another important element in mutual understanding is the ability to listen. Not for nothing do people say that the art of listening is as important as the art of speaking.

Understanding takes place on an incredible number of different planes due to the fact that the whole fabric of language and any speech context are interwoven with threads of metaphor and imagery. For the same reason there is often an illusion of understanding, as opposed to a real understanding of what is being said. However, despite all the difficulties, mutual communication is built on a sound foundation of mutual understanding, without which there could be no rational contact between people, and social life would be inconceivable.

The unity of language and consciousness. If we want to know more about communication between people, epochs and cultures, we must investigate the nature of the means of communication—language. Language is the highest form of thought expression, the basic means of controlling behaviour, of knowing reality and knowing oneself and the existence of culture. Without the gift of speech man could never acquire cultural values. Consciousness presupposes speech as its material reality in the form of gesture, sound, symbol, and so on. Speech may convey thoughts, feelings and volition in the process of mutual communication, because words are material and can therefore be sensuously perceived. Speech is language functioning in a specific situation of communication. It is the activity of communication and its recorded results. Russian speech, for example, embraces an infinite number of statements by specific individuals and all that has been written in that language. Language, on the other hand, is a specific vocabulary and grammar, expressed in rules and sentence patterns, which have been evolved historically and are national in character. But specific sentences, both spoken and written, belong not to language but to speech: they form the symbolic reality that constitutes the existence of language.

Speech is the material expression of thought. In speech the content of our intellectual world is objectified for others.

Speech fulfils several interconnected functions. It is both communicative and thought-creating, it is a means of influencing and of regulating. The communicative function is primary and predominant. Since thoughts in themselves are non-material, they cannot be perceived by the sense organs. They cannot be seen or heard, touched or tasted. The expression "people exchange ideas" is absurd if

understood literally. No exchange of ideas actually takes place. The process of communication is effected in the form of mutual material influencing by means of words, which appears to be an exchange of thoughts. We do not convey thoughts by means of words; we evoke analogous thoughts in the mind of the person we are speaking to.

By means of speech a person can internally, in his mind, manipulate things, their attributes and relations, without touching them or seeing them. Man has made this tremendous advance thanks to language. It is customary to distinguish two aspects of the word: its meaning and the form of its existence. The first is a representation, an experience, an idea, a thought; the second is a sign or symbol. A word is a unity of meaning and symbol. What makes a word a word is its meaning. A word represents not only the meaning of a thing but the thing itself. A symbol is the material object, process, action that performs the role in communication of representing something else, and that is used for obtaining, storing, transforming and conveying information. When we speak of the meaning of symbols, we have in mind the information about things, their properties and relations, which is conveyed to us by means of corresponding symbols. Meaning is the reflection of objective reality expressed in the material form of a symbol. Meaning comprises conceptual, sensuous and emotional components, volitional motivations, and requests, in brief, the whole sphere of consciousness.

The basic sign system is a normal, everyday language. Non-linguistic signs may be classified as copy-signs (photographs, fingerprints, fossils of plants, animals, etc.), signs as symptoms (shivering as a symptom of illness, a cloud as a sign of approaching rain), signs as signals (traffic lights, bells, applause, etc.), and signs as symbols. Consciousness is woven out of innumerable threads, which form a complex web of symbols, a complete and specific world.

Symbolisation is a specific act of consciousness. It permeates all its levels and is expressed in generalisation of that which symbolises the object and that which is symbolised. For example, a flag is not simply a strip of cloth of a certain colour but a piece of cloth with certain attributes: colour, shape, etc. What is a symbol? It is a certain object, action, process, word or outline, the meaning of which lies in the fact that they express something, that they contain, as it were, another object or phenomenon. A symbol is a phenomenon which may express a certain meaning not directly but in a formalised manner. For example, justice is symbolised by the Goddess Themis. Consequently, a symbol is not just a sign. In its external form it already contains a notion, an image that it symbolises. A symbol has an expressive function and, thanks to

the embodiment of a sensuously concrete content, it indicates something that in itself it is not. The use of special symbols, and particularly the invention of artificial systems of formulae, yields huge advantages for science. Symbol systems in scientific thought perform the function of formulating conceptual images. They contribute to the progress of scientific cognition in its eternal movement towards an object and in the creation of a true picture of the world. For example, the use of signs or symbols from which formulae are made up enables us to register a connection between thoughts in abbreviated form, to carry out communication on an international scale. Artificial sign systems, including the formalised and code languages used in technology, in interpreting machines, are a supplement to the natural languages and exist only on their basis.

Everything known to humanity is in some way named, given a symbol or sign. People have acquired a permanent need to know the names of things. Even when they acquire no information from the name of a certain person or object, they feel a certain satisfaction in knowing what she, he or it is called and often show intense curiosity concerning names, for example, the name of a girl we happen to meet, or the name of a plant or a distant star, although it tells us very little.

Because of the unique individuality of things and human conditions, every word in a certain context has certain shades of meaning, or even a whole range of different meanings. Its sense differentiations are as varied as the shades of colour in a peacock's plumage.

The meaning of a word is "minimum knowledge", which probably refers only to certain attributes of the object rather than reveals its essence. For example, when we seek the meaning of the word "water", we do not reveal its physico-chemical nature, we do not explain the content of the given scientific concept (that is the task of physics and chemistry); we merely indicate that this is a liquid that is transparent. Many words may be used in a figurative sense. For example, the word "water" is sometimes used to refer to a lack of substance in a lecture, an article, a book, and so on.

Although the sense organs are directly influenced by speech, speech in itself, its material fabric, is something that cannot be consciously perceived. A person is not conscious of the word itself, just as he is not conscious of the light rays by which he perceives a thing. Speech is concentrated entirely on the object. In relation to reason, which perceives things, events in their conceivable reality, it is neutral. We are confronted with a word or sentence and in our heads there arises a

whole world of things and events. A person only begins to notice words when he ceases to understand their meaning. Or he may specially fix his thoughts on the material envelope of the word for purposes of analysis, etc.

It would be wrong to intellectualise speech altogether, relegating it merely to the role of a vehicle for thought exchange. Speech performs an emotional, expressive and regulative-volitional function. Its emotional content is expressed in rhythm, pause, intonation, in various kinds of interjections, in emotionally expressive vocabulary, in the whole range of lyrical and stylistic devices. As a means of expression speech, including gesture, facial expressions and so on, ties in with the whole complex of expressive movements.

Thought is always mental activity in any language. If a rational being from another planet were to visit the Earth and describe all the languages that exist today and in the past, it could not fail to notice their astonishing resemblance in logical structure, which is determined by the structure of the unified Earth system of thinking. If a given thought is expressed in English, Russian or French, despite the differences in linguistic form, the content of all three sentences remains the same. The structure of a language is formed under the decisive influence of objective reality, through certain unified standards of thought, through the category structure of consciousness. But at the same time these unified universal standards of thought are materialised in thousands of different linguistic ways. Every national language possesses its own structural and semantic specifics.

It is sometimes alleged that people speaking different languages perceive things in different ways: that language determines the character of perception. People classify things, their properties and relations according to existing linguistic categories. Language, we are told, is responsible not only for the content but also the structure of thought. Different peoples analyse the world in different ways, the structure of the language entirely determines forms of thought and behaviour and every language possesses its own philosophy.

Actually, language has only a relative independence, its own internal logic. Whereas the categories of consciousness as a whole have a universal character (otherwise contact between different groups would be impossible and translation would also be an impossible task), the basic means of expressing these categories are extremely varied. At present there are more than 3,000 languages on the globe. This shows the complexity and contradictory nature of the connections between

consciousness and speech. In its structure, speech is not simply a mirror reflection of the structure of the world of things, their properties and relations; it is also a reflection of the individual's intellectual world. It cannot therefore be fitted on to thought, like a hat onto a head. Language influences consciousness in the sense that its historically evolved forms, the specific nature of its semantic structures and syntactical peculiarities endow thought with different shades. We know that the style of thinking in German philosophical culture differs from that of the French, for example. Each style took shape under the influence of the peculiar features, including language, of the two respective peoples and their national cultures as a whole. On the other hand, any absolutising of the influence of speech on consciousness leads to the mistaken assertion that consciousness is determined not by the object, the objective world, but by the way it is represented in language.

To sum up, by means of speech we communicate something to a person, we inform him of our thoughts, moods, feelings, motives. We share the content of our intellectual world. Consequently, speech carries a certain intellectual content, which must pass through language and come to terms with its structure. Otherwise this content, if not rendered meaningless, will assume an amorphous shape which we shall be unable to examine as something with a definite quality. The linguistic form is not only a condition for conveying the thought content; it is primarily a condition for the realisation of that content.

The relationship between consciousness and speech is not simply coexistence and mutual influence, but a unity in which consciousness plays the decisive role. As the reflection of reality, consciousness "moulds" the forms and dictates the laws of its existence in the form of speech. Consciousness is always a verbally expressed reflection: if there is no language there can be no consciousness. And no deaf mutes or blind-deaf mutes who have received even a little training would deny this general principle: they have their own special language. And only out of ignorance can it be maintained that these people think barely on the basis of visual images.

There is no case for the view that consciousness and speech live parallel, independent lives and come together only at the moment when a thought is uttered. They are two aspects of an integral process: by carrying on speech activity a person thinks; by thinking he carries on speech activity. Think before you speak, says popular wisdom. If there is a thought in our consciousness, it is always contained in a word, although it may not be the word that best expresses that particular thought. And on the contrary, if we remember a word, a thought occurs

in our consciousness together with that word. When we are inspired by an idea, when a person has a thorough grasp of a certain thought, it "comes out of his head" clothed in suitable words.

In its search for the truth human thought cannot bypass the barriers of language. Language is not the external vestment of thought, but the element in which thought actually lives. Naturally, the relation between language and consciousness should not be oversimplified, for example, by comparing thought to the contents of a vessel, the vessel being language. This comparison won't work, if only because the "linguistic vessel" is never empty, despite the not infrequent emptiness of its contents. Moreover, the individual's actual intellectual content does not exist outside the "vessel of language". Language is never exhausted by the outpourings of thought, and thought is not detached from language at any stage of its existence. Thoughts are not converted into language in such a way that their intellectual uniqueness disappears.

The history of science records many attempts to identify thought and language, to reduce the one to the other. These attempts are still being made today. They are expressed, for example, in such statements as "reason is language" or "all philosophy is grammar". The notion of language as a highly abstract structure that consists of a system of universal rules (universal grammar) generating linguistic sentences, fits in very well with the universal nature of thought, and this leads some people to identify formal linguistic universals with the categorial structure of thought.

Consciousness reflects reality, but speech symbolises reality and expresses thought. Speaking is not yet thinking. This is a platitude and it is only too frequently confirmed by life. If the mere act of speaking indicated thought, as Feuerbach once remarked, the greatest chatterers would be the greatest thinkers. Thinking means knowing, cognising; speaking means communicating. In the process of thinking a person uses verbal material and his thoughts are formed, moulded in speech structures. The work that is needed to formulate thoughts in speech is performed more or less subconsciously. When thinking, a person works on the cognitive content and is aware of it while the speech envelope of thought may remain outside the control of consciousness or be controlled only on the general plane. Thought should not be imagined as a kind of "cloud suspended overhead", which opens and rains down words. One cannot agree with the assertion that the relationship between language and thought has formed in such a way that, on the one hand, there is thought, or ideas, i.e., that which goes on in consciousness and is observable only introspectively, while, on the other

hand, there is the semantic structure, the primary filter through which thoughts must pass before they are embodied in sound. Speech serves not only to express, to convey a thought that has taken shape. Thought is both formed and formulated in speech.

In the process of communication the unity of consciousness and speech appears to be "self-evident". But is it possible for mind to exist without being expressed in words? Processes of consciousness that are not externally expressed take place on the basis of so-called internal speech, which in its turn is realised in the form of internal dialogue. Speech had to arise and mature as something external in order to become something internal. When we think silently, we often unconsciously rehearse certain thoughts in our minds. Internal speech is soundless. It is a kind of inhibited and abbreviated form of external speech. Meditation, which takes place in the form of internal speech, is always a kind of dialogue with oneself. Such speech performs only an imaginatively communicative role and its basic function is that of an instrument for forming and developing thought. Internal speech is distinguished from external speech not only by its function but also by its structure. Since internal speech is aimed at itself, it leaves out everything that can be taken as understood.

Is thought possible without speech? We emphasised above that there was an indissoluble unity between consciousness and speech, and this is true as a general rule. But if it were possible to express everything in words, why should there be expressive movements, the plastic arts, painting, music? And how do matters stand in relation to scientific theoretical thought? As Einstein told us, at certain moments in the mechanism of his cogitative activity ordinary words, as pronounced and written, played no decisive role. He was able to think in more or less clear images of physical reality: the sea in motion symbolising electromagnetic waves that cannot be visually perceived, physical forces operating in a manner similar to the work of muscles, and so on. And how does the act of thought take place when a person is swept towards the light of truth on the "wings of intuition" and not by means of the "rope ladder" of logic?

This is not only because the process of conceptual thought is constantly interspersed with imagery that does not need any verbal forms. Thinking in images may be profoundly conceptual because images may perform the role of symbols richly endowed with conceptual content. Generally speaking, no one has yet been able to prove by facts that thought takes place only by means of the natural language. This has only been stated, but experience tells us otherwise.

However, thinking in images takes place only as an exception or in the form of components woven into the fabric of ordinary cogitative activity, and this does not rule out the general principle of the unity of consciousness and speech. We know that the possibilities of thought are inseparably bound up with the possibilities of the given language: a poor vocabulary is a sure sign of mental poverty. This is natural enough. A person can operate only with the accumulated knowledge that is established in the semantic aspect of language. Primitive man, whose consciousness was meagre, used only a few dozen words, whereas the average person today has an active vocabulary of between 3,000 and 5,000 words and major writers use more than 10,000. Nevertheless, poverty in the intellectual sphere does not spring from a poor vocabulary, but on the contrary, a poor vocabulary is the result of superficial thinking, due to lack of culture, social experience and social relationships.

One of the convincing arguments for the principle of the unity of thought and words is to be found in clinical facts, which tell us that mental disorders have an effect on speech.

In ordinary consciousness the process of communication appears to be very simple, something which may be taken as a matter of course. But the expression of consciousness in words is often an extremely complex problem and not every speech formulation of thoughts is the best possible one. We often feel that what we have said does not adequately express what we are thinking. We reject one word as not fully expressing our idea and substitute another. The content of thought regulates the means of its verbal expression. A person sometimes cannot recall a word or name, although it's "on the tip of my tongue". But everything that is well thought out is expressed clearly. A fine thought is devalued by being poorly expressed. There are two kinds of nonsense: one comes from a lack of thought and feeling concealed by words, the other, from an overabundance of thought and feeling lacking the necessary words to express them.

Realisation of the process of thought in the forms of language involves both the agony of intellectual creativity and the agony of search for adequate means to express it. Sometimes an idea that suddenly dawns on the consciousness may for a time, as Mayakovsky put it, "writhe languageless". Thought must overcome certain external material, which is sometimes resistant to thought.

We know that language contains the rudiments of obsolete forms of thought. In order to comprehend the world of today we use words

created by the world of yesterday. Language influences consciousness also in the sense that it exercises a kind of coercion, "tyranny" over thought, directs it along certain linguistic channels, forces constantly changing, individually unique, emotionally coloured thoughts with their endless shades and nuances, into general linguistic patterns, thus placing a kind of fetter of universality on thought. Sometimes it throws thought to the mercy of clichés and hackneyed phrases.

The more unusual our experiences, the more difficult it is to express them by socially evolved, schematised symbolic means. Platitudes are more easily expressed; they are like a standard flow of metal, which comes freely into the ready-made clichés of language. Thoughts, emotions and speech, all have an individual character. When we speak of the language of Pushkin, Shakespeare or Gogol, we usually have in mind the linguistic means and specific ways in which these writers used them. One may judge a person by many signs, including the nature of his speech, the way he talks. There is a close connection between the way of thinking and the way of expressing thought. If, for example, we study the creative methods of any writer we soon come to the conclusion that persistent and painstaking work on the form in which thought is expounded is also work on perfecting and sharpening the thought itself. A basic rule for almost any writer is to rewrite, revise, insert and generally rework his manuscripts. Dostoyevsky stressed that the greatest ability of a writer is his ability to cross out.

Speech is a powerful means of influencing human psychology. And this function is among its oldest. A well-turned phrase can sometimes stop soldiers in flight and snatch victory from defeat. A word may be a medicine relieving human sufferings, or a poison that causes great pain. Language therefore has much power to influence. We all believe in the power of words. They may make a person cry, weep or laugh. Words can kill a person and also console him in his grief. In ancient times, when everything was permeated with faith in the magic of words, and even today, words have been known to exert a kind of mysteriously powerful influence and are so used by skilled psychiatrists in healing their patients.

The aim of verbal communication is not only understanding and agreement but also the desire to suggest something to somebody else, to convince, to teach, to influence that person and guide his actions. There exist between people so-called volitional relations, which are expressed in the form of orders, instructions, prohibitions, permissions, obedience, disobedience, and so on.

Influence on consciousness by means of speech takes place not only in the narrow framework of bilateral communication; it is also exercised on the scale of the social group and of whole countries and humanity in general.

Chapter 4. The Theory of Knowledge and Creativity

Table of Contents

General Concept of Cognition
Cognition and Practice
What Is Truth?
The Sensuous Image of the World
Thought

General Concept of Cognition

The theory of knowledge and creativity is an important department of philosophy. It arose historically with philosophy, as its core, around which everything else was built. This department of philosophy considers a wide range of problems: the relationship between knowledge and reality, its sources and driving forces, its forms and levels, the principles and laws of cognitive activity, and the trends of its development. Philosophy analyses the criteria of the authenticity of knowledge, its veracity, and also the causes of error, the problems of the practical application of knowledge.

As selective reflection of the world cognition expresses the highest creative aspirations of human reason and constitutes the crown of human achievement. Throughout the millennia of its development humanity has travelled a long road, from the primitive and limited, to an increasingly profound and comprehensive understanding of the essence of existence. This difficult path has led us to the discovery of innumerable facts, properties and laws of nature, of social life and man himself, to the building of an extremely complex and almost unencompassable scientific picture of the world, to the highly sophisticated sphere of art, to the achievements of modern technology.

Humanity has always striven to acquire new knowledge. The process of mastering the secrets of existence continues unceasingly and its vector is oriented on the infinite vistas of the future. The pace and scale of cognitive activity are constantly increasing. Every day is marked by intellectual advances in a constant quest, which ever more widely and vividly illuminates the remote horizons of the as yet invisible. We are deluged with new discoveries.

The path travelled by science convinces us that the possibilities of human cognition are limitless. Our reason perceives the laws of the universe in order to bring them under man's control, in order to refashion the world in the interests of man and society. Human knowledge is a highly complex system, a social memory whose wealth is passed on from generation to generation by means of social heredity.

Cognition coincided with the rise of man. But it was some time before man began to think about what knowledge actually was. The conscious posing of this problem and the attempt to solve it was the beginning of philosophy in the true sense of the word. All philosophers in some way or another analyse the problem of the theory of knowledge and some have reduced the subject of philosophy entirely to this problem.

In the philosophy of the ancient world the basic problems of epistemology were developed by defining types, such as "knowledge" and "opinion", "truth" and "error". Opinion was opposed to knowledge as a subjective notion of the world, while knowledge was its objective investigation. Heraclitus saw the highest goal of cognition in "studying the universal", understanding what was hidden in the universe, the "logos", the universal law. Discussion of the problem of dividing knowledge into types proceeded from the relationship and opposition between ordinary consciousness and standards of theoretical thought, with its techniques of proof, disproof, and so on.

To sum up, knowledge is the result of the process of cognition of reality, tested by socio-historical practice and authenticated by logic, the true reflection of reality in human consciousness in the form of representations, concepts, statements and theory. Knowledge has varying degrees of accuracy, reflecting the dialectics of relative and absolute truth. In its genesis and mode of functioning, knowledge is basically a social phenomenon. It is fixed, embodied in the form of the symbols of the natural and artificial languages.

The relationship of knowledge to reality takes place on many planes and is indirect in character. It develops both phylogenetically, in the history of human culture, and ontogenetically, in the process of the development of the personality. Elementary knowledge, conditioned by biological laws, is inherent in animals, whom it serves as a necessary condition for their existence and the performance of behaviour acts. Knowledge may be pre-scientific or everyday, artistic (as a specific form of aesthetic assimilation of reality) and scientific (empirical and theoretical). Ordinary everyday knowledge, based on common sense

and ordinary consciousness, is an important orienting basis for people's everyday behaviour. The bulk of daily practice is based upon it. This form of knowledge develops and is enriched as scientific knowledge progresses. At the same time scientific knowledge itself absorbs the experience of everyday knowledge. Scientific knowledge may be defined as the comprehension of facts in the system of concepts of a given science and it becomes part of theory, which forms the highest level of scientific knowledge. Since it is a generalisation of authentic facts scientific knowledge detects what is necessary and law-governed behind the accidental, what is general, behind the individual and the particular. Forecasting is carried out on this basis. Human thought constantly moves from ignorance to knowledge, from the superficial to more profound, essential and all-embracing knowledge, which is a necessary factor in the transforming activity of human beings and the human race in general.

Pre-Marxist philosophy contained no understanding of the fact that without socio-cultural factors there could not have been a human picture of the world at all. Marxism is distinguished by its socio-historical approach to cognition. The basic principle of the theory of knowledge of dialectical materialism is the principle of reflection. The knower, the cognising subject is not an isolated individual but an individual as part of social life, using socially evolved forms of cognitive activity, such as language, categories of logic, and so on. By developing the theory of the activity of the subject and thus overcoming the contemplativeness of metaphysical materialism, Marxism showed that objective reality can be known only to the extent that a person masters it in the forms of his practical activity and the cognitive activity that is derived therefrom.

Any notion of the world always bears traces of some kind of social development. Even sensuous notions are by no means the same in all ages. They have a certain structure according to the type of social development that went on when they were acquired. Objects on which cognition is concentrated are mostly the products of previous activity; they could not be understood, considered or assimilated outside the historical context.

The knowability of the world. Are there any limits to the power of human reason and hence to human power over the universe? At the dawn of its development philosophy, in effect, proclaimed the principle of the knowability of the world. But not everyone agreed with this view.

Some philosophers expressed and still express doubts as to the authenticity of human knowledge, and prefer to remain sceptical or

even completely deny the possibility of knowing the world, thus adopting the position of agnosticism. Scepticism acknowledges the existence of an external world and seeks a knowledge of things. But when confronted with the universal relativity of knowledge, it is so beset by doubt that it retreats to the position of "withholding judgement".

Agnosticism is a philosophical theory that denies the possibility of man's achieving authentic knowledge of the objective world. Some agnostics, while recognising the objective existence of the world, deny its knowability, others regard the very fact of the world's objective, existence as something unknowable. They maintain that knowledge is subjective by its very nature and that we are in principle unable to reach beyond the boundaries of our own consciousness and cannot know whether anything else except the phenomena of consciousness exists. From the standpoint of agnosticism the question of how a thing is reflected by us differs fundamentally from the question of how it exists in itself. A person moved by the desire for knowledge, says, "I do not know what this is but I hope to find out". The agnostic, on the other hand, says, "I do not know what this is and I shall never know". Most consistent and conscious materialists defend and seek to prove the principle of the knowability of the world, but some fall back on agnosticism. Agnosticism is closely connected with the idealist view. Some idealists recognise the knowability of the world, which they infer from the ideal essence of things. For example, Hegel's recognition of the knowability of the world stems directly from his principle of the identity of being and thinking. In contrast to agnosticism, Hegel believes that the hidden essence of the universe cannot resist the audacity of cognition; it must reveal itself and unfold its riches and the profundity of its nature and allow knowledge to enjoy both.

The classical exponent of agnosticism is Kant, who divorced the content of consciousness from its actual foundation. In his view a phenomenon occurs as a result of the interaction between the "thing-in-itself" and the subject, the knower. The "phenomenon" must therefore be considered from two aspects: its relationship to the "thing-in-itself" and its relationship to the subject. Kant maintained that when we consider an object perceived by the external senses only as a phenomenon, we thereby acknowledge that it is based on the thing-in-itself, although we do not know its properties. We know only that which is manifest to us. And everything that is manifest to us is refracted through consciousness and emotions. We see everything through the prism of our senses and our reason, and therefore cannot know essence

as it is, independent of us. An unbridgeable gap lies between the world of things-in-themselves and that of phenomena that can be known. According to Kant, one cannot compare what is in the consciousness with what is outside it. A person may compare only what he knows with what he knows. This implies that we move endlessly in a world of our own consciousness and never come into contact with the actual objects of the objective world. Hence the conclusion that it is impossible to discover anything that does not already exist in thought. The external world, according to the agnostics, is like a traveller. It knocks at the door of the temple of reason, awakens it to activity and then withdraws without revealing its identity, leaving reason to guess what kind of person knocked at its door. So we see that the source of agnosticism lies in the absolute opposition of reason to the external world.

Most characteristic of the 20th century is the agnosticism of neopositivism, which tells us that philosophy cannot provide objective knowledge but must be confined to the analysis of language.

Another source of agnosticism is relativism, that is to say, the absolutising of the variability, the fluidity of things and consciousness. The relativists proceed from the pessimistic principle that everything in the world is transient, that scientific truth reflects our knowledge of objects only at a given moment; what was true yesterday is error today. Every new generation gives its own interpretation of the cultural heritage of the past. The process of cognition is foredoomed to a random pursuit of eternally elusive truth. Relativism works on the assumption that the content of knowledge is not determined by the object of cognition but is constantly transformed by the process of cognition, thus becoming subjective. Absolutising the relative in knowledge, the relativists regard the history of science as movement from one error to another. But if everything is relative, then this assertion, which can have meaning only in relation to the absolute, is also relative.

Treating all human knowledge as relative and void of any particle of the absolute amounts essentially to acknowledgement of complete arbitrariness in cognition, which then becomes a continuous flux, in which nothing is stable or authentic and all distinctions between truth and falsehood are erased. But if we cannot believe any of scientific propositions, we have nothing left to guide us in life and in practice. The metaphysical thinker has a tendency to reason as follows: if we speak of truth, it must be absolute truth, and if it is not absolute it is not truth. The relativists, on the other hand, usually argue that the history of science records many cases when propositions once recognised as true

were later dis proved and, conversely, propositions believed to be false eventually emerged as true in the course of the further development of science. Admittedly, the path of scientific cognition does not proceed in a straight line; it may often swerve in unexpected directions. But this does not prove that all our knowledge is nonsense. It is not enough to assert that scientific truths change. We must remember that this process of change moves in a certain direction, proceeding ever deeper into the essence of things. The historical transformation of the content of knowledge on the road to its maximum fullness is regarded by agnostics as "proof" of its independence of the object of cognition. The relativist substitutes for the true proposition "knowledge contains an element of the relative" the false assertion that "all human knowledge is unreliable".

Dialectics recognises the variability of the world and the flexibility of concepts, their "fluidity", their transmutations. But its premises are the actually existing processes of the development of objects and their reflection in concepts; it does not absolutise the variability of things or their reflection. It does not deny their relative stability and qualitative determinacy. Variability and stability, both in things and their reflection, form a real contradiction. Whereas absolutising the element of stability leads to metaphysics and dogmatism, absolutising the element of variability leads to relativism. Relativism undermines belief in scientific truth, and when belief in truth in general collapses it brings down belief in science and even in life. Dialectics embraces the elements of relativism, negation and scepticism but cannot be reduced to relativism. It sees relativity not as negation of the objectivity of truth but as evidence of the fact that cognition is historically conditioned in its approach to objective truth.

Knowledge is historically limited, but in every relative truth there is some objective content, which is intransient. The Intransient elements of past knowledge form a part of new knowledge. Scientific systems collapse but they do not disappear without a trace; more perfect theories are built on top of them. One of the forms in which relativism manifests itself is conventionalism, which maintains that the concepts of science are formally accepted postulates, and that the question of whether they correspond to reality may be discarded as irrelevant to science.

The history of science is the history of omnipotent cognition, which renounces both the absolutising of achieved scientific truths and their sceptical denial.

Agnostics also resort to the following arguments. One cannot know the parts without knowing the whole. The whole is infinite and, as such, unknowable. Therefore its parts are also unknowable. Pascal, for example, believed that man would understand the life of his body only when he had studied everything it needed, and for this man would have to study the whole universe. But the universe was infinite and could not be known. Empiricists have always maintained that we can know only the finite and that the infinite is unknowable. But by getting to know the finite, the transient, we in so doing begin to know the infinite.

The knowability of the world does indeed imply a profound paradox. The world, the universe is boundless and inexhaustible and our knowledge of it at every given level of the development of science is inevitably limited and always will be. Nevertheless, the universe is knowable and agnosticism evaporates in the light of more complete knowledge. This comprehensibility of the world, which some people regard as the most incomprehensible thing of all, is not a figment, but the result of the whole preceding history of science, technology, and practice, which demonstrates that as a matter of principle there is nothing "classified" in the universe. All knowledge is opposed by unknown but knowable reality. There is nothing hidden that cannot be revealed, nothing secret that cannot be discovered. Humanity is capable of getting to know the whole universe because there is no limit to the development of its organs of cognition or of action. But humanity is limited by the historical framework and by the abilities of each individual. These limitations are overcome by the subsequent development of science and practice. All the preceding practice of humankind, the history of the development of cognition itself convincingly show that there is no limit to knowledge. When it plunges into the waves of existence, reason will never hit the "bottom" of the universe. Knowledge of the world has its beginning but no end.

Let us recall some of the stages in the triumphant march of human reason. For example, the mathematicians, beginning with Euclid, evolved a geometry that was perfectly true on the terrestrial scale; the physicists, beginning with Archimedes, revealed with increasing precision the laws of terrestrial mechanics. The astronomers, beginning with Hipparchus, penetrated ever deeper into the regions of the visible heavens. The biologists, beginning with Aristotle, delved ever deeper into the secrets of life. Copernicus, Galileo, Newton and Darwin evolved great theories that led to fundamental changes in the human view of the universe and exerted a tremendous influence on all aspects of human culture and modes of thought. The greatest discovery of 19th-

century biology was the discovery of the living cell; in chemistry the palm belongs to Mendeleev's periodic system of the chemical elements. On the threshold of the 20th century X-rays and radioactivity were discovered. A turning-point in the history of natural science was Einstein's theory of relativity. Recent decades of our century have been marked by the discovery of a new world of elementary particles of matter and the emergence of cybernetics. The successes of natural science and technology have made it possible to launch artificial satellites of the Earth, the Moon and Venus, to put artificial planets in orbit, and to send man into outer space. The list of the great achievements of human reason probing ever deeper into the secrets of nature and society, and of reason itself, could be extended still further. This undoubtedly proves the powers of human reason and science's ability to continue to multiply its discoveries and provide humanity with knowledge of new things and their properties whose existence we do not today even suspect. The advances of science are a constant reproach to agnosticism. Auguste Comte, the founder of positivism, declared that humanity would never know the chemical composition of the Sun. But the ink was scarcely dry on the paper where these sceptical words had been written when spectral analysis revealed the Sun's composition. Some supporters of Machism boldly averred that the atom was a chimera, a mere figment of a sick imagination. But as most people know, atomic theory is now the basis of all contemporary natural science. The same thing has happened with the "unknowability" of the dark side of the Moon.

In the enormous world of astronomy and the tiny world of the atom man has discovered secrets that were thought to be undiscoverable. Under the pressure of advancing science the agnostics have been compelled to yield one position after another.

We should not forget, however, that the knowability of the world does not mean that it is known. What we now know is a mere drop from the ocean of the unknown. While rejecting agnosticism, we also reject the absolutising of the results of scientific cognition and also the absolutising of the possibilities of cognition, an absolutising that ignores the real conditions of cognitive activity. Science is incompatible with immoderate claims to absolute knowledge, claims which would set a limit to its development.

Man has got to know a great deal. But cognition also reveals our abysmal ignorance. Reality extends beyond the frontiers of any knowledge. It is always more "cunning" than any theories and infinitely richer. Any tendency to categorical and final statements on all questions

is bad form in philosophical thinking. There is so much mystery in the world that we are obliged to be modest and reasonably cautious in our judgements. The true scientist knows too much to share an immoderate optimism and he regards the "super-optimists" with the kind of melancholy that grown-ups feel when watching children's frolics. We know for sure only comparatively simple things. Human beings are always 'standing on the shore'. Before them lies the majestic, infinite, unencompassable ocean of what is knowable but not yet known, dotted with only a few inshore islands of the known. And we are always trying to see further through its enveloping mists.

We live in a world where far more is unknown than known. And by the very logic of things we are destined to stand forever confronted by an unknown that moves further and further away from us.

The volume of our knowledge is incomparable with what we have yet to discover; but in content and depth we are getting to know reality with a great degree of accuracy. Reason must more often put us under the protection of doubt. Doubt is an essential component of developing science. There can be no cognition without a problem, no problem without doubt. Human reason may be compared to a lamp. The brighter the flame, the deeper the shadow of doubt. Legend tells us that one day Zeno, when asked why he doubted everything, drew two unequal circles and, pointing first to the larger, and then to the smaller, said that this large circle was his knowledge, and the smaller that of his pupil. Everything outside those circles was the sphere of the unknown. His contact with the unknown, he went on, was therefore greater than his pupil's, so he was bound to doubt more than his pupil. "Subject everything to doubt" is a maxim adopted by every creatively thinking scientist.

Scepticism within reasonable limits is beneficial; but cheap scepticism is like blind fanaticism. They are both equally often encountered in narrow-minded people. Denial of the knowability of the world leads to pessimism about science and to repudiation of its values. And this opens the door to various forms of reaction against reason and science. When attempting to explain any phenomenon it is absurd to assume that it is inexplicable. A person must believe that the incomprehensible can be comprehended; otherwise there is no point in thinking about it.

Cognition and Practice

The unity of cognition and practice. The basic form in which human life manifests itself is activity —sensuously objective, practical, and intellectual, theoretical. Man is an active being, not a passive observer at the "feast" of life. He influences things around him, gives them the shapes and properties necessary to satisfy historically evolved social and personal needs. The human being does not merely inhabit nature, he also changes it. An immeasurable amount of human labour has been expended on its transformation. People have drained marshes, erected dams, built factories and created enormously complex implements of labour.

Humanity converts the wealth of nature into the wherewithal of the cultural and historical life of society. For how many centuries did the flash of lightning in the night cause destruction and terrify the imagination of man, forcing him to prostrate himself on the ground at every thunderbolt! But man has conquered and disciplined electricity, forcing it to serve the interests of society. Lightning obediently flashes in laboratories, illuminates streets and houses, sets machines and trains in motion.

As society develops, its labour has an ever greater effect in changing the environment, endowing it with new properties that take it further and further away from its virgin state.

Practice is material, sensuously objective, goal-oriented activity intended to master and transform natural and social objects and constituting the universal foundation, the motive force of the development of human society and knowledge. Practice has numerous facets and different levels. By practice we mean all forms of sensuously objective human activity. But the basic forms of human practical activity are the production of material goods, labour, and also the revolutionary activity of the masses for the purpose of changing social relations, their participation in socio-political life, the class struggle, and social revolutions. Sensuously objective scientific activity involving the use of instruments and equipment in the process of observation and experiment is also a form of practice.

As the basic mode of human social existence, the crucial form of man's self-fulfilment in the world, practice is a complex and integral system. It comprises, above all, such elements as need, goal and purposeful activity in the form of separate actions and also the object upon which this activity is targeted, the means by which the target is achieved and, finally, the result of activity.

Social practice forms a unity with cognitive activity, with theory. It is a source of scientific cognition, its motive force, it gives cognition the necessary factual material for generalisation and theoretical processing. People began not from thinking about the world but from activities, mastering the objects of the external world by means of practice. People's power of discovery depended at first on the extent to which they acted in practice and were themselves influenced by the external world. The essence of things was revealed through the forms and ways of human practical activity. Man's very cognitive abilities have been formed and developed in the actual process of social practice, which has determined the structure, content and direction of human thought. At the early stages of human development the process of cognition reproduced the techniques of practical actions directly, which then served as a basis for logical operations. Cognition arose and developed because it ensured the survival of society and became a vitally significant social value. People's practical production activity was the foundation for the emergence of the natural sciences. For example, the need to cross the seas gave rise to astronomy, geometry sprang from the needs of agriculture, medicine from the needs of health, and so on.

In the final analysis it is practice that predetermines the choice of the objects of scientific research. The vital needs of society and individuals guide research activity. Production emerges as the basic consumer of the results of scientific cognition and the provider of the technical means for it, the instruments and equipment without which research is practically impossible.

Consequently, practice not only stimulates cognition but also creates the conditions for it to come about. Success in science depends not only on the scientist's talent, intelligence and imagination but on the existence of the necessary equipment. The development of technology has provided science with powerful means of experimental research up to and including computers, synchrotrons, and space ships. Electromagnetic and intra-atomic processes became targets of research only when society achieved the high level of production that provided science with the means for investigating these phenomena.

The increasingly bold practical application of the natural and social sciences created the mechanism of feedback between science and practice, which has become a crucial factor in the choice of many basic channels of research. For instance, the development of sputniks and spaceships as new means of astronomical observation has not only upgraded research of the solar system to a leading place among the problems of astronomy; it has also laid the foundation of a new science,

experimental astronomy, which has much in common with geophysics. Astronomers have acquired the ability to "touch" the environs of the Sun and observe the various streams of particles that it sends out into surrounding space.

Scientific knowledge has practical meaning only if it is realised in life. Practice is the arena where knowledge demonstrates its force. The ultimate aim of cognition is not knowledge in itself but the practical transformation of reality in order to satisfy society's material and spiritual needs. The practical realisation of ideas, their conversion into an objective world is a process of objectification. Knowledge is objectified not only in linguistic forms, but also in material culture. This also has considerable practical meaning. Since practical activity implies awareness, the intellectual principle is one of its essential components. Any theory that separates material and spiritual activity is alien to dialectical materialism. The two form a unity. Knowledge exists only in people's heads; it is there and only there, for better or worse, that cognition takes place, whereas everything that becomes reality is practice. Practical activity is performed with the aid of material means and creates material products, whereas spiritual, intellectual activity operates with images, concepts and generates thoughts and ideas. The process of practically influencing the world is both material and ideal.

Theory and practice form a unity, in which practice has the initially decisive role.

However, we know that man's practical transforming attitude to objective reality is impossible without accurate reflection of objects, their properties and relations. Theory is by no means confined to the simple generalisation of practice that has already taken place. It works creatively on the empirical material and thus opens up new prospects for the development of practice. In relation to practice theory plays a programming, intellectually enlightening role. Practice precedes theory. This becomes particularly clear as soon as we raise the question of the origin of knowledge. It is significant that in the language of tribes who have only recently emerged from the tribal system things are designated by the same words as human actions. At the earliest stages of the development of science, when human empirical thinking was taking its first timid steps, knowledge was indeed formed mainly on the basis of generalisation of direct practical operations with objects. At the level of scientific thought, however, this way of building knowledge cannot be the basic one, although it may be applied at certain stages of research. Here there is a tremendous growth in the possibility and necessity of mental, theoretical use of ideal models of things, their properties and

relations without having direct resort to practice. As thought becomes more sophisticated, as science develops, the link between cognition and practice becomes increasingly mediated and human progress makes this mediation ever more complex and multistaged. Whereas practice used to march ahead of theory now, on the contrary, theory tends more and more to anticipate practice and illuminate its way forward. Knowledge seems to take shape above practice and finds its embodiment and confirmation in practice. This has opened up many opportunities for theoretical thought to break out of the confines of direct experience and made possible a very long-term vision of practice in the future. The chains of mediation between theory and practice become longer and longer, and the first link may be as much as a century away from the last. The patterns of object interactions encountered in the mechanics of Archimedes, Leonardo da Vinci and Galileo were directly projected on the production situations of their time, but this certainly cannot be said of the theory of relativity or of quantum mechanics, for instance.

The internal logic of the development of cognition. By this we mean the stimuli that appear in the actual process of cognition, when one discovery leads to another and the development of one science encourages vigorous growth in other spheres. It is also seen in the influence that some ideas have on others, the methods of one science on others, of some minds on others.

Society has a duty to know more about the world than it can use at the given moment. Science must resemble an iceberg. Its visible peak should always be less than the part hidden under water. Utilitarian objections to pure theory may be discounted. Theory usually produces not immediate benefit but a spiritual value which sooner or later will acquire direct usefulness. When, for example, we speak of the general physical picture of the world or general field theory, or the origin of matter, science does not need to excuse itself for being too abstract. Not all the movements of theoretical thought need to be justified by immediate returns. For example, thousands of scientists in hundreds of laboratories the world over are investigating the behaviour, properties and interactions of elementary particles which have as yet not been used in practice. Experimenters and theoreticians are making unexpected discoveries, mounting ingenious experiments, advancing bold hypotheses, arguing with each other in search of the laws governing the structure and motion of matter.

The cognition of the forces of nature and society is bound to be followed sooner or later by the practical mastering of these forces. There is no such thing as a useless discovery. There is nothing more

practical than a true theory. When people ask about the possible practical application of any new discovery, one is reminded of Faraday's answer when questioned about the practical significance of the electromagnetic induction that he had discovered. How can one say, he replied, what kind of a man a baby boy will grow into? No one can predict the ultimate result of any scientific discovery. The history of science tells us there have been many cases of a discovery becoming the cornerstone of a whole branch of technology.

Scientific research has various stages, some of which cater for the immediate needs of practice (solution of today's tactical problems, as it were), while others are targeted on more distant prospects. These are the upper floors of scientific research. They are oriented on solving strategic problems, revealing bigger, wider opportunities for the practice of the future, introduction of fundamental changes in existing practice.

Narrow practicism may be harmful to science, particularly its fundamental theoretical departments. It restricts scientific thought, confining it to the limits of the object of research, which are important only for historically transient forms of practice, and thus scales down the range and content of research activity. Conversely, when scientific thought is not fettered by such limits, it is capable of discovering in an object properties and relations that in perspective offer the opportunity of its far more diversified practical use.

After setting up its logical basis, scientific theory acquires a capacity for self-development and reproduction of properties and relations of things that are not yet within the scope of practice and sensuous cognition, or that will be there only in the future. The development of science at any given period depends on the thought material inherited from past generations, from theoretical problems that have already been stated. Scientific development has a relative independence thanks to the necessity, based on the needs of cognition itself, to systematise knowledge, to break down its branches into various interacting disciplines, thanks to need for intellectual intercourse and free exchange of opinion. Many discoveries were not directly triggered by practice and only later became the source of new practice, i.e., the discovery of X-rays, radioactivity, and so on. The general theory of relativity arose not thanks to certain hitherto unknown experiments, which threw new light on the essence of gravity, but by means of purely theoretical analysis of the system of knowledge that had already taken shape in physics. The predicted experimental proofs only appeared at a later stage.

Discoveries arise partially as a result of the solution of internal contradictions in a scientific theory itself, and appear before the practical demand for them is consciously appreciated. Sometimes a new need arises under the influence of this or that discovery or invention. But quite often the opposite is the case. Despite the intense practical needs of society, science cannot come up with the answer and the need remains unsatisfied. At each stage in the development of society practice has to make do with the level of theory that has been achieved, no matter how poor it may be.

The ideal incentives to knowledge. What is it that drives people into the jungles of the unknown? The search for knowledge does not depend on practice. It is the result of the mind's inner urge to seek truth. The scientist studies nature not only because his studies yield useful results, but also because they give him satisfaction.

Material incentives play a by no means inconsiderable role in the development of science; but moral stimuli, ideal incentives, play an even greater role. Such incentives include the desire to make people's work easier, to enlighten, to reorganise social relations in the public interest, to delight in the process of creativity, to win fame, and so on. The awareness of one's duty to society and the desire to serve the interests of humanity have stimulated the creative work of many scientists. The work of Marx on *Capital* provides an impressive example. In one of his letters he wrote: ". . . Well, why didn't I answer you? Because I was constantly hovering at the edge of the grave. Hence I had to make use of every moment when I was able to work to complete my book, to which I have sacrificed health, happiness and family. I trust that I need not add anything to this explanation. I laugh at the so-called 'practical' men with their wisdom. If one chose to be an ox, one could, of course, turn one's back on the sufferings of mankind and look after one's own skin. But I should have really regarded myself as *impractical*, if I had pegged out without completely finishing my book, at least in manuscript."¹

A scientist may indeed be carried away by the adventure of exploring the unknown. The joy he derives from creative work, when successful, is that he sees the most deeply hidden secrets of the world unfolding before him. He sees the mysteries of the origin of the universe revealed. He sees his own reason discovering purpose and order where those before him were unable to perceive anything but chaos. This feeling may

¹ Karl Marx, "Letter to Sigfried Meyer in New York", *Selected Correspondence*, Progress Publishers, Moscow, 1975. p. 173.

be described as philosophical delight. And these incentives to creativity do indeed play a massive role; but it would be wrong to absolutise them.

Ideal incentives are not prime movers, they are derivative. They have an objective basis and express the real needs of society. Even a scientist of genius is the child of his age, whose needs ultimately determine the character of his activities. But in the course of humanity's historical development cognition becomes a relatively independent need, an insatiable thirst for knowledge, a curiosity that amounts to a totally unselfish interest in creativity.

Knowledge begins with wonder. He who is not surprised at anything discovers only the fact that he has lost the ability to think creatively. For the real researcher, discovery of something surprising is always a happy event and a fresh stimulus to work. The most wonderful thing of all is that we are able to experience the mystery of the unknown. A true scientist is irresistibly attracted by the sheer beauty of a logical scientific theory, by the amazing ingenuity of experimental techniques and solutions to the brain-teasing riddles of nature, society, and thought itself. "Even the most dispassionate scientist is at the same time a human being; he would like to be right, to see his intuition confirmed; he would like to make a name for himself, to be a success. Such hopes are motives for his work, just as is the thirst for knowledge."²

The all-absorbing urge for knowledge is one of the thinking person's deepest needs. It is like a demon, it pounces on the scientist and forces him to make desperate efforts in search of truth. Driven on by this demon, people store up knowledge and create works of art with no regard at all for practical goals and considerations. Most of us have read the biographies of such truth-seekers and know what their fate usually was. In upholding truth they risked their reputation, they were persecuted, accused of charlatanism. Many died in poverty. It has been truly said that he cannot become an apostle of truth who lacks the courage to be its martyr.

The history of science abounds in the spirit of selfless questing. Pioneers of science! For them the search for truth was the meaning of their whole conscious life. They made us wiser and more enlightened. They were martyrs in the name of humanity, crucified for our sake, so that we might rise a little higher. We should remember them with gratitude.

² Marx Born, *My Life and My Views*, p. 190.

What Is Truth?

Truth, error and faith. Any idea, no matter how far-fetched, contains some objective content. Then are mermaids, witches and devils images of truth? The metaphysically-minded materialists, who interpret reflection one-sidedly, deny that there is any reflection of reality in error. Religious consciousness, for example, is regarded as completely void of any objective content. But the history of humanity's search for knowledge shows that error does reflect, admittedly one-sidedly, objective reality, that it has its source in reality, has an "earthly" foundation. There is not and cannot be any absolute error which reflects absolutely nothing. Even the delirium of the insane is a reflection of something. In all the above cases there are threads of objective reality, woven into fantastic patterns by the force of imagination. Taken in their entirety, these images do not add up to something true. Far from every phenomenon of consciousness possesses the same degree of veracity. But humankind lives and progresses not because its consciousness is cluttered with error, blind faith and falsehood, but because that consciousness also contains true knowledge. If cognition had not been, from the very beginning, a more or less accurate reflection of reality, man would never have been able to transform his environment creatively or even to adapt himself to it. The very fact of man's existence, the history of science and practice prove the truth of this assertion. This is not to say, of course, that human knowledge is not prone to error. In acquiring the ability to think abstractly and imagine productively, which has taken us far beyond the confines of what is given by the senses, people have earned the privilege of making mistakes and being carried away by all kinds of nonsense.

Animals are incapable of abstract thought but they do not make the same mistakes as man, who has evolved a whole world of fantastic, fairy-tale images, unbelievably bizarre, gorgeously beautiful or hideously grotesque.

Error is an idea or a combination of ideas and images that arise in the mind of the individual or society and do not correspond to reality but are regarded as true. This definition of error follows logically from that of cognition as the reflection of reality. Error is honest untruth. Unlike error, falsehood or deception is dishonest untruth. A person knows that a certain idea is untrue but for some reason or other he presents it as true. The person who makes a mistake leads others into error because he himself has erred. The liar, on the other hand, while deceiving others,

What is Truth?

is not himself deceived. Falsehood speaks of something that exists as non-existent and of the non-existent as existing. But truth has a force that the lie lacks: the latter is usually exposed in the long run. Someone has said that a lie is rather like spitting against the wind; the spit is bound to fly in the liar's face. Error should be distinguished from the mistake that is the result of incorrect practical or mental activity, evoked by purely accidental, personal causes. It is commonly believed that errors are annoying accidents. But they have relentlessly pursued knowledge throughout history, they are a kind of penalty that humanity has to pay for its daring attempts to know more than is permitted by the level of practice and the scope of theoretical thought. The ancients saw the source of error either in the natural imperfection of our cognitive abilities, in the limitations of sensuous and rational knowledge, in lack of education, or a combination of all these factors.

The philosophy of modern times sometimes regards error as the distorting influence of emotion or will on human reason. Error is rooted in the social conditions of man's existence and in the nature of his mind, which may be compared to a mirror with an uneven surface that mingles its own imperfection with the image of the thing reflected. Thinkers have seen the source of error in free will and insufficient knowledge. According to Kant, the source of error lies in the fundamentally unjustifiable emergence of human consciousness beyond the bounds of possible personal experience into the objective world for itself, or in violation of the logical rules of thought.

Error is a historically conditioned, and therefore constantly overcome, discrepancy between knowledge and the object of knowledge. It expresses theoretically the limitedness of people's actual power over nature and their own relations, and results from the constant urge to overcome the limitations of existing knowledge and practice. Truth is a complex, contradictory process in which error is constantly overcome through the development of knowledge, while truth itself becomes increasingly complete and profound. People themselves are to blame for their errors, although the latter are by no means an inherent, immanent feature of human nature, but only a transient possibility realised on the basis of certain historical conditions.

By its very nature scientific cognition is impossible without a clash of different views, a struggle of beliefs, without discussion; it is therefore impossible without error. Only those who do nothing or who constantly repeat platitudes make no mistakes. Numerous opinions may be advanced on a certain question and quite often not one of them is correct. Every scientific discovery usually entails numerous errors, which

are stages in the development of truth, as illustrated by the common expression "learning from one's mistakes". If the doors are locked to error, truth cannot enter the mind either. This is not to say, however, that one should look pessimistically on cognition as an endless groping among figments of the imagination. Errors are removed or gradually overcome, and truth, though sometimes badly wounded, fights its way through to the light. "One may have the desire not to burden oneself with the negative as something false, one may demand to be brought at once to the truth. Why should one become involved with what is false?... This notion is one of the biggest obstacles to truth.... Truth is not a stamped coin which can be supplied ready-made...."¹

How many cases have there been in science when under certain conditions error proved to be truth and truth error! Even legends and fairy-tales come true in the course of time. For example, when the ancients began to describe atoms they made a tremendous discovery and at the same time became victims of error. They called particles of matter atoms because they considered them to be indivisible. They were right and wrong at the same time. Humanity has achieved its present level of culture not because of error but despite it. Attainment of truth is the prime task of science.

Truth is the true reflection of reality in the consciousness, the reflection of reality as it exists for itself, independently of the will and consciousness of people.

Closely connected with truth and error is the concept of faith, which ordinary consciousness often associates with the meaning it has been given in religion. In the broad philosophical sense faith should be understood as an individual's profound conviction of the correctness of his actions, thoughts or ideals. And this conviction may have a generic or a derivative character. As something generic, faith may be just blind everyday superstition or it may simply be a confidence in science, scientists and so on. As something derivative, faith is scientifically grounded, authentic knowledge and in this sense it is based on truth. Faith may be true, but this principle is not reversible.

The concept of truth is linked with the moral concepts of honesty and sincerity. Truth is the aim of science and honesty is the ideal of moral motivation. Fruitful studies in science and philosophy are impossible where fear of the consequences of thinking is stronger than the love of

¹ *Georg Wilhelm Friedrich Hegel's Werke*. Vollständige Ausgabe. Zweiter Band. Phänomenologie des Geistes, Berlin, 1832, Verlag von Duncker und Humblot, S. 30.

What is Truth?

truth. Truth is authenticated knowledge and knowledge is strength, the greatest strength of all. It cannot be destroyed by prisons, penal servitude, the gallows, the guillotine, or the stake. The burning bush of truth will never burn out. Giordano Bruno died at the stake in the Campo dei Fiori in Rome as a martyr to scientific truth. His body perished in the flames but truth remained, it was indestructible. Although the great majority, misled by all kinds of false arguments, may be against it, truth is bound sooner or later to win through. An ardent and selfless love of truth is often to be found in individuals who are richly endowed morally as well as intellectually.

The objective content of true knowledge. All truth is objective: its content does not depend on the subject, his intentions or will. A correct answer to the question, "What is truth?" presupposes recognition of the fact that outside our consciousness there exists an infinite world developing according to objective laws. Truth is the accurate reflection of the object in the consciousness of the subject. Authenticity is the mode of existence of truth.

Since it is the correct reflection of the object, truth always has objective content. If we conceive ideas that have no correspondence in reality, it is clear that these concepts have nothing to do with truth and cannot therefore stand up to the test of practice.

Any truth is objective. There is no such thing as unobjective truth. Subjective truth is merely an individual's opinion. So the definition that we have given of truth is at the same time a definition of objective truth. Truth is not reality itself but the objective content of the results of cognition. Its content does not depend on the will, desire, passion or imagination of human beings. Only objective knowledge corresponding to the essence of things themselves allows the individual and society to control natural and social processes; one can control the forces of nature and society only by obeying their objective laws.

Can there be several true statements about one and the same phenomenon in one and the same relation? There may be many opinions but there can be only one truth!

Truth as a process. The relativity of truth. The principle of correspondence. The statement that the world is knowable does not mean that an object is revealed to the subject, the knower, at once in all its attributes and relations. Our life is not a placid existence in the lap of truth but a restless and constant search for its acquisition. Science is not a stockpile of ready-made and all-embracing verities but a process of finding them, of moving from limited, approximate knowledge to

What is Truth?

knowledge that becomes ever more embracing, profound and precise. This process has no limit. The ideas of finite and immutable truth are illusions that have nothing to do with true science. The mental vision of the scientist is always an incomplete picture. Some things are well known and have become trivial, others are not quite comprehensible, others doubtful, others insufficiently proven, others contradict new facts, and others are entirely problematic.

When we try to understand a certain object, we have to reckon with its inexhaustibility and tendency to change. Every object has a vast number of properties and enters into countless relations with other objects. It would take a very long time to know these properties and relations. In the history of science we find many cases when scientists agreed that all the properties of an object had been established, only to discover later that it had other properties besides. Water, for instance, was considered to have been studied inside out. But science then discovered something called "heavy water", with properties hitherto unsuspected. Recent research has shown that a number of the peculiarities and states of water depend on the influence of outer space. And the problem of the distribution, role and specific properties of water in the universe still awaits a satisfactory solution.

As proven knowledge increases, the circle of probable knowledge also expands. We are still able to grasp only a little of the boundless mystery-story of existence.

Truth is relative inasmuch as it reflects an object not exhaustively but within certain limits, certain relations, which are constantly changing. Relative truth is limited true knowledge about something.

Scientific knowledge, even the most authentic and precise, is relative in character. The relativity of knowledge lies in its inevitable incompleteness and probabilistic nature. For example, our knowledge of the atom, molecule, electron, living cell, organism, man himself, no matter how profound, is only partial, it gives an incomplete reflection of the properties and essence of these objects. Truth is historical. In this sense it is a child of the epoch. It is in the nature of truth that it breaks through when its time comes.

The people of every epoch cherish the illusion that at long last, thanks to the strenuous efforts of previous generations and their contemporaries the promised land of truth has been achieved and thought has reached a peak beyond which it can climb no further. But time passes and they find that this was not the summit but only a small hillock, which is often either trampled down or at best used as a base for

What is Truth?

further, endless ascent. The mountain of knowledge has no summit. Each subsequent theory is more complete and profound than its predecessor. Moreover, new scientific truths do not throw "old" truths on the scrapheap of history, but supplement them, concretise them or embrace them as necessary elements in more general and profound verities. The whole rational content of previous theory becomes part of the new theory that succeeds it. Science throws out only the claim that it was exhaustive. Previous theory is interpreted in the new theory as relative truth and thus as a specific case of a fuller and more accurate theory (Newton's classical mechanics, for example, and Einstein's theory of relativity). Such a relationship between theories in their historical development is known in science as the correspondence principle, according to which theories whose correctness for one or another sphere of phenomena has been tested by practice, by experiment are not dismissed as false upon the appearance of new, more general theories, but retain their significance for the previous sphere, as a particular case of the new theory. This principle rests on the fact that relative truth is objective truth. When speaking of the relative character of truth, one must bear in mind that this refers to truths in the sphere of scientific theory and not to the empirical stating of facts. Our knowledge of empirical facts may be true or untrue. But it cannot be relatively true. A court of law, for example, has no right to punish a person unless the case is completely proved against him. No judge has a right to say: "The accused may or may not have committed a crime, but let's punish him just in case."

The absolute in truth. By absolute truth one means exhaustive, maximum knowledge of the world as a whole, full realisation of all the potentials of human reason, the achievement of frontiers beyond which there is nothing worth knowing. Is this possible? In principle, yes. In reality the process of cognition is carried on by succeeding generations, who think very restrictedly and only in terms of the given level of development of their culture. Absolute knowledge is therefore only an aim for which science strives and to which the road is endless. Complete knowledge does not exist; we can only approach it, as we do to the speed of light.

The development of science is a series of consecutive approximations to absolute truth, of which each is more precise than its predecessor.

Absolute truths are those which, having been once stated with complete clarity and authenticity, do not encounter any further counter-arguments. In this sense an absolute truth is a reflection of a thing that remains true under all conditions of its existence. Such absolute truths

What is Truth?

are represented in science by such statements as "Nothing in the universe is created out of nothing and nothing disappears without a trace" or "The Earth revolves around the Sun". These are old truths and general ones, but they have not ceased to be true. Fully authenticated facts, the dates of events, of births and deaths and the like, are also ranked as absolute truth. But these truths are ordinary trivial statements.

The term "absolute" is also used of any relative truth in the sense that if it is objective it must contain something absolute as one of its elements. Absolute truth is a piece of knowledge that is not refuted by the subsequent development of science but enriched and constantly reaffirmed by life.

Humanity seeks full knowledge of the world. And although it will never attain such knowledge, it is constantly approaching it and every step in that direction, although relative, contains something absolute. Taken as a whole, our knowledge of nature and the history of society is not complete, but it contains many grains of the absolute. The development of any truth is an accumulation of moments of the absolute.

Science commands not only absolute truths but also and to a greater degree, relative truths. The absolute is the sum-total of relative moments in truth. Every stage in the development of science adds further grains of truth to this total.

It may be said that any truth is both absolute and relative. In human knowledge taken as a whole the specific gravity of the absolute in truth is constantly increasing.

The concreteness of truth. One of the basic principles of the dialectical approach to knowledge is recognition of the concreteness of truth. Recognition of this principle means approaching truth not abstractly but in connection with real conditions. The concreteness of truth means that we must pinpoint the decisive concrete historical conditions in which the object of cognition exists and identify the essential properties, relations and basic tendencies of its development. Concreteness is the real connection and interaction of all aspects of the object, knowledge of it in all the wealth of its interactions. A statement about an object is true if it exactly reflects the object in the stated conditions; different conditions require a different statement. A true reflection of one moment of reality may become false if it is divorced from its context, from certain conditions of place, time and its role in the composition of the whole. For example, a physical organ cannot be

What is Truth?

comprehended without an understanding of the organism, an individual cannot be comprehended without understanding of society, and a historically concrete society at that, and outside the context of his specific biography. The statement "water boils at 1000 C,, is true if we are speaking of ordinary water at normal pressure. It is not true if we are referring to "heavy water" or if we change the pressure.

Every object has general features and also its specific qualities, its unique "context of life". So besides a general approach, one must also have a concrete approach to an object in accordance with the principle: truth is never abstract, always concrete. Are the principles of classical mechanics true, for example? Yes, they are, if applied to macrobodies and to relatively low velocities.

For one and the same process truth cannot be eternal, given once and for all. The process itself develops, the conditions in which it proceeds change, and the truth that reflects it undergoes modifications. What was truth in certain conditions may become untrue in others.

Since every given truth is incomplete, it is quite justifiable to ask about any theory or idea: to what degree of accuracy does it reflect the object? Because of this incompleteness the application of any given truth is limited. And if one takes any truth "too far", extends it beyond its frame of reference, it can be reduced to absurdity.

The principle of the concreteness of truth means that we must approach facts not with general formulas and schemata, but with maximum consideration of the decisive conditions, and this is totally incompatible with dogmatism.

The criteria of truth. What guarantee have we of any truth in our knowledge? What forms the basis for distinguishing truth from error, from lies and mistakes? In other words, what are the criteria of true knowledge?

Descartes and Spinoza, for example, proposed clear and distinct apprehension as the criterion of truth. Clarity was what was perceptible by the observing reason. Only that which could be clearly apprehended and gave rise to no doubts could be considered true. Descartes' examples of such truths were mathematical statements such as "a square has four sides". Such truths have a distinctness that rules out all doubts. They are the result of the "natural light of reason". Just as light reveals both itself and the surrounding darkness, so is truth the measure of itself and of falsity. Leibnitz defined the truth of an idea as its clarity based on the clarity of all its elements. This view of the criteria of truth was historically progressive. It gave precedence to the power of human

What is Truth?

reason. But it did not take into consideration the fact that clarity itself also requires criteria. The mere fact of obviousness does not guarantee truth. History has severely judged many clear and obvious "truths". What was quite clear to science yesterday, today becomes incomprehensible. What, it once seemed, could be more clear and obvious than the immobility of the earth? And many regarded this as an obvious truth and believed in it fanatically.

The Conventionalists saw the foundation of truth in any fact that had been conventionally agreed upon between groups of scientists, capable of judging what should be considered true or false. Other thinkers advanced the principle of universal significance: what corresponded to the opinion of the majority was true. But long before this Democritus had said that questions of truth could not be decided by a majority vote. History abounds in cases where only one person was in possession of true knowledge in a certain field while all the rest were mistaken. We have only to recall Copernicus and his discovery, which no one else was prepared to believe.

The pragmatists maintain that truth is anything that justifies itself in practice, that helps to achieve the required aim. True ideas are those that "work", that are useful.

The fundamental principle of scientific thinking lies in the following: a proposition is true if one can prove that it applies in certain specific conditions, or if there is an acknowledged precedent for its having been so applied. This principle may be termed the principle of "realisability". Through the realisation of an idea in practical action knowledge is measured against, compared with, its object and reveals the actual degree of its objectivity, the truth of its content. The veracity of a principle can be proved only by its successful practical application. Any proposition which is directly or indirectly confirmed in practice, or which may be effectively realised in practice, is correct. If a person compares his concept of things with other concepts that have been practically tested, he thereby indirectly, through this correct image, compares his own concept with the object itself. Correspondence between a concept and its object is fully proved only when one can find, reproduce or create such an object, corresponding to the concept that one has formed. The truth of a theory is the necessary guarantee of its realisability. For example, the practice of launching artificial earth satellites confirmed the correctness of the theoretical propositions and calculations on the basis of which these satellites were built.

What is Truth?

The criterion of practice cannot fully confirm or refute any notion completely. It is flexible enough to guard us against treating knowledge as an ossified truth that needs no development. At the same time it is sound enough to allow us to argue successfully against the varieties of agnosticism.

"The atom is indivisible." Is this true or false? For many centuries it was considered true and practice sanctioned it. In those days the atom was indeed indivisible, just as today it is practically divisible and elementary particles are as yet indivisible. Such is the level of contemporary practice. Practice is a "cunning" creature. It not only confirms truth and exposes error, it also keeps quiet about what is beyond its frame of reference.

Practice has many different facets and various levels of development, beginning from empirical experience and ending with rigorous scientific experiment. It is one thing to consider the practice of primitive man obtaining fire by means of friction. And quite another, the practice of the medieval alchemist trying to find the philosopher's stone that would change base metals into gold. Modern space flights, physical experiments with equipment of tremendous resolving power, computer calculations and heart surgery, the liberation movements of peoples, these are also practice.

Some theoretical propositions may be directly confirmed and put into practice (for example, the geologists' assumption that there is uranium ore in a certain place at a certain depth). Others have to be practically confirmed by extremely circuitous ways, involving long or short intermediate links, through other sciences, through the applied fields of knowledge, through the revolutionary action of the masses, whose effect may show only years later. This is how certain mathematical ideas, the propositions of theoretical physics, biology, psychology, sociology, philosophy, history, aesthetic theory, and so on, take effect. Everything that is truly scientific must inevitably, directly or indirectly, sooner or later, be realised in life.

Notes

- 1.

The Sensuous Image of the World

Sensation and perception. Traditionally, any analysis of the levels and structure of knowledge begins with sensuous knowledge, which is divided into three levels: sensation, perception and representation. The point of departure of all intellectual life lies in sensuousness and not in thought, which both historically and ontogenetically is derived from the senses. In sense perception we experience the direct effect of the objective world, its resistance to us. In the act of contemplating an object, a person relates directly to it, he senses it and feels the authenticity, the reliability of its existence. For example, in an orange we sense the orange colour, the firmness, the specific smell, the taste, the shape and the size. Sensations arise under the influence of processes coming from the external and internal environment and acting upon our sense organs. External irritants may be sound or light waves, mechanical pressure, chemical effect, and so on.

Sensation is the reflection of certain properties of objects during their immediate action on a sense organ, the conversion of excitation into a fact of consciousness.

The sense organs are, as it were, channels or windows open to the external and intra-organic world, through which enormous streams of impulses are constantly flowing into the brain. The sense organs carry on their cognitive function by means of a certain system of motive acts depending on the object that they reflect. For instance, a feeling hand reproduces the shape of an object by actively touching it, while the eye, like a feeling hand, passes over an object at a distance in various directions, and observes it.

The modal division of sensations is based on the specific features of the influence they reflect: touch, vision, hearing, vibration, temperature, smell, taste, and so on. Visual sensations are crucial in human sensuous cognition. They provide us with thirty times more information than we obtain through hearing. The visual is also more reliable. Visual sensations originated from the sensations of touch. Not for nothing is it said that the seeing eye is the pupil of the feeling hand. And when we doubt the reliability of the "pupil's" evidence, we resort to the assistance of the teacher: we feel the object with our hands. Spatial, tangible sensibility is the chief means of getting to know the world geometrically, as an assembly of material bodies. Hearing also plays an important role in sensuous reflection. Its development is mainly

connected with the sound structure of language as the basic means of communication and also with the sound structure of music.

Sensations are the most reliable bond between knowledge and the universe and we should know nothing about the sensuous properties of things without them.

What is perception? No matter what object we take, it possesses many diverse aspects and properties. Take a lump of sugar for example. It is hard, white, sweet, has a certain shape, mass and weight. All these properties are combined and we perceive and comprehend them not separately but as a whole, a unity—a lump of sugar. Consequently, the objective basis of perception, as perception of a whole image, is the unity and, at the same time, the diversity of the various properties of the object in question. A perception is an integral image directly reflecting the object or objects influencing the sense organs, their properties and relations. It is a stage of knowledge higher than, and substantially different from, sensation. Perception implies a comprehension of the object, its properties and relations, based on the reception of a recently received impression into the system of knowledge already available, whereas sensations may simply "flash past" on the periphery of consciousness and remain out of the focus of concentrated thought. Perception, on the other hand, is thinking, living contemplation; we looked at things with our external eyes and see them with our internal vision. The depth of this comprehension depends on a person's intellectual level, his total experience.

Representation. Representations come about through the perception of external stimuli and their preservation in time by the memory. A perception refers only to what is actually happening at a given moment. A representation is an image of an object that at some time influenced the sense organs and is later revived from the traces left in the brain while the object is absent; it may also be an image created by an effort of the imagination. As imaginal knowledge a representation is the highest form of sensuous reflection. Objects that are not present before us or not accessible to our sense organs are present in our consciousness and are grasped by the mind in the form of representations, which synthesise many comparable sense impressions. A representation differs from a perception in that it rises above the immediate givenness of an object and links it with a concept by means of some general principle and in itself becomes a focal point of thought.

In epistemology a representation means something more than the act of direct contemplation in the form of an image of an absent object.

It is a summing-up of historically accumulated empirical material registered in books, tables, the recordings of various apparatuses, minutes, and so on. It is a synthetic intellectual form, richer in content than its previous stage. It comprises everything that people know about the object in question. It is a cache of social memory, whose contents have not yet been theoretically processed by thought.

The mental process which creates representations and mental situations not directly received as entities is *imagination*, which creates images of the desirable or possible future, and also images of things that are not to be found in personal experience but can be put together out of the elements that are there. These images may simply reproduce something that exists or has existed, or may anticipate the future and guide practical actions to its actual, real creation. The more real the *reflection* in the imagination, the more productive is its regulative and stimulative activity, which possesses a great power of imaginative generalisation.

Thought

The general concept of thought. A person does not live in the world of direct impressions all the time; he may also be concerned with abstract concepts and live in a world of symbols. He not only accumulates visual and conceptual experience, he also assimilates the experience acquired by mankind and formulated in systems of written memory. So human beings can operate on both the visual and the conceptual planes. How does the shift from the sensuous to the conceptual level come about?

Thought relates the evidence of the senses to all the other knowledge possessed by the individual. And it does this by drawing on the accumulated experience and knowledge of humanity to the extent that these are possessed by or available to any specific individual. The shift from the sensuous to the conceptual, the rational does not mean, however, a shift from reality to the empty darkness of the suprasensuous. Thought is based on the sensuous material of speech, particularly, internal speech, and on symbolised sensuous images.

Thought is goal-oriented, mediated and generalised reflection of the significant properties and relations of things, the creative forming of new ideas, the posing and solving of problems. One can readily understand what is meant by goal-oriented, but what do we mean by mediated? Mediation is the movement of thought towards essence through its manifestations. For example, we cannot see directly, immediately what a person is thinking about. We know this by perceiving and understanding his words and actions. The experienced psychiatrist can tell from the appearance of his patient alone, from his facial expression, his eyes or his behaviour, what disease he is suffering from. A qualified doctor examining his patient's eyes under a lamp learns a lot about the condition of the other organs from the state of the iris. These are examples of mediated thought. What is inaccessible to sense perception is discovered through the evidence of instruments, by means of various signs, signals, symbols, etc.

Another way in which thought is mediated is through the historically accumulated experience of mankind in general. In the process of thought a person does not rely entirely on his personal experience. He weaves into the fabric of thought various threads from his brain's general store of knowledge of all kinds of things, of all accumulated historical experience. And quite often the most unexpected comparisons, analogies and associations lead to the solution of an

important practical or theoretical problem. In scientific cognition one often has to operate with quantities that are not known and the power of logical thought has to fill in the inevitable gaps.

The distinctive feature of thought is the solving of problems. A part of thinking is, in fact, the posing of a problem. In order to state a problem one must have a certain skill, if one does not want to be accused of asking silly questions.

Thought may proceed as a process of problem-solving according to strict rules, algorithms (algorithmic thought), or it may be creative, generating new ideas. Theoretical activity and curiosity is a significant attribute of the thinking mind. The concept of creative thought emphasises the element of its original productivity, its ability to pose new problems and devise unique solutions to them.

To sum up, human thought, based on sense data, is the highest form of the active reflection and intellectual conversion of objective reality and consists in goal-oriented, indirect and generalised cognition by the subject of the essential law-governed connections and relations of things, in the creative production of new ideas, and also in the forecasting of events. It proceeds in various forms and structures — concepts, statements, categories, inferences, hypotheses, theories, etc., which record and generalise the socio-historical experience of humankind.

One of the instruments of thought is language, and also other sign systems, such as the abstract symbols of mathematics, or the concrete images of the "language of art". The elements of these systems support such basic operations of thought as abstraction, generalisation and mediation. Abstraction enables us to ignore an object's inessential properties and relations and concentrate on those that are relevant to the intellectual task in question. Generalisation enables us to classify large numbers of phenomena according to certain essential attributes. For example, one can classify certain symptoms as symptoms of a certain illness.

As a complex socio-historical phenomenon, thought is studied by many sciences: the theory of knowledge (analysis of the relations between the subjective and the objective in thought, the sensuous and rational, the empirical and the theoretical, etc.), by logic (the science of the forms, rules and operations of thinking), by cybernetics (technical modelling of thought operations in the form of the artificial brain), by aesthetics (which analyses thought in the process of the creation and perception of artistic values), by science history (the history, theory and

practice of scientific cognition), by linguistics (the relationship between thought and language), by neurophysiology (the cerebral substratum and the physiological mechanisms of thought), by psychopathology (various forms of mental disorder), by ethology (the preconditions and features of the development of thought in the animal world), by psychology (thought examined as a cognitive process connected with certain individual features of the personality, with the influence of emotion on thought), and so on. Innate intelligence differing according to a person's natural gifts develops into the actual ability to think in the process of ontogenesis under the influence of education and training.

The question of the essential nature of thought, its relations to the material world, of the human being as the subject of thought, of the logic of thinking, and of the constructive, creative nature of thought, has always been the central problem of philosophy throughout the history of its development.

The biological substratum of thought is the high level of development of the human brain, which took shape historically in the process of the development of man, of human society and culture.

A human being becomes a thinker only by obtaining command of language, logic and historically accumulated culture. By assimilating culture he learns to construct hypotheses, to test them theoretically and experimentally by means of thinking operations, and to forecast future events.

Knowledge of thought as a special form of cognitive activity came into being in the framework of philosophy and led to the separation of thought as such from intellectual processes taken as a whole. At the very dawn of Oriental and ancient Greek philosophy thought was separated from sensuous knowledge, and thought itself made distinctions between its unreliable manifestations ("opinion" as a manifestation of ordinary consciousness) and the discovery of universal laws that did not depend on individual, human subjectivity (Parmenides, Heraclitus). The idea that the actual atomic structure of things could be discovered only by means of thought was upheld by Democritus. The philosophy of the "teachers of wisdom", the Sophists, shifted the emphasis to analysis of the linguistic and logical means of thought as something derived from individual human qualities (Protagoras). Considering these means without reference to the objective content of thought, the Sophists arrived at relativism, which was criticised by Socrates, whose watchword, "Know thyself", required that thought be "purged" of all vague and indeterminate notions in the name of sound

and reliable knowledge. Such knowledge, according to Socrates, could be obtained in a dialogue between people who were all seeking truth. In this way a direct link was found between thought and communication and the dialogical nature of thought was discovered. Plato, a pupil of Socrates, decided that the main attribute of thought was its ideality, a special, non-sensuous form of reality, which constituted the essence of thought as distinct from the world of sensuous things. This form was elevated by Plato into a specific entity that could not be related to anything material and, moreover, was primary in relation to the material. Generalising the experience of Greek philosophy, Aristotle created his theory of the forms and structures of thought, thus laying the foundation of formal logic. He also showed the dialectics of the transition from sensation to thought, thus revealing the important role in thought processes of the images of representation ("imagination") as the connecting link between the sensuous and the rational.

In contrast to idealism, certain materialist theories arose even in ancient times. These theories (Epicurus, Lucretius) regarded the ideal content of thought (ideas, concepts, judgements) as being derived from matter, as recording external stimuli. All further theories of thought are permeated with the struggle between these two philosophical approaches.

The scientific revolution of the 17th century led to the rise of empiricism, which gave priority to experience and induction (Bacon and Locke) and also of rationalism, a doctrine which regards abstract thought as the basis of human knowledge and gives priority to the deductive method, i.e., to deduction of particular propositions from general principles (Descartes, Spinoza, Leibnitz).

The advances of natural science in the 18th century led to a theory that thought was a function of the brain, a product of external natural stimuli and the social environment. Consideration was also accorded to the problems of the development of thought (Diderot) and of individual differences in thought capacity (Helvetius). At the end of the 18th and beginning of the 19th century the systems of classical German idealism (Kant and Hegel) developed the theory that the forms and modes of thought were creative, dialectical, and that individual thought depended on its historical premises. The next period in the history of philosophical theories of thought is dominated by positivism, which denies universal laws of the development of nature, society, and thought, and restricts the function of theoretical thought to establishing facts and empirically observed connections between them. In various new versions (e.g.,

neopositivism), the positivist approach to thought is typical of contemporary bourgeois philosophy.

In Western philosophy positivism is opposed by the intuitivist (Bergson), phenomenological (Husserl) and existential (Jaspers, Sartre, Heidegger) concepts of thought, which regard thought as the contemplation of spiritual essences (phenomenology) or deny all human ability to rationally comprehend the objective world (intuitivism and irrationalism).

Psychological research into the nature of thought in the 19th century was based on the principles of formal logic and the doctrine of association. It did little more than identify and describe certain thought processes such as abstraction, generalisation, comparison and classification. The main element in thought was considered to be the concept, the nature of which was discussed in terms of formal logic, while thought itself was regarded as being produced by the mechanical summation of sense images or representations, the identification of their general attributes and the elimination of those which did not conform to the general. The process of thought itself was presented as the complex associative combination of representations and concepts in obedience to the laws of formal logic. The concept was equated with the representation and interpreted as a set of attributes connected by association; a judgement was regarded as the association of representations; an inference as the association of two judgements serving as premises with a third deduced from it as the conclusion (syllogism). This conception provided no explanation for the most essential features of thought, namely its goal-oriented and creative character.

With the development of experimental psychology thought became the target of empirical laboratory research. The naturalistic and mechanistic notions of thought were suggested by the behaviourists. Watson, for example, studied the reactions of animals in problematic situations and regarded thought as a form of behaviour consisting of stimuli and motor responses to them. A new rational feature of this theory was the objective approach to thought in contrast to its being regarded as an incorporeal essence, but the mechanistic method prevented the development of a scientific theory of thought, which was ultimately reduced, at the level of human behaviour, to speech reactions formed on the basis of trial and error.

The study of thought led to the discovery that it was conditioned by the social environment and also to discovery of the important role

played in its regulation by non-sensory, imageless elements. It was established that thought could not be reduced to the visual-image content of the consciousness. In contrast to the "pure" sensuousness of the associative psychology thought was treated as being "purely" a systematised activity directed at a definite object.

The Gestalt psychologists understood thought as the process of transforming the structure of consciousness in its immediate givenness. They assumed that consciousness was a kind of field whose intensity was increased by any situation that had become a problem for the thinker. The process of thought itself was the relieving of this intensity by transforming the "field of consciousness", by moving from one structure to another. By interpreting thought as a self-generating process, the Gestalt psychologists associated them selves with intuitivism, a theory that denies the determining significance of rational analysis in solving problems.

The beginning of the 20th century saw the appearance of works (by Lévy-Bruhl and others) which generalised and systematised the accumulated data on the thinking of peoples who were at a relatively lower level of socio-economic and cultural development. These works helped to establish the principle of historicism in thought research, exploded the proposition that certain structures of thought were invariable, and introduced the idea that thought could change qualitatively in the process of its development and historical advance. The new genetic approach to thought, which goes back to Charles Darwin, emerged thanks to the successes of experimental research on the behaviour of animals with highly developed brains, particularly apes. This research showed that even animals have the rudiments of thought (analysis, synthesis, the ability to solve situational problems, etc.). Two tendencies emerged in the interpretation of the results of these experiments. One identified intellectual operations of man and those of the higher animals, and the other showed the qualitative difference in their thinking, while admitting the continuity between them. Animal thought was characterised as immediate and active. Coupled with the investigation of immediate and active thought in children this helped to overcome notions of thought as a process contrasted to the actual behaviour of the organism. Investigation of thought activity in the form of external actions in complicated situations, and of operations with diagrams, models, and so on, destroyed the obsolete notion of thought as something purely internal, as a purely verbal and logical process, and led to recognition of the existence in the human beings of various forms

and levels of highly developed thinking that were closely interwoven and could pass into one another.

Genetic analysis of thought and the notion of a close relation between logical thought operations and practical actions were made more profound by the investigations of the Swiss psychologist Jean Piaget, who showed that there were definite, law-governed, successive stages in the development of thought from childhood to the age of adolescence.

The peculiarities of thought connected with professional activities in science, technology, art and other spheres of social life were subjected to specialised psychological analysis. One variety of professional thinking is the mental activity pursued in the field of politics, "political thought", which presupposes certain specific forms of analysis and synthesis connected with the politician's need to relate the general picture of international and home affairs to a process he considers particularly important, and to take a quick and timely decision, proceeding from the unity of the components of his experience both known and unknown, logical and intuitive.

This raises the problem of the "style" of thought and its specific nature at various levels in the historical development of society. One particular style of thought is dogmatism, which operates with ossified concepts and ignores the principle of the concreteness of truth. The characteristic thing about dogmatic thought is a blind obstinacy. Disregarding all other considerations, the dogmatist, having once taken a decision or absorbed an idea, regards it as incontrovertible under any circumstances. He ignores the element of the relative in knowledge and tends to absolutise everything. Such thinking is inhibited by the very dogma on which it is based. Accepted techniques and methods of thought, old truths tend to repeat themselves and, when using them, people feel they are protected from the danger of mistakes. This kind of thinking sees nothing in the surrounding world but what it knows from the books, instructions, precepts and statements of a real or imagined authority. Dogmatic thought suffers from a great inertia, taking cover behind platitudes, no matter how patently obsolete. In his day Francis Bacon fought against scholasticism with its blind faith in authority and dogmatic style of thought. Soviet psychologists pay considerable attention to the problem-solving and critical capacity of thought, its creative character and the formation of mental techniques in the process of developing education, and also to the process of transforming external practical actions into internal, mental ones, particularly in reference to programmed learning. Basing themselves on

the theory of Sechenov, with its genetic, reflectory and objective approach to the structure and mechanism of thought, and also that of Pavlov on the analytico-synthetic activity of the cortex, Soviet psychologists carry detailed studies of the principle of reflection, determinacy and the genetic approach, the inseparable connection between external-objective and internal-subjective manifestations of thought; the principles and problems of the theory of medicine have been further developed on the basis of these studies. The unity between theoretical principles and practical skills in the doctor's professional activity appears in the unusual form of so-called clinical thought. By this we usually mean the combination of conscious and unconscious intellectual operations by means of which the doctor recreates an integral picture of a disease and, on this basis, predicts its course and probable outcome, and arrives at a rapid decision on the measures needed to influence the patient's organism and the personality taken as a whole. Clinical thought is related to the doctor's ability to comprehend a disease not on a local basis but integrally, taking into account the unique features of its manifestation in each specific case. Clinical thought is not limited to the process of making a diagnosis and certain predictions, and it achieves success in cases when it helps the doctor to get a correct orientation among the whole diversity of separate interacting components (symptoms) in the highly complex system presented by the patient's organism. To be effective clinical thought should be integral, i.e., be able to unite a great number of approaches — etiological, pathophysiological, therapeutic, psychological, personal, and so on.

Clinical thought involves a detailed, differentiated and comparative analysis of complex disease symptoms. Since the exponent of clinical thought is an individual doctor with a specific social and moral responsibility, the effectiveness of his thought depends in some degree on his awareness of his specific professional role. Clinical thought should be regarded as the conscious or unconscious application of the dialectical systems method to the theory and practice of medicine. Its successful application in practical activity presupposes that the doctor has certain psychological qualities, such as skill in relating theoretical knowledge to each specific clinical case, with all unique features. Clinical thought develops in a doctor in the process of his accumulation of medical practice, but also presupposes a special gift of quick orientation and an ability to combine the logical and the intuitive.

By treating thought as a product of socio-historical development, as the highest form of active reflection and creativity, dialectical

materialism has revealed the initial connection between thought and human practical activity. "The production of ideas, of conceptions, of consciousness is at first directly interwoven with the material activity..; Conceiving, thinking, the mental intercourse of men at this stage still appear as the direct efflux of their material behaviour".¹ The results of man's cognitive and practical activity, fixed in linguistic forms, are passed on by means of the processes of speech communication from one generation to another and become part of a system of knowledge, the subject of which is society. In the integral process of thought its linguistic means, which acquire a certain relative independence of practical activity, create conditions for the transition from separate stages of external-objective cognitive activity to the internal speech plane of consciousness. As a result, the initial sensuous data and practical actions are mediated by ever more complex sets of thought processes, which acquire the ability to separate themselves from external practical activities and emerge in the form of mental work. The social division of labour, the development of private property and the class differentiation of society separate mental work from physical work. Becoming an important factor in cultural progress, this phenomenon in the conditions of a class-divided society leads to the contrasting of theoretical thought to practical thought and to a one-sided interpretation of the relations between them in the various concepts of idealist philosophy, which elevates theoretical thought and its products to the status of a separate existence.

Thought's acquisition of a certain independence in relation to sensuous-object activity may pave the way for various untrue, illusory notions of reality, and this raises the problem of the criterion of the truth of thought. In practically verifiable historical experience certain definite, relatively independent structures and principles, certain rules of thought, take shape and are studied by logic as a special discipline.

In contrast to the idealist view of logical laws as being immanently inherent in thought, dialectical materialism regards them as a generalised reflection of objective relations of reality that have been assimilated by practice. It was human practical activity that was destined to stimulate man's consciousness to abstract various logical figures that have acquired the significance of axioms. From the fact that thought has its roots in human socio-historical experience it follows that thought cannot be regarded as merely a summation of its putative operations or

¹ Karl Marx, Frederick Engels, "The German Ideology", *Collected Works*, Vol. 5, Progress Publishers, Moscow, 1976, p. 36.

equated with the "thinking" done by logical machines, which perform only the operations that are fed into it by human beings. Machines are nothing more than auxiliary organs of the human brain created by human hands. The true subject of thought remains the person who creates and controls them as a social being. This is also true of modern computers, which can work only on the basis of programmes made by human beings. In the present era of scientific and technological revolution considerable work has been done on modelling human thought by means of computers. This has stimulated the elaboration of the problems of formal logic from new positions, particularly its mathematical apparatus, which enables us to describe and reproduce complex sets of formalised thought operations by computer techniques. Despite the importance of this trend, it does not replace philosophical theory about the general methods of thought, which is based on dialectical logic. The increasing complexity of the problems confronting contemporary science and technology has further developed the logical apparatus of thought, leading to new trends in logic and widely differentiating this discipline, which is now a theory of the self-movement, development, and contradictions of reality, as reflected in the movement of concepts, and of the unity of the semantic and logical aspects of thought. The task of logic is to generalise the achievements of contemporary science, including those sciences that study thought.

To sum up, beginning with sensations and perceptions, continuing in the form of representations and imagination, and rising to the highest stages of theoretical thought, consciousness is a unified process closely connected with the will and emotions. Scientific research also demands a keen, clear and profound intellect, breadth and depth of imagination, and a passionate devotion, without which there never has been and never can be a search for truth. Thoughts live in close unity with emotions. This is understandable, for it is not thought by itself that thinks but an individual moved by certain passions, needs and inclinations. A person begins to know, to think, when he feels the need to understand something. Under the influence of his emotions he may arrive at results that he passionately desires but that are far from reality. Wishful thinking is a well-known phenomenon. At the same time thought, sharpened and inspired by emotion, may penetrate more deeply than dispassionate contemplation.

Logical thought is impossible when separated from the sensuous, from which it stems. At any level of abstraction it comprises certain sensuous components in the form of diagrams, symbols, signs and models.

It is an ancient maxim that there is nothing in the mind that has not been in the sensations. While emphasising the unity of the sensuous and rational stages of cognition, we must nevertheless remember that they possess a relative independence. Thinking is a qualitatively independent whole, which has its own specific structure differing from that of the emotional sensuous consciousness. Between the sensuous consciousness and logical thought there is not only a difference but also a contradiction: thought, confirmed by practice, removes the illusions created by the sensations, and the evidence of the senses corrects and authenticates the veracity of the work of thought.

The basic forms of thought. As the highest form of cognition, thought has a complex intrinsic structure. The basic forms in which it arose, is developing and is realised in practice are the concept, the judgement and the inference. Built up in the course of thousands of years, these supreme intellectual values — concepts, judgements and inferences — are humanity's most priceless possession.

The concept is a form of thought reflecting the essential properties, relations and connections of objects and phenomena in their contradictions and development; it is thought that generalises, grouping the objects of a certain class according to certain specific attributes that they have in common. Our concepts are objective in their content and universal in their logical form, inasmuch as they are related not to the individual but to the general. The human being, the animal, the plant, and so on, are examples of such concepts.

"To conceive" means to grasp the essence of something, to understand the meaning or purpose of a certain action, of certain natural or historical events. But concepts do more than reflect the general; they also differentiate things, their properties and relations, group them together, classify them according to their actual distinctions. Thus the concept "man" may reflect both the essentially universal (that which is inherent in all people) and the essential difference between human beings and the rest of the world.

There are simple, everyday concepts and scientific concepts. The former identify the universal, similar properties of objects and phenomena and record them in words. They erase from the rough marble of the object everything that is individual, specific and "superfluous". This is not to say that the concept is a kind of collective photograph in which images are superimposed on each other, ultimately forming something average.

Scientific concepts reveal the profound properties, what is general, essential and law-governed in an object. Just as the whole is not merely the sum of its parts, so the concept is not merely the sum-total of certain general features. We move on from the sensuous stage of knowledge to logical thought when we proceed from perception and representation to reflection in the form of concepts and, on this basis, to judgements and inferences. Abstract thinking implies operating with concepts. It is thanks to concepts that thought becomes theoretical as well as practical, because the essence of things is perceived only in concepts. Concepts arise from the summing up of human experience, they are compressed travelogues, digests, of the road that has been travelled towards knowledge. A concept is both the sum and the means of cognitive activity.

To think is to make a judgement about something, to discern certain connections and relations between various aspects of an object or between objects. Concepts acquire logical meaning only in a complete judgement. A concept that we cannot develop into a judgement has no logical meaning for us.

The judgement is a form of thought in which something is asserted or denied about something by linking up certain concepts. For example, the sentence "the maple-tree is a plant" is a judgement in which an idea is expressed about the maple-tree, the idea that it is a plant. Knowledge does not lie in impressions but in judgements, because it is through them that we become aware of truth. As the solution of a certain problem a judgement is a cognitive act, but as a means of achieving the solution it is a logical operation. Logical operations are means of establishing the essential connections and relations between ideas that make thought move cognitively from ignorance to knowledge. Thought is impossible without judgements and judgements are impossible without definitions.

A person may arrive at this or that judgement by means of direct observation of a certain fact or by indirect means, with the help of inference. An inference is a process of reasoning in the course of which from one or several judgements, called premises, or assumptions, a new judgement (conclusion) is reached, which follows logically from the premises. When one infers conclusions from a general correct principle, one may arrive at quite unexpected results. Inferences develop not by arbitrary means but according to the laws of thought.

The operations and modes of thought. Comparison is the mother of knowledge. One cannot know what is good unless one knows what is

bad, one cannot recognise what is small without seeing something big. One cannot judge the future in any other way than by comparing it with the past and the present. Everything is known through comparison. A comparison is not an explanation, but it helps us to explain things. For example, in order to find out the weight of a certain body

one must be able to compare it with the weight of another body, which is taken as a standard, a measure. In scientific comparison one compares not attributes and relations that are selected at random, but essential attributes and relations.

Analysis and synthesis. The process of cognition begins by our getting a general picture of the object without paying much attention to details, particulars. When we look at a thing in this way, its intrinsic structure and essence remain inaccessible to us. In order to study the essence we must break down the object into parts. Analysis is the breaking-down of objects into their component parts or aspects, and this is done by both practical and theoretical work. By analysis we also mean mental consideration of the specific nature of the components. The essence of an object cannot be understood merely by breaking it down into the elements of which it is composed and examining these elements as such. The chemist subjects meat to various operations and then says: "I have discovered that it consists of oxygen, carbon, hydrogen, and so on." But he knows as well as we do that these substances are no longer meat.

In every field of knowledge there is a limit to the breaking-down of an object beyond which we pass into a world of different qualities and laws. When the particulars, the elements of an object have been sufficiently studied by means of analysis, we come to the next stage of cognition — synthesis, that is to say, the practical, mental integration of the elements that we broke it down into and examined. Analysis establishes the basic thing that distinguishes one part of an object from another. Synthesis reveals what is essentially universal, what links the parts into a single whole. In our thoughts we can break down something that in reality is a relatively independent whole and link up things that are connected or may be connected in the world itself.

In the process of thought a person breaks down an object into its parts in order to discover what these parts are, to discover the composition of the whole, and then to examine it as something consisting of these parts, which have already been examined separately. After this, in the light of reason the whole presents itself not as it was "from the look of it", but much more profoundly, meaningfully, and

comprehensively. Analysis, which presupposes synthesis, is concerned primarily with identifying the essential.

Abstraction and idealisation. One cannot take in all the attributes of objects at one glance. Like a searchlight, human thought picks out and illuminates only a certain part of reality at any given moment, while the rest remains in darkness. At any moment in time we can be aware only of some one thing. But even this one thing may have a large number of attributes and relations. We can understand this "one" only if we take it in order of priority, concentrating our attention on certain qualities and connections and ignoring others.

Abstraction is the mental identification, singling out of some object from its connections with other objects, the separation of some attribute of an object from its other attributes, of some relation between certain objects from the objects themselves. Abstraction is a method of mental simplification, by which we consider some one aspect of the process we are studying. The scientist looks at the colourful picture which any object presents in real life through a single-colour filter and this enables him to see that object in only one, fundamentally important aspect. The picture loses many of its shades but gains in clarity. Abstraction has its limit. One cannot abstract the flame from what is burning. The sharp edge of abstraction, like the edge of a razor can be used to whittle things down until nothing is left. Abstraction can never be absolute. The existence of content shows intrinsically in every abstraction. The question of what to abstract and what to abstract from is ultimately decided by the nature of the objects under examination and the tasks confronting the investigator. Kepler, for example, was not interested in the colour of Mars or the temperature of the Sun when he sought to establish the laws of the revolution of the planets.

What we get as a result of the process of abstracting is various concepts about certain objects, such as "plant", "animal", "human being", ideas about the separate properties of objects and the relations between them ("whiteness", "volume", "length", "heat capacity", etc.).

Idealisation as a specific form of abstraction is an important technique in scientific cognition. Abstract objects do not exist and cannot be made to exist in reality, but they have their prototypes in the real world. Pure mathematics operates with numbers, vectors and other mathematical objects that are the result of abstraction and idealisation. Geometry, for example, is concerned with exact circles, but physical object is never exactly circular; perfect roundness is an abstraction. It cannot be found in nature. But it is an image of the real: it was brought

into existence by generalisation from experience. Idealisation is a process of forming concepts, whose real prototypes can be indicated only to a certain degree of approximation. As a result of idealisation there comes into being a theoretical model in which the characteristics and aspects of the objects under investigation are not only abstracted from their actual empirical multiformity but also, by means of mental construction, are made to stand out in a sharper and more fully expressed form than in reality itself. As examples of concepts resulting from idealisation we may take such things as the "point" (an object which has neither length, nor height, nor breadth); or "the straight line", the "circle", and so on.

The use of idealised objects in research allows us to build the abstract schemes or diagrams of real processes that we need in order to penetrate deeper into the laws of their development.

Generalisation and limitation. In the process of generalisation we move from individual concepts to general concepts and from less general concepts to more general ones, from individual judgements to general ones, from statements of less generality to statements of greater generality, from less general theory to more general theory, in relation to which the less general theory becomes a particular case of the more general. We should not be able to cope with the abundance of impressions that surge over us every hour, every minute, every second, if we were not constantly uniting them, generalising them and registering them by means of language. Scientific generalisation is not simply the identification and synthesising of comparable attributes, it is also a penetration into the essence of a thing: the perception of the individual in the multiple, of the general in the individual, of the law-governed, the uniform in the accidental. In order to discover the general one must ignore what veils, over shadows, and sometimes even distorts it. Individualisation and generalisation taken in their unity are the path along which knowledge moves.

As examples of generalisations we may take the mental transition from the concept "spruce" to the concept "conifer", from the statement "mechanical energy turns into heat energy" to the statement "every form of energy turns into another form of energy".

The mental transition from the more general to the less general is a process of limitation. Without generalisation there can be no theory. Theory, on the other hand, is created so that it can be applied in practice to solve certain specific problems. For example, when measuring objects or building certain technical structures, we must always proceed from

the more general to the less general and the individual, there must always be a process of limitation. The grotesque fantastic images of mythology with its gods and monsters are closer to ordinary reality than the reality of the microworld conceived in the form of mathematical symbols. One can see that the turn towards the abstract is a very obvious trend of our time. Recourse to the abstract may also be observed in art, in abstract pictures and sculptures.

The abstract and the concrete. The concept of "the concrete" is used in two senses. First, in the sense of something directly given, a sensuously perceived and represented whole. In this sense the concrete is the starting point of cognition. But as soon as we treat it theoretically the concrete becomes a concept, a system of scientific definitions revealing the essential connections and relations of things and events, their unity in diversity. So the concrete appears to us first in the form of a sensuously observable image of the whole object not yet broken down and not understood in its law-governed connections and mediations, but at the level of theoretical thought it is still a whole, but internally differentiated, understood in its various intrinsic contradictions. The sensuously concrete is a poor reflection of phenomena, but the concrete in thought is a richer, more essential cognition. In contrast to the abstract the concrete is only one moment in the process of cognition, we understand it by comparing it with the abstract. Abstraction usually suggests to us some thing "mental", "conceptual", in contrast to the sensuously observable. The abstract is also thought of as something one-sided, poor, incomplete, separated, or as a property, a relation, a form, etc. withdrawn from its connection with the whole. And in this sense not only a concept but even an observable image, for example, a diagram, a drawing, an abstract painting, stylisation, a symbol may be abstract. The category of abstraction is contradictory. It is dead, one-sided, separated from the living phenomenon, but it is also an essential step towards the knowledge of a concrete fact brimming with life. We call knowledge abstract also in the sense that it reflects a fragment of reality, as it were, stripped down, refined and thereby impoverished.

Abstractions are "bits" of whole objects, and our thinking works with such "bits". From separate abstractions thought constantly returns to the restoration of concreteness, but each time on a new, higher basis. This is the concreteness of concepts, categories, and theories reflecting unity in diversity.

What do we mean by cognition as a process of ascent from the abstract to the concrete? "... Cognition rolls forward from content to content. Above all, this progress is characterised by the fact that it

begins with simple definiteness, and that the subsequent definiteness becomes ever richer and more concrete. Because the result contains in itself its beginning and further movement of this beginning has enriched it (the beginning) with a new definiteness. The universal constitutes the base; therefore forward movement should not be understood as a flow from one thing to another. In the absolute method the concept is preserved in its other-being, the universal in its particularisation, in a judgement and reality; at each stage of further definition the universal elevates the whole mass of its former content and not only does not lose anything as a result of its dialectical forward movement, not only does not leave anything behind itself, but carries with itself everything that it has acquired, and becomes richer and more concentrated within itself."² Seen in this light, the process of abstraction is a realisation of the principle: one must step back in order to get a better view. The dialectics of the cognition of reality lies in the fact that by "flying away" from this sensuously given reality on the "wings" of abstraction, one may from the heights of concrete theoretical thought better "survey" the essence of the object under investigation. Such is the history and logic of scientific cognition. Here we have the essence of the Marxist method of ascent from the abstract to the concrete. According to Marx, this method is the means by which thought assimilates the concrete, reproduces it by linking up concepts into an integrated scientific theory, which reproduces the objective separateness of the objects and the unity of its essential properties and relations. The concrete is concrete because it is a synthesis of many definitions, and, consequently, a unity of the diversity. The principle of concreteness means that we must approach facts of natural and social life not with general formulas and diagrams but by taking into exact account all the real conditions in which the target of our research is located and distinguish the most important, essential properties, connections, and tendencies that determine its other aspects.

Analogy. In the literal sense this word means correspondence, that is to say, an objective relationship between objects that makes it possible to apply the information gained through investigating one object to another object that is similar in certain respects.

Analogy, which links the threads of the unknown with the known, lies at the very heart of our understanding of facts. The new can be understood only through the images and concepts of the old, of what is

² *Georg Wilhelm Friedrich Hegel's Werke*, Vollständige Ausgabe. Fünfter Band. Wissenschaft der Logik. Berlin, 1834, Verlag von Duncker und Humblot, S. 348-49.

known. The first aeroplanes were invented by analogy with the behaviour of other, objects in flight, such as birds or kites.

An analogy is a similarity, a probable conclusion about a resemblance between two objects on the basis of a resemblance established in other respects. This conclusion, moreover, is more likely to be true, more heuristic and convincing, the more similar attributes we find in the objects under comparison and the more essential these attributes are. The application of analogy may lead to erroneous conclusions. Hence the aphorism: the principle of analogy is a technique of cognition that limps on both legs. For example, when comparing the Earth and Moon, Kant found a number of attributes that were common to these celestial bodies and drew the conclusion that the Moon must be inhabited. Analogy with something that is already known helps us to understand what is not known. Analogy with that which is relatively simple helps us to understand that which is more complex. For example, by analogy with the techniques of artificial selection used to produce the best breeds of domestic animals Charles Darwin arrived at the law of natural selection in the animal and vegetable world. Analogy with the flow of liquid in a pipe played an important role in the evolution of the theory of the electric current. Observation of the workings of the brain has provided an important heuristic technique for inventing logical machines, computers and so on. The most developed field where the method of analogy is often used is the so-called similarity theory, which is widely used in modelling.

Modelling. A characteristic feature of modern scientific cognition is the enhanced role of the method of modelling, which is used with great effect in the technical, natural, and social sciences. Modelling is the practical or theoretical replacement of the object of research by some natural or artificial analogue whose investigation helps us to understand the essence of the original object. For example, by examining the properties of a model aeroplane we get a better understanding of the properties of the real thing.

Modelling is based primarily on the principle of reflection, on similarity, analogy, on different objects having certain properties in common, and on the relative independence of form.

One starts out to build a theory of modelling by defining the concept "model", which is often identified with theory, hypothesis, image. The model is a materially realised or mentally represented system that replaces the object we wish to know or construct. The model and the original are in a relation of similarity (isomorphism), of analogy, or

physical resemblance, as, for example, the model of a gas in the form of elastic balls, the model of an electric current in the form of a liquid flowing along pipes, the "conductors". Any object that reproduces the required features of the original may be a model.

If a model has a physical nature identical to that of the original, we are concerned with physical modelling. When a model is described by the same system of equations as the object itself, such modelling is called mathematical modelling. If certain aspects of modelled objects are represented by a formalised system of symbols, which is then studied in order to transfer the acquired information to the modelled object itself, we are concerned with logic-sign modelling. Cybernetic modelling is functional in character. The model and the original may be different in their substratum, their energy processes and internal causal mechanisms, but they resemble each other in their behaviour.

Modelling inevitably involves a certain simplification of the object that is modelled. At the same time it plays an enormous heuristic role. Modelling is so widely used because it enables us to carry out research into processes characteristic of the original without having the original actually to hand.

Formalisation. The advances of modern science have brought profound changes in the methods of scientific cognition. One of the most important is the method of formalisation —generalisation of the forms of processes that differ in content, abstraction of these forms from their content. Here the form is regarded as a relatively independent object of research. It is sometimes thought that formalisation is connected only with mathematics, with mathematical logic and cybernetics. This is incorrect. Formalisation permeates all kinds of practical and theoretical activity and differs only in degree or level. Historically it arose at the same time as language. Certain techniques of labour activity, certain skills emerged, were generalised, described and passed on from generation to generation in a form divorced from the concrete actions, objects and means of labour. Our ordinary everyday language expresses the weakest level of formalisation. Its other extreme is mathematics, and mathematical logic, which studies the form of a process of reasoning by abstracting from the content. Here formalisation strips thought to the bare bones and leaves only the skeleton of its structure. Any book or article on physics, chemistry, astronomy, impresses the non-specialist by the abundance of its mathematical and other symbols and formulas and at the same time by the amazing compactness of its descriptions of natural phenomena in ordinary language.

When we formalise a line of reasoning, we abstract from the qualitative characteristics of objects and discover the logical form of the statements containing assertions about these objects. The syllogism, the line of reasoning is then transferred from the plane of considering the connections between objects in thought to the plane of operation with statements on the basis of the formal relations between them. The use of special symbols enables us to eliminate the ambiguity of the words used in everyday language. In formalised reasoning every symbol is strictly univalued, unambiguous. Symbols also allow us to record briefly and economically expressions which in ordinary language are clumsy and often difficult to understand. The main advantage of the language of formulas is not so much its brevity and compactness, as its freedom from ambiguity. The word "water" has more than one meaning but the formula H_2O has only one. The use of symbols makes it easier to draw logical conclusions from premises, to test the veracity of hypotheses, to prove scientific statements, and so on.

Despite its enormous importance for modern technology, formalisation has certain intrinsic limits to its sphere of application. It has been proved that there is no universal method that would allow us to replace all reasoning by computation. Only a very meagre content can be completely formalised. Formalisation can deal with only a little bit of ever changing life, taken one-sidedly, within the limits of its relative stability. Formalisation, as we have defined it, cannot be used for describing facts, which is an essential element in any scientific research. Scientific wisdom tells us that we should never be in a hurry to formalise when the subject-matter, the essence of the case is still not clear.

With the growing influence of abstraction and symbolism in the advance of knowledge, the problem of interpretation becomes increasingly acute. Just as abstraction becomes meaningless without concretisation, so formalisation ultimately proves sterile without interpretation. Whereas formalisation is the process of the motion of thought from the content of the object to its abstract form, interpretation is the converse, logically opposite process. A formal system is built on the basis of meaning and, once it is built, again returns to the sphere of meaningful relations. Abstraction from content is only a temporary process. The reverse process may be fairly often observed in modern science. At first certain abstract mathematical equations are evolved and studied, a formal system is devised, and then applied concretely.

Historical and logical methods. From the two main aspects of objective process of cognition we draw two methods, the historical and

logical. The logical method is used to express the general line, the pattern of development of an object, the development of society from one social formation to another, for example. The historical method is used to describe a concrete manifestation of a given pattern or law in all the infinite diversity of its specific and individual manifestations. In relation to society, for example, this is the real history of all countries and peoples with all their unique, individual destinies.

The logical is a generalised reflection of the historical: it reflects reality in its law-governed development and explains the necessity of this development. The logical is the historical, liberated from the principles of chronology, from its accidental and unique form. For example, when applied to the history of any science, the logical method of research presupposes a generalisation of the historical process, its stripping of all the transient, accidental turns or zigzags evoked by various, often external, relative factors, such as the zigzags of thought of a particular scholar, changes in historical circumstances, and so on.

The logical method of research into the actual historical process is thus a matter of abstracting from the real historical process its intrinsic necessity and analysing that necessity in a logically "purified" form.

The empirical and the theoretical in thought. Observation, experiment, description. The motion of cognitive thought begins with the empirical, with the observation and establishing of facts, their analysis and classification, and goes on from there to their generalisation, the making of hypotheses, the testing of these hypotheses and, finally, the construction of theories. Observation is an intentional, planned process of perception, carried out in order to identify the essential properties and relations in the object of cognition. Observation may be direct or indirect, mediated by various technical devices (molecules, for example, are now visually observed by means of electronic microscopes). Observation acquires scientific significance when it allows us on the basis of a research programme to present objects with maximum precision and may be repeated several times in conditions that we deliberately vary. The important thing is to select the most representative group of facts. Hence the importance of the researcher's intention, the system of methods he adopts and his interpretation of results and their control.

The success of observation depends on how well it has been prepared, on the setting of its targets, the demands that it should fulfil and the preliminary drawing up of a plan and method of observation. This indicates its close connection with thought. Observation registers

what is given by nature itself. But it is in the nature of man not merely to observe but also to experiment.

The experiment is a method of research by which the object is artificially reproduced or placed in certain conditions that answer the needs of the researcher. The history of scientific thought, particularly natural science, abounds in examples of brilliant experiments that have allowed us to examine, to have a glimpse into the most profound secrets of nature. By means of experiment Faraday discovered magnetic induction, Lebedev discovered the pressure of light, and so on.

The method of varying the conditions in which the object of research is usually found is the basic method of experiment. This allows us to uncover the causal connection between its conditions of existence and its properties, and also the changes that take place in these properties as we change the conditions, thus revealing new properties that could not be observed in natural conditions. For example, in laboratories of artificial climate one can more or less precisely determine the influence of temperature, light, humidity, etc., on the growth and development of plants. Because certain properties of an object change (or emerge anew) as conditions change, and others do not suffer any essential changes, we can make abstractions, ignoring the latter.

The characteristic features of experiment are control of conditions, measuring of processes and use of a specific instruments and apparatus. The growing sophistication of the methods and techniques of experiment, giving it greater flexibility and precision are largely responsible for current scientific advance.

An experiment may be repeated several times and produce a large number of observations to prove its conclusions. "Observation and experiment are crafts which are systematically taught. Sometimes, by a genius, they are raised to the level of an art. There are rules to be observed: isolation of the system considered, restriction of the variable factors, varying of the conditions until the dependence of the effect on a single factor becomes evident; in many cases exact measurements and comparison of figures are essential."³ In order to mount an experiment, just as when we are making observations, there must be some preliminary knowledge. The researcher must have a certain general notion of the object as something on which to hook the facts. In most cases an experiment is conducted in order to decide whether certain theoretical constructions are true or false. A scientific experiment is

³ Max Born, *The Natural Philosophy of Cause and Chance*, Oxford, Clarendon Press, 1949, p. 6.

usually preceded by some hypothesis, by a mentally devised experimental situation and its possible results, and this predetermines the specific angle from which the object is examined. It is through the prism of these constructs and hypotheses that the scientist examines the object and dissects its structure in his experimental activity. If you look through an electronic microscope at a physical or biological object, without the right scientific qualification and a well thought-out hypothesis you will see nothing but a few blobs of light and colour. For what you see to become meaningful you must have a certain training in the given field of knowledge and certain preliminary ideas. These general notions or suppositions, working hypotheses, are drawn from previous observations, and experiments, and from the general human experience, and provide the guidelines for further experiment. Observation and experiment, whether practical or performed in the mind, cannot produce any effective results without a clearly conceived goal. If you have no ideas in your head, you won't see any facts either.

During and as a result of observation and experiment we arrive at description. Description is done by means of generally accepted terms, visually, in the form of graphs, diagrams, photographs and films and, symbolically, in the form of mathematical or chemical formulas and so on. The basic scientific demand in description is authenticity, precision in reproducing the data of observation and experiment. Description may be complete or incomplete. It always presupposes a certain systematisation of the material, that is to say, its classification and generalisation. Pure description takes place only at the very beginning of scientific work. As scientific knowledge is acquired, the scientist employs the so-called mental experiment, when he operates with certain images in his mind and puts the object of research into certain conditions which, according to his general notion, should help to achieve the desired result. This is the usual process of theoretical thought taking the form of an experiment. An experiment pursues a double purpose, the testing and confirmation of a hypothesis, and also the heuristic factor. The answer given by the experiment may sometimes be unexpected, in which case the experiment becomes the prime source of a new theory. This was how the theory of radioactivity came into being, for example, and it illustrates the heuristic importance of experiment. Experiment and its results are something that we obtain through our senses. Thought judges the nature of the object through experiment. In itself an experiment only establishes certain facts. Thought penetrates into their essence. What the scientist sees through his microscope or observes through a telescope or a spectroscope demands a certain amount of

interpretation. This means that experimental activity has a rather complex structure: the theoretical basis of experiment is scientific theory, hypothesis; the material basis of the experiment is the various instruments and measuring devices that are used; then we have the actual conducting of the experiment, the experimental observation of phenomena and processes, the quantitative and qualitative analysis of its results, and their theoretical generalisation. Consequently, an experiment comprises both practical and theoretical activity, the latter being predominant. Observation and experiment enable us to test the authenticity of a fact or a hypothesis.

What is a fact? A fact is a phenomenon of the material or intellectual world which has become an authenticated part of our knowledge. It is the registering of certain phenomena, certain properties and relations. Science begins and ends with facts, regardless of what theoretical constructs are made in between.

The statement that an object exists is the first but very limited stage in cognition. The establishing of the fact of a criminal case has supreme significance for the court. A court must be certain that the fact which is being investigated did actually take place. Similarly, the surgeon cannot begin an operation or the general practitioner has no right to prescribe a drug and certain treatment without diagnosis, i.e. without establishing the fact of a certain illness.

A scientific fact is the result of reliable observation and experiment. It appears in the form of direct observation of objects, the readings of apparatus, photographs, descriptions of experiments, tables, diagrams, notes, archive documents, authenticated evidence of witnesses, and so on. But in themselves the facts are not yet science, just as building material is not yet a building. Facts are woven into the fabric of science only when they are selected, classified, generalised and explained, at least hypothetically. The task of scientific cognition is to reveal the cause of a given fact, to define its essential properties and establish a uniform link between facts. The facts that science values most are those that do not fit into any existing theories. It is from the explanation of such facts that we may hope for scientific advance.

The fact contains quite a lot of accident. But science is mainly interested in what is law-governed. The basis of scientific analysis is not simply an individual fact but a large number of facts that reflect a basic tendency. There is no limit to the number of facts. From their abundance one must make a reasonable selection of those that are needed for getting at the essence of the problem. The history of

cognition tells us that scientific generalisation is performed on the basis of a finite number of facts. Generalisation that leads to the establishing of a law may be achieved even on the basis of only one fact, as long as it is typical or characteristic.

Facts acquire scientific value if there is a theory to interpret them, if there is a method to classify them, if they are studied in their relation to other facts. Only by having mutual connections and integrity can facts serve as the basis for theoretical generalisation. Taken in isolation, facts can prove nothing. From a tendentious selection of facts one can build any "theory", but it will have no scientific value.

Hypothesis. Science begins when we enter the realm of the unknown and start making suppositions, conjectures, hypotheses. It is always much easier to make suppositions than to prove them. The conjecture is a supposition that has not yet been proved but sets out to explain certain facts. Its becoming a hypothesis involves the finding of arguments, the conversion of a miracle into something knowable.

The hypothesis is a supposition based on facts, a starting-point for investigation of a part of reality that has not been sufficiently studied. It is a kind of probe with which the scientist takes his first soundings in the world of the unknown, or, to use another image, the scaffolding which is erected and then taken down when the building is finished. The hypothesis has a purely auxiliary, heuristic significance, it helps us to make a discovery. "If the only laws that you find are those which you have just finished observing then you can never make any predictions. Yet the only utility of science is to go on and to try to make guesses. So what we always do is to stick our necks out.... Of course, this means that science is uncertain; the moment that you make a proposition about a region of experience that you have not directly seen, then you must be uncertain. But we always must make statements about the regions that we have not seen, or the whole business is no use. So we have to make guesses in order to give any utility at all to science."⁴

As a rule, the formulation of hypotheses is the most difficult part of the work of theoretical thinking. No one has yet found a method of stating a hypothesis according to certain rules. A hypothesis is a necessary precondition for the collection of facts, their sorting out and classification.

⁴ Richard Feynman, *The Character of Physical Law*. A series of lectures recorded by the BBC at the Cornell University U.S.A. and televised on BBC-2 British Broadcasting Corporation, 1965, pp. 76-77.

A hypothesis is substantiated and proved by analysis of accumulated knowledge, its comparison with the already known empirical facts, with new facts, and also with facts that may be established in the future. In other words, the substantiation of a hypothesis presupposes its evaluation from the standpoint of the explanatory effectiveness of the available facts and the previsioning of new facts.

Like a theory, a hypothesis appears as a generalisation of already existing knowledge. At the same time the knowledge contained in a hypothesis does not follow necessarily from previously existing knowledge. A hypothesis is new knowledge, stochastic knowledge that has not yet been properly proved. In this sense one can say that the essential difference between the hypothesis and the theory is that the content, arguments and conclusions of the former are less definite and reliable.

In its further development the hypothesis may completely or partially become authentic knowledge or it may be utterly rejected. So an essential condition for the truly scientific hypothesis is that it should not be condemned to remain a hypothesis forever, that it should be either provable or refutable.

Testing is done not only by means of facts but also by confirmation, through experiment, of the consequences of the hypothesis that is to be tested.

What is theory? Theory is an internally differentiated, developing system of objectively true, practically tested scientific knowledge that explains a law concerning phenomena in a certain field. Unlike the hypothesis, the theory provides reliable knowledge (including reliable knowledge of the probability of certain events). For example, the idea of the atomic structure of matter remained for a long time only a hypothesis. When confirmed by experiment, this hypothesis became authentic knowledge, it became the theory of the atomic structure of matter.

A mature theory is not only a system of knowledge that is stable or in the process of being realised. It includes a certain thought mechanism for constructing and developing knowledge, a programme of research. A theory is changed by incorporating in it new facts, ideas and principles. When a contradiction is discovered in a certain theory, a contradiction that cannot be resolved in the framework of its initial principles, the resolving of this contradiction leads to a new theory.

The core of scientific theory is its laws. Theory may be said to have the following essential elements: its initial empirical basis (facts

registered in the given field of knowledge, experimental data that require theoretical explanation); various assumptions, postulates or axioms; the rules of logical inference and proof admissible within the framework of a given theory; the conclusions and their proofs which form the basic stock of theoretical knowledge, and finally the scientific laws, and some kind of prediction of future developments.

The multiplicity of the forms of modern theoretical knowledge has a corresponding multiplicity of types of theory and also a wide diversity of classification. We may distinguish descriptive theories, which systematise usually very extensive and heterogeneous material; mathematised theories, which use the apparatus and models of mathematics; theories in which the main role is played by empirical interpretation; deductive theoretical systems, in which both the initial propositions and the logical rules of construction and development are strictly fixed. This kind of theory is also broken down into a number of different types.

Both on the empirical and the theoretical level thought has the power to anticipate events. Even at the elementary, everyday level it is clear that in order to exist people must be able to foresee at least the things that matter for their own survival. And these can only be foreseen on the basis of reliable knowledge of at least certain properties of the whole, a small part of which is the knowing subject. One can foresee or predict only in areas where there is order, an objective logic that can be understood.

Knowledge of causal, law-governed connections and understanding of the essence of things enable us from time to time to break out of the confines of the present and have a glimpse into the mysterious future, to perceive the existence of things not yet known and predict the probable and necessary occurrence of events. Prevision is the crown of scientific cognition. It reveals the far horizons of natural phenomena or historical events. The prognosticating power of our thought increases with the study of historical experience. Without history there can be no theory, and without both of these there can be no true prevision. Prevision shows that scientific thought can make the forces of nature and the forces that control the life of society serve the needs of humanity. "To control is to foresee", states an ancient maxim.

Prevision constitutes the highest stage in the "conversion of the complex into the simple", which is the aim of any gifted scientist, who through the darkness of the unknown and the infinite fluidity of

individual phenomena discerns the basic significance of events and senses their main current.

All advance of knowledge is connected with growth in the power and range of scientific prevision. Prevision offers the opportunity of controlling processes and guiding them. Scientific knowledge reveals the possibility not only of foreseeing future but also of consciously shaping that future. The vital importance of any science may be defined as follows: to know in order to foresee, to foresee in order to act.

To foresee, this is what humanity has dreamed of since the very beginning, and it has often endowed the heroes of myth and fairy-tale with this gift. The history of science is in many respects the history of prevision, whose power and range are the evidence of the maturity of theoretical thought. This is quite understandable. In order to make a forecast one must know the diagnosis. Theoretical thought has always needed the guidance of certain precepts, rules and methods. Without them our reason would surely lose its way on its long road through the unknown.

The difficulty of prevision and overcoming the limits of human capacities is particularly noticeable in the sphere of social life, where we are confronted with tendency laws. Because the history of human society obeys not dynamic but statistical laws, it would be unrealistic to demand mathematical precision in forecasting the time and character of future events and, even less, the actual form they will assume. And whereas prevision may be precise in relation to events whose occurrence is determined by already existing laws, causes and conditions, the specific features of the future, which depend on circumstances that have not yet come about, cannot be precisely envisaged. The depth of mental penetration into the future and the precision of prognostication in regard to the events of social life greatly depend on the extent to which the conditions that determine these events have been prepared.

The creative power of human reason. By means of thought we not only learn the existing, we also create what should be. The very understanding of reality is a profoundly creative process. Creativity is an activity of the human mind whose result is the creation of unique values, the establishing of new facts, the discovery of hitherto unknown properties and regularities and also methods of knowing and changing reality. The originality of a discovery or invention may be considered objective, if it appears as such in the context of a whole culture, or subjective, if it is original only for the author. The process of creativity

begins from the identification of a problem and goes on to the formulating of conjectures and hypotheses. It presupposes the ability not only to state but also to solve problems, to generate new ideas, which in turn presupposes thinking independently of established stereotypes and demands a moral standpoint dictated by the essence of the case and not by opportunistic considerations. Reason constructs image goals which regulate the practical creation of the new. The creative principle in the broad sense is characteristic of nature as a whole. Nature is inexhaustibly creating the new, for example, the fantastic shapes of crystals, living organisms, cosmic systems. Creativity in nature appears as a self-propelling active process of development, as the self-generation of more and more new structures of existence. Creativity is to be found also in animals, particularly the higher animals. It is expressed in their behavioural inventiveness, in their constructive solutions of problematic situations. But the creative power of reason is the privilege of man. Our remote ancestors' invention of the first cutting tool was a creative act. However primitive they may be, their paintings, sculptures, fairy-tales, legends, means of healing and much else are all manifestations of the creative power of reason. This power of the mind is a vital necessity for human existence. It is the human being's essential characteristic. Discoveries in science, technical inventions, works of art, innovation in politics and in all spheres of life are facts of the creative activity of the mind. Without them there could be no social life. Thinking may not always be creative. It may also be stereotyped, moving in a rut, reproducing results that are already known, and bringing about both in method and in result only something that has been learned beforehand, programmed, at best finding only tiny grains of the new as it plods along the beaten track. The rope ladder of stereotyped thinking rules out cultural progress. Such a "dormant" life of thought indicates an unhealthy state of the mind and even of the whole socium. The degree of stereotyped or creative thinking may vary from one person to another. The creatively thinking individual experiences inspired moments and moments of depression while the person who thinks in stereotypes may produce something that is not merely trivial. This variation ranges from the total dogmatism of those who blindly and persistently repeat what they have learned by heart, to the eagle flight of the genius, who is always sparkling with originality. Creativity demands tremendous effort and sometimes also an ability to relax completely, so that one can give oneself up freely to the play of associative images and thus become receptive to information which may be, as it were, hovering in the atmosphere. The power of creativity is related to imaginative power, which gives man wings for high-soaring

thought. By allowing him to rise above reality, imagination may indirectly bring his thought nearer to it. There is no sphere of the mind where logic alone is sufficient, and often the power of imagination brings us by the most devious roads to the temple of truth. The laws of imagination are still wrapped in mystery. It operates sometimes on the principle of analogy, which has produced quite a number of great discoveries and inventions. Creativity is not only a conscious act of the mind, it is also the unconscious spontaneity of mental phenomena, within which something unusual, something new may come into being. Only later can it be grasped by the controlling power of reason and fitted into the tabulated framework of logic. A person may arrive at the truth both by the power of reasoning and by an instantaneous leap of intuition, when he grasps the essence of the problem without argument or proof. Here previous experience and certain complex bioinformational interactions between people are both at work. Intuition and imagination play an enormous role in creative activity. To them humanity is indebted for much cultural progress, but their power is effective only in alliance with the power of the rationally thinking mind, guided by the standards of a historically formed culture.

Chapter 5. On the Human Being and Being Human

Table of Contents

What Is a Human Being?
The Human as the Biosocial
Man in the Realm of Nature
Man and Society
Man as a Personality
Man the Doer
Destiny, Freedom and Responsibility
Man and culture

What Is a Human Being?

An ancient maxim tells us that the proper study of man is man. The problem of man is an eternal and at the same time the most urgent of all problems. It lies at the heart of the philosophical questions of man's place and destination in a world that is being discovered and transformed in the name of humanity, the highest of all values. The main goal of social development is the formation of human abilities and the creation of the most favourable conditions for human self-expression.

Physicists are perfectly right in stressing the difficulties of research into elementary particles. But they should not resent being told that such research is child's play in comparison with the scientific comprehension of games played by children! The rules of any game are only a conventionally marked path; children "run" along this path very capriciously, violating its borders at every turn, because they possess free will and their choice cannot be predicted. Nothing in the world is more complex or more perplexing than a human being.

Many sciences study people, but each of them does so from its own particular angle. Philosophy, which studies humanity in the round, relies on the achievements of other sciences and seeks the essential knowledge that unites humankind.

Idealism reduces the human essence to the spiritual principle. According to Hegel, the individual realises not subjective, but objective aims; he is a part of the unity not only of the human race but of the whole universe because the essence of both the universe and man is the spirit.

The essence of man comprises both the spiritual sphere, the sphere of the mind, and his bodily organisation, but it is not confined to this. Man becomes aware of himself as a part of the social whole. Not for nothing do we say that a person is alive as long as he is living for others. Human beings act in the forms determined by the whole preceding development of history. The forms of human activity are objectively embodied in all material culture, in the implements of labour, in language, concepts, in systems of social norms. A human being is a biosocial being and represents the highest level of development of all living organisms on earth, the subject of labour, of the social forms of life, communication and consciousness.

If we examine human existence at the organismic level, we discover the operation of laws based on the self-regulation of processes in the organism as a stable integral system. As we move "upwards", we encounter the world of the mind, of personality. At the organismic level, the human being is part of the natural interconnection of phenomena and obeys its necessity, but at the personal level his orientation is social. From the world of biology through psychology we enter the sphere of social history.

In ancient philosophy man was thought of as a "small world" in the general composition of the universe, as a reflection and symbol of the universe understood as a spiritualised organism. A human being, it was thought, possessed in himself all the basic elements of the universe. In the theory of the transmigration of souls evolved by Indian philosophers the borderline between living creatures (plants, animals, man and gods) is mobile. Man tries to break out of the fetters of empirical existence with its law of karma, or what we should call "fate". According to the Vedanta, the specific principle of the human being is the *atman* (soul, spirit, selfhood), which in essentials may be identified with the universal spiritual principle—the Brahman. The ancient Greeks, Aristotle, for example, understood man as a social being endowed with a "reasoning soul".

In Christianity the biblical notion of man as the "image and likeness of God", internally divided owing to the Fall, is combined with the theory of the unity of the divine and human natures in the personality of

Christ and the consequent possibility of every individual's inner attainment of divine "grace".

The Age of the Renaissance is totally inspired by the idea of human autonomy, of man's boundless creative abilities. Descartes worked on the principle, *cogito, ergo sum* — "I think therefore I am". Reason was regarded as the specific feature of man. Soul and body were understood dualistically. The body being regarded as a machine, similar to that of the animals, while the soul was identified with consciousness.

Proceeding from this dualistic understanding of man as a being belonging to two different worlds, the world of natural necessity and that of moral freedom, Kant divided anthropology into "physiological" and "pragmatic" aspects. The first should study what nature makes of man, while the second is concerned with what he, as a freely acting being, does, can or should make of himself. Here there is a return to the conception of man as a living whole which characterised the Renaissance. Unlike that of the animals, man's bodily organisation and sense organs are less specialised, and this is an advantage. He has to form himself, by creating a culture. Thus we arrive at the idea of the historical nature of human existence. For classical German philosophy the determining factor is the notion of man as a spiritually active being creating a world of culture, as a vehicle of reason. In criticising these ideas Feuerbach achieved an anthropological reorientation of philosophy centering it on man, understood primarily as a spiritually corporeal being, as a vital interlocking of the "I" and the "you

According to Nietzsche, man is determined by the play of vital forces and attractions and not by the reason. Kierkegaard gives priority to the act of will, in which the individual, by making a choice, "gives birth to himself", ceases to be merely a "child of nature" and becomes a conscious personality, that is to say, a spiritual being, a being that determines itself. In personalism and existentialism the problem of personality is central. A human being cannot be reduced to any essence (biological, psychological, social or spiritual). Existentialism and personalism contrast the concept of individuality (being a part of the natural and social whole) to that of personality, as unique spiritual self-determination, as "existence".

The point of departure of the Marxist understanding of man is the human being as the product and subject of labour activity. ". . . The

essence of man is no abstraction inherent in each single individual. In its reality it is the ensemble of the social relations."¹

¹ Karl Marx, *Theses on Feuerbach* in: K. Marx and F. Engels, *Collected Works*, Vol. 5, Progress Publishers, Moscow, 1976, p. 4

The Human as the Biosocial

Contemporary science considers the human being on the basis of two different dimensions of his existence: the biological and the social. Human beings appeared on earth as a result of a long process of development. As biological creatures, they still retain a close genetic connection with the animal world. Man's organism has many features in common with the higher animals.

Man got ahead of the mammals thanks to the intensive development and differentiation of the cerebral cortex. The characteristic anatomical and physiological features of the human being are erect posture, free upper extremities, adapted for using and making tools, and advanced development of the means of communication. The need to maintain balance in the erect posture caused a certain curvature of the spinal column and a shift in the general centre of gravity.

Since the upper extremities were no longer used for body support and walking, the skeleton of the lower extremities became stronger and their muscles developed, the feet became arched to act as springs. All the systems of the internal organs have adapted to the erect posture, the means of delivering blood from the lower extremities to the heart and the brain have become more complex. The diaphragm has shifted from a vertical to a horizontal position, the muscles of the abdomen have come to perform a much greater role in the act of breathing. At a certain level of anthropogenesis, under the influence of labour activity and communication, biological development became what is, in effect, the historical development of social systems.

The human being is also a natural being and, as such, is endowed with natural vital forces, which take the form of inherited qualities. Birth gives man existence as a natural individual. Although he comes into the world with insufficiently formed anatomical and physiological systems, they are genetically programmed as uniquely human. The newborn child is not a "tabula rasa" (clean slate) on which the environment draws its fanciful spiritual patterns. Heredity equips the child not only with instincts. He is from the very beginning the possessor of a special ability, the ability to *imitate* adults, their actions, the noises they make. He has an inherent curiosity, an ability to enjoy bright objects. He is capable of being upset, disappointed, experiencing fear and joy. His smile is innate and it can be observed even in prematurely born babies. Smiling is the privilege of man. And these purely human innate potentials are developed in the course of his whole subsequent life in society. Many

specific features even of the human being's physiological make-up (the round shape of the head, the sophisticated structure of the hands, the shape of the lips and the whole facial structure, the erect posture, etc.) are products of the social way of life, the result of interaction with other people.

To sum up, man is an integrated unity of the biological, the organismic and the personal, the natural and the social, the inherited and what he acquires during his life. Developing both historically and in the course of his individual development as a social being, man does not "opt out" of the multiform biotic flow. The physiological rhythm of the blood circulation, nutrition, breathing, sex life, the rhythmical vortices of the energy and information processes in the organism, birth, maturity and death, the phases of individual existence —childhood, adolescence, rebellious youth, young manhood, maturity, advanced life, old age, senility and complete decline— all this and much else is genetically programmed. Human beings are the towering peak of a great biological system, the latest to emerge in time, and the most complex.

Three forms of determination —the biotropic, the cosmotropic and sociotropic— operate in the human being. They embrace the whole history of humanity, regional and national traditions, the influence of a certain social group, of microconditions, the great power of biological heredity. The accuracy and purity of heredity is maintained by a specific material substratum, the apparatus of the genes, which for millions of years has carefully guarded man's racial essence as the highest biological species. If a chimpanzee were placed from birth in ideal conditions and surrounded by gifted teachers, it still would not change from an ape into a man. Heredity sets an impassable gulf between ape and man.

The genetically coded abilities of the child are the product of a long process of evolution, but even such apparently simple and seemingly innate abilities as the ability to distinguish ordinary sounds of speech and musical tones are formed only in the process of its living mastery of the historically shaped forms of language and music. The ability to think as a human being does not simply appear and mature in the process of the child's individual development; it is shaped by life in society. At the moment of birth a child is only a candidate human being, it cannot become a full member of the human race if isolated. It must learn to become human through communication, through being introduced to the world of people, of society, which regulates, guides and fills his behaviour with social meaning.

Every human being has amazingly obedient fingers; he can take up a brush and colours and begin to paint, but this does not make him into an artist. It is the same with consciousness, which is not our natural birthright. The conscious mental phenomena inherent in man are shaped during life by education, training, the active mastery of world culture, language, and a world-view. Thus, the social principle permeates the individual and determines the essentially human structure and mechanisms of his mentality, consciousness and mode of behaviour.

For various cognitive or practical purposes we may stress man's biological or social aspects, but we must always remember their essential unity.

In the past decade world science has devoted much attention to the problem of the relationship between the biological and the social in man. Paradoxically, it is the social conditions of life of modern man that have so urgently confronted us with the problem of his *natural* origin: the social has, as it were, "highlighted" the biological, sometimes to the point of vulgarisation, such as the assertion that nature has endowed man with "three brains", which despite their completely different structures have to function together and maintain contact. According to this view, the oldest of our brains is reptilian, the second was inherited from the lower mammals, and the third is the achievement of the higher mammals. This is the one that turned the living creature into man. So, figuratively speaking, when a doctor invites his patient to lie down on a couch, he is dealing simultaneously with a human being, a horse and a crocodile. Such views stem from the notion that man's biological essence is invariable. The conception of *socio-biologism* has also won some recognition in Western science, due probably to the striking successes of biological research in recent decades, particularly in the sphere of genetics, neurophysiology, ethology, etc.

To the question does man rely on "genes or society?" we often receive the answer that it is the genes that count most.

Some thinkers envisage man's biological destiny in an extremely optimistic and colourful light. They believe that the existing system of heredity fully reflects the results of his appearance as a unique biological species. Its significance is so great that it can virtually serve for an unlimited period, for the whole foreseeable future, and this precious hereditary basis of humanity must be preserved from any harmful external influences.

Others maintain that the human being as a biological species is already on the way to extinction. Thanks to the creation of his own environment and the successes of medicine, man has deviated from the stern discipline of natural selection and thus burdened himself with increased pressure from accumulated mutations.

A third school of thought works on the assumption that the human being, as a biologically young species, carries too many animal genes in his heredity. The social environment in which he lives is created not by the history of humanity but by the activity only of its elite.

The last two of these doctrines are based on the idea that man's genetic nature as a whole requires some adjustment or correction, that the near future threatens humanity with destruction through biological factors, and that in these conditions only genetics, by taking evolution into its own hands, can avert this grave menace.

On the crest of these ideas there emerges a somewhat elaborated form of eugenics, which imperatively declares that whether we want it or not, science must deliberately control the reproduction of the human race, and introduce some kind of partial selection for the "benefit" of humanity. Some Western scientists propose that the sperm of the "finest specimens of the human race" should be used for this purpose. It should be put into deep freeze for a long time to allow for objective assessment of the true value of the individuals concerned. Sperm thus preserved may then be used for mating purposes. The wife and the donor will be the biological parents while the husband (assumed to be inferior to the donor) remains only the "adopting parent". Exercises in "genetic engineering" even go as far as to assume an "adopting mother", in which case neither mother nor father is a truly biological parent. Even if one ignores the purely genetic implications of such selection, one is confronted by a host of moral and psychological questions. Who possesses the genotypes with the desirable features? Who should or could decide the question of what precisely is desirable? Who would dare, and by what right, to prevent the majority of men and women producing progeny, and limit this activity to an elite group? To whom can society entrust such a crucial decision? What are we to do about the incorrigible desire to perpetuate oneself in one's children? This hypertrophy of genetic factors and opportunities stems from the belittling of the social principle in man. Man is a natural being, but a *human natural* being. Nature gives the human being less than life in society requires of him. Life and the development of society may continue only through the biological form of human existence, and human biology can develop its genetic programme only in the context of

the social reality. In its origin, biological law is socially conditioned. Only when swaddled in the "cotton wool" of social care can the child —the most helpless of all young animals— realise the species programme implanted in it by nature.

The animal is born with fur or feathers, it is clothed by nature. But the baby is born naked and has to be clothed by society. It must learn to be human. And this it does in constant communication with adults, in its lifetime acquisition of culture.

The influence of the social on the biological is demonstrated by the increase in longevity from approximately 18 years in the stone age to between 64 and 74 in modern times. The active period of life has also increased, particularly that of mental activity. The onset of old age has receded, the period of childhood has lengthened and sexual maturity has accelerated. The phenomenon of acceleration is regarded as an epochal shift, one of the most significant phenomena in contemporary biology, with serious medical, pedagogical and other social implications.

What regulates the relationship of the sexes? Why does one find the following stable ratio in human population: 103 boys to 100 girls? In post-war years, after the loss of so many males, the birth rate of boys increases.

Life shows that on the borderline between the biological and social the pressure of conflict sometimes reaches great intensity. Quite often it causes shifts and disruption. The number of diseases is ominously increasing, particularly those of the cardio-vascular, oncological and neuro-psychiatric types.

Physical time flows on smoothly but socio-biological time is constantly accelerating. Every hour and every minute of physical time is becoming more and more full of socio-psychological living content. The flow of contemporary life is like a violent mountain stream, it rushes us along at perilous speed. Man's psycho-physiological powers cannot always stand the pace. Everyone is trying to live faster, so as not to lag behind the general information front, to keep up with the accelerated development of culture. In the last 10 or 15 years the volume of scientific information, of discoveries and inventions, has outstripped everything previously achieved in human history. The sense organs and the human brain are fiercely and ceaselessly bombarded by all kinds of information.

When discussing biological factors, one should not reduce them to the genetic. More attention should be given to the physiological and ontogenetic aspects of development, and particularly to those that

evoke a pathological effect, for it is these that modify the biology of the human being, who is also beginning to perceive even social factors in quite a different way. Dialectics does not simply put the social and the biological factors on an equal footing and attribute the human essence to the formula of biotropic-sociotropic determination favoured by some scientists. It stresses the dominant role of the social factors. Nor does dialectics accept the principles of vulgar sociology, which ignores the significance of the biological principle in man.

As the highest intelligent being, man is the focal point of all forms of the motion of matter. They are represented in him hierarchically, and the highest ultimately guiding and regulative factor is the social, to which all other forms are subordinate. In other words a human being embodies and sums up, as it were, the whole development of the universe.

High though he stands in the universal hierarchy, a human being, when he becomes the target of scientific research, is dissected into small and even minute particles, each of which, the teeth, the stomach, the intestines, and so on, are investigated and treated separately. This is the result of the progressive differentiation of scientific knowledge, which enables us to penetrate deeper into the intricacies of human structural organisation. Without this it would be impossible to advance science. But in the course of such differentiation scientific thought tends to overlook the real and higher integrity of man, although he cannot be fully understood or treated without taking into account the whole. So there is a need for the opposite process of cognition, namely understanding of man as the highest unitary system.

The important thing is to overcome the obvious and blatant fascination with the analytical method and achieve a synthetic, complex approach, concentrating intellectual efforts in various fields on the problem of the human being as a whole. Such a "short-circuiting" of the sciences could produce a flash that would illuminate and help to identify new problems.

The independence of each separate science is an important fact, but it must be relative and should not develop into autonomy. The autonomy of the sciences that study man is a sign that they have lost the integrity of knowledge that is so essential to an understanding of the essence of the case, and to effective treatment or education. When discussing the disunity of man one must first of all realise that he is divided by the scientific scalpel into two: one half is studied by the natural sciences (biology, physiology, biochemistry, biophysics, etc.),

while the other is the province of the social sciences, and also of medicine, which occupies an intermediary position and would appear to be all-embracing.

Life demands that we combine both these methods of studying humankind. Natural scientific methods frequently ignore, or pay too little attention to the social aspects and consequently the social methods of cognition. On the other hand, the social sciences often omit the natural principle in man and consequently the natural scientific methods of cognition. The result is to the detriment of both sides and the bad effects are particularly apparent in the practice of healing and education. What we need is an integrated, complex study of human beings as a basis for the creative cooperation of natural science and the social sciences, of philosophy and all the other fundamental and applied sciences which in some way or another study humanity.

Man in the Realm of Nature

The unity of man and nature. Human beings live in the realm of nature, they are constantly surrounded by it and interact with it. The most intimate part of nature in relation to man is the biosphere, the thin envelope embracing the earth, its soil cover, and everything else that is alive. Our environment, although outside us, has within us not only its image, as something both actually and imaginatively reflected, but also its material energy and information channels and processes. This presence of nature in an ideal, materialised, energy and information form in man's Self is so organic that when these external natural principles disappear, man himself disappears from life. If we lose nature's image, we lose our life.

Everything, from each separate cell of a living organism to the organism as a whole, generates bioenergy. Just as the bioenergy of the separate cell goes beyond its boundaries, so the bioenergy of the organs and the organism as a whole extends beyond their boundaries, forming a luminous aura. As the ancient acupuncture therapists intuitively established, bioenergy and bioinformation move along special channels (meridians) forming a complex structure, in which all the components of the living whole interact both with themselves and with the external world. Energy-information interactions are a vital dimension of any living system, including that of man as the highest stage in the hierarchy of the structures of existence known to science.

Man is constantly aware of the influence of nature in the form of the air he breathes, the water he drinks, the food he eats, and the flow of energy and information. And many of his troubles are a response to the natural processes and changes in the weather, intensified irradiation of cosmic energy, and the magnetic storms that rage around the earth. In short, we are connected with nature by "blood" ties and we cannot live outside nature. During their temporary departures from Earth spacemen take with them a bit of the biosphere. Nowhere does nature affect humanity in exactly the same way. Its influence varies. Depending on where human beings happen to be on the earth's surface, it assigns them varying quantities of light, warmth, water, precipitation, flora and fauna. Human history offers any number of examples of how environmental conditions and the relief of our planet have promoted or retarded human development.

At any given moment a person comes under the influence of both subterranean processes and the cosmic environment. In a very subtle

way he reflects in himself, in his functions the slightest oscillations occurring in nature. Electromagnetic radiations alone from the sun and stars may be broken down into a large number of categories, which are distinguishable from one another by their wavelength, the quantity of energy they emit, their power of penetration, and the good or harm they may do us. During the periods of peak solar activity we observe a deterioration in the health of people suffering from high blood pressure, arteriosclerosis or infarction of the myocardium. Disturbances occur in the nervous system and the blood vessels are more liable to suffer from spasms. At such times the number of road accidents increases, and so on. It has been noted that there is a dependence between any weakening in the Earth's magnetic field and acceleration of growth, and vice versa, growth is retarded when the magnetic field becomes stronger. The corpuscular, radioactive irradiations, cosmic dust, and gas molecules which fill all universal space are also powerful creators and regulators of human existence in biological life. The universe is in a state of dynamic balance and is constantly receiving various forms of energy. Some forms are on the increase or decrease, while others experience periodic fluctuations. Each of us is a sensitive resonator, a kind of echo of the energy flows of the universe. So it would be quite wrong to regard only the energy of the sun as the source of life on earth and humanity as its highest manifestation. The energy of distant cosmic bodies, such as the stars and the nebulae, have a tremendous influence on the life of man as an organism. For this reason our organisms adjust their existence and development to these flows of external energy. The human organism has developed receptors that utilise this energy or protect themselves from it, if it is harmful. It may be said, if we think of human beings as a high-grade biological substance, that they are accumulators of intense energy drives of the whole universe. We are only a response to the vibrations of the elemental forces of outer space, which bring us into unity with their oscillations. Every beat of the organic pulse of our existence is coordinated with the pulse of the cosmic heart. Cosmic rhythms exert a substantial influence on the energy processes in the human organism, which also has its own rhythmic beat.

Man's influence on nature. Man is not only a dweller in nature, he also transforms it. From the very beginning of his existence, and with increasing intensity human society has adapted enviring nature and made all kinds of incursions into it. An enormous amount of human labour has been spent on transforming nature. Humanity converts nature's wealth into the means of the cultural, historical life of society.

Man has subdued and disciplined electricity and compelled it to serve the interests of society. Not only has man transferred various species of plants and animals to different climatic conditions; he has also changed the shape and climate of his habitation and transformed plants and animals. If we were to strip the geographical environment of the properties created by the labour of many generations, contemporary society would be unable to exist in such primeval conditions.

Man and nature interact dialectically in such a way that, as society develops, man tends to become less dependent on nature directly, while indirectly his dependence grows. This is understandable. While he is getting to know more and more about nature, and on this basis transforming it, man's power over nature progressively increases, but in the same process, man comes into more and more extensive and profound contact with nature, bringing into the sphere of his activity growing quantities of matter, energy and information.

On the plane of the historical development of man-nature relations we may define certain stages. The first is that of the complete dependence of man on nature. Our distant ancestors floundered amid the immensity of natural formations and lived in fear of nature's menacing and destructive forces. Very often they were unable to obtain the merest necessities of subsistence. However, despite their imperfect tools, they worked together stubbornly, collectively, and were able to attain results. This process of struggle between man and the elements was contradictory and frequently ended in tragedy. Nature also changed its face through interaction with man. Forests were destroyed and the area of arable land increased. Nature with its elemental forces was regarded as something hostile to man. The forest, for example, was something wild and menacing and people tried to force it to retreat. This was all done in the name of civilisation, which meant the places where man had made his home, where the earth was cultivated, where the forest had been cut down. But as time goes on the interaction between man and nature is characterised by accelerated subjugation of nature, the taming of its elemental forces. The subjugating power of the implements of labour begins to approach that of natural forces. Mankind becomes increasingly concerned with the question of where and how to obtain irreplaceable natural resources for the needs of production. Science and man's practical transforming activity have made humanity aware of the enormous geologic al role played by the industrial transformation of earth.

At present the interaction between man and nature is determined by the fact that in addition to the two factors of change in the biosphere

that have been operating for millions of years —the biogenetic and the abiogenetic—there has been added yet another factor which is acquiring decisive significance— the technogenetic. As a result, the previous dynamic balance between man and nature and between nature and society as a whole, has shown ominous signs of breaking down. The problem of the so-called replaceable resources of the biosphere has become particularly acute. It is getting more and more difficult to satisfy the needs of human beings and society even for such a substance, for example, as fresh water. The problem of eliminating industrial waste is also becoming increasingly complex. The threat of a global ecological crisis hangs over humanity like the sword of Damocles. His keen awareness of this fact has led man to pose the question of switching from the irresponsible destructive and polluting subjugation of nature to a reasonable harmonious interaction in the "technology-man-biosphere" system. Whereas nature once frightened us and made us tremble with her mysterious vastness and the uncontrollable energy of its elemental forces, it now frightens us with its limitations and a new-found fragility, the delicacy of its plastic mechanisms. We are faced quite uncompromisingly with the problem of how to stop, or at least moderate, the destructive effect of technology on nature. In socialist societies the problem is being solved on a planned basis, but under capitalism spontaneous forces still operate that despoil nature's riches.

Unforeseen paradoxes have arisen in the man-nature relationship. One of them is the paradox of saturation. For millions of years the results of man's influence on nature were relatively insignificant. The biosphere loyally served man as a source of the means of subsistence and a reservoir for the products of his life activity. The contradiction between these vital principles was eliminated by the fact that the relatively modest scale of human productive activity allowed nature to assimilate the waste from labour processes. But as time went on, the growing volume of waste and its increasingly harmful properties destroyed this balance. The human feedback into nature became increasingly disharmonised. Human activity at various times has involved a good deal of irrational behaviour. Labour, which started as a specifically human means of rational survival in the environment, now damages the biosphere on an increasing scale and on the boomerang principle —affecting man himself, his bodily and mental organisation. Under the influence of uncoordinated production processes affecting the biosphere, the chemical properties of water, air, the soil, flora and fauna have acquired a negative shift. Experts maintain that 60 per cent of the pollution in the atmosphere, and the most toxic, comes from

motor transport, 20 per cent from power stations, and 20 per cent from other types of industry.

It is possible that the changes in the chemical properties of the biosphere can be somehow buffered or even halted, but the changes in the basic physical parameters of the environment are even more dangerous and they may turn out to be uncontrollable. We know that man can exist only in a certain range of temperature and at a certain level of radiation and electromagnetic and sound-wave intensity, that is to say, amid the physical influences that come to us from the atmosphere, from outer space and from the depths of the earth, to which we have adapted in the course of the whole history of the development of human life. From the beginning man has existed in the biosphere, a complex system whose components are the atmosphere, the hydrosphere, the phytosphere, the radiation sphere, the thermosphere, the phonosphere, and so on. All these spheres are and must remain in a natural state of balance. Any excessive upsetting of this balance must be to the detriment not only of normal existence but of any existence at all, even human vegetation. If humanity does not succeed in preventing damage to the biosphere, we run the risk of encountering the paradox of replacement, when the higher plants and animals may be ousted by the lower. As we know, many insects, bacteria, and lichens are, thanks to their relatively simple structure, extremely flexible in adapting to powerful chemical and even physical factors, such as radiation. Mutating under the influence of an unfavourable environment, they continue their modified existence. Man, on the other hand, "nature's crown", because of the exceptional complexity of his bodily and mental organisation and the miraculous subtlety and fragility of his genetic mechanism may, when faced with a relatively small change in the chemical and physical factors of the environment, either produce unviable progeny or even perish altogether.

Another possible result of harmful influences on the environment is that the productivity of the biosphere may substantially decline. Already we observe unfavourable shifts in the great system of the universe: Sun-plants-animals-plants. Much more carbon dioxide is being produced on earth than plants can assimilate. Various chemical preparations (herbicides, antibiotics, etc.) affect the intensity of photosynthesis, that most subtle mechanism for the accumulation of the vital energy required by the universal torch of life. Thus, not only progress but even human life itself depends on whether humanity can resolve the paradoxes in the ecological situation that have arisen today.

Modern technology is distinguished by an ever increasing abundance of produced and used synthetic goods. Hundreds of thousands of synthetic materials are being made. People increasingly cover their bodies from head to foot in nylon, capron and other synthetic, glittering fabrics that are obviously not good for them. Young people may hardly feel this and pay more attention to appearance than to health. But they become more aware of this harmful influence as they grow older. As time goes on the synthetic output of production turns into waste, and then substances that in their original form were not very toxic are transformed in the cycle of natural processes into aggressive agents. One gets the impression that human beings are working harder and harder to organise bits of synthetic reality by disorganising the systems evolved by nature. Emphasising man's hostility to nature —a hostility armed with the vast achievements of modern technology— both natural scientists and philosophers are today asking themselves the pessimistic question: Is it not the fatal mission of man to be for nature what cancer is for man himself? Perhaps man's destruction of the biosphere is inevitable?

One would like to think that the limited capacities of nature do not signify a fatal limitation of civilisation itself. The irrational principle, which once permeated human nature, still exists in human behavioural mechanisms, as can be seen, for instance, in the unpredictable consequences of their individual and concerted efforts. Much in human activity goes beyond the limits of the predictable, even when it is humanely oriented.

The man-nature relation, the crisis of the ecological situation is a global problem. Its solution lies in the plane of rational and humane, that is to say, wise organisation, both of production itself and care for mother nature, not just by individuals, enterprises or countries, but by all humanity, linked with a clear awareness of our planetary responsibility for the ecological consequences of a civilisation that has reached a state of crisis. One of the ways to deal with the crisis situation in the "man-nature" system is to use such resources as solar energy, the power of winds, the riches of the seas and oceans and other, as yet unknown natural forces of the universe. At one time in his evolution man was a gatherer. He used the ready-made gifts of nature. This was how human existence began. Perhaps even today it would be wise to resort to this method, but on a quite different level, of course. The human being cannot restrict himself to gathering, any more than he could in primitive times. But such a shift in attitude could at least abate the destructive and polluting principle in civilisation.

As cybernetic methods and principles in the various fields of knowledge and practice develop, control theory has been widely applied in many spheres. Its aim is to ensure the optimal function of a system. A humanly oriented mind should be able to transfer the idea of optimality and harmony to ecological phenomena.

In their production activity people are mastering more and more new materials and learning to replace one with another. In the long term this could lead, as the alchemists once believed, to production on the principle of everything out of everything. Moreover, our planet has an active balance —it loses less substance in the upper layers of the atmosphere than it receives from outer space. It would therefore appear that the amount of substance available as a whole will not place any radical limitation on material production.

Life, including human life, is not only metabolism; it is also a form of energy transformation and movement developed to degrees of subtlety that are as yet beyond our comprehension. Every cell, every organ and organism as a whole is a crucial arena of the struggle between entropic (dispersing) and anti-entropic processes, and the biosphere represents the constant victory of life, the triumph of the anti-entropic principle in the existence of the living.

Losses of living energy from our organism are constantly compensated by various forms of energy flowing from the vast expanses of the universe. We need not simply energy, such as electromagnetic radiation or heat, but radiant energy of the finest quality. The struggle for the existence of living creatures, including man, is a struggle not so much for the elements that compose his organism —they are abundantly available in the air, water and underground— not for solar energy in its direct, electromagnetic radiation, but for the energy that is captured by the mechanisms of photosynthesis and exists in the form of organic, particularly plant structures. When we consume vegetable food, we take the energy of nature, particularly that of the sun, at first hand, so to speak. But plants are also the food of herbivorous animals, and when we eat meat, we take this energy at second hand.

So the biosphere is not a chaotic conglomeration of natural phenomena and formations. By a seemingly objective logic everything is taken into account and everything mutually adapts with the same obedience to proportion and harmony that we discern in the harmonious motion of the heavenly bodies or the integral paintings of the great masters. With a sense of wonder we see revealed before us a picture of the magnificent universe, a universe whose separate parts are

interconnected by the most subtle threads of kinship, forming the harmonious whole which the ancient philosophers surmised when they viewed the world with their integrating, intuitively perceptive gaze. We are part of the ecological environment and it is a part of the universe. It contains myriads of stars and the nearest of them is the Sun. The Sun is the master of Earth. We are, in a certain sense, its children. Not for nothing did the rich imagination on whose wings mankind flies ever further and higher in the orbit of civilisation portray the Sun in ancient legends as the highest deity.

But to return to our theme, the bitter truth is that those human actions which violate the laws of nature, the harmony of the biosphere, threaten to bring disaster and this disaster may turn out to be universal. How apt then are the words of ancient Oriental wisdom: live closer to nature, my friends, and its eternal laws will protect you!

Man and Society

The human being and the group. The problem of man cannot be solved scientifically without a clear statement of the relationship between man and society, as seen in the primary collectivity —the family, the play or instruction group, the production team and other types of formal or informal collectivity. In the family the individual abandons some of his specific features to become a member of the whole. The life of the family is related to the division of labour according to sex and age, the carrying on of husbandry, mutual assistance in everyday life, the intimate life of man and wife, the perpetuation of the race, the upbringing of the children and also various moral, legal and psychological relationships. The family is a crucial instrument for the development of personality. It is here that the child first becomes involved in social life, absorbs its values and standards of behaviour, its ways of thought, language and certain value orientations. It is this primary group that bears the major responsibility to society. Its first duty is to the social group, to society and humanity. Through the group the child, as he grows older, enters society. Hence the decisive role of the group. The influence of one person on another is as a rule extremely limited; the collectivity as a whole is the main educational force. Here the psychological factors are very important. It is essential that a person should feel himself part of a group at his own wish, and that the group should voluntarily accept him, take in his personality.

Everybody performs certain functions in a group. Take, for example, the production team. Here people are joined together by other interests as well as those of production; they exchange certain political, moral, aesthetic, scientific and other values. A group generates public opinion, it sharpens and polishes the mind and shapes the character and will. Through the group a person rises to the level of a personality, a conscious subject of historical creativity. The group is the first shaper of the personality, and the group itself is shaped by society.

The unity of man and society. A person's whole intellectual make-up bears the clear imprint of the life of society as a whole. All his practical activities are individual expressions of the historically formed social practice of humanity. The implements that he uses have in their form a function evolved by a society which predetermines the ways of using them. When tackling any job, we all have to take into account what has already been achieved before us.

The wealth and complexity of the individual's social content are conditioned by the diversity of his links with the social whole, the degree to which the various spheres of the life of society have been assimilated and refracted in his consciousness and activity. This is why the level of individual development is an indicator of the level of development of society, and vice versa. But the individual does not dissolve into society. He retains his unique and independent individuality and makes his contribution to the social whole: just as society itself shapes human beings, so human beings shape society.

The individual is a link in the chain of the generations. His affairs are regulated not only by himself, but also by the social standards, by the collective reason or mind. The true token of individuality is the degree to which a certain individual in certain specific historical conditions has absorbed the essence of the society in which he lives.

Consider, for instance, the following historical fact. Who or what would Napoleon Bonaparte have been if there had been no French Revolution? It is difficult or perhaps even impossible to reply to this question. But one thing is quite clear—he would never have become a great general and certainly not an emperor. He himself was well aware of his debt and in his declining years said, "My son cannot replace me. I could not replace myself. I am the creature of circumstances."¹ It has long been acknowledged that great epochs give birth to great men. What tribunes of the people were lifted by the tide of events of the French Revolution— Mirabeau, Marat, Robespierre, Danton. What young, some times even youthful talents that had remained dormant among the people were raised to the heights of revolutionary, military, and organisational activity by the Great October Socialist Revolution.

It is sometimes said that society carries the individual as a river carries a boat. This is a pleasant simile, but not exact. An individual does not float with the river; he is the turbulently flowing river itself. The events of social life do not come about by themselves; they are made. The great and small paths of the laws of history are blazed by human effort and often at the expense of human blood. The laws of history are not charted in advance by superhuman forces; they are made by people, who then submit to their authority as something that is above the individual.

The key to the mysteries of human nature is to be found in society. Society is the human being in his social relations, and every human

¹ Ralph Waldo Emerson, *Representative Men*, London, Bell and Daldy, 1870, p. 113.

being is an individual embodiment of social relations, a product not only of the existing social system but of all world history. He absorbs what has been accumulated by the centuries and passed on through traditions. Modern man carries within himself all the ages of history and all his own individual ages as well. His personality is a concentration of various strata of culture. He is influenced not only by modern mass media, but also by the writings of all times and every nation. He is the living memory of history, the focus of all the wealth of knowledge, abilities, skills, and wisdom that have been amassed through the ages.

Man is a kind of super-dense living atom in the system of social reality. He is a concentration of the actively creative principle in this system. Through myriads of visible and invisible impulses the fruit of people's creative thought in the past continues to nourish him and, through him, contemporary culture.

Sometimes the relation between man and society is interpreted in such a way that the latter seems to be something that goes on around a person, something in which he is immersed. But this is a fundamentally wrong approach. Society does, of course, exist outside the individual as a kind of social environment in the form of a historically shaped system of relations with rich material and spiritual culture that is independent of his will and consciousness. The individual floats in this environment all his life. But society also exists in the individual himself and could not exist at all, apart from the real activity of its members. History in itself does nothing. Society possesses no wealth whatever. It fights no battles. It grows no grain. It produces no tools for making things or weapons for destroying them. It is not society as such but man who does all this, who possesses it, who creates everything and fights for everything. Society is not some impersonal being that uses the individual as a means of achieving its aims. All world history is nothing but the daily activity of individuals pursuing their aims. Here we are talking not about the actions of individuals who are isolated and concerned only with themselves, but about the actions of the masses, the deeds of historical personalities and peoples. An individual developing within the framework of a social system has both a certain dependence on the whole system of social standards and an autonomy that is an absolutely necessary precondition for the life and development of the system. The measure of this personal autonomy is historically conditioned and depends on the character of the social system itself. Exceptional rigidity in a social system (fascism, for example) makes it impossible or extremely difficult for individual innovations in the form of creative

activity in various spheres of life to take place, and this inevitably leads to stagnation.

The relationships between the individual and society in history. To return once again to the simile of the river. The history of humankind is like a great river bearing its waters into the ocean of the past. What is past in life does not become something that has never been. No matter how far we go from the past, it still lives to some extent in us and with us. From the very beginning, the character of the man-society relationship changed substantially in accordance with the flow of historical time. The relationship between the individual and a primitive horde was one thing. Brute force was supreme and instincts were only slightly controlled, although even then there were glimpses of moral standards of cooperation without which any survival, let alone development, would have been impossible. In tribal conditions people were closely bound by ties of blood. At that time there were no state or legal relationships. Not the individual but the tribe, the genus, was the law-giver. The interests of the individual were syncretised with those of the commune. In the horde and in tribal society there were leaders who had come to the fore by their resourcefulness, brains, agility, strength of will, and so on. Labour functions were divided on the basis of age and sex, as were the forms of social and other activity. With the development of the socium an ever increasing differentiation of social functions takes place. People acquire private personal rights and duties, personal names, and a constantly growing measure of personal responsibility. The individual gradually becomes a personality, and his relations with society acquire an increasingly complex character. When the society based on law and the state first arose, people were sharply divided between masters and slaves, rulers and ruled. Slave society with its private property set people against one another. Some individuals began to oppress and exploit others.

Feudal society saw the emergence of the hierarchy of castes, making some people totally dependent on others. On the shoulders of the common toiler there grew up an enormous parasitic tree with kings or tsars at its summit. This pyramid of social existence determined the rights and duties of its citizens, and the rights were nearly all at the top of the social scale. This was a society of genuflection, where not only the toilers but also the rulers bowed the knee to the dogma of Holy Scripture and the image of the Almighty.

The age of the Renaissance was a hymn to the free individual and to the ideal of the strong fully developed human being blazing trails of discovery into foreign lands, broadening the horizons of science, and

creating masterpieces of art and technical perfection. History became the scene of activity for the enterprising and determined individual. Not for him the impediments of the feudal social pyramid, where the idle wasted their lives and money, enjoying every privilege, and the toilers were kept in a state of subjugation and oppression. At first came the struggle for freedom of thought, of creativity. This grew into the demand for civil and political freedom, freedom of private initiative and social activity in general.

As a result of the bourgeois revolutions that followed, the owners of capital acquired every privilege, and also political power. The noble demand that had been inscribed on the banners of the bourgeois revolutions —liberty, equality and fraternity— turned out to mean an abundance of privileges for some and oppression for others. Individualism blossomed forth, an individualism in which everybody considered himself the hub of the universe and his own existence and prosperity more important than anyone else's. People set themselves up in opposition to other people and to society as a whole. Such mutual alienation is a disease that corrupts the social whole. The life of another person, even one's nearest, becomes no more than a temporary show, a passing cloud. The growing bureaucracy, utilitarianism and technologism in culture considerably narrow the opportunities for human individuality to express and develop itself. The individual becomes an insignificant cog in the gigantic machine controlled by capital. Alienation makes itself felt with particular force.

What is alienation? It is the conversion of the results of physical and intellectual activity into forces that get out of human control and, having gained the whip hand, strike back at their own creators, the people. It is a kind of jinn that people summon to their aid and then find themselves unable to cope with. Thus, the state which arose in slave society, became a force that oppressed the mass of the people, an apparatus of coercion by one class over another. The science that people venerate, that brings social progress and is in itself the expression of this progress, becomes in its material embodiment a lethal force that threatens all mankind. How much has man created that exerts a terrible pressure on his health, his mind and his willpower! These supra-personal forces, which are the product of people's joint social activity and oppress them, are the phenomenon known as alienation.

The thinkers of the past, who were truly dedicated to the idea of benefiting the working folk, pointed out the dangers of a system governed by the forces of alienation, a system in which some people live

at the expense of other people's labour, where human dignity is flouted and man's physical and intellectual powers drained by exploitation.

The individual is free where he not only serves as a means of achieving the goals of the ruling class and its party but is himself the chief goal of society, the object of all its plans and provisions. The main condition for the liberation of the individual is the abolition of exploitation of one individual by another, of hunger and poverty, and the reassertion of man's sense of dignity. This was the kind of society of which the utopian socialists and the founders of scientific socialism dreamed. In contrast to bourgeois individualism, socialist collectivism starts off from the interests of the individual— not just the chosen few but all genuine working people. Socialism everywhere requires striking, gifted personalities with plenty of initiative. A person with a sense of perspective is the highest ideal of the creative activity of the socialist society.

Man as a Personality

The concept of personality. Whereas the concept "human being" emphasises man's biosocial, body-mind origin, the concept "personality" is connected mainly with his social and psychological aspects, such as his sense of dignity, his self-appraisal, his value orientations, beliefs, the principles by which he lives, his moral, aesthetic, socio-political and other social positions, his convictions and ideals, and also the character, the special features of his intellect, the style and independence of his thinking, the specific nature of his emotional make-up, his willpower, cast of mind and feelings, his social status.

One cannot conceive of a personality as something separate from the human being, or even from his external and general physical appearance. The personality (Lat. *persona*= mask) is the face that confronts us. When in their later years, people have plastic operations and face-lifts, they change their external appearance, which, as psychological observations have shown, also changes something in their mentality. Everything in a person is "interconnected" and affects the personality as a whole. What a person looks like is the outward expression of his inner world.

A *personality* is a socially developed person, one who is part of a certain specific historical and natural context, one or another social group, a person possessing a relatively stable system of socially significant personal features and performing corresponding social roles. The personality's intellectual framework is formed by his requirements, interests, frame of reference, peculiarities of temperament, emotion, willpower, motivation, value orientations, independence of thought, consciousness and self-consciousness. The central feature of the personality is world outlook. A person cannot become a personality without evolving what is known as a world outlook or world-view, which includes his philosophical view of the world.

A knowledge of philosophy is an inseparable attribute of a person's higher education and culture. Because a world-view is the privilege of modern man and its core is philosophy, one must know a person's philosophy in order to understand him. Even those who deny and make fun of philosophy possess a philosophy. Only the animal has no world-view whatever. It does not meditate upon things in the world, the meaning of life and other problems. A world-view is the privilege of the personality, that is to say, a human being uplifted by culture. Both historically and ontogenetically, man becomes a personality to the

extent that he assimilates culture and contributes to its creation. Our distant ancestor, in the conditions of the primitive horde and the initial stages of the formation of society, was not yet a personality, although he was already a person, a human being. A child, particularly in his earliest years, is, of course, a human being, but not yet a personality. He has yet to become one in the course of his development, education and upbringing. A human being may or may not become a personality. The child who is isolated from people and surrounded by animals does not. Personality may or may not take shape, and it may also disintegrate, be deformed, or broken up altogether either by pathological processes in the organism, mental disorders, alcoholism, and so on, or by certain extremely unfavourable, tragic circumstances.

So, the term "personality" implies an integrating principle that unites the biological and social in a single whole, and also all the psychological processes, qualities and states that regulate behaviour, giving it a certain consistency and stability in relation to the rest of the world, to other people and itself. The personality is a socially historical, naturally conditioned and individually expressed being. A human being is a personality inasmuch as he consciously distinguishes himself from everything that surrounds him, and his relation to the world exists in his consciousness as a certain standpoint in life. The personality is a human being who possesses self-consciousness and a world-view, and who has achieved an understanding of his social functions, his place in the world, who has comprehended himself as a subject of historical creativity, a maker of history. The essence of personality is not its physical nature but its socio-psychological properties and the mechanism of its mental life and behaviour. The personality is an individual concentration or expression of social relationships and functions, a subject of cognition and transformation of the world, of rights and duties, of ethical, aesthetic and all other social standards. When we speak of a personality, we have in mind its social, moral, psychological and aesthetic qualities crystallised in a human being's intellectual world.

In each of his essential relations a person appears in an especial quality, in his specific social function, as the subject of material or spiritual production, the vehicle of certain production relations, as a member of a certain social group, of class, the representative of a certain nation, as a husband or wife, father or mother, in short, as the creator of family relations.

The social functions which man has to perform in society are many and various, but personality cannot be reduced to these functions, even taken as an integral whole. The thing is that the personal is what

belongs to a given person and distinguishes him from others. In a certain sense one can agree with the view of those who find it difficult to draw a line between what a person calls "himself" and what he calls "his own". Personality is the sum-total of everything that a person may call his own. How does a person describe himself as a personality when he is asked what he is? He does this by relating himself to what he does or has done, by telling us with whom he is associated. Hence the principle: "Tell me who your friends are and I will tell you what you are." In addition, he tells us what belongs to him, what he has mastered, what he has made his own, and in what way he has fulfilled himself, to what context of life he belongs—labour, social, age, family, education, and so on. What belongs to the personality is not only his physical and intellectual qualities, but his clothing, the roof over his head, husband and children, ancestors and friends, social status and reputation, first name and family name. The structure of the personality also includes what it has given its strength to and also the powers that have been embodied in it. It is a personal manifestation of embodied labour.

Take, for example, a person's name. It is not something purely extraneous in relation to the personality. A name grows together, as it were, with the personality, becomes affixed to the face and forms something inseparable from the given personality. And only if he is playing someone else on stage, or works as an intelligence agent, or has adopted a different faith does a person change his name, and everyone knows how difficult that is both for the person himself and for others. The whole physical existence of the personality is confined to the framework of a person's life, to the limits of his complex biography. But does this account for the existence of personality in general? Of course, not. Particularly if we consider historical personalities, whose existence extends far beyond the framework of their bio-physical lives; they live on through the centuries and not only live but "work" actively through the hands and heads of subsequent generations.

Thus, the limits of the personality are far broader than those of the human body and its inner intellectual world. These limits may be compared to circles spreading over water; the nearest circles are the fruit of creative activity, then come the circles of one's family, one's personal property and friendships. The far-out circles merge with the seas and oceans of all social life, its history and prospects.

The fullness of the personality is expressed in its individuality, in its uniqueness, its irrepeatability. Personality in general is an abstraction, which is concretised in real individuals, in separate, single rational beings with all the inimitable properties of their mentality and

physique, the colour of their skin, hair, eyes, and so on. The personality is a unique representative of the human race, always particular and unlike any other personality in the fullness of his spiritual and material, physical life: every "ego" is unique.

Take, for example, a striking personality like Socrates. He attracted the attention of literally everyone he met both by his outward appearance and by his way of life, his beliefs, his activities, his teachings, and everything connected with his unique individuality. Socrates was rather stocky, with thick lips, a paunchy stomach, a short neck and a large bald head with a huge bulging brow. He had a habit of going about barefoot, both winter and summer, and looking around him with prominent eyes from under lowered brows. Marvelling at the individuality of Socrates, Alcibiades stressed the exceptional originality of his intellectual personality, in which something incomprehensible, mysterious, elusive seemed to be hidden. The most surprising thing was that he was quite unlike anyone else. In his manner and conversation Socrates was so original that we search in vain for anyone remotely resembling him either among the ancients or among the people of today.

One could similarly describe the appearance and personalities of other great men and eminent individuals, and each of them would be unique in some way.

A personality is an individual rational being. In the broader sense the individual is not only a person but a synonym for a separate specific being. This also applies to the concept of "individuality", which includes the personality's spiritual features as well as his physical peculiarities.

There is nothing more individualised in the world than the human being, the person, nothing in creation is more diverse than people. At the human level diversity achieves its highest peak, the world contains as many individuals as there are people. This is due entirely to the complexity of human organisation, whose dynamics would appear to have no limits. Human individuality is expressed in its having different opinions, in abilities, level of knowledge, experience, degree of competence, in temperament and character. Personality is individual to the extent that it has independence in its judgements, beliefs and views, that is to say, when the brain is not "stereotyped" and possesses unique "patterns". In every person, regardless of the general structure of his individuality, there are specific features of contemplation, observation, attention, various types of memory, of orientation, and so on. The level

of individual thinking varies, for example, from the heights of genius to the worst cases of mental retardation.

The principle of individualisation has its limits, its proportion. Beyond this borderline we come to complete relativism, which maintains that if every person has his own soul, then every person must also have his own world, and hence there are as many worlds as there are people. But the actual dialectics of existence tells us that the uniqueness both of outward appearance and a person's spiritual world is relative. It is derived from the universal, to which it belongs and from which it has sprung. The personality has a general origin, position, culture, language, certain standards, a world-view, and so on, that it shares with others. The more fully it represents, individually, the universal human principle, the more significant the personality becomes. Every person is a unique individuality in the whole complex of his physical and spiritual peculiarities, but at the same time he embodies the essence of the race and also certain general features of his class and nation.

People may be divided into various types, depending on the predominance of certain elements in the structure of their personalities. A person may be inclined to practical or theoretical thinking, to rational or intuitive understanding of reality, to operating with sensuous images, or he may possess an analytical cast of mind. There are people who are largely governed by their emotions. For example, sensuous types have an exceptionally highly developed perception of reality. For them the sensation is the concrete expression of the fullness of their life. A person of the intellectual-intuitive type constantly strives for new opportunities. He cannot be satisfied with a commitment to generally recognised values but is always seeking new ideas. People of this type are the driving force of culture, the initiators and inspirers of new enterprises. The types of personality may also be classified according to behaviour orientation. A person may be classified as extrovert or introvert according to whether his orientation is on objective reality or his own inner world. Introverts are often reticent, and rarely, or with difficulty, open their hearts to those around them. As a rule, their temperament is melancholic and they rarely stand out or come to the fore. Outwardly calm, even indifferent, they never try to compel anyone else to do anything. Their true motives usually remain hidden.

In psychology and sociology a person is usually characterised by his individual peculiarities. Qualities connected with a certain manner of perception or judgement and also with the way a person is influenced by his environment are singled out. Attention is focussed on originality, on the features that make a person stand out in society, on the

functions he performs, on the degree of influence he exercises or the impression that he makes on other people: "aggressive", "submissive", "hard", and so on.

Independence, decisive judgement, willpower, determination, passion, intellect and wisdom are regarded as highly important.

Intelligence and wisdom. What do we mean when we say a person is clever? Usually someone who thinks well, with subtlety and profundity, who is able to speak convincingly and precisely, and who suits his actions to present and future circumstances. Intelligence is an adequate reaction to a situation. A clever person is capable in any circumstances of coming to grips flexibly with events, of finding his place and asserting himself. He says no more than the situation and the circumstances demand, but is not at a loss if something of importance to the matter in hand needs to be said. Intelligence should be clearly distinguished from various other gifts, for example, talent, when a person because of his resourcefulness, the vitality of his intellect or phenomenal memory, his gifts of spoken or written speech is able to brilliantly interpret or convey something that has already been achieved by humanity, that is available in the general experience and to perfect it in certain ways. However, a talented person may not be clever, astute. These are different forms of human ability and they do not always go together. A talented person may be careless, unorganised, and unmotivated. He may be carried away by some idea, forget about everything else and even appear absurd to those around him, forgetful of the world, impractical and in general "have his head in the clouds". A clever or astute person has a well-ordered mind, is diplomatic in his words and actions. He may be quite untalented or possess only a small talent. But his chief advantage is his ability to make maximum use of even small gifts for the sake of achieving his aims, particularly those of a practical or organisational nature. The clever person does not suffer from the carelessness of the talented.

The highest expression of the gifted personality is genius, an unusually powerful gift of nature, moulded and polished by education and upbringing. History places on men of genius the tremendous and extremely responsible mission of pioneering new paths and, by the power of their mighty reason, advancing science, art, technology, and social and political life. Destiny endows the genius with strong wings for his great flights of imagination. They are capable of carrying him high in the realms of thought and in the world of public affairs. But anything that flies very high is extremely vulnerable to the lightning! And an essential feature of genius is courage. Very often these luminaries of

humanity are martyrs on whose shoulders human culture rises to new heights.

Both talent and genius are not only a gift of nature, not only the product of education and upbringing; they are also achieved by extraordinary diligence, which is a crucial component in the structure of talent. In analysing talent, genius and intelligence, I have no desire to contrast them. It would be absurd to speak of the genius being stupid. The stupidity for which humanity has as yet found no remedy is characterised by a primitive and muddled way of thinking. The judgements of the foolish person are poorly thought out, disordered and vague. He is always being diverted from the chosen direction of his thought and with the greatest difficulty struggles out of the jungles of his own vagueness and muddle. Foolishness comes from the inability to concentrate attention on anything definite and consists in a constant flitting from one object to another. Foolish people are a great burden to those around them. They are the embodiment of intellectual chaos and empty chatter.

The measure of human intelligence and its effectiveness is determined by the degree to which things, events and their transformation conform to logic. To a certain extent intelligence depends on experience, on knowledge. But an intelligent person is not merely someone who knows something. Much knowledge, as most people realise, does not necessarily make a person clever. Goethe's Faust was a person of great erudition but he was a split personality. With horror he sees in a mask features that are not characteristic of his true self. But he can do nothing about it. The metaphor fully expresses the common destiny of his contemporaries and this serves as some consolation to the hero. Finally, however, comes the moment of enlightenment. This is my real face and that which I believed to be my real face is, in fact, only a mask. There the mask is the symbol of adaptation to circumstances, the symbol of alienated impersonal forces that impose their laws, their way of acting and style of thinking on the personality. All their lives people perform roles, and yet preserve the stamp of their individuality, which itself, in essence, is a variation of the socially typical. We move freely within the framework of the role we have chosen or that has been chosen for us, and this frame has both its centre and its periphery. Some people may take efficiency to the point of bureaucratism or convert liberalism into anarchy, while others do their work intelligently, reasonably and even wisely. Role-playing demands discipline. But if it fetters the creative principle in the

personality, it loses its reasonable proportions and evokes a natural protest.

The choice of a role in life and its performance are, in effect, the whole of our life. And it is a bitter feeling when neither role nor performance are what we would have wished, what our true self desired and needed. In later life a person may ask himself bitterly, "Hasn't it worked out that the whole of my conscious life has been 'not what it should be'?" So intelligence is not merely knowledge in itself, but the ability to realise that knowledge, to apply it in practice. Intelligence is not simply a characteristic of thought but a special feature of the personality that is able to behave properly according to the circumstances.

When we wish to stress the highest expression of a person's intelligence we call him wise. Cleverness may be bound up with egoistic centres, with narrow personal expectations and everyday interests. Wisdom, on the other hand, has a rich moral content. Socrates associated wisdom with virtue, maintaining that one could not consider a person wise who possessed knowledge but lacked virtue. The clever person may turn out to be an adventurer, a criminal, and, as a criminal, the cleverer he is the more dangerous he may be. This cannot be the case with a wise man. The immoral and everything connected with the narrow egoistic centres of cold rationalism is incompatible with the very essence of wisdom. As a personal characteristic of perfect knowledge, wisdom presupposes the ability not only to apply one's knowledge, but to apply it skilfully and behave with dignity and consideration, in accordance with the objective logic of things and the interests of the matter in hand. The wise man has the ability to grasp the very essence of events, to solve problems that seem insoluble. The characteristic feature of wisdom is the achievement of maximum results with the least expenditure of means, the ability to grasp even the most confused situation and to find the best way out of what seems to be a hopeless situation and, while doing so, to maintain coolness and restraint.

A person who has true wisdom cannot live by the purely private interests of the philistine. This is the lot of stupidity, of self-satisfied and comfortable stagnation. A truly wise person is one who possesses knowledge of what really matters in life and behaves in accordance with the situation and the objective tendencies of its development, who would not spare even his life to have these tendencies realised. Wisdom is bound up not only with intellectual and emotional culture but also with moral culture, the ability and desire to use it in life, to bring good to

others. The truly wise person lives by the principle: we are forever indebted to one another.

Wisdom is often reduced to the notion of carefulness, caution, the ability to trim one's sails to the wind. But this is a great mistake. If everyone in society were that kind of wise" person, progress would slow down sharply. There would be no revolutionaries, burning with the desire to transform life in the interests of humanity, of the people. As a rule, this can only be achieved at the cost of suffering or even life itself. Wisdom, of course, presupposes not only knowledge but also a reasonable way of life, which cannot however be identified with moderation, obedience and certainly not with mere adaptability. "Wisdom for a man's self is, in many branches thereof, a depraved thing. It is the wisdom of rats, that will be sure to leave a house somewhat before it fall. It is the wisdom of the fox, that thrusts out the badger, who digged and made room for him. It is the wisdom of crocodiles, that shed tears when they would devour".¹

Personal self-appraisal. The human being as a personality is a self-appraising being. Without this ability it would be very difficult or even impossible for anyone to assert his identity in life. A true self-appraisal presumes an adequate degree of self-consciousness and knowledge of one's intellectual, emotional and volitional powers, the features of one's character and in general everything that goes to make up one's mental and spiritual world, and also one's physical abilities. Life makes extremely varied demands upon us. We are constantly obliged to relate these demands to our capabilities so that our obligations do not exceed our powers. Otherwise there are bound to be internal conflicts and breakdowns, disorders of our neuro-psychological organisation, which may lead to various kinds of illness. An adequate self-appraisal implies the ability to set oneself realisable goals, to rationally control the flow of one's thoughts, to guide their general direction and choose their final destination, to constantly check the suppositions one is making and to weigh up pros and cons, to reject unjustified variants and hypotheses, in other words, to be self-critical. In performing the very important function of organising effective control of one's behaviour, self-appraisal is a necessary precondition for measuring the level of one's expectations, i.e., the tasks that a person sets himself and considers himself capable of accomplishing. A true self-appraisal enables us to abandon any undertaking we may have begun if we realise that it

¹ *Essays, Civil and Moral and The New Atlantis* by Francis Bacon in a collection, P. F. Collier and Son Company, N.Y., 1909. p. 61.

cannot yield good results, and particularly if we see that it is a wrong or harmful course.

Self-appraisal helps to establish a person's dignity and gives him moral satisfaction. A correct appraisal leads to inner harmony, ensuring a reasonable self-confidence, an incorrect one, to constant conflict. The ability to see oneself as one really is is the highest degree of self-appraisal and is to be found only in wisdom. As the experience of history has shown, even some very intelligent people, not to mention mediocrities, suffer from conceit, while others, on the contrary, fall into a state of self-depreciation and acquire an inferiority complex.

To make a true appraisal of oneself, a person needs to take into consideration all his personal experience, although sometimes even this is not enough. One must test and check on many levels: one's own experience in personal life, the overall experience of humanity, public opinion, particularly the opinion of those who are something, and also the power of one's own reason. The ability to assess one's own value springs initially not from the depths of the personality itself but from outside. A person begins to sum himself up more or less correctly after he has learned to adjust to other people and take in their assessments of himself. A child acquires a notion of himself on the basis of the assessment made by adults and by children of his own age. Subsequently a great deal depends on teachers, who check both the pupil's intellectual development and behaviour, pronouncing their judgement both in words and in marks. Here one has an intensive daily correlation of oneself with the behaviour, words and actions of others, particularly one's classmates. The growing child comes to know himself more and more fully and accurately and to judge himself by receiving encouragement or criticism that corrects his own self-appraisal. In short, the result is that we find ourselves in others and begin to penetrate more and more deeply into our own world. We thus look at ourselves primarily through the eyes of society, the eyes of its whole history, and then through the eyes of the future, which emerges as the supreme judge of our present, of our thoughts, actions and our own self-appraisal. At first the individual assesses himself through others, and later he himself becomes a yardstick for assessing others. In this complex interaction of personal relationships one observes a general principle: self-appraisal and self-testing of the personality is mediated, indirect social appraisal and testing.

Self-appraisal has a wide range of modalities, beginning from Narcissus-like self-adoration to pitiless self-condemnation, bordering on cruelty, or pangs of conscience so violent that they may sometimes drive

a person to a tragic end. An abated and more relaxed form of self-condemnation is constant scepticism, remorse, a painful contempt for oneself, an inferiority complex and, in general, a convoluted personality, which has no confidence in anything and believes in nothing, a personality tangled up in itself. Such self-consciousness is permeated with a feeling of constant anxiety and tragedy. But this state of mind, no matter how regrettable, is often the fate of people with a very subtle and hence vulnerable spiritual make-up. Self-admiration, over whelming self-confidence approaching arrogance and acting on the principle that everything is permissible, is quite a different matter. Arrogance uses not the mind but the elbows and fists, bulldozing its way through. It can be put down by a sudden and vigorous rebuff or protest. Otherwise it runs riot until it is curbed by severe public censure or even by legal coercion. The mild appeal to the conscience of those who have no conscience is useless.

Personal self-appraisal and also self-appraisal by a social group, a party or nation is an exceptionally complex psychological phenomenon. People have somehow evaluated themselves from time immemorial. We find such self-portraits in diaries, autobiographies, letters, paintings, religious and other forms of confession. True self-portraits are rare. Most people are tempted to embellish themselves in the eyes of others and of history. It is rather different with one's own self. In his secret thoughts a person can be perfectly frank and trust himself with the whole truth. Yet much of what people think about themselves is pure illusion, which they nevertheless cherish because it helps them to endure the difficulties and disappointments of real life. Here not only moral but epistemological factors come into play. A person is not really so clearly visible to himself. Fear of public opinion and fear of losing prestige, lack of clarity in one's self consciousness, all these things lead people to misjudge themselves. Here we may observe a specific tendency to compensate one or another kind of one-sidedness in the personality, a quite understandable desire to maintain psychological equilibrium, which has a valid biological purpose. This is no apology for incorrect self-appraisal but a desire to understand what brings it about. Knowing all this, everyday wisdom advises us to judge a person by his deeds rather than by what he says about himself.

What is the human "Self"? In ancient times the concept of the Self was the object of much attention among the philosophers of India. The Self was interpreted as individuality of spiritual existence, as the vehicle of the infinitely diverse relations of the personality both with itself and with everything around it. With great zeal and psychological detail this

amazingly subtle and complex problem has been tackled, mostly at the practical intuitive level, in the various schools of yoga, which have refined their methods of self-training to an astonishing degree, making wide use of the techniques of long and systematic concentration on one thing, such as the state and functioning of the internal organs. In order to achieve complete isolation the yogis went out into the deserts, the mountains, the forests and plunged themselves into the contemplation of the world and themselves, and achieved amazing results in self-control, in changing their physical states and reaching the point of dissolving themselves in the natural whole and the total self-abnegation known as nirvana, a state of unequalled beatitude. By means of exercises evolved through the centuries the yogis achieve great self-control over both body and mind. Yoga has been practised for thousands of years and allowed its adherents to make a very subtle analysis of the gradations of the various states of the Self, the levels of its regulative functions, the specific features of its structure.

In ancient Greek culture, the problem of the Self attracted particular attention from Socrates. He thought of it as something independent, supra-personal, as a very powerful razor-sharp conscience—the *daimonion* by which he was guided at the most critical moments of his life. This dictating or advising Self told him how best to act.

In medieval philosophy the Self was identified with the soul, whose volitional, emotional and intellectual forces were striving for communion with God. The individual is torn between constant fear of punishment and hope of salvation, of the forgiveness of sins, of the goodness of the Lord. He feels himself a helpless toy before the absolute power of the Creator, while at the same time he carries on a constant dialogue with God, appealing for his help at moments of trouble and despair and imploring forgiveness for his sins. The individual is always and everywhere watched over by a god regarded as the regulating principle in the structure of the Self. This is observed with great psychological subtlety in the "Confessions" of Saint Augustine, who identifies the sense and knowledge of Self with the sense of God in oneself. Augustine maintained that he could not even have a Self if there were no God in him as the regulating principle of his personal will. Thomas Aquinas was, in effect, proceeding from the same principle when he maintained that everyone should test his actions in the light of the knowledge given to him by God. On the whole, the Christian orientation is on personal spirituality, as expressed in the maxim: "Linger not without, but enter into thyself!"

Beginning with the Renaissance, the orientation of the Self changes sharply. Leonardo da Vinci defined man as a model of the universe. The personality sets out to reveal itself. This is the time of the triumph of individuality, the great awakening of the sense of being a person. The individual enters the arena of modern history, asserting the principle of the self-sufficient value of the Self. According to Descartes, Self means the same thing as "my soul", thanks to which "I am what I am". A thinking Self knows only one incontrovertible truth—that it thinks, doubts, affirms, desires, loves and hates. Descartes stressed the rational principle in the structure of the personality. In his philosophy the Self acts, above all, as the subject of thought, its regulator and organiser. Rejecting the Cartesian interpretation of the Self as a special substance, English empiricism regards the Self as a totality of processes. ". . . For my part, when I enter most intimately into what I call *myself*, I always stumble on some particular perception or other, of heat or cold, light or shade, love or hatred, pain or pleasure. I never can catch *myself* at any time without perception, and never can observe anything but the perception." So the Self, it turns out, is nothing but a bundle of perceptions, which "succeed each other with an inconceivable rapidity, and are in a perpetual flux and movement".² These profound reflections of a subtle thinker show that our subjective pursuit of the essence of the Self is constantly baffled by the actual flow of the concrete sensations of the given moment, either directed inwardly or outwardly. Nothing else is perceived. This is rather like a traveller in a wood, who literally cannot see the wood for the trees. He is in the wood and therefore cannot see it as a whole. It is just the same with ourselves. Wishing to reconcile rationalism with empiricism, Kant distinguished two types of Self, the empirical and the pure. The first was the flow of intellectual processes, of various sense impressions rushing hither and thither, while the pure Self was something that had a kind of supra-individual character. Its basic function was to unite the multiform by means of pure categories of Reason. This was known as transcendental apperception, which meant the unity of consciousness, which was the essence of the Self.

According to Hegel, the Self is the individual as a universal formula embracing all personalities in general. The individual "self s" become part of the formula as a means of giving it individual expression. Hegel loathed all preoccupation with the individual and had a great bent for raising the individual to the universal, to an all-embracing formula in

² *The Philosophical Works of David Hume*. in four volumes, Vol. 1, London, 1874, p. 534.

which everything intimately personal dissolved. In Hegel the Self as a universal formula swallows up all the concrete egos of separate individuals.

In contemporary Soviet philosophy and psychological literature the concept of the Ego or Self is usually identified with that of the personality. In my view, this is not quite correct. The concept of the personality is much wider than that of the Ego. It cannot be identified either with consciousness or self-consciousness because it also embraces something from the depths of the subconscious, and this something acts as a kind of irrational "governor" in the structure of the personality when the unconscious takes into its sinister hands the will of the individual and drives the flows of energy towards irrational behaviour. This is seen particularly clearly, for example, in neuroses of obsession and paranoidal forms of schizophrenia. The person who suffers from such mental disorders becomes a prey to voices and images that command him and guide his thoughts and feelings into nightmares of illogicality and disordered conduct, void of all adaptive powers.

Man's mental world, generated by the brain and depending on its biophysical condition and the state of the organism as a whole, presents a kind of relatively independent structure, with its own logic, its own specific mental mechanisms, the elements of this structure are mental states, processes and formations. Moreover, these elements may have several values and are not all of the same value. And it is this intimately profound subject of all mental phenomena in their integral wholeness that forms the Ego. This Ego is the spiritual nucleus in the structure of the personality. It is the very deepest and most profound part of it. In its essence it is psycho-social. When people speak of "my Self", they have in mind something that is not simply personal but intimately personal in the highest degree, something extremely precious and valuable and therefore vulnerable. Hence the phenomenon of "hurt Ego", when the personality is wounded to the quick on its tenderest spot. It is damage to our Ego that causes our most painful and morbid reactions and moral suffering. The Ego is the throne of conscience itself.

The term "Ego" or "Self" also denotes the personality as seen in the light of its own self-consciousness, i.e., a personality as perceived by itself, as it is known and felt by the Self. The "Ego" is the regulative principle of mental life, the self-controlling force of the spirit; it is everything that we are essentially both for the world and for other people and, above all, for ourselves in our self-consciousness, self-appraisal and self-knowledge. The "Ego" presupposes knowledge of and

a relationship to objective reality and a constant awareness of oneself in that reality.

Sensuous and conceptual images, states and goals are all part of the Ego, but they are not the Ego itself. The Ego rises above all the elements that compose the spirit and commands them, regulates their life.

Every personality has a large number of facets to its Ego—what it is in itself, how it is mirrored by its own self-consciousness (the "Ego image") in general and at a given moment in time, what kind of ideal Ego it conceives (what it would like to be), how it looks in the eyes of other people at a given moment, particularly the eyes of "those who are something" and also the "eyes" of the future and even, posthumously, of history, while among religious people it is important how the Ego looks in the "eyes" of God. All these constantly interflowing aspects of the Ego, glittering with their own specific colours, possess a certain stability, balance and harmony. The Ego is essentially reflexive. Its regulative and controlling power takes part in every act of the individual. It is not the separate mental processes, formations, properties and states, as was assumed by Hume and long before him by Plato, who urged his readers to think of themselves as wonderful living dolls manipulated by the gods. The internal states of the personality are controlled by very fine strings, which pull a person in various and sometimes opposite directions, some towards good and others towards the precipices of vice. But, one may ask, who pulls these strings? In Plato, it is a god who made these dolls, called human beings, either for his own divine pleasure or for some serious purpose unknown to us.

If we look at the problem through the categorial apparatus of modern culture, we find that our Ego is nothing but the integrity, the wholeness of our mental, intellectual world, notwithstanding its internal contradictions, which are nevertheless harmonised if, of course, the Ego is in order. The healthy vector of its energy flow is vitality-oriented, life-asserting and in general self-asserting. The means by which it asserts itself in the stream of existence depend on the level of its moral culture.

To recapitulate, the Ego is not just the sum-total of sense impressions; it is that to which all impressions are related. It is not only the vehicle of consciousness, self-consciousness, world-view and other intellectual phenomena, but also the core of a person's character, the expression of his principles and positions. It is a living bundle not simply of experience accumulated by the individual in action, but of the active and guiding force of experience, the power of selfhood, a certain psychic mechanism regulating this experience and expressed in the fact that the

individual feels himself to be the master of his desires, emotions, thoughts, efforts of will and actions. Through the prism of our Ego we become aware of the difference between us and everything else, and feel the constant identity of ourselves with ourselves. The fact that the Ego performs the role of "master" in the spiritual world of our subjectivity is aptly illustrated by the phenomena of dreams. In dreams the "master" is absent or rather he is asleep; his controlling power is no longer active and hence the meaningless kaleidoscope of images, whose origin, direction and purpose we cannot understand any more than we can understand their connection with other equally strange guests of our soul.

In a normal waking state, however, the flow of our feelings and volitions has its own logic, a certain integrity and organising principle, and also a surprising stability of the whole amid this constant change of its elements. The Ego is something united in its diversity and variability. The Ego of our childhood is something quite different from the Ego of puberty and adolescence. The Ego of maturity differs substantially from the Ego of rebellious youth with its abundant hopes, and also from the Ego of old age and senility, burdened with physical disabilities and an intense awareness of the approaching and inevitable end.

The differences spanned by the age ladder, particularly between its top and bottom rungs, are so great that it is hardly believable that this is one and the same person. Evidently we all experience something similar when we look at photographs taken in our childhood, from which gaze the naive, innocent, inexperienced eyes of our distant and almost dream-like past. Our Ego may also change almost instantaneously, depending on the state of our health. It is different in a state of sickness from when we are healthy. At times of joy and inspiration and high flights of the intellect the Ego differs greatly from what it is when we are tired. And how enormously, sometimes beyond recognition, does the Ego change under the influence of drink! As the poet says:

At every instant we are not the same.

All changes, changes not the name.

At the same time in all this interflow of the changing Ego, in all conditions, something invariable, stable, integral is preserved which, like the thread of Ariadne guides a person through life, saving the something that is his Ego, the something that distinguishes it from any other Ego. Through out his life a person carries in himself all his ages, recorded on the "tape of memory". Without this thread that leads us along all the

roads of life, our Ego would fall apart into separate, disintegrated acts of existence and feeling.

The Ego is impossible without concrete sensations, thoughts, feelings and motivations, principles, positions and value orientations. But sensations, thoughts and feelings constantly change, moving from one qualitative state to another. They may also be controlled, programmed, for example, as in the change of personality achieved by an actor. If the Ego were nothing more than these separate acts of consciousness, it would change together with them and there would be no unity in this diversity of constantly changing states. There are "situational personalities" who drift with life and become so malleable that they adapt to any situation, become mere playthings of circumstance. And there are also natures that are quite the opposite, integrated, stable, confidently and firmly following their chosen path in life.

The fact that the Ego remains relatively stable and can resist external influence is based on the brain's ability to record, store and reproduce information. A person regards even his childish pranks as his own, although they were performed by a different body and a different (child's) mind. Between our Ego of today and our Ego of yesterday lies a night full of dreams—the triumph of the unconscious, in which the chain of conscious acts is broken. There would be no continuity between these Egos but for the bridge of memory that spans the gap.

The plasticity and variability of our Ego reveals itself also in its changes of role. At work as a manager a person is different, for example, from what he is in the role of father of the family. When he finds himself in an official atmosphere a person cannot permit himself all that he does in the family circle. Constantly moving with the flow of life, every person changes his Ego on entering an office, his home, a railway carriage, an airplane, theatre, hospital, and so on. Every day of our lives we are in motion, crossing various thresholds, entering this or that place, which has its own specific psychological atmosphere, requiring a certain readiness, a certain tuning of thought and feeling, a certain attitude and state of mind. Any change of situation influences our state in some way.

This is particularly apparent when a person is in critical situations, taking an examination, consulting his doctor, meeting somebody he loves, and so on. In order to cope with such situations a person must reckon with what lies beyond each "threshold of existence". But despite the amazing plasticity of our Ego, it possesses, when healthy, an internal connectedness, integrity and relative stability.

That this is so can be seen in cases of mental illness. Highly relevant to our understanding of the human Ego is the well-known syndrome of depersonalisation, which sometimes assumes the strangest forms of deformation of the personality, ranging from a diffused awareness of Self to the complete disappearance of self-awareness, when a person loses the sense of controlling his own feelings, thoughts and actions: I am no longer I. The initial stage of this mental disorder is derealisation, when reality is removed, alienated from the person; objects, events and people, without losing their empirical existence, become psychologically insignificant, unreal in the sense that the patient is incapable of establishing any meaningful contact with them. A wall rises between him and the world in general. He is alienated from his surroundings. He sees and understands but feels everything in a different way from what he did before. He loses his intelligent, comprehending sense of existence. The perception of things becomes a sensationless, "dead" fixation of only their outward appearance. In more serious cases, when depersonalisation in the full sense of the word takes place, the patient loses all sense of the reality of his own body. The body is alienated and seen as something extraneous, the patient ceases to be aware of any form of life activity. He suffers from complete apathy. His feelings are blunted, he no longer experiences any joy in life. All its emotional colours fade. Out of sheer necessity he tries to appear cheerful. But inwardly he is drained and empty and consumed by hopeless misery. At times of temporary depression, overfatigue, a bad mood, apathy evoked by certain unfavourable circumstances, such a state can, of course, overcome people who are mentally quite healthy. In such cases the zest for life is sometimes lost, everything seems grey, dull and uninteresting. But when the condition becomes permanent, it may cloud the reason, destroying the unity of the Ego, splitting or even causing pluralism.

Psychiatry has described cases of the so-called alternating Ego, when a person somehow has within himself two coexisting autonomous Egos, which take possession of him for periods of a few hours or even years. In such cases, when dominated by one Ego, a person is unaware of the existence of the other. Everything he does under the sway of his other Ego is ousted from his consciousness. The two Egos may be quite different from one another and even opposites. If the first Ego is shy, timid, indecisive and oversensitive, the second Ego may be very resolute, unceremonious, outgoing, free, and even impudent. The second Ego may know nothing at all about the life of the first. Sometimes one Ego is more grown up than the other.

Such is the tragedy of mental disorders. When a person is in a healthy state he carries through the whole of his life, through all its transformations, transmutations and states, the stable nucleus of his Ego, conditioned both by the unity of his bodily organisation, particularly the nervous system, and by the sturdy framework of character, temperament, and manner of feeling, thinking and acting. When remembering any stage of the path travelled, some surrender of principle or taste, a person tends to identify his present Self with the past, his childhood and youth, with mature age. Not everything in us flows away irredeemably with the river of oblivion.

Thus, the human Ego, while substantially changing under the influence of social conditions and together with growing knowledge, cultivated emotions and training of the will, and also with changes in physical states, health, and so on, nonetheless preserves its intrinsic integrity and relative stability. Thanks to the existence of certain essential invariable characteristics of the structure of his mental world, a person "remains himself". We move from one stage in life to another, carrying with us all the baggage of our intellectual gains, and change as this wealth increases and our physical organisation develops.

To sum up, at the point when the Ego comes into being there is a self-identification of the personality; it knows itself. The Ego is a unity, an entity of spiritual and physical existence. It is given as the vehicle of infinite relationships both with the surrounding world and with ourselves. These connections, while infinitely diverse, are possible only thanks to this unity and wholeness of mind as the system of the highest organisation of everything we know.

Man the Doer

The concept of human activity. A human being lives in a material and spiritual world. He is connected with nature and the events of social life by innumerable material and spiritual threads. In this constant interaction between the individual and the world there is a meaning which is denoted by the comprehensive term "life". The social effect of the individual's activity is determined to a great extent by his position in the structure of the social whole. The individual world forms around the things, institutions and relationships created by human beings, and around other people and their activity. Human activity is motivated by needs which are the objectively determined forms of a person's dependence on the external world, his subjective expectations of that world, his lack of certain objects and conditions that are necessary for his normal activity, self-fulfilment and development.

A person's life is not simply vegetation in the world, but a purposeful, historically shaped form of creative social activity. A person achieves maximum growth when he expresses this active essence to the fullest extent. According to Saint-Exupéry, the inner life of Louis Pasteur when he bent excitedly over his microscope was self-fulfilling. Pasteur became a person in the fullest sense of the term when he was observing. This was when he was in a hurry. This was when he was moving forward with huge strides, although physically he was completely still, and yet here he saw infinity revealed before him. Or, to take another example, Cezanne, standing motionless before his easel, was also living an invaluable inner life. The painter was at his most human when he was silent, observing and judging. It was then that his canvas was as infinite to him as the ocean.

Action is the clearest and most expressive revelation of the personality, the revelation of a person's state of mind and his goals.

What is activity? In the broad sense it is behaviour regulated by the mind, by consciousness, a process of interaction of living beings as integral systems with the environment. Only man is capable of the highest forms of activity. Activity, as the basic mode of social and personal existence and the decisive form of man's self-fulfilment in the world, is a complex integral system. It comprises such elements as need, goal, motive, and purposeful activity itself as a process consisting of separate acts and movements. Activity is always directed at a certain object. Without this objective orientation it is not activity. Moreover, the influencing of an object presupposes the application of certain

means. The concept of the means of activity is very broad, comprising not only the ordinary tools, beginning with the stick, the chisel and ending with modern machinery and logical robots, but also goal-achieving means that have a moral content.

Activity, in realising its goal, culminates in a certain result, which is also a part of its structure. In short, in performing any activity a person always proceeds from a certain need and out of something, by means of something and for the sake of something, creates something.

The ultimate cause of activity lies not in the subject himself and his will. The real basis of will, which manifests itself as a fusion of thought and feeling, is need. It is through the objects that satisfy them that needs acquire their objective quality. A person constantly experiences dissatisfaction, the upsetting of the balance in his organism and the world of his mind, his consciousness; he is constantly deprived of something that is necessary for the restoration of this equilibrium; he constantly desires something and strives for something.

Need is constantly reproduced and modified through changes in the character of the objects and the modes of their satisfaction. In the course of history all people's needs have undergone substantial transformation. In our activity we are both subordinated to our needs and constantly free ourselves from them. We have a highly intricate hierarchy of needs, from the simplest biological, physiological and material needs to the most subtle demands of the intellect, demands of a moral, aesthetic and generally spiritual nature. Needs may also be classified as objective, that is to say, needs for certain objects, and functional, needs for certain forms of activity. As a certain state of the organism and the mind, need prompts the individual to mobilise his biological, psychological and social activity to restore equilibrium. There is no escape from need. It demands satisfaction, which can be achieved only through activity designed to bring satisfaction. Conscious need, having discovered the object of its satisfaction, becomes a goal. It is the goal that provides the model for that part of the content of our thought that must become action. A goal is the intended result of activity, an ideal model of a desired future. Through his anticipatory thinking a person creates a certain plan of the expected results of his activity. If the activity coincides with this plan, it is culminated and ceases, if it does not coincide, the information again circulates and the search for a solution continues. Every action presupposes two closely interconnected processes: anticipation, foreseeing of the future, and programming, planning of the ways of its achievement. Thus activity obeys a force moving from the individual's past experience towards the future, and

the goal-setting force that moves from the future to the present. From being the ideal form of the goal the future is transformed into the reality of the present. A goal determines the means for changing a thing, and an effort of will makes it possible to achieve the goal through action. While thought takes the world as it is, will, on the contrary, aims at making the world into something that it should be. It is the will that enables us to objectify the force of knowledge. The effectiveness of activity depends to a great extent on our ability to see the connection between the goal and the means of its achievement.

The term "means" implies everything that exists for the achievement of a goal. It may be a hand, the surgeon's scalpel, the bandit's knife, the axe of the savage, modern machinery, an animal, or another person. A thing is not a means unless it has a goal, and a goal is merely an abstract and empty desire if there is no means to achieve it. In a certain sense, a means is something higher than a goal. Possession of means gives a person great power over nature, whereas when formulating his goals he tends to be subordinate to nature. Human reason constantly, persistently and inventively creates increasingly powerful and sophisticated means, and puts them to work for the achievement of its countless and constantly proliferating goals.

We have been analysing human activity as the highest form of activity, but activity also exists in animals, which also proceed from needs, from the goals and means available, but the determining factor in animal behaviour is only biological need. Activity in general is a property of the animate form of the organisation of matter, when its animate structural formations acquire the ability to perceive, store and transform information, using it for purposes of survival and adaptation to the conditions of existence or —at the human level— their active rational modification. So one can speak of the behaviour of non-organic objects (for example, the behaviour of the electron, the planet, a machine, and so on) only in the metaphorical sense.

The term "behaviour" is applicable both to individuals and to groups of individuals—the behaviour of the biological species, the behaviour of the social group.

Of fundamental importance in activity is a person's world-view, which determines the orientation of activity and its social value. Human activity is inseparably connected with the system of speech signals which a person assimilates in the process of communication with other people. This provides the preconditions for the transference of external activities to the internal plane. This is what enables us to create the

image of the desired future in our consciousness, to evaluate ourselves and maintain self-control.

In social life a person's activity depends on the character of his relations with the groups of which he is a member. The group itself acts as a special kind of subject of activity, with collective goals and motivations. In group behaviour one observes such unique phenomena as imitation, emotional "infection", empathy, the subordination of individual activity to group standards and role requirements, and the appearance of a leader, a person exerting the most influence over the group.

The evaluative, axiological aspects of activity appear most clearly when activity acquires the character of an act, an action that has a sharply expressed personal significance and is related to a special social responsibility both in its accomplishment and in its possible consequences. Heroic acts have a special place in all human activity. In the social consciousness only an individual, guided by the highest moral ideals, who fearlessly, at the risk of his own well-being or even life itself undertakes an action for the sake of these ideals, deserves the evaluation of heroic. This is what raises the heroic act above the level of ordinary human activity.

Any real behaviour is affected by the complex relationship between its conscious and unconscious components. Although, at bottom, human activity is rational and follows a certain logic, which actively reflects the objective logic of real events, human activity also comprises unconscious psychological factors, whose influence is most apparent in the emotional sphere, in likes and dislikes, in the affective manifestations of behaviour and so on, when it obeys the "logic of the emotions".

The most significant symptoms of pathological behaviour are the individual's failure to respond to the demands of the objective situation and his own principles, a discrepancy between the objective stimulus and the behavioural act, between motive and action. The integrity of behaviour is destroyed by any breakdown of the connection between its verbal and actual planes. An action is begun but not completed according to the individual's intention, the critical faculty controlling the realisation of the programme of action is weakened, and obsessive activities take place, compelling the individual to act independently, as it were, of his own will.

Because it is socially conditioned, human behaviour changes its character in different societies. The characteristic feature of human

behaviour in a socialist society is its orientation on realisation of the highest moral and social ideals, its adherence to the principles of the scientific world-view.

Motivation. Activity is not just the spontaneous reactions of the individual. It is stimulated by external and internal forces which are called motives.

Motivation is a crucial factor in the spiritual, mental regulation of life-activity, a factor which stimulates such activity and gives it its selective, stable orientation. As an expression of human activity, motivation tells us why, for what purpose and in what way a person's actual activities are carried out. The concept of motivation embraces a broad range of intellectual phenomena constituting the personality and its activity—needs, attractions, intentions, interests, precepts, stance, value orientations and ideals. Nobody does anything or can do anything without doing it for the direct or indirect satisfaction of his needs and interests. But motivation as such cannot be reduced to one of these mental factors. Because it is closely connected with need and interest, motivation may in certain circumstances come into contradiction with them. Actions imposed on the individual from outside, particularly those that are imposed forcibly, against his will and interests, and thus sometimes setting up a very sharp motivational conflict, fall into a special category.

To understand the meaning of any action or deed one must discover why it was performed, i.e., what its motivation was. Unmotivated actions often bespeak pathological disorders in the individual. Objectively motivation may not coincide with its subjective reflection in the consciousness, with the way the individual himself explains the causes and purpose of his actions, not only in cases when he deliberately hides them, but also when he is puzzled as to the true motivation of his actions. Identification and comprehension of human motives help to restore mental health in cases of neurotic behaviour. Motivation is a crucial factor not only in the realisation of actions but in their inhibition, which plays an important part in shaping the personality with a stable will, capable of resisting undesirable impulses and attractions. Motivation may come into conflict with the organism's direct biological needs, regulating behaviour in contradiction to these needs or impelling a person to perform actions that compensate for their absence. For example, in a sick man who feels no need for food the absence of this need is compensated by the motivation created by his understanding of the importance of food for the function of his organism. A motivation comprises not only certain goals but also the

ways of achieving them. Even man's most elementary organic needs are conditioned by the history of society and culture. Hunger is always hunger. But hunger which is satisfied by roast meat with various flavourings or spices, and eaten with a knife and fork is not the same as the hunger satisfied by tearing at the bloody flesh of the prey.

In the development of the theory of the personality the category of motivation has always been treated as one of the most fundamental. It comprises all the motivating forces of human behaviour, defined by such terms as "instinct", "passion", "emotion, affect", and so on. Up to the time of modern psychology, which now has a developed apparatus of categories, the phenomena related to motivation were attributed either to the effect of organismic needs (hunger, thirst, self-preservation) or to the activity of the consciousness and will, understood as special immaterial forces. The specific feature of motivation as a psychological factor that could not be reduced either to physiological mechanisms or to projections in the individual's consciousness was not investigated. The first psychological theories of motivation were proposed by Sigmund Freud and his school, by the German psychologist Kurt Lewin and the American behaviourists. All these theories share the notion that motivation intervenes in the system of tensions between the individual and his environment as a way of releasing this tension. The general biological principle of homeostasis was thus extended to the psychological regulation of behaviour. Freud believed that tension, originating from unconscious psychic impulses (sexual or aggressive) and striving to break through the censorship of the consciousness, was released in various symbolic forms, both intellectual and behavioural. This idea gained a particularly wide following in the psychoanalytical schools of Western psychiatry. A large number of experimental researches on motivation were carried out on the basis of Lewin's dynamic theory of personality (field theory) which maintained that when the individual interacts with his environment the objects of this environment themselves acquire a stimulating force, that is to say, become motives of behaviour. It was established that in the case of interrupted, incomplete action the motive, being unreleased, retained its urgency. For this reason uncompleted actions make a deeper impression on the memory than the completed, whose motivation potential has been exhausted ("incomplete action phenomenon"). It was also discovered that constant repetition of one and the same action resulted in the phenomena of "satiation" and "oversatiation", due to the drop in pressure in the system of motivation, which had been exhausted. Exhaustion was less in cases of activity that was of great

importance to the individual and affected the stable "nucleus" and not the peripheral aims and values. In contrast to Freud who reduced motivation to infantile impulses, Lewin believed that the origin of motivation in human beings was to be found in the contact between the immediate concrete environment and the individual at a given micro-interval of time. He also studied the dynamics of motivation as a process depending on success or failure in solving various kinds of problems, both practical and theoretical, and showed the dependence of motivation on the level of expectation, that is to say, the degree of difficulty that might be encountered in achieving the chosen goal.

Much importance is also attached to the problem of motivation in the theories of the behaviourists, who understand a motive as a stimulus, external or internal, influencing behaviour, and activating certain responses in the organism. The behaviourist position, which stresses the determining role of biological motivation, contrasts with conceptions that give priority to high intellectual values, aims, and ideals as having a unique human character (humanistic or existentialist psychology). The individual's desire to fortify and expand his internal "phenomenal world", to unfold his creative potentials and strengthen his own Ego is regarded as a most important aspect of motivation. The basic motivation of human behaviour lies in the desire originally implanted in the subject for self-realisation, self-actualisation. The structure of the personality has various levels of motivation, the lower levels being connected with homeostatic needs (desire to relieve tension), and the higher, with the development of such human qualities as initiative, sense of responsibility, quest for new situations, demanding effort and the accomplishment of increasingly complex tasks in life. In man such higher motivations dominate and are functionally autonomous in relation to elementary biological motivation.

Man's basic motivations include the need to communicate, to feel that one belongs to other people, the need for love, creativity, in which the personality finds self-fulfilment. Failure to satisfy these needs can cause neuroses. However, these theories tend to ignore the socio-historical nature of human motivation.

Motives are shaped in the system of a person's vital relations with the real world and for this reason, while having biological preconditions in the form of the corresponding needs of the organism, they are concretised, transformed and realised according to the conditions of a person's social existence. Since they are an objectively operating factor, motives are refracted at the level of consciousness in various intellectual forms: the image, the concept, the idea, the dream, and the ideal, which

expresses global motives determining the behaviour of individuals and the social group in the long term. The degree to which a motive is understood by a specific individual may differ and depends both on the individual's experience of life and on his individual qualities and peculiarities. Acute forms of inadequate reflection of real motives in consciousness are to be observed in pathological behaviour. Psychology has evolved theories of the dynamics of motivation as a conflict of motives, which is one of the important phases of volitional action. In pathological cases the individual finds himself unable to take a decision that adequately answers the situation. A prolonged conflict of motives may paralyse the individual's abilities to act and induce acute suggestibility.

Motivation is closely connected with the individual's emotional make-up, which reflects the nature and degree of satisfaction of his needs. Emotional experiences in their various forms are enriched through the development of motives, which draw into the sphere of human activity an increasing range of objects, evoking positive and negative emotions.

The individual's need to assert his own value and dignity in the process of real activity, in socially significant actions and creative achievements plays a special role in motivation. Satisfaction of this need is closely connected with positive assessments of the individual's achievements by other people, particularly those whose opinion he values. When such an assessment is not forthcoming or is seen by the individual as inadequate, he experiences emotional discomfort, which may, in extreme cases, have a negative effect on his mental health.

A person's mental health may also be unfavourably affected by excessive pretensions, making satisfaction of his own high self-appraisal impossible. This leads to emotional stress, breakdown and conflicts with other people. The building of a sound self-appraisal as a factor of motivation plays an important part in medical pedagogics and psychiatric therapy.

Obviously the study of the decision-making mechanisms, particularly in crisis situations, when alternative situations require that an individual take the optimal decision in the shortest period of time in accordance with changing circumstances, is of great importance. The absence of such an ability may cause disorientation and have disastrous results for the personality.

In the process of activity human motives range in importance. Recent studies have thrown light on the complex relationship, depending on

upbringing, between such personal motivations as orientation on oneself, on one's cause, on the group to which one belongs. In socialist society upbringing tends to orient a person in a socially valuable direction.

Motives differ not only in their orientation but also in their intensity. A person's eagerness or reluctance to act depends on the force of his motivation. A strong motivation provides the psychological basis for an individual's belief in the importance of the goals he is pursuing and the rightness of his cause.

In the process of historical development the range of objects on which human activity may be centered changes, as does the character of the needs that are objectified thanks to the creation of new cultural values. The needs of modern man which motivate his behaviour are immeasurably enriched by scientific, technological and social progress. A specifically human form of motivation is linked with the individual's historically formed need to create, i.e., to transform reality in the sphere of material and intellectual production. Characteristically the creative personality is guided by motives conditioned by human culture, a deep sense of being involved in its development (something called "internal" motivation, i.e., motivation created by activity in transforming and creating objects of culture and emerging in the form of the play of vital human forces). This "internal" motivation has a complex relationship with the "external" motivation towards the object of creativity itself—the desire for fame, ambition, material enrichment, and so on.

As an individual develops, his motivational sphere expands through the strengthening of cognitive, moral, aesthetic, civic and philosophical motives.

The personality and its social roles. Human activity is sometimes understood as the playing of roles. Plato saw life as a kind of drama, both tragedy and comedy, in which people play the parts assigned to them by fate or the gods. In world literature human life has often been portrayed as a stage on which people play their appointed roles, changing them according to age, social status, and circumstances. Shakespeare vividly and aptly described the life of man in its role-playing aspects.

When we want to know something about a stranger we ask the question, "What is he?" In reply we receive a description of his social roles or functions, his status at work, his profession, his family position (father of a family, bachelor), and so on. This is all easily understandable. The individual is characterised primarily through the various forms of his

activity. These forms reveal the essence of his personality— his intellectual, emotional and volitional qualities, features of character, temperament, morality, aesthetic taste, socio political and other positions.

When a theatre producer is considering the staging of a play or a film he selects certain actors for the parts —emperor, fool, lover, and so on. To perform any role an actor must be able to transform himself. This is the essence of his profession. This involves one Ego becoming another, one Self leaving itself and entering another Self. The actor tries to get away from the sense of being himself in a certain role to the sense of that role becoming his Self. By putting himself in the place of another Self the actor acts in the name of that person, as though by proxy. This ability implies living a second life or even quite a different life and, in doing so, manifesting one's true artistic life, one's artistic Ego. Much though he may desire it, however, even if he loves another person immeasurably, no one can, in principle, become wholly fused with another. He may only temporarily assume his role, assimilate and reproduce his manner of behaviour, his gestures and manners, the unique features of his make-up, way of life, thinking, feeling, the way his will acts, and so on. In order to play a role skilfully, an actor impersonates the character of another man and expresses his inner world by his acting. But to be able to assume the role of another man, whether on the stage or in life, is not the same as merging with him completely. This is not only impossible but entirely unnecessary. As a reflective being, the actor is always clearly aware of himself in a certain role. And by this fact alone he performs not only as an actor but also in a certain sense as a director, and even as a viewer of his own performance. Along with the spectators he views himself from the side and can adopt a critical attitude to the image he has created and also towards himself in this image.

The concept of role is complex. At the level of ordinary consciousness, role is often understood as behaviour that is unnatural to the individual, does not reveal his true Self and is assumed as something unreal, programmed not by the deepest motivation of the Ego but by external forces. The expression "getting into a role" suggests simulation, acting. Philosophy and psychology, however, following a profound literary and sociological tradition, use this concept for defining historically shaped, generalised and socially fixed modes of behaviour, which are constantly reproduced in human life. And in this, scientific sense one can say that all our lives we do nothing but play certain roles, and each of us does this to the extent of his gifts, inclinations, moral

culture, aesthetic taste, view of the world, and his understanding of social duty and mission in life. Even children in their play activity enter into a situation of role-playing with accepted rules of the game. The child begins by playing the role of pupil and various other school roles, then goes on to the roles he adopts at college. When he later enters the full sweep of life, the young man feels the need to choose a certain role or a system of roles for himself, which is mainly a matter of choosing a profession.

History has prepared and perfected for us its "scenario", containing all the various roles that society needs at a given stage of its development. And the logic of life offers every person who enters it a kind of list of roles, mainly in the form of certain professions. It goes without saying that to play one or another role there must be a vacancy for that role. With different people this comes about in different ways. Some persistently and purposefully choose and carefully assume their role, while others adopt quite a different approach and allow themselves to be drawn into a certain role by the spontaneous forces of life. Yet others are placed or even pushed in various ways into a certain role.

In offering people its specific roles society makes specific demands on the performers. In slave society, for instance, certain roles were allotted to the masters and to free citizens in general, while quite different roles were assigned to the slaves, who were deprived of almost every opportunity of displaying social activity. Feudalism substantially changed the roles and the demands on the performers. The new roles were those of kings, tsars, feudal lords, stewards, serfs, servants. Capitalism introduced more new roles and requirements for those who were to perform them. Here there were business men, entrepreneurs, merchants, manufacturers, workers. Qualitatively different roles and demands on the performers were brought into being by the world of socialism with its principles of equality, the abolition of exploitation, the new moral content of labour and of other social functions.

Role-playing in society is not what it is on stage. While an actor plays the part of another person, the human being in real life is not an actor, he is playing himself and remains himself in all the forms of his life-activity. Here we have the true essence of the human being as a non-actor. Exceptions are to be found in the work of the intelligence agent, and so on. But even in ordinary life people may resort to acting when they find themselves in a difficult situation that requires cunning or even hypocrisy. This is pretence and it is by no means harmful for the individual's integrity. When he has played his role, the actor discards the

mask and returns to his own Self, he becomes himself again. Admittedly, there have been cases of an actor entering his role so completely, particularly when playing a pathological type, that for some time afterwards he feels the "scratches" left on him by the sick personality he impersonated. In life a human being may receive not just "scratches" on his Ego, but deep and sometimes dangerous wounds, when he plays a role to the point of inner discord between his true Self and the mask. On the moral plane, the splitting of one's own conduct into that of Ego and mask, no matter how we may try to justify it, signifies an attempt to avoid responsibility for certain aspects of one's activity. The victory of the mask over the Ego, for which the individual very often blames circumstances —such is life!— sometimes signifies the triumph of the mask over the true face. It is impossible without serious harm to the subtle mechanism of one's mentality to live for a long time in an atmosphere of psychological division, of constant bargaining with oneself. Sooner or later a person must make his choice. And what at first seemed to be an adaptive mechanism, with the passage of time is reinforced and assimilated and becomes one's own. The mask becomes the face.

If the person publicly, time and again says something that he does not believe, this gradually, without his realising it, may cause a change in his beliefs and his motivations. It is difficult for him to justify his lack of principle, so what is he to do? His only resort is to adapt his views to his publicly expressed time-serving position. The inner conflict is thus reduced and then removed and the Ego recovers its integrity, but in a different quality. Sometimes a person does not identify himself with a certain act, if it remains anonymous or if the action is forced upon him, or in the case of collectively taken decisions, where the measure of personal responsibility is not defined and here there may be no conflict.

The human Ego is sometimes compared to a rubber ball: it can be compressed, squeezed out of shape, even trodden on and yet is still capable of recovering its previous "inflated" state. But sometimes we encounter the powerfully protected Ego, hard as a diamond, invulnerable to ridicule, proud, free of any servility, and not easily influenced. These are whole, compact personalities and their structure differs from the looseness and flabbiness of some other Egos. Besides physiological protective mechanisms there are also psychological mechanisms. Some people protect their Egos by attacking, others are less aggressive and more skilful in defence, and others rely on a real or assumed indifference to everything. A childish helplessness may also serve as a kind of armour for the Ego. Some people are astonishingly

vulnerable. They protect themselves with the gleaming shield of unlimited kindness, the shield of "moral holiness".

It must be stressed that the individual himself and not someone else is the initiator of all the aspects of his behaviour. We may stress the impersonality of social roles when we want to awaken a critical attitude to the inherited modes of life. But when this impersonality is absolutised, this may serve as a justification for passivity and moral irresponsibility, for becoming a tool in somebody else's hands. The wry joke that the respectable person is one who feels disgusted by the dirty tricks he plays only emphasises the fact that the truly respectable, decent person would not play a dirty trick for anything in the world. This is the inspiring integrity of the morally cultivated personality who truly understands his noble purpose in life. The integrity that humanity so deeply needs has nothing in common with the rock-like hardness of the unfeeling monolith, which is only eroded by time. Every sensible person shows the necessary flexibility in fulfilling the role dictated by the nature of the specific situation. There can be no set roles or rules, instructions or orders, for all the infinitely varied situations in life.

People's characters are different and this shows itself in literally everything. According to our knowledge of people we expect from those around us certain actions characteristic of a given person in a given concrete situation. All the time we are in a state of expectation. From one person we expect help, kindness, sympathy, humour, from another stubbornness, ambition, from another, silent thoughtfulness or vigorous action. Sometimes, however, the response may not be quite what we expected. The person concerned suffers from a conflict of roles. This may happen for many reasons, for example, the performer lacks the intellect required for the role he has to play. The role may demand exceptional wisdom while the performer is a primitive, undeveloped person. Conflicts may also arise on moral grounds. A person thinks one thing but acts differently, or holds one view but expresses another. In one situation a person may say one thing, in another the opposite. Unfortunately, this is common enough in life. Fiction has often portrayed such situations and roles. Role-playing activity is noted for its polarity. Where a trusting simpleton appears we also find an arrogant trickster, the humble person is often associated with a dominating personality, and where somebody is "holier than the pope" we also find heretics. In other words, where there is an anvil we may expect to see a hammer. Is a person responsible for his social role? Or is he rather the victim than the responsible agent of his actions? This is the problem of the conflict of the mask and the Ego. The mask is not the Ego but

something quite separate from it. It is put on to hide the true face, to free oneself from convention and obtain anonymity, and at the same time a personal freedom amounting to irresponsibility. This happens, for example, in the masquerade. The shy person no longer has to play the role of shyness, and the servile person need no longer be servile. A character in one of Marcel Marceau's pantomimes changes his masks before the public. He is happy, merry and entertains his audience. But suddenly everything takes on a tragic note: the mask sticks to his face. He struggles and tries to tear it off with both hands, but it is no use. It won't come off and becomes his new face.

Similar situations are often portrayed by contemporary Western writers. The idea of the "insincerity" of life one has lived, of the need to fight to preserve one's own Self, to guard its integrity is found in various forms in the work of Albert Camus, Kobo Abe, Heinrich Boll and Graham Greene, and in the tragic films of Antonioni and Bergman, which deal with the profound spiritual conflicts in contemporary bourgeois society, constantly stressing the fragility of human existence. How difficult it is to live without pretence! How impossible to be oneself!

Writers who think profoundly and honestly have graphically described the tragic situation of the person who gazes sadly at the face of the unknown. Hence such pessimistic statements as: "Life is but the melting smoke of a cigarette!" or "Living only means deepening the squalor we live in!"

Quite often, particularly at turning points in his life, a person has to reappraise all his previous values and ask himself burning questions that he places before the judgement of his own conscience. Have I played my roles on the stage of life properly and have I played the right roles? Or perhaps I have cancelled out the real side of life? Perhaps I have played roles that were not in the character of my true Self? Perhaps I never found myself in life and was merely a pawn in the hands of circumstances? Then what is my true calling? Has it gone past me?

Social status does not, of course, rigidly determine the whole diversity of personal qualities. But every society, social group, class, or social institution does have a ramified system of "filters", of selective devices by means of which certain kinds, certain types of people who are most suited to play this or that role come to the top.

It is naive to moralise on the cruelty of the fascist executioners and all other dictatorial regimes. No person with a fine spiritual organisation could, in principle, succeed in such systems: he would be either sifted out or perish, or perhaps he might win through as a hero.

Man the Doer

To sum up, in human behaviour there is always something preconditioned by society, by its standards, taboos, traditions, and experience. This is what makes the human being an "actor" on the great stage of life. At the same time human behaviour cannot be equated with mere obedience to this precondition. In the very character of the performance of his social role the individual brings something uniquely individual, something actively creative. When we speak of the social function of the individual worker, student, scientist, writer, artist, athlete, politician, we have in mind the personal features of the individual that are essential to him precisely in this social function. But in studying any individual one cannot confine oneself to his social function. The psychological aspect is no less essential to a definition of his personality. So, the concept of "personality" embraces not only the person's social function but primarily his inner essence, which determines how a person performs his social function.

Destiny, Freedom and Responsibility

The idea of destiny and necessity. Everything in the world is conditioned and takes place according to necessity. When we consider not merely objective events that occur in the world but also conscious human activity, the problem of necessity reveals itself in a new aspect: by becoming aware of it we turn necessity into freedom. The thinkers of the ancient world pondered the question of who governed the universe—the gods or destiny? Was the world ruled by reason or by blind necessity? According to Heraclitus, everything depended on destiny, and destiny meant necessity. The essence of destiny was reason, which guided everything.

At first destiny was regarded not as a universal abstract necessity but as the fate of individual mortals. Everyone had his own particular fate. Necessity was thus broken down into a large number of fatal forces, sometimes embodied in various creatures such as the oracle, the sorceress, the magician, and so on. Sometimes these forces of destiny came into conflict with each other.

Fatalism is based on the assumption that everything in the world and in people's lives is predetermined by natural or supernatural forces, that there is a rational being which sets the goal for everything that happens in nature, and that this being is called god. Everything in the world is predestined and no one is responsible for what happens.

Fatalism has a crushing effect on the individual. In human nature he sees a repulsive sameness, in human relations an irresistible force that belongs to everything in general and to no one in particular. The individual is merely driftwood on the waves. It is ridiculous to fight against the relentless law of fate. At best one may discover what it is, but even then one can only obey. Destiny leads the person who follows voluntarily, and those who resist are dragged by force. Freedom, according to the fatalist, is no more than the will of the horse, whose harness allows it to move only in one direction and in the framework of the shafts. Fatalism links up with religion, which asserts divine predestination. Both fatalism and religion grant human beings only a predestined role along with the illusion that they are acting independently. In any event the fatalist sees only a manifestation of necessity. Absolute surrender is what is expected of every individual in the face of imminent death.

Not only the religious idealist philosophers and superstitious people generally, proceeding from the idea that we can't get away from fate,

adopt the standpoint of fatalism. It is also held by some philosophers who, as materialists, are opposed to religion and idealism, but believe that everything that happens in the world is predetermined by the "iron chain of cause and effect". Spinoza, for instance, maintained that people were mistaken in believing themselves free because they were only aware of their actions but did not know what causes determined them.

In contrast to religious fatalism, Holbach developed the conception of materialistic fatalism. All events were predetermined, not by the divine will but by the relentless sequence of cause and effect, a chain from which not a single link could be eliminated. Necessity commanded not only the physical world but also the world of the mind, wherein consequently everything was also subordinate to fate. Although this mechanistic conception differs from the religious in that it makes its appeal to the natural and not to the supernatural, the two coincide in their general principle. In both philosophies man is doomed to obedience, in one case, to the will of God, in the other, to the immutable laws of nature. Primitive society presupposes the complete identity of freedom and non-freedom for its members, none of whom are yet capable of separating their inner being from that of the tribe. Human actions are thought of as the expression of the will of supernatural forces, as the inevitable blind and capricious power of destiny, which man must obey just as he obeys the life cycle of his organism (blood circulation, breathing, etc.) and the compelling force of instinct.

As classes and states arise, the concept of freedom gradually becomes contrasted to necessity. In ancient Greece, for instance, a person's inner and outward life was determined by his status in the social system which he inherited in the same way as his natural "gifts". Fate did not come to a person from outside but unfolded like a scroll out of his very essence. It was the expression of his character. No matter how tragic their fate, people could not, in principle, desire another because this would mean becoming someone else. The characters in Greek tragedy are carved out of marble, as it were. For example, in the works of Aeschylus all the actions of Oedipus are programmed by fate long before his birth. Even the gods themselves obey fate. According to legend; the Pythian of Delphi proclaimed that even the gods could not avoid what was preordained by fate. No one knew the intentions of fate except the three fateful sisters, Clotho, Lachesis and Atropos. Clotho held the distaff of inevitability on which the thread of life was spun. Lachesis turned the spindle and decided the actions and events of life. Atropos held the scissors to cut the thread of life.

Although fate was thought of as something unknowable and absolutely mysterious, people sought to discern its intentions by turning to the oracles.

It was believed that fate could not be understood by means of causal explanation and could reveal its secrets only to the unconscious. The divinity, according to Plato, made prophecy the province of the irrational principle in human nature. The voice of fate could be heard in thunder and lightning, in the flight of birds and the rustle of leaves. Later fate came to be identified with coincidence, chance, something that could not be controlled. A person expected to receive not what was assigned to him by the objective logic of events, but what came his way in the course of the game. Circumstances could make a beggar into a king, or a king into a beggar. The destiny of whole *nations* was sometimes dependent on petty court intrigues. The only consolation and hope lay in the fact that fate could be regarded as "lucky chance", as a goddess who could be prevailed upon to act in one's favour. Later fate came to be seen as an all-embracing and inavertible determinacy, alienated from human life and assuming its own continuity and necessity—destiny. Man was thus divided, as it were, into what he was in himself and what he was fated to be. On the one hand, duty as the expression of a person's social mission and, on the other, his personal feelings and interests acted as forces operating in different directions and fighting to control the behaviour of the individual. Now one side, now the other was victorious, depending on a person's inner nature and on external circumstances. The resulting conflict permeated the whole history of humankind.

The Christian world-view condemns fatalism. It presupposes faith in divine providence, which leaves room for free expression of the individual will. Confronted by divine omnipotence, fate has to retreat from the sphere of mythology and philosophical disputes to the world of ordinary everyday notions. The religiously oriented conscience, dominated by fear of divine retribution, is opposed to the concept of fate. Everything of importance in human life must therefore proceed outside its influence. However, the idea of fate does not disappear. It is kept alive by the prestige of astrology, the principle of man's being part of the picture of the universe, whose forces determine the logic of human life. This form of belief in fate assumes that a person is born under a certain star and thus receives a certain programme in life, including even his personal qualities.

With the spread of the idea of historical progress and hope of the revolutionary transformation of social life, the concept of fate was

defeated in its main citadel, a defeat that is expressed in both philosophical writings and *belles lettres*. Shakespeare's Hamlet fights to determine his line of conduct amid "the slings and arrows of misfortune". But the principles of the largely irrational life of bourgeois society continue to foster the idea of fate, particularly in social relations. Many bourgeois political leaders, including Napoleon, the "man of destiny", believed that politics were pure fate, understood as the play of chance defying reason. Goethe referred to a mysterious force that everyone felt but which no philosopher had the power to explain.

By studying the symbols of astrology Goethe tried to get back to the ancient conception of fate as something immanent in all living things, the irrational life programme. According to Nietzsche, man's selfhood is, in fact, fate. Spengler thought the idea of fate implied active rejection of individual conscience and good will and scorned all belief in human free will. Fate was the equivalent of such concepts as "life", "development", and "time". The idea of fate thus became symbolic of the pessimistic demand for activity at all costs. Though such activity was bound to be futile, people had to do something all the same.

By one-sidedly stressing the role of heredity, the fatalist can maintain that everything we are is predetermined in the inseminated ovum from which the organism develops, that the conditions of our life play hardly any role or perhaps none at all. From this fatalistic principle several practical conclusions are drawn. One can do nothing about inherited proclivities and diseases, because no one can change his ancestors. This gloomy view of the world found its ultimate expression in the ideology of fascism, which exploited the idea of fate as a weapon of arch-reactionary propaganda.

In recent years numerous works interpreting the problem of fate in various ways have appeared in the West. The neo-Thomists combine the idea of fate with that of god. Interpreting fate as a manifestation of an infinitely remote and mystically frightening divine will, the neo-Thomists urge us to submit to fate. In their view a person is in the power of supernatural forces that render him helpless. At times of happiness and strength, hope or inward contentment he feels he is achieving success, but this is really an illusion. Basically the essence of life lies in obedience, awareness of the futility and hopelessness of existence.

In scientific, realistically oriented thinking the idea of fate has no categorical meaning. The word is often used to denote an unfavourable or favourable set of circumstances beyond human control and planning. The word "fate" is also used among people who have no faith in any

kind of destiny. In the ordinary consciousness it serves to express the idea of necessity, chance or a combination of the two. It is used, for example, when we are talking of the law-governed result of development of certain events which are truly inevitable, although there is nothing mystical about this outcome. For example, we speak of a certain person's fate being decided in advance. The concept of fate is sometimes used to denote a person's path in life, not necessarily determined by any one person or thing but the outcome of a combination of the necessary, the accidental, the spontaneous, and the conscious in human life. By fate we may also mean a certain programme of behaviour determined by heredity, and by the features of temperament and character (wisdom or stupidity, restraint or hot-headedness) acquired during life. In folk wisdom this is expressed in the saying: sow a deed and reap a habit, sow a habit and reap a character, sow a character and reap a fate.

The problem of freedom. Stressing the complexity of the problem of freedom, Hegel wrote: "Of no idea can it be stated with such complete justification that it is vague, ambiguous, and capable of generating the greatest misunderstanding, and therefore liable to be misunderstood, as the idea of freedom, and no idea is discussed with so little understanding of its nature."¹ Freedom is the key philosophical problem, the crown of all the efforts of theoretical thinking, the culminating moment of any mature philosophical system. There is nothing higher or more significant in any system of philosophical world-view or in the actual stream of human life. It encompasses the meaning of history and stands as the true criterion of social progress. The sacred word "freedom" has resounded throughout the centuries on the lips of the oppressed and is the guiding star of their social endeavours. For the sake of the triumph of freedom in the life of society, for the sake of the individual's right to self-expression and creativity, revolutionaries at all times and among all peoples have been ready to face deportation, the stake, the gallows, the guillotine. Guided by a profound social awareness, their hearts yearn for freedom in the name of the happiness of the poor and oppressed.

The entire system of connections between the individual, nature and society, all the demands that society makes on the individual and the individual's dependence on the world are in constant contradiction with the idea of free will. But this contradiction takes place in the framework of a unity—the unity of will and the real conditions for the manifestation of its freedom.

¹ Hegel. *Die Philosophie des Geistes* in: *Werke*, Siebenter Band, Berlin, 1845, S. 374

The actively creative nature of the human consciousness refuses to accept the purely mechanistic interpretation of people's dependence on external circumstances characteristic of the metaphysical materialism of the 18th century, which maintained that our life was a line that we were bound to follow across the face of the earth guided by external forces from whose control no man could deviate by a single step. If a person acted only under the influence of external forces, he would suffer the fate of Buridan's ass, which was unable to choose between two equidistant stacks of hay and therefore died of starvation.

Is a human being free in his choice of action or are his actions preordained by forces beyond his control and opposed to his will? If we say that man is free, how can we reconcile our answer with our acknowledgement of objective necessity? If we say he is not free, does this mean that people are only a means of realising the laws of social development? According to Kant, if human acts of will are empirically conditioned and necessary, no human being can be held responsible for them. That is why Kant maintains that there may be contradictions between freedom and necessity in one and the same human action. In pronouncing his final verdict on the human being, Kant states that although you, as a human being, acted thus because you could not act otherwise, your actions being conditioned by circumstances and, consequently, you are not to blame, it does not matter whether, after all, you could or could not have acted otherwise—you are still guilty, since you should not have acted as you did.

Where, then, is personal initiative, the constructive, creative and transforming role that human beings are able to perform? The doctrine of non-freedom of the will, which belittles the dignity of man as a self-determinant active personality, absolves man of all responsibility for any crime or action and disentitles him of any reward for heroism. If everything is preordained, where is the fault of the criminal or the merit of the good man and the hero?

The thinkers who built the Christian world-view had to face up to this problem at an early stage. The problem of the relation between freedom and necessity was understood as a relation between freedom and grace, that is to say the freedom of man and the freedom of god. Here an antinomy arises that Christian theology since the days of Augustine has wrestle with. If we assume freedom of the human will, what are we to do about freedom of the divine will and vice versa? Unlimited freedom for man must limit the freedom of God, while assumption of the latter deprives man of free will. Augustine solved the contradiction by acknowledging only the human right to do evil (the idea

of the Fall), while only God had the freedom to do good. Here we have the basis of Augustine's theory of predestination, which is, in effect, a theory of the freedom of a personal god. Man's good actions are performed by the grace of God; he is free only to commit sin.

According to Kant, the ability to initiate events independently (i. e., without compulsion) is freedom. Man has many roads before him and he can choose any one of them. But they all lie in the zone of activity of knowable natural and social laws.

The problem of freedom cannot be solved (although many attempt to do so) by discussing free will, understood as a mental phenomenon that is not determined in any way. Such a psychological statement of the problem of human freedom reveals a tendency to contrast metaphysically two independent kinds of phenomena: the material, which are causally conditioned, and the ideal, the mental, which are not objectively determined. Thus, freedom and necessity are not seen as being intrinsically related but are referred to different spheres of existence, that is to say, mental and material phenomena are dualistically counterposed and an impassable gap is set between them. Free will is associated with indeterminism and thus, in effect, identified with arbitrariness, with licence.

Psychologists define free will as the possibility of performing alternative actions in one and the same situation, as the ability to choose one of them and to rule out all the other possibilities. This is related to the struggle of motives, and the domination and victory of one particular motive. In other words, human freedom amounts to the possibility of deciding which line of conduct to take and which to reject. In this sense freedom assumes a meaning full of vital importance. According to Spinoza, we are in bondage to the extent that what happens to us is conditioned by external causes, and free to the extent that we act upon our own judgement.

Free will takes the form of purposeful and selective action based on conscious necessity. Thus, every free action is a unity of necessity and freedom. The concept of freedom is ambiguous. For example, an individual becomes free in the positive sense of the word when he acquires the opportunity to fulfil himself, to realise his essential powers. In the words of Marx, man "is free not through the negative power to avoid this or that but through the positive power to assert his true individuality".²

² Marx and Engels, *The Holy Family in: Collected Works*, Vol. 4, Progress Publishers.

Freedom is sometimes defined only in a negative sense, as personal independence, as the ability to say "no". However, every denial has to be made from certain, perhaps not fully conscious positions, implying a positive principle, which justifies a person's rejection of something and expresses the meaning and value of his rejection. Any rejection of one thing must imply an assertion of something else. Every struggle against one thing ultimately amounts to a struggle for something else. The significance of this struggle is determined by the goals it sets and the positions from which it is conducted. In this sense freedom is in direct contrast not to necessity, understood as determinacy, but to compulsion, to coercion, the use of force. But no coercion, even of the most violent nature, rules out the possibility of freedom, although it may severely restrict that possibility. The determinacy of freedom should not be confused and certainly not be identified with coercion. On the other hand, one should not separate intrinsic freedom as a psychological, personal phenomenon from external freedom, the moral from the political. The degree to which personal freedom is restricted by compulsion on the part of the ruling classes in a state based on exploitation has varied historically.

Freedom is a specifically human mode of existence and only that which is the realisation of freedom can be good in the human sense. One cannot live in society and be free of society. Freedom, as understood by the Greek philosopher Diogenes, who lived in a tub to show his independence of society, denotes the breaking of all human and social ties with the world and thus implies only an abstract symbol of freedom. Such freedom indicates either a withdrawal from life or a complete opposing of oneself to social standards on the principle "everything is permissible". However, there is no action that does not in some way affect another person, there are no completely isolated human beings. The person who alienates himself from the community does harm to that community. The individual is not free always to act as he sees fit. He must coordinate his actions with those of the people around him. It is his responsibility to correlate his behaviour with their interests and activities. He is compelled to suppress some of his feelings and impulses and channel them in different directions from what he may have wished. These channels are determined by historically formed social standards, which in relation to the individual have objective reality.

When speaking of freedom, one should not think of it as doing anything one likes. Such "freedom" simply does not exist. Human actions are restricted by various factors, legal, moral, aesthetic, and by various traits of character, natural abilities, and so on. According to Sartre, freedom is autonomy of choice. It is realised where a person initiates his own desires, chooses on his own behalf, on behalf of his Self. A girl wishing to become a singer discovers that she lacks the necessary gifts, so she becomes a teacher instead and her choice turns out to be a good one. Her personality, her character played a part in this choice. A person's decisions are also determined by external factors, and to an even greater degree by the whole make-up of his personality. For example, an honest person acts on principle and we say that he could not act otherwise. Remember Giordano Bruno, who stood for the truth and could not do otherwise.

If circumstances condition human life, and a human being himself changes the circumstances of this life, if a person is the product of social relations, the social relations are themselves a product of the activity of living individuals. Man's free fulfilment of goals which he, as a rational being, sets himself, can be based only on utilisation of the laws of nature and social reality, not on contempt for them. Consequently, freedom presupposes, above all, a knowledge of laws that are not dependent on human beings, and it is this knowledge that makes people intrinsically free. Thus free will emerges as a concept closely related to the concepts of consciousness and knowledge. Knowledge is not only power, it is also freedom. The only path to freedom is the path to knowledge; ignorance is bondage. The degree of knowledge determines the degree of freedom. One cannot desire what one does not know. The core of freedom is conscious necessity and action, governed by the extent to which we are aware of that necessity, of the possibility of its realisation. Knowledge in itself is not yet freedom, but there can be no freedom without it. Freedom implies not only knowledge of the conditions and laws of development in the present but also preparation of the future results of conscious activity, their prevision. Both personal and social freedom consist not in some imagined independence of objective laws, but in the ability to actively choose and take decisions with a knowledge of the case and, above all, to think and act in conditions that make it possible to realise one's intentions.

The conception of freedom as conscious necessity is an essential, but only the first, step on the road to an understanding of the nature of freedom. It allows us to distinguish freedom from arbitrariness and stresses the priority of objective conditions. Idealism, which maintains

the positions of indeterminism, regards the will as an immanent, autonomous, self-contained spiritual force, supposedly generating certain actions from its depths. For example, the existential notion of absolute freedom has no objective roots. According to Nietzsche, "the will to power" has more need of lucky errors than the truth for which we strive. Why, he asks, is falsehood, the unknown, even ignorance not better than truth? Jaspers's statement that not truth but ignorance is the guarantee of freedom strikes us as a meaningless paradox. According to Jaspers, the freest people of all are the insane, because they have no logic. Existentialism interprets the human being as a force standing in opposition to the world and hostile to it. Its system of philosophy thus transforms will into what is, essentially, mere self-will. This is an apology not for freedom but for arbitrariness. There is a counterblast to this notion in Feuerbach, who believed that freedom was not the right of any man to be a fool in his own way. If we think that freedom is something absolute, independent of all objective necessity, we resemble the imaginary pigeon who believed that it would have flown much faster had it not been for the resistance of the air. It forgot one "little" thing: without air it could not live, let alone fly.

The framework of human freedom, its reality, is objective necessity. Freedom is a river that flows within the banks of the laws of life. The law-governed course of historical events in which people take part is realised not despite but through the human will, through people's conscious actions. A correct understanding of determinacy rules out any one-sided dependence of human actions on external influences. This dependence is mediated both by the nature of the person, his total experience, interests, character, value orientations, and so on. The effect of external influences on a person depends on how that person reacts to these influences, to what extent they affect the vital cords of his being. Depending on his personal beliefs and conscience, a human being is free to desire both good and evil. The content of a person's beliefs manifests itself in decisive actions. This is what makes a person responsible for them. When he chooses one action from a number of possible actions and rules out the others, the chosen action is also determined. But it was not predetermined before it took place. Until the action is completed, not all the determining factors are present. To assume that it was completely determined before it took place would be to substitute predestination for determinacy and thus exclude freedom altogether. In human actions everything is determined but there is nothing predestined in them. Man is not ruled by the power of fate. What is more, the apparent incompatibility of freedom and necessity, in

the sense of determinacy of events, arises because along with acknowledgement of the determinacy of human actions these actions themselves, and also the decisions involved, are thought of as being outside this determinacy. A person defends his freedom not from being determined by everything that exists but from the blind irrational forces, which impose the fetters of taboo and compulsion on his thoughts, his feelings and his will. Consequently the measure of freedom is part of the concept of man.

Man is free not from nature, not from society and their laws, but within the framework provided by the operation of both the laws of nature and society. When they are known, they make a person's will relatively free. But they also determine its limits, the limits to the realisation of goals that man sets himself: free will is not self-will, arbitrariness. Spinoza in his day thought that freedom should be understood as free necessity and not as arbitrariness. The will is the most active part of the human consciousness. It shows itself in the desire to act, in choice of the direction of action, in the decision to act in a certain way and realise a certain goal. A human being is not a piece of driftwood on the waves of cause-effect connections. He is active. Free will manifests itself precisely in purposeful activity.

To sum up, freedom is the ability, based on knowledge of necessity, to choose and to act in accordance with this necessity. It consists not only in knowledge of natural and social laws but also in the practical realisation of this knowledge. Realisation of freedom presupposes the overcoming of certain obstacles, and the more difficult the obstacles, the stronger and more freedom-loving the will must be. "... Freedom is not a reward or a badge of distinction that is celebrated with champagne. It is not some nice present, such as a box of chocolates. Oh, no! Quite the contrary, it is an imposition, a gruelling race that one must run alone. No champagne, no friends to raise a toast and give you their friendly encouraging glances. You are alone in a dim hall, alone in the dock before your judges, and alone you must answer to yourself and to the court of humanity. At the end of every freedom there awaits retribution, and that is why freedom is too hard to bear..."³

A human being realises his essence in material and intellectual activity, in its results, which appear as his "objectified" human abilities, skills, ideas, feelings and will. Consequently, the whole history of

³ Albert Camus, *La Chute*, Gallimard, Paris, 1956, p. 154.

material and spiritual culture emerges as the external existence of man's inner world.

Free will is. the mode of realisation of one of the possibilities of action, the creative drawing up of an ideal plan of action, the process of goal-setting, which presupposes the choice of only one reference point from a whole hierarchy of possible directions and motives. Every choice means ruling out what is not chosen and emphasises the vital significance of what is. Thus in its very essence action presupposes a relative freedom of will, the possibility of choice. Some people believe that choice is made not so much by the individual as by circumstances, which choose for him. This also happens. But it is not characteristic of strong-willed people. Freedom lies not only in the choice of a certain aim from a number of possibilities, but also in creativity, in the setting of new goals. Freedom is not only conscious necessity, but also the existence created by human beings themselves, the social relations, the world of material and. intellectual culture. Historical necessity arises as the natural outcome of the subjective orientation of human actions and their objective result, which takes shape independently of will and consciousness. In this case dialectics means that the freedom of the individual acting in history becomes through the results of his actions his necessity.

The idea of freedom is wholly human and social. It differs in every concrete historical set of circumstances. In itself freedom is an abstraction. As a reality it is always full of concrete historical meaning. Freedom is a historically developing thing, a process of development that is never fully realised. Nature knows no freedom. "The first men who separated themselves from the animal kingdom were in all essentials as unfree as the animals themselves, but each step forward in the field of culture was a step towards freedom."⁴ Because it is social, the idea of freedom is historical and reflects the metamorphoses of the idea of fate and necessity. By no means everything in human life and relations is the result of the realisation of freedom. They also contain much that is irrational and inevitable, they are bound by a framework that sets the limits of the permissible for every historical epoch. The degree to which the individual's personal freedom is curtailed by his duty to the state varies greatly, and is both concrete and historical.

All nations, the best minds of humanity have from time immemorial longed passionately for a just social system, for democracy, for freedom. When voiced by the people, this word makes dictators and tyrants

⁴ Frederick Engels, *Anti-Dühring*, p. 137.

shudder. Under the banner of freedom the rising people have toppled the thrones of monarchs and the power of capital. The whole history of mankind may be pictured as a stubborn ascent to the cherished peaks of liberty. The call for freedom has always had popular appeal. Despite all contradictions, freedom has blazed a road for itself even in the face of antagonistically contradictory social development.

The feudal lord possessed great freedom and arbitrary power because his subjects were deprived of freedom. In slave society this contradiction was even more striking. Through contradictions, including antagonistic ones, the history of mankind moves along the path of development of freedom for the individual, both in relation to the spontaneous forces of nature and to social conditions. To achieve social freedom one must first "kill the slave in one's own self".

"What kind of freedom?" asks Dostoyevsky. "Equal freedom to do anything one likes within the limits of the law. When can one do that? When one has a million. Does freedom give everyone a million? No. What then is a person without a million? A person without a million is not one who does anything he likes but one who has everything that other people like done to him."⁵

Reflecting on the exploiting society of his day, Schiller wrote:
*Into the bosom's holy, silent cells,
Thou needs must fly from life's tumultuous throng!
Freedom but in the realm of vision dwells,
And beauty bears no blossoms but in song.*⁶

The true freedom of the working man in an exploiting society shows itself in revolutionary action aimed at realising the objective laws of history. The desire for freedom is an essential feature of the revolutionary character.

The objective conditions for true freedom come about only with the abolition of the society based on relations of domination and obedience, on various forms of oppression. Marx and Engels defined personal freedom as the positive strength to manifest true individuality, they believed that to secure freedom "each man must be given social scope for the vital manifestation of his being".⁷ In communist society, Marx

⁵ F. M. Dostoyevsky, "Winter Notes on Summer Impressions. An Essay on the Bourgeois" in: *Collected Works*, Moscow, 1956, Vol. 4, p. 105 (in Russian).

⁶ *The Poems of Schiller*. Translated by Edgar Alfred Bowring, G.B.N.Y. United States Book Company, Successor John W. Lovell Company, p. 289.

⁷ Karl Marx and Frederick Engels, *The Holy Family* in: *Collected Works*, Vol. 4, p. 131.

observed, beyond the realm of necessity there would begin the development of the human personality as a goal in itself.

Responsibility. Human behaviour is regulated by many factors, including moral standards, the sense of shame, of conscience, of duty, and so on. The basic manifestations of the ethical life are the sense of social and personal responsibility and the awareness of guilt that this implies. Responsibility is not only a moral category, but also a psychological, legal and socio-political one.

Great controversy has raged around this problem for centuries. The idealists believe the sources of responsibility to be in the immanent principles of the human personality, even in the depths of its psychophysiology. For example, according to one conception of psychoanalysis, an individual is essentially helpless in the face of the forces that influence him from within. The responsibility placed upon him by society is merely an illusion. According to this conception, a person has got to realise that he is not the master of his own fate. Officially he is conscious. But although he himself is not aware of the forces that are at work within him, his choice is determined for him—his conscious will is only an instrument, a slave in the hands of the deep subconscious urge which determines his action.

The existentialists absolutise the individual's responsibility to society, believing that every person is responsible for everything that happens in the world. This thesis is based on the premise that the individual will is independent of the flow of historical events, and that these events are the product of the individual will. Every separate person is responsible for everything because this "everything" is consciously created by him. But this is subjective idealism. It is vividly expressed, for example, in Sartre, who maintains that man, being condemned to freedom, assumes the weight of the whole world on his shoulders; he is responsible for the world and for himself. There is no point in complaining because nothing external has determined what we feel, how we live or what we are. This absolute responsibility, however, is not mere submission. It is simply the logically necessary condition for awareness of our freedom. Such is the position taken by Sartre.

But would it not be more correct to assume that the objective foundation for the individual's responsibility to society and himself is the real relation between society and the individual, which is always contradictory. Responsibility expresses society's specific demand on the individual in the form of duty. There are certain social standards, but there is also freedom of choice, including the possibility of violating

these standards. So in all societies a certain responsibility is laid down for such violations. Where there is no choice, there is no responsibility.

It is impossible to discuss morality and law without touching upon the question of free will, of liability, of the relationship between freedom and necessity. The individual becomes aware of his personal responsibility when he knows what other people expect of him. Responsibility may appear in two forms: retrospective and actual, i. e., responsibility for previously performed actions and for actions that are being performed at the given moment.

Responsibility is a state of consciousness, a feeling of duty towards society and oneself, an awareness of the purpose of the actions performed, their consequences for a certain social group, class, party, collective and oneself. Responsibility is society's necessary means of controlling the behaviour of the individual through his consciousness. As an integral attribute of the socially developed personality, responsibility takes the form of the spiritual aspect of all forms of the individual's activity in the moral, political, civic, legal and other spheres. There are no forms of non-responsible activity inasmuch as there is no activity whose consequences do not affect the interests of the individual himself, the social group or society as a whole.

Historically, individual responsibility to society shows a tendency to increase in the wake of social progress. In contemporary society the importance of every individual's civil, political and moral responsibility to society, his responsibility for the fate of nations and of all humanity has sharply increased. The individual is responsible to the extent that he is free in his actions. The individual is generally free only in doing or achieving something that is the realisation of his own intention. It is for this kind of action and achievement that the individual is responsible. He is not responsible and cannot be held responsible for what is done by others against his will. The blame for such actions cannot be laid at his door. Responsibility and liability have meaning only in so far as they induce positive change in the individual in relation to his future behaviour. Responsibility means much more than accountability. Inward responsibility for one's behaviour and intentions, that is to say, self-control, self-appraisal, and the general regulation of one's life, is also of great importance.

An important form of responsibility is responsibility for the future, both near and distant, which is built on the sense of responsibility for the present and the past.

The character of responsibility and its forms have changed in the course of history. The tribal system knew no personal responsibility. There was responsibility only to the community, which imposed a certain course of action on its members and controlled these actions. The slave society revealed the beginnings of a tendency towards individuality. While the commune fettered the actions of the individual, the slave society allowed him to act at his own risk, with a certain degree of independence. During the slave-owning period the individual was responsible not to the community, nor yet to himself, but to the polity and to the gods. With the rise of the state the concept of individual responsibility to the state, the monarch and to God began to take shape.

As the idea of state developed and with it culture, there arose the idea of personal responsibility, which was to be further developed in feudal society. On the historical philosophical plane the idea of responsibility to oneself begins with Socrates, with his persistent listening to his own inner voice, the voice of conscience. It was Socrates who sought in the individual certain eternal standards that could not be violated.

The Middle Ages saw a deepening of the subjective world and the formation of a complex hierarchy of personalities — the divinity, the tsar or king as god's deputy on earth, the servant of god, the feudal lord, the steward and so on. The whole gigantic pyramid took possession of man's consciousness and dictated certain modes of action.

Under capitalism the degree of individual responsibility to society further increases. The working class, all working people of both hand and brain, led by parties that truly represent their interests, take responsibility for the future of society as the general crisis of capitalism develops.

Individuals in large numbers, the masses strive to judge whether their actions are correct or not. This inner judge is what we call conscience. Historically, the prick of conscience was most vividly expressed in the immortal image of Hamlet, in whom this dawning self-consciousness became tremendously important as a spiritual motivator and controller of all his actions. Evidently it was at that time that the idea of conscience was making its way into social consciousness. Today the role of conscience is greatly enhanced by, among other things, the manufacture of the means of mass extermination.

When atom bombs were dropped on Hiroshima and Nagasaki, causing monstrous destruction and suffering, many scientists,

technologists who took part in the making of these deadly weapons, and the men who had used them, experienced agonising pangs of conscience and one of the pilots went mad. The usual argument is that they were only executors of the will of the politicians and the military, who in their turn excuse themselves on the ground of historical necessity, the interests of the nation, and so on. The argument thus becomes a vicious circle.

How are we to regard the idea of personal and social responsibility, the inner judge of socially significant human actions, the social conscience of the individual? Any scientific solution of this problem rests on the practical solution of the problem of the individual's right to real freedom.

The idea of man's responsibility for his actions has with great difficulty and suffering penetrated the consciousness of society. It has made its way as the individual has won the right to independent decision-making and freedom of personal behaviour. The early capitalist period placed a gigantic responsibility on the individual and helped to develop individuality. Individuals made discoveries and inventions, travelled to new lands, created masterpieces of literature, painting, sculpture, and so on.

To say that a person is responsible is to say that he is capable of correctly answering the question of what is right in the moral, legal, political and other respects. Any responsibility is based on knowledge of what is necessary in the interests of the group and society as a whole. A human being cannot be regarded as a cybernetic machine processing information fed into it. It is responsibility that expresses the individual's appraisal of his ability to be a personality, to control his actions, to combine word and deed, to be able to use his freedom rationally. If we want to decide whether the given individual could or could not have acted differently, our criterion is primarily the objective circumstances and possibilities, while the measure of responsibility is decided by the degree to which the individual made intentional use of the available opportunities.

The main difficulty of the problem of responsibility lies in establishing not so much responsibility as its degree, i.e., the individual's voluntary, conscious participation in determining reprehensible or criminal action. A closer inspection of the motivation of every individual act shows that independently taken decisions and actions are determined to some extent by such factors as the objective coincidence of circumstances, a person's habits and character, weakness or strength of will, and so on.

All this and much else influence the direction of his thoughts, his choice of goals, his motivation. Added to which, the sphere of possible choice is sometimes so narrow that the choice itself is merely a formality. So the problem of the compulsory and the voluntary becomes extremely complicated and confusing.

The real measure of responsibility that a person bears for his actions depends on the real conditions that life has granted him for consciously evaluating the consequences of his actions and taking a corresponding personal stand.

Responsibility is the concern not of fists, but of the will. A person may bear responsibility only for intentional activity. Without intention there is no responsibility. When a crime is committed without intent, there is no complete unity between the external and internal aspects of the action. Guilt due to negligence lacks awareness of the possibility of the consequences that actually occurred. Oedipus, who killed his father without knowing it, cannot be held responsible for patricide despite the views held on this point by the ancient world. Depending on the conditions, people have to answer in different ways for their actions and they do answer for them in different ways.

Every human action, when it becomes part of the independent course of events, leads to results that do not coincide with its immediate aim. What is more, the aim that the person sets himself does not always coincide with his motive, i.e., with the goal that he seeks to achieve by his action. The question then arises as to what actually is a person responsible for—only for his aim, his inward intention and motive or for the result of his action?

In life there are cases when an action prompted by good intentions has disastrous or even tragic consequences. And on the other hand, a person may for discreditable reasons perform an action which produces good results. Such cases are used sometimes to contrast subjective intentions and objective results, so that the subjective can be distinguished from the objective on the practical plane. But this purely superficial contrasting cannot be accepted as logic. In fact, every intention of an individual performing some action stems and must inevitably stem from the foreseeable, desirable result of the action. When a person, guided only by good intentions, fails to foresee the results of his actions, this merely means that he has not fully considered certain consequences which do not form a part of his intention.

A person's action, which he willed to become part of external circumstances, develops in various directions according to a chain of

cause-effect connections. Any separate action may have a large number of consequences. When they acquire an independent life, these consequences may run very far and lead to effects that were never intended by the person concerned. Thus the question is transferred to the practical plane and may now be reduced to a discussion of precisely what consequences should in fact be taken into account, and to what extent. Obviously all the consequences that could be foreseen must be considered. Any failure to take into account the consequences of one's action constitutes an irresponsible or not fully responsible attitude to what one is doing. At the same time, when appraising an action, the right approach is to consider not everything that might have followed but only what could have been foreseen out of everything that actually did follow. This is what a person is responsible for and this is where his guilt may lie. In contrast to such conscious responsibility, a group of physically involved people whose individual wills have been suppressed and who have lost conscious control of their actions and their sense of social responsibility, are nothing but a mob.

Freedom manifests itself not only in practical action, but also in thought. Something new can be created only by a person who is thinking freely, who has shaken off the fetters of obsolete orthodox doctrines, as was the case, for example, with the thinkers of the New Age, who broke down the spiritual prison of medieval scholasticism.

Human freedom is manifest not only in the choice of a line of conduct, not only in control over the forces of nature and conscious reform of social relations. It is vividly expressed also in the individual's power over himself, over his instincts, inclinations and feelings. He is responsible both to society and his own conscience, for the forms in which these are expressed. Man becomes more perfect when he learns, under the influence of education, of moral, social and state demands, to consistently restrain impulses that are forbidden by social standards. And conversely we see that the person who has lost the power of self-restraint speaks and acts in a way in which he would not allow himself to do in an ordinary frame of mind and which he bitterly regrets when he returns to normal.

The cosmonaut who ventures into outer space is moved by his sense of duty to his people, and this inhibits the innate defensive biological reaction which generates a sense of fear. Such actions reflect man's long battle with his emotions and biological instincts in the name of rational forms of behaviour. They crown man's centuries of struggle for the right to call himself a personality. Man's development has been not so much a

matter of suppressing his various biological instincts as of their noble expression, based on the demands of the social mode of his existence.

Man and culture

Never has so much been written about man and culture as in recent years. The problem is so relevant to the present day that it comes up constantly for discussion at national, regional and international levels. In the West some people predict a tragic future for both man and culture; others are inclined to optimism, though their optimism is often tempered with anxiety. The backcloth for these speculations is an outward wellbeing and even an unprecedented flow of material goods. Nevertheless the gloomy predictions prevail.

They present a marked contrast to the philosophy of man and culture in Marxism, which radiates a bright view of the future.

Any discussion of the phenomenon of culture calls for an analysis of the related concept of civilisation. Neither can be understood outside their contradictory unity.

The concept of civilisation. Society and its history constitute the most complex and multi-dimensional process. And if we are to make any sense of this highly developed piece of reality we shall need a wide range of concepts. Human reason, which for centuries has been nurtured by this seething polyglot reality, has evolved numerous concepts and categories to explain the world historical process. For a long time idealist views prevailed, but dialectical materialism, with its materialist understanding of world history, has evolved a new and comprehensive system of concepts, categories and principles that enable us to reveal the essence, sources, mechanisms and driving forces in the development of society.

Historically the idea of civilisation was formulated during the period of the rise of capitalism in order to substantiate the principle of *historical progress*, the necessity for the replacement of the feudal system, when the claim that it was God-given no longer satisfied social and philosophical thought. Instead it was maintained that history was motivated by man's vital interests, his desire to realise the principles of social justice and legal equality. Thinkers became concerned with the future of world civilisation as a whole and this prompted them to create a different paradigm of philosophical thought, particularly when the victory of the Socialist Revolution in Russia in 1917 launched a new stage in the development of civilisation—development with a humanist orientation on the national and social emancipation of mankind, on distribution of the wealth of society according to work, and on freedom of the popular will in managing the affairs of state and society.

On the other hand, the sharpening of social contradictions in capitalist society led some philosophers to believe that the "sun" of social progress was about to set. This idea was most fully expressed in Oswald Spengler's well-known book *The Decline of the West*, which stimulated such thinkers as Pitirim Sorokin and Arnold Toynbee to produce their own socio philosophical patterns of the global historical process. Sorokin attempted to reduce recurrence in the historical process to recurrence in the spiritual sphere by generalising the corresponding spiritual phenomena into a concept of "types of culture" (culture being treated as synonymous with civilisation), while treating the historical process as their fluctuation. According to Sorokin, the sensate society that we know today is moving towards inevitable collapse and this is connected with the successes of science and materialism. He sees the salvation of humanity in the victory of the religious and altruistic principles, which should be active and creative. According to Arnold Toynbee, there is no single unified history of humankind. We are concerned with a score or so of unique and self-contained civilisations, and all of them are equally valuable in their own peculiar way. In its development every civilisation passes through the stages of emergence, growth, breakdown and disintegration, after which it is replaced by another. At present, according to Toynbee, only five main civilisations have survived: the Chinese, the Indian, the Islamic, the Russian, and the Western. Civilisation's driving force is the "creative minority", which leads the "passive majority". In the stage of disintegration the minority imposes its will on the majority not by authority but by force. The doctrines of Toynbee and Sorokin are both idealist, in the sense that they tend to ignore the development of the material life of society as the basis of the historical process and to absolutise the spiritual element. On the other hand, these doctrines do attempt to revise the mechanistic doctrine of the purely linear progress of society, to evolve an alternative to the conception of "Eurocentrism".

Marxism went to the root of the problem by showing that the development of society proceeds in successive stages, pinpointing the distinctive features of each stage, and thus evolving the category of the socio-economic formation. This placed our understanding of history on a scientific, dialectical-materialist basis, which is the only feasible one. The category of the socio-economic formation is crucial for interpreting both the history of mankind and its specific phenomena, such as culture and its interconnections with society and the individual.

However, this category does not account for the whole categorial apparatus of socio-philosophical thought. The infinitely rich texture of

history cannot be reduced to various types of formation and the histories of many nations do not fit into any formational typology. Some nations never passed through the slave-owning formation, others "bypassed" capitalism, others are a mixture of tribal, feudal, capitalist and even socialist relations, while yet others exist in a state so indefinite as to defeat even the most subtle socio philosophical typology. In view of this complexity of the historical process, Engels noted that no one specific formation had ever exactly corresponded to its definition. History is constantly moving forward but not in a straight line; it zigzags, it turns back and all these different directions are taken in an extremely unsteady rhythm. The arrangement of the socio-economic formations in a straight line is a scientific idealisation, which the ideological critics of Marxism misinterpret as a desire to provide a theoretical basis for the idea that all the roads of history lead to one goal, and that all the past has been merely an exhaustingly long preparation for the ascent to the sunlit peak of universal happiness. But mankind's desire for social equality is indeed a recurring phenomenon. From time immemorial it has provided inspiration to the best minds of humanity, but this does not make the vector of history a straight line. Each people takes its own road. Some civilisations achieve a great and brilliant efflorescence and then, for some strange or even known reason perish, as was the case with the Mayas; other civilisations soar like a firework into the heavens, shedding their brilliant light on everything around them, then fall back in a shower of historically insignificant sparks. Yet others move slowly, retaining their uniqueness, protected from change as if by embalment.

In Marxist literature there is no unanimity about the meaning of civilisation. Some thinkers are inclined to dismiss the concept altogether, holding that it adds nothing to the broad concept of society. Others identify civilisation with the socio-economic formation, which is also a way of denying the necessity for the concept of civilisation. I believe that the correct standpoint is to regard civilisation as a special and very important category, as something which coincides with the category of the socio-economic formation in some respects but also differs from it essentially in others. The concept of civilisation "works" particularly well when world history is thought of in global terms, as something integral, and the future of mankind is regarded from the standpoint of unity and diversity. Historically civilisation defines not the early dawn of humanity, not its childhood or even adolescence, but its youth and maturity, the established forms of society. Basing himself on Lewis Henry Morgan's book *Ancient Society*, Frederick Engels followed him in observing that society began with the stages of savagery and

barbarity. These were the first gleams of sociality. And they were superseded by civilisation, the centres of which arose in various continents, some in Africa, others in Asia, others in Europe, and yet others in America. From this point we can begin to discuss the stages of civilisation and its corresponding forms.

The concept of civilisation has more than one meaning. Generically it denotes the historical alternative to the savagery and barbarity, which we mentioned above.

Secondly, civilisation may be taken to mean a relatively high stage in society's mastery of the forces of nature, a relatively high level of organisation of social relations and, in general, all aspects of social existence and culture and also a uniqueness of material and spiritual life of society in the framework of the nation, the state unit or the region. In this sense it embraces the overall motion of human history, the global achievements of society, the world standards evolved in the development of culture, society, technology and the productivity of labour, and also, of course, all the specific features of regional, national and ethnic forms of social existence.

Thirdly, civilisation may be thought of as a limitless universal phenomenon embracing not only terrestrial but also extraterrestrial forms in their assumed endless diversity, denial of which would be tantamount to acknowledging the greatest of all divine miracles. The universe is eternal and infinite. It cannot, in principle, contain only one terrestrial civilisation. If it did, civilisation would not be something natural and functioning according to certain laws, but a unique, unnatural, entirely fortuitous exception to the logic of the life of the universe and would thus have to be regarded as something miraculous. This was intuitively perceived by many ancient thinkers, who acknowledged a countless number of worlds inhabited by rational beings. It would be only natural if human civilisation, having penetrated outer space, sooner or later came into contact with extraterrestrial forms of civilisation.

The present age is characterised by a growth of integrating trends and the acceleration of development. Uniqueness preserves itself by overcoming its own hypertrophy. Even the least developed countries are being drawn increasingly into the orbit of modern civilisation. Interrelations are becoming closer and there is greater exchange of historical experience between one nation and another. All this goes to show that an unprecedented world-historic community of mankind is in the process of formation and requires a joint coordinating reason, not

centrifugal forces that generate trouble spots all over the world and bring grief and suffering upon millions of innocent people. More intensely than ever before humankind expects enmity and strife to be replaced by order and harmony. As yet, however, everything is in a state of contradiction. The victories of technology are often won at the cost of human health. Even the pure light of science with its radiant truths may also contain destructive rays. Discoveries and inventions, all the brilliant fireworks of the human intelligence, may burn up the very torch of reason.

While acquiring boundless wealth, although in extremely unevenly distributed forms, mankind has also created the real possibility of its own destruction. The imperialist threat of an annihilating nuclear, laser, chemical and bacteriological war has as its scientific and technological premise the achievements of modern civilisation. How is it that the great forces of civilisation imply not only benefits for humanity but also the possibility of a completely opposite effect? Where can we find a realistic solution to this seemingly hopeless contradiction? This predicament has been ideologically expressed in various philosophical, sociological, artistic and religious works whose conceptions tend to be more and more often of an apocalyptic nature. The scientific answer to these problems is given by Marxism and the real solution to them is to be found in the achievements of the countries of socialism.

The wise statesman is one who understands the overall tendency of the historical process, the law-governed tendency of society to organise itself in such a way as to eliminate the very possibility of some people building their happiness on the unhappiness of others, to liberate everyone from social inequality, from the unjust distribution of wealth, which results in some people smothering themselves in luxury while others are deprived of the merest necessities.

Civilisation is characterised not only by the level of production of material and spiritual goods that has been achieved, by a certain stage in the development of social relations, by freedom of the individual and of the nation as a whole, but also by the *possibility*, the potential for progress that is inherent in the social system it has evolved. The higher the civilisation, the richer and more energetic its potentials, the more rational and viable its orientation on the future. But not, of course on the "pie-in-the-sky" principle.

A society that has been doomed by history lacks these vital potentials and its line of development declines, like that of the Roman Empire, for instance. Empires in general tend to resemble the dinosaur. With its

gigantic body and disproportionately small head, it became less and less capable of rationally organising its own life activity and therefore was unable to compete in the grim struggle for existence. In the extinction of this clumsy giant among animals we may justifiably perceive a symbol of the inevitable end of imperialism in general.

Imperialist expansion, the desire for world domination in all its forms, the growing menace of war, the accelerating pace of scientific and technological progress and the accompanying ecological disturbance, threaten civilisation with a serious crisis. A vicious circle has arisen from which only the responsible forces of the collective wisdom of humanity can save us. It is not enough now for statesmen to think on the scale of the interests of one state. What humanity now needs are minds that think in terms of the planet as a whole.

The paramount consideration today is the preservation of peace, which has become the cause not of just one nation but of all nations, and responsibility for peace rests on the shoulders of every rationally thinking person and all social groups and classes of society. The defence of peace is the highest aim of the peoples of the socialist countries and this fact is enshrined in their constitutions.

The philosophy of culture. Civilisation depends on culture for its development and existence and, in its turn, provides the conditions for the existence and development of culture. Historically culture precedes civilisation.

Usually culture is understood as the accumulation of material and spiritual values. This is a broad and largely correct interpretation but it leaves out one main fact, and that is the *human being* as the maker of culture. Culture is quite often identified with works of art, with enlightenment in general. This definition is too narrow. Nor can one agree with the notion that culture embraces only the sphere of intellectual production, even if we take this sphere to include the whole of science. Such an interpretation leaves out a great deal. For example, the culture of physical labour, administration, of personal relationships, and so on. Reducing culture to the intellectual sphere results in an elitist approach depriving culture of its nationwide significance. But any person may make a contribution to culture, and not only artists, writers, or scientists. The concept of culture is an integral and all-embracing concept which includes various phenomena, ranging from the cultivated blackcurrant bush to *La Gioconda*, and methods of administering the state. Culture defines everything that man does, and how he does it, in the process of self-fulfilment. Culture is the method of the self-

realisation of the individual and society, the measure of the development of both. Various fields in knowledge— ethnography, archeology, history, literary criticism and so on—study the various spheres of culture. What we are interested in here is not the numerous spheres in which cultural activity of various peoples, nations, ethnic groups, social groups and individuals have manifested themselves, but the essence of culture, i. e., culture as a philosophical category.

We may gain some idea of the meaning of culture by turning to the etymology of the word, which can be traced back to the Latin *cultura*, deriving from the word *colere*, meaning both to "cultivate" and to "worship". It is a curious fact that the very origin of the word *culture* contains the wisdom of the people's understanding of culture as the worshipful cultivation of something, particularly the land. The word "culture" was thus from the beginning related to good action. And action usually means assimilation of our world in some form or another. It may therefore be said that culture is a kind of prism, through which everything essential to us is refracted. Every nation, every level and form of civilisation, and every individual attains knowledge of the world and a mastery of its principles and laws to the extent that it masters culture. The forms of culture are a kind of mirror that reflects the essence of every enterprise, its techniques and methods, and the contribution which it makes to the development of culture itself. In this sense man himself is a phenomenon of culture, and not only of nature. If we may attempt an analogy, it may be said that culture is the opened, read and understood pages of the "book of life", pages which when assimilated by the individual become his selfhood.

Culture is not merely a matter of skill raised to the level of art, but also a morally sanctioned goal. Culture manifests itself in ordinary consciousness and everyday behaviour, in labour activity and the attitude that one adopts to such activity, in scientific thought and artistic creation and the vision of their results, in self-control, in one's smile and manner of laughing, in love and other intimate relationships, which the individual may elevate to unexpected heights of tenderness and spiritual beauty. The truly cultured person shows all these facets in every manifestation of his selfhood. Culture is characterised by the vital ideals of humankind, of the individual, the social group, the class and society as a whole. The more significant these ideals, the higher the level of culture.

In what forms does culture exist? First of all in the form of human activity, which is generalised into certain modes or methods of its realisation, in the sign or symbolic forms of the existence of the spirit,

and finally in palpable material forms, objects, in which the individual's purposeful activity finds its embodiment. As something created by human beings, culture is at the same time a necessary condition for humanity's cultural existence and development. Outside culture the individual cannot exist as a human being. As water permeates soil, culture permeates every pore of social and individual life. When studying one or another culture we usually think of it as something relatively independent. In reality, culture exists as a historically evolved system comprising its objects, its symbolism, traditions, ideals, precepts, value orientations and, finally, its way of thought and life, the integrating force, the living soul of culture. In this sense culture exists supra-individually, while at the same time remaining the profoundly personal experience of the individual. Culture is created by mankind, by the nation, the class, the social group and the individual. The objective forms in which culture exists are the fruit of the creative activity of the people as a whole, the masterpieces of geniuses and other great talents. But in themselves the objective and symbolic forms of culture have only a relatively independent character; they are lifeless without man himself and his creative activity. All the treasures of culture in their palpable material form come to life only in the hands of a person who is capable of revealing them as cultural values.

In defining civilisation we stressed that it arose historically after culture and on its basis. The two form what is to a great extent a unified social formation, but their unity is internally contradictory and may in some respects become diametrically so. For example, nature accepts everything from culture but by no means everything from civilisation. A generally cultured attitude to nature presupposes the rational use of its forces without violating their natural harmony. Such forms of the spiritual life of society as science, literature and art are facts of culture. They organise and ennoble human feelings and serve as the plastic means that connects the reason and the heart in a single whole, thus eliminating the disharmony that often arises between them. The general cultural significance of science is enormous. It raises society and human beings to a higher level of spiritual development, thus increasing the power of reason. In science, however, a fact of culture is, above all, what is directly or indirectly aimed at improving the higher intellectual principles in man and society. And one certainly cannot describe as culture or the making of culture any activity which is deliberately aimed at destroying the achievements of reason and of human hands. Science is a beneficial phenomenon of the mind. But how much evil it brings and may yet bring in unscrupulous hands!

Civilisation is organically linked with the advance of technology. But the main thing in technological progress is, or should be, its humane orientation. It is important to know what a certain technology gives to man and what it takes away from him. The face of culture bears the imprint of humanity, and anything that is against humanity is not culture but anti-culture. For example, such highly technical sophisticated means of murder and violence as war, torture, and imprisonment, have nothing in common with culture, although they occur in civilised societies. Can the brutalities of despotic regimes be described as a phenomenon of culture? Can the means of mass annihilation be called a material reality of culture? It would be a great sacrilege to recognise such things as cultural realities, even when acknowledging the inevitability of their existence. All this is a creation of civilisation, but not of culture. This contradiction between culture and civilisation may also be found in the individual, the self. The adjective "cultured" presupposes something more than the acquisition of the ability to solve complex intellectual problems or to behave properly in society. Culture in the true sense presumes the observation of all the formal elements of socially accepted standards not as something external but as an integral part of the personality, of consciousness and even subconsciousness, of its habits. These standards then acquire a true and lofty spirituality, which is something more than obedience to certain rules. The culture of both the individual and society has various degrees of sophistication.

Every educated person may at times have a good opinion of himself. He may feel that he is cultured, and even intellectually advanced. But true culture and intellect are something very elevated and also very profound. They imply not only a subtle, sophisticated cast of mind developed through education but also a restless conscience, a bitter sense of discomfort when one is pursued by doubts as to the truth or falsehood of a situation. They imply concern and compassion for the fate of the people. An intellectual person knows that intellect is not an aim in itself but the dedication of one's life to others, the altruistic service of truth, goodness and beauty. All this is what we mean when we say a person is cultured. And we also mean the ability and courage to take responsibility for things that may have no direct bearing on ourselves but affect other people, and not only our near ones, but the people in general, the whole of humanity.

People are not born cultured; they become so through education and upbringing. Every individual learns to be cultured.

The objective and symbolic forms of culture are not implanted in man, they are merely given to him as the subject for study. In order to

master them, to make them his own, to incorporate them in the structure of his personality and thus cultivate that personality, a person must enter into special relations with them through other people and subject himself to what is called upbringing, an active process that involves both the educator and the educated in culture making, without which the life of contemporary or any other society would be inconceivable. Upbringing or education is itself historical. At first, in the earliest stages of human society, as with small children, education was simply imitative of the elementary actions of others. But this process becomes educative inasmuch as it takes place under the control of educators. With the passage of time it becomes more and more complex. Until, finally, such forms arise as school and college education and training on scientifically evolved principles. At the same time the boundlessly rich school of life as well as self-education also play the part of educator.

Without education and self-education there could be no culture, and certainly no cultural progress. It is education that relays cultural values from one generation to another and helps to multiply them. The constant accumulation of cultural values places increasingly complex demands on education as a most essential form of the creation of culture.

Culture is a social phenomenon that embraces not only the past and the present, but also the future.

Like everything else in life, culture is historical. The primitive horde and the tribal society and all the subsequent forms of organisation, all the stages of civilisation are characterised by their own peculiar way of life, perception of the world, and levels of consciousness. The culture of all peoples throughout history is permeated to some extent by religion. This is expressed in various rituals, forms of worship, in deities, in art, in philosophy and even in science. It is hidden in the very fabric of language—even an atheist, for example, may say several times a day "goodbye", which originally meant "God be with you". Without some fundamental knowledge of the history of religion it is impossible to understand our human biography, the biography of the human race, and to become a cultured person generally. For example, primitive society was full of animist, magic and mythological beliefs and this left its imprint on the whole system of the life, thought, emotions and interrelations of people and their relationship with nature.

The ancient Orient is characterised by an urge to achieve complete union between man and nature, the extinction of the self in nirvana,

understood as the highest level of the existence of energy. An intuitive integral knowledge of the world and of human nature permeates the whole of human existence and the spiritual life of human beings. This is a kind of knowledge in which philosophy, art, religion, science and social psychology are all intrinsically merged. The philosophy of the ancients was steeped in an awareness of the cosmic element and its exponents thought in terms of images which were plastic and almost geometrically integrated; and this was expressed in science, philosophy, art and everything else. The Middle Ages had a special type of culture related to the desire to achieve a personal absolute—God. Medieval culture is a culture of religious spirituality and the mortification of the flesh in the name of this spirituality with its orientation on the heavenly kingdom as the highest ideal of earthly existence, to which all the spheres of the life of society are subordinate. When capitalism came into being, everybody began to claim the right of free manifestation of his creative ego. The whole mode of human existence changed. The standards of culture also changed. Everything was subjected to the judgement of human reason and everything that failed this test was rejected. Society was rife with individualism, calculation and pragmatism.

Socialism has brought different ideals and standards of culture that are permeated with a profound and comprehensive humanism, as expressed in the maxim: everything for the benefit of man and everything in the name of man. The freedom of every person is seen as an indispensable condition for the freedom of all. This is the truly humane principle of life and standard of cultural development that permeates the whole world outlook of socialist society.

These are very general outlines of the historical types of culture and are not intended to draw strict dividing lines between them. It should also be stressed that to this day in many parts of the world huge masses of people on our planet adhere, in varying degrees, to some kind of religious belief and this is true not only of "simple folk" but also of highly educated people. At the same time growing numbers of people are estranged from this form of culture. The striking thing is the vitality and social power of religious culture, which provides a kind of spiritual integrating principle for whole nations and also for various social groups within one or another nation. This extremely complex social and psychological phenomenon needs investigation in the context both of world history and the present day.

The dominating role of certain forms in relation to others is characteristic of culture. In the Middle Ages religion clearly played the dominating role; its values were placed higher than anything else. The

religious-philosophical consciousness is the dominant form of culture in the Orient. Literature and music were the prime factors in all Russian culture of the 19th century, just as, a little earlier, philosophy and music played the dominant role in Germany. The development of culture does not follow a straight ascending line. It is beset with contradictions, that can be both beneficial and harmful, and signal decline as well as achievement. The wisdom of the people, folk wisdom, for example, has amassed a great wealth of empirical discovery connected with healing. But how much has been lost or passed unnoticed or deliberately ignored through the "ignorance of the wise"? The rediscovery and rehabilitation of what is reasonable in folk culture but has been "tarnished" is also a contribution to culture, and a very important one.

The contradictory nature of culture finds expression also in the fact that every culture has progressive, democratic and antidemocratic, reactionary, regressive tendencies and elements. This is expressed in Lenin's idea that there are two cultures in the national culture of every class-divided society. The expression "mass culture" is today extremely popular in the West. It is mostly used with a tinge of scorn, meaning something "watered down for the majority". But the concept of mass culture may also be understood positively. Socialism has made culture accessible to the masses, to millions of ordinary people, who previously vegetated in a state of ignorance and illiteracy. Today the peoples who have shaken off colonial oppression are vigorously and with all their strength striving towards the heights of modern culture.

What is imposed or implanted under the guise of "mass culture" in the capitalist countries has a political and ideological implication—the reinforcement of the power of the bourgeoisie.

The term "mass culture" becomes negative when the masses are not raised to the level of real culture, when "culture" itself is refabricated to suit the primitive tastes of the backward sections of the population and itself declines, degenerates to a level so low as to be an affront to all real cultivation of the senses. The mass of the people with its great fund of folk wisdom is presented with stupidity in the guise of culture and the sacred majesty of true culture's historical mission is insulted in the process.

If cultural progress may be defined as the growth of spirituality both in individuals and society as a whole, its regress is expressed in a lack or decline of such spirituality. And this is not compensated by material wellbeing. In the developed capitalist countries the ordinary person is surrounded by an abundance of consumer goods, but society as a

whole is in the midst of a moral crisis. Crime, drug addiction, mental sickness and even suicide are on the increase.

In the bourgeois world the further progress of civilisation goes hand in hand with a decline in its spiritual values. This was pointed out and expressed long ago in a morbidly acute form by Nietzsche and Spengler.

According to Nietzsche, the whole of European culture had for long been in a state of mounting torment and tension, which was carrying it to its destruction. European culture, he thought, was thrashing about, violently, convulsively like a flood seeking an outlet, with no thought of its own actions and even fearing to consider them. While acknowledging the multiplicity of local cultures, each of which was passing through its life cycle and dying, Spengler maintained that civilisation was the dusky end of culture, its ossified body. Why were two such positive concepts, expressed in such fine words, so sharply contrasted? Both thinkers, horrified by the crisis they observed in the world of capital, were painfully aware that certain destructive principles had arisen and were gaining momentum in civilisation, which both produced cultural values and put them at risk of total destruction. What Nietzsche and Spengler failed to see, however, was that the destructive principles were not inherent either in civilisation or culture, but in the character of the socio-political relations of the society they were studying. In many respects politics determines the vector of the forces of both civilisation and culture.

It is generally known that a disproportion very often arises between the level of civilisation, particularly its technico-economic reality, and the level of culture that has been achieved, and that this disproportion may become paradoxical. The times of the oil lamp and the wooden plough were graced with brilliant achievements in art, literature and philosophy. We have only to think of the great cultures of ancient Greece and even more the ancient Orient, the age of the Renaissance, and of Russian culture, which in conditions of serfdom astonished the world. This does not mean, of course, that beneficial urges of the mind require difficult circumstances, although there is a modicum of truth in this notion. Great works of art have indeed often been created in very hard conditions, as though they required some kind of resistance, a kind of "purgatory" in order to test the strength of their all-conquering power. But this in no way suggests that the difficulties themselves give rise to greatness. Difficulties are not its "parents" but merely its stern "examiners"! By no means all nations who are known for their backwardness in the technical and economic spheres have created

masterpieces of world cultural significance. Here there is a mystery which demands a solution.

At one time cultures tended to be extremely self-contained, closed. In the course of their comprehensive historical development they became more open to all kinds of influences and a process of interaction of cultures took place. Life evolves increasingly flexible mechanisms for this interaction, which helps to raise the whole culture to a higher level. Despite their uniqueness, the originality of the subtle fabric of any given culture, whose threads go back into the distant past, the various types of culture are in principle comparable, and a dialogue of mutual understanding can, and does, take place between them. Culture in its individual and socio-psychological expression is also characterised by the means with which it assimilates other cultures and its relation to them. Indifference or even hostility to the unique aroma of "alien" cultural values indicate a low level of development of one's own culture. Today one may observe a tendency towards the flowering of national cultures, one feels the great potential of ethnos. One may assume that further human progress will take place in the form of a mounting rational mutual enrichment of the cultures of West and East in the historical sense of the term. The overall unity of the general principles of human thought does not preclude a certain historical specific in the philosophies and other forms of culture. The predominantly analytical Western mind, which dissects everything into parts with its scientific scalpel, will be enriched by the intuitive integrating spirit of the Orient, by borrowing its subtle truths and perceptions and in its turn enriching them. World culture can only gain from this beneficial and probably indispensable synthesis which can be achieved without dimming the unique and rich colours of the local cultures.

The world of values. The highest of all existing values is man himself, his sense of dignity, his honour, his rights, his free thought, the self-realisation of his capabilities. Man has at his disposal the ocean of cultural values created by world history, and also the boundless treasures of virgin nature, which he is constantly using and enjoying as far as his own talent, education and upbringing permit him. The value perception of the world is a special dimension of reality in its application to man and society. An unquenchable need to know the meaning of life is a part of the very structure of the human ego and this impels us to build and accept a certain system of values, by which we must be guided in our thoughts, feelings and actions, in our relation to the world and to other people. In order to know what kind of a person we are dealing with, the nature of this or that society, we must examine it very closely

and try to see what it is ruled by, what it worships, what it admires and what it hates, what it is striving for and what it avoids by all possible means. A system of values is something that is deeply rooted in the structure of our ego. Everyone knows how painful, even agonising any "reappraisal" of values can be.

Things and processes, events, people, culture—all this exists objectively, independently of us, but it may also exist for us; we get to know the world, to admire it, we enjoy something or use it for some purpose or other. A human being cannot limit himself merely to stating the fact that something has happened, is happening or will happen, i. e., to mere knowledge of the fact as such. He always tries to understand, or sense what meaning this fact has for him, for his life, and also for the life of others, his own family, the life of society, whether it bodes well or ill.

How is one to define the concept of value in philosophy? Value is a fact of culture, and it is social in its very essence. It is a functional and at the same time an objective-subjective phenomenon. In themselves, things, events, outside their relation to man, to the life of society, do not exist as "categories of value". But as soon as a given reality comes into the focus of human consciousness and is made, transformed or modified by it, it also acquires a value aspect of its existence, a meaning. For example, instruments of labour, like everything else made by man, are a value which both determines the mode of their production and demands that they be used in a certain way. Life gives things certain functions—ways of serving man with their natural and man-made properties. This refers not only to humanised nature, that is to say, to the whole mass of civilisation, but even to the celestial bodies. They are in themselves significant in the context of the universe, as is everything in nature. But man's perception of them, the way he sees and comprehends them, and his relation to them are already a phenomenon of culture. The stars, for example, "speak" in various ways to man. In various periods of his history, at different levels of culture and even depending on his state of mind and mood man has had different attitude to the stars. The concept of value is correlative with such concepts as "meaning", "use" or "harmfulness". Use may be of a purely utilitarian character. There may be material or spiritual values (clothes, home, implements of labour, knowledge, skills and so on). We speak of the truth as a cognitive value, which brings enormous benefit to human beings and may also be used for evil purposes, as scientific truths often are. People may be burned at the stake or condemned to penal servitude for the sake of truth. History abounds in the exploits of people who have done good for others. These are moral values.

Cultural values are expressed in all kinds of symbols and systems of symbols, which constitute a huge layer of our value consciousness. An important place in this system belongs to the names of famous people, of heroes, various kinds of rituals, memorials, and so on. A person is born with symbols. His whole conscious life is surrounded by them. He dies with them. They accompany him on his last road. Symbols pursue us even into "the other world". Historians are known to have long disputes about the place of burial of some historical personalities.

What is the secret of the beauty of virgin nature, of the marvellous colours of the ever rolling sea waves, of the purple sunset, the enchanting Northern Lights, the majestic silence of mountains or the sounds of the forest? Is the delight that a human being experiences when he perceives all this confined simply to physical reality? Of course, not. And what kind of a reality is this delight anyway? Here we need not everyday language, but the language of music and art, the world of images used by the poet and writer. In other words, here we are speaking of aesthetic value.

When a person describes beauty, he characterises the aesthetic reality through his sensations and emotions in inseparable unity with the source that evoked them or, on the contrary, he describes the objective source in its unity with the emotions it has evoked in his soul. Nature speaks to us in our human language. Any attempt to think of beauty by itself, outside the objective-subjective unity is senseless. And this is true of everything that concerns the world of values.

When discussing the objective content of value, we also encounter a certain degree of convention. For example, conformity to the rules of decency is a phenomenon of cultural value. But what is considered decent depends on historically shaped standards and customs.

Such are the logic and psychology of the value relationship that an object discovered by our need may become an interest while the opportunities for satisfying that need remain extremely indefinite, problematic. This increases the attraction of the object, thus raising its value. What do people think of as valuable? And what is really valuable at bottom? The measure of value is decided by the degree of significance that a given object has for man and the possibility of acquiring that object. Value is historical. Take, for example, time. In the distant past time was treated carelessly, people scarcely bothered to count it. But now time is becoming increasingly compact and costly. People value it more and more, it has even acquired a commercial significance. In the age of the scientific and technological revolution

nearly every human action is timed down to the last minute. The value that human beings attach to time characterises in some degree the level of their culture.

When making an evaluation, particularly when facing a choice, it is important to know how strong and lasting is the "pleasure" or usefulness, the significance, including the negative significance, connected with the attainment of what is chosen. Whether it is easily or repeatedly attainable. As most people know, there is what we call the phenomenon of the effort spent: the more effort we have put into something, the more valuable it is for us. We attach less value to what was easily obtained. An act of heroism, involving self-sacrifice, is highly valued precisely because it is significant for society and there was a possibility of action of a quite different order. The beautiful is beautiful only against the background of the ugly. This applies equally to both moral and aesthetic values.

The evaluating consciousness has its "yardstick" which it constantly applies to things, events and actions, to everything that concerns people. The ideal is the eternal criterion in moral, aesthetic, political and other assessments of events, things and people. One cannot, consequently, speak of values outside their specific historical content, out of the context of the type of civilisation, formation or culture that is involved.

The phenomenon of value is linked not only with the intellectual, the cognitive sphere, but also with the rich sphere of human emotions. After all, it is our emotional state that constitutes the decisive psychological condition of happiness. Wisdom tells us that happiness—one of the supreme values— does not depend on high social status, power and riches or even intellectual ability.

Value is a "capricious thing". An object of value may be admired, it may repel, it may arouse delight in some and contempt in others, while others remain entirely indifferent. Much depends on taste and taste is fickle and subject to the "winds" of mood, of time and space. Taste may be traced to the depths of the human soul, which is moulded by the forms of culture which the individual has absorbed.

Although values are concretely historical, there are some which, like diamonds, are treasured at all times. These are the values of wisdom, kindness, heroism, love of one's parents, the love of a mother for her children, and respect for one's ancestors, for one's country, for freedom.

To sum up, then, the concept of value expresses the properties of things, phenomena, events, material and spiritual objects satisfying, or

capable of satisfying, certain needs and interests of human beings and society. Value is that which has meaning for man and society. All objects that are of interest to human beings, and thus possess value, have only a conditional value. Were it not for human inclinations, liking and interest, and the needs on which they are based, these objects would not have any value. Consequently everything that brings or may bring satisfaction of human needs, beginning from the most elementary, instinctive biological and material needs, to the sophisticated demands of intellectual taste, composes a world of values. This world also includes social standards, which prohibit or permit, which tell us what is allowable, desirable, obligatory or otherwise.

From the standpoint of its significance for the intellectual life of a given person or even a nation it would be wrong to contrast, for example, some scientific discovery or invention to Christian or Buddhist ethics. These are different voices in the single chorus of the spiritual life of humanity. And any belittling of one or another voice is unworthy of a truly cultured person, just as any discrimination against one nation is in itself a belittling of human dignity as a whole, and exposes the discriminator as a chauvinist and lacking in respect not only for himself as an individual but for his own nation. It is equally wrong to insist on any single standard of value judgement for the cultural features of different peoples.

But it is not enough merely to acknowledge the legitimate right of every people to live in its own specific way. One must also understand what this originality stands for. One culture may raise its voice about something on which another has nothing to say. And when even one voice is suppressed, the harmony of the chorus of the world culture cannot be complete.

Endless contradictions arise in the system of socio psychological stereotypes. The very concept of values in their full sense presupposes a creative attitude to life and is incompatible with standardisation of thought or behaviour. As the highest degree of spirituality, in the sense of high value orientations, culture consequently presupposes the breaking down of stereotypes. And it is those who break them that are the innovators. They create new values and, in so doing, generate new stereotypes, a new style of thought and behaviour. Hence there is a struggle, and this struggle involves losses; immortality may sometimes be won through premature death. Such has been the fate of the revolutionaries of thought and action at all times and among all peoples.

Man in the system of culture. Culture is the living process of the functioning of values in the context of the existence of the individual and society. It is the process of their creation, reproduction and use in historically changing ways. Culture arose and is developing together with society, creating an enormous tradition. The history of culture is full of stagnant phenomena, rigid dogmatic systems and conservatism, and also of revolutionary innovations. The previous achievements of culture are not parted from us. Their finest examples continue to live and "work". No child can become a developed personality without absorbing some of the treasures of culture. Culture always survives those who have created it and that which it originally served.

The first stages of a child's growth pass in the family, where the elementary notions of what is good and bad in the moral and aesthetic senses, of what is beneficial or harmful, are acquired. This is where the foundation is laid of sensory experience, the power of imagination and thought, and the elements of emotional culture. Admittedly, the educational effect of the kindergarten or the creche or the school, which carry out a planned educational programme on the emerging personality, are added to the experience of the family and thus bring with them the experience of centuries, developing in the child such qualities as curiosity, love of country, and so on.

Modern civilisation has enormously expanded the opportunities not only of human knowledge, of physical, biochemical, physiological and intellectual forms of activity, but also the various ways of developing them. Here an important role has been played by such disciplines as psychology, neurobiology, and medicine, which have long made humanity their study. They are constantly perfecting their research techniques in order to penetrate the mechanisms of life.

Great efforts are being made to find hitherto unknown human reserves in the hope of discovering more effective ways by which the nerve centres and other body centres can generate and transform bioenergy and information, of scientifically explaining the human ability to receive various radiations from living and other objects and the information effects connected with these radiations, which people have for long observed but which have not yet been properly researched. The advances that science has already made in penetrating the secrets of the living organism with the help of instruments of great resolving power give us hope and confidence that we shall be able to understand many mysterious phenomena, and that this knowledge may transform the very style of man's philosophical and scientific thought, his idea of

himself and his place in the universe, of the factors that control his vital functions.

The sages of ancient India discovered astonishingly subtle and profound psycho-biophysical connections between the human organism and cosmic and subterranean processes. They knew much that even today is beyond the ken of European scientific thought, or that it ignores, often trying to conceal its helplessness by asserting that oriental wisdom is mere mysticism, and thus showing its inability to distinguish the rational but not yet fully understandable essence from various figments of the imagination. It is sometimes difficult for us to penetrate the profound language of symbolic forms in which this wisdom is couched, to get at the essence of that wisdom. A full understanding of these complex problems can be achieved only in the broad context of history and culture. Historical experience offers us some instructive lessons for the present day. If we look around thoughtfully at the path humanity has travelled, it is not difficult to see that the minds of the makers of culture have been guided by the desire to achieve an understanding and a rational transformation of the human being himself, his bodily and spiritual organisation, the preservation and strengthening of his health. Socio-political, philosophical, religious, moral, aesthetic and all cultural efforts in general have tended towards this goal.

The culture of the ancient Orient affirmed not only ideas of man's dependence on the supernatural forces that were external to him; there was also a tendency to cultivate certain rules of behaviour in relation to these forces, including techniques of training the body in order to regulate and perfect bodily and spiritual processes. Various systems of exercises linked with religious beliefs were evolved to change the state of the mind, the consciousness, to achieve complete unity with the universe, to become one with the energy of nature. These techniques for influencing one's own organism through the mechanisms of psycho-physiological self regulation and control —techniques that are much in fashion today— could not have survived for centuries and have penetrated other cultures with a different ethnos, if they had not contained some real knowledge of the most subtle and hidden structural, ergo-informational, neuro-psychical and humoral potentials, which even now sometimes seem fantastic to the analytical European mind, particularly when it is fettered by stereotypes.

Oriental culture is full of beliefs about the role of the way of life and its various components—breathing techniques, diet, self-training, cultivation of the skin, physical mobility, the ability to commune very

subtly with nature, acupuncture, cauterising, and other ways of influencing the biologically active centres of the organism, herbomedicine, diagnostics by means of the iris of the eye, pulse and olfactory diagnostics, consideration of the position of the earth in relation to the celestial bodies in medicine, the time of year and day and of the properties of water in relation to the state of the earth strata and the character of its flow in connection with geomagnetic phenomena—all this and much else has contributed to the great wisdom of the Eastern peoples, the wealth of their culture and man's place therein, their understanding of the mechanisms of regulation of his life activity and vital potentials. Thus already in the distant past, in the mists of mythological world views the precious crystals of knowledge, tested by the experience of centuries, of skills in beneficially influencing man's body gradually accumulated. How could people in those far-off times know so much without any experiments or apparatus about the conditions and factors that regulate the course of the vital processes and the character of the interaction between man and nature, particularly the influence of the celestial bodies, the sun and moon and various radiations proceeding from outer space and the bowels of the earth!? And all this was taken into consideration both in diagnosing and in treatment! Does this not go to show an astonishingly high level of culture that should arouse our admiration, gratitude and desire to study! This knowledge could not have retained its vitality if it had not again and again been confirmed by practice.

With the liberation of cognitive thought from the fetters of dogma, knowledge about man controlled by experiment and logical analysis made substantial advance. We can see this in the ancient schools of medicine (Hippocrates) and the work of the Arabic middle ages (Avicenna), where the art of medicine acquired such firm foundations that what was achieved in this period has become part of the fund of present-day prophylactic, hygienic, dietetic and other rules, not to speak of physical culture. Behind all this lay many centuries of popular wisdom about healing that was sometimes astonishingly effective. Despite the barriers and profound scepticism of blinkered thought, scientists are now taking a much more sophisticated interest in this age-old wisdom because they see that it offers clues to the hidden processes in the human organism, and ways of changing the internal and external forms of human behaviour. On the basis of these clues, one can say that man's whole moral-psychological make-up is shaped by the direct and indirect influence of the conditions of his information-evaluative perception of the countless diversity of the environment, not only natural and

specifically climatic but above all that of the unique world of culture, which he drinks in even with his mother's milk.

In this information-evaluative perception a great significance attaches not only to the boundless wealth of the concepts, notions, feelings and ideals evolved by human experience but also, and to a deeper extent, the values that have engraved themselves in the memory and that are imparted to the individual in childhood by his native culture—his native language, music, songs, fairy tales, paintings, sculpture and architecture, in a word, all the mental wealth of his own people. The ethnic climate of the home culture forms certain value orientations in the individual which make him a representative of precisely that culture.

Every patriot experiences a feeling of pride in the depth and inexhaustible wealth of his own culture. "... I am far from admiring that which I see around myself; as a writer I am irritated, as a person with prejudices, I am insulted, but I swear on my honour that not for anything in the world would I change my country or have a different history than that of our ancestors, that which God gave us."¹ Pushkin had an intense feeling of being organically linked with his own land, with the aroma of its history, with the charm of its memorials—the creation of the minds and hands of his fathers and forefathers.

The sense of pride in the culture of one's ancestors, one's people, plays an active role in forming the dignity of the individual and reinforces his civic maturity, his sense of responsibility for the future of his country. The memory of one's gifted ancestors, who created the works of art and literature and contributed to science, to social relations, is a sign of a person's rich spiritual endowment, of his respect for all the work of human hands, in which one can feel the soul of their creator, his labour, his amazing skill and perceptive observation. Literature has portrayed splendid characters with a complete mastery of their trade, characters who embody the talent of the nation, the sensitivity to beauty and the urge for free creative work and inspired labour that is inherent in any people. This wonder at the people's creative gifts helps a person to become a personality. Beauty is a source of moral health and strength.

Just as a tree growing in a certain soil puts down deep roots and drinks its juices, so a person from the moment of his birth until he departs from this life is deeply and in every respect rooted in the system

¹ A. S. Pushkin, *Complete Works*, Vol. 7, Moscow, 1964, p. 863 (in Russian).

of his culture and nourished by the spirit of his own people, their customs and morals, their sensory, emotional, intellectual and speech system of their culture. A person is also nourished by the specific type of natural landscape in which he lives and the memory of the people, its symbols and specific genetics. And if by force of circumstances a person is uprooted from the soil of his own culture and all its unique integrity, this is always a painful experience which may result in agonising forms of nostalgia. Such experience has been vividly and fully reflected in literature and music, particularly by those artists who felt such pangs themselves. The innate relationship with the native culture can be traced even to certain genetic mechanisms, which carry a powerful life-long programme, which is not only racial, national, but also family and even individual.

The gap between Western and Oriental cultures and the ignorance that exists on both sides often results in a representative of one culture becoming overenthusiastic about the other and forgetting his roots. For example, he may become dedicated to yoga or karate without taking into account the specific features of his own culture or the genetic and other natural factors of his psychosomatic structure. This may have a result that is directly opposite to what he desires. Resorting to the East in search of exotic variants of cultural values merely for the sake of the current fashion usually indicates a low level of culture. It is like a person chasing in the darkness of the unknown for something that he does not know. Any culture, especially its very deep personal stratum, has full significance only for its own conditions and within its own limits. The ways of behaviour pertaining to one system of culture cannot be thoughtlessly implanted in another. This cannot always be done even with plants. The culture of one's personal life, for example, with regard to health lies not so much in the stubborn desire to prolong one's genetically programmed life expectancy as in trying not to shorten it by all the means, which unfortunately are only too readily available in one's particular system of civilisation, for example, in the form of alcoholism, drug addiction, overindulgence in food, lack of exercise, and so on. Culture is closely akin to wisdom, or that part of it which is acquired by education. It involves the ability to observe the rule of moderation in everything, and if this moderation must be violated in the name of a new culture, it should also be done in accordance with reason and objective necessity.

* * *

The thinking mind of culture is philosophy. Philosophy is its focus and, without it, no real culture of the mind or heart, no true intellectual achievement is possible.

We have considered all the basic propositions of philosophy, its principles, categories and laws, its cognitive, creative and evaluative aspects. The author has sought to show how through the conceptual apparatus of philosophy the whole system of world-view, the methodology of cognition and the transformation of the world and man himself is organised. In concluding this book I have concentrated attention on the most essential problem of all, that of man and his existence in the world. We began with a definition of philosophy as a fact of culture, as its nucleus, as its self-consciousness; our concluding chapter has been an examination of culture as the human factor, the highest of all values known to man.

Appendix A. Request to Readers

Progress Publishers would be glad to have your opinion of this book, its translation and design and any suggestions you may have for future publications. Please send all your comments to 17, Zubovsky Boulevard, Moscow, USSR.