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LOGIC, LANGUAGE, AND ARGUMENTATION IN PROJECTION OF PHILOSOPHICAL KNOWLEDGE

CONTENTS

Ch. I. THE NATURE OF PHILOSOPHICAL KNOWLEDGE[1]

1. The Specificity of Philosophical Knowledge

Knowledge of any kind, physical, mathematical, biological, geographical etc., informs us on some features, aspects fragments and so on regarding reality surrounding us. Thus, the picture of reality in our consciousness is the sum total of different kinds of sources of knowledge. If the picture of reality is a scientific one, it means that it integrates the results of sciences. But as there are various opinions on the nature of philosophy (in the sense of its status as a science) I prefer to make an analysis, first, of the picture of the universe - as a compound of different kinds of knowledge, abstracting from the fact of their being scientific or not.

A simple way to explain the specificity of any field of knowledge is to define it. When we define biometry as the scientific application of mathematical analysis to biological problems (Runes 1967: 39), we explain (though in a general way) the specificity of biometry, its differences from other fields of knowledge. Here is another example: Formal logic is defined as a discipline investigating the structure of proposition and of deductive reasoning by a method which abstracts from the *content* of propositions which come under consideration and deals only with their logical *form* (Ibid: 170). This definition of formal logic explains the specificity of this branch of sciences and its differences from others. So a definition of a branch of knowledge is called upon to show the specificities of that branch and its differences from all the rest of the genus (which is knowledge in this context).

This way of finding specificities is valid enough in order to describe all fields of knowledge except philosophical knowledge. The specificity of philosophy is not of the same level as those of all other branches of knowledge. The definition by genus and difference does not explain the main property of philosophy since its specificity cannot be characterised by distinguishing it from the other species of knowledge. This can be demonstrated on a higher level. It is necessary to indicate the differences between philosophy and *all* the other fields of knowledge. In other words if we want to show the specificity of any field of knowledge, except that of philosophy, we can do it, first of all, by dividing the class knowledge into sub-classes, each corresponding to a definite field of knowledge. The differences of these sub-classes from one another must show the specificity of knowledge which is known as philosophy, we can do it by dividing the class knowledge into two subclasses of contradictory relation (A and ¬A).

Having in mind to show the specificity of philosophy, its differences from all other fields of knowledge, let us consider knowledge as a kind of architectural building. In order to locate each branch of knowledge let us consider the horizontal projection (plan) of this imaginary building. We can see some rooms. Each of them represents one of the fields of knowledge. Is it possible to find rooms corresponding to all fields of knowledge? The answer depends on the character of the building under consideration. In case the structure is apartmental we cannot find rooms corresponding to all fields of knowledge. The place corresponding to mathematics is not a room among such rooms. To find a place for mathematics among the other branches of knowledge we must design another kind of building: e.g. a hotel. The location of mathematics will be the passage (corridor) which communicates with all the rooms. (It reflects a well-known fact that at the present state of the development of science many of its branches make use of the method and conceptual apparatus of mathematics).

But we are looking for the place of philosophy. And in vain. There is no place for philosophy in the horizontal project of this construction, nor in the horizontal project of any construction.

If we want to find the place of philosophy in the design of any construction, we must look for it not in a horizontal but a vertical section of construction. Then we can consider some constructive elements which: a) do not belong to any floor or room, but have immediate connection with all of them, b) are the necessary building elements among the various parts of the construction, c) make possible the existence of the construction as such, as whole and stable.

It is possible to consider knowledge as a net where each square may represent a separate field of knowledge. Then, philosophy will be desig-

nated as knots.

Both comparisons show the relation between philosophy and all other fields of knowledge. It means that philosophy investigates such laws which expose, in a concrete way, through other fields of knowledge, but philosophy itself does not belong to any concrete field. Thus, philosophy has its own object of investigation. On the other hand, both comparisons show that there is no single field of knowledge (specially scientific) without philosophical implications. That is why such concepts as philosophy of mathematics, philosophy of biology, philosophy of law, philosophy of history, etc. are quite understandable.

Some investigators of this problem maintain that philosophy is not a science. This constitutes a specificity of philosophical knowledge from such a point of view. But this is not a way of discovering the specificity of philosophy. One of the arguments in defense of such a view is this: the main, central, fundamental question of philosophy is the relation of mind to body, of consciousness to being. What is primary? The material world or consciousness? Two contradicting answers are possible. And as yet alternative answers to the same questions do not constitute specificity of philosophy at all. The history of science shows many examples of such situations from different fields of science (such as Heliocentricism and Geocentricism, the systems of logic which are based on the law of excluded middle as systems which neglect this law of logic, etc.).

The specificity of philosophy is not alternative answers to the same question but an operation by the largest concepts, by concepts having universal character (for example: mind, body, consciousness, being, etc.). Many of them can be a genus or class of a term, but not distinguishing characteristic of a term. (For example: matter or consciousness can be only the genus of another term, but never a distinguishing characteristic).

That is why philosophy must itself create its logic and not introduce it from outside. The terms matter, consciousness cannot be defined by definitions of traditional formal logic: definitions by genus and distinguishing characteristics, genetic definition, ostensive, operational, nominal definitions, etc. The representatives of dialectical philosophy have defined such types of concepts as opposing correlative concepts (for example matter is primary and consciousness – secondary or vice-versa).

Philosophy is a general method of inquiry. Every branch of science uses this method. Hence, every branch of science, except philosophy, introduces a method of investigation from outside. Philosophy itself constructs a method for itself. The famous "The School of Athens" by Raphael tells us more than many painters and critics can imagine. Plato and Aristotle are arguing. Plato has put his hand up, Aristotle let his down. According to the interpretation of French philosopher Jean Wahl the nature of argumentation between Plato and Aristotle is determined by their contradicting primary points (Wahl 1963:1).

The primary points of each philosophical system determine the nature of its argumentation, inner method, logic, etc. Hence one of the main characteristic signs of any philosophical system as a system in the unity of its ontological premises, way of argumentation, inner logic, methodology and gnoseology.

Each science except philosophy finds its consciousness, reflection in philosophy. Only philosophy has self-consciousness, self-reflection.

When philosophy and other branches of knowledge analyse the same objects, concepts, there are some differences between their attitudes, between the levels and characters of their interests in the same objects. We can agree with John Passmore who writes: "...Consider, for example, the difference between neurophysiologist talking about mind and body and a philosopher talking about the same topic. The neurophysiologist tries to find out which cells in the brain are involved in particular forms of mental activity. While the philosopher is concerned with quite different questions, such as whether everyday explanation of human behaviour in terms of reasons, motives, and intentions are or are not compatible with explanations of human behaviour in philosophical terms" (Passmore 1967: 223).

The possibility of contradictory (materialistic or idealistic) premises of different philosophical systems leads to the conclusion that we do not prove anything in philosophy, we only postulate in it. In spite of this view we think that premises in philosophy are provable. But the proof of a philosophical statement has its specificity. We prove philosophical statements in different ways, such as: a) by human everyday activity which some philosophers call naive realism, b) by scientific experiment, c) by conclusions of sciences,

d) by deducting them from the premises, etc.

Philosophical knowledge has synthetic, integrative character. Philosophy does not consist of only contental, or formal, or formalised components. Philosophy uses all these components in connection with the object of its inquiry.

We do not differentiate between empirical and theoretical levels in philosophical investigations. Here they exist in unity.

While other forms of knowledge find their criteria of truth of their statements in philosophy, philosophy itself forms the criteria of its truth, explains and argues the nature of these criteria.

The specificity of philosophy reveals itself in some sense in the relationship between philosophy and other sciences. The circumstance that in the course of the history of the development of philosophy many sciences detached themselves from it, is badly looked upon by certain philosophers. W. Windelband says, that philosophy is like King Lear who divided all his property among his children who later threw him out, as a beggar. In order to imagine the relationship between philosophy and other sciences one has to resort to the similarity of the relationship between parents and offsprings, then one should give the example of a family not of unwholesome relationship, neither should the period of time be limited by the life of one family. The relationship between philosophy and other sciences is rather like the relationship between parents and offspring in general, the parents giving strength and affection to the children and in their turn leaning against them. And when the offspring grow mature and wise, the parents find immortality in them. That is why philosophy is never exhausted (the death of parents does not put an end to parenthood) and does not break up into concrete sciences (to exist without philosophy).

While investigating the specificities of philosophical knowledge, some thinkers called philosophy the queen of sciences, others consider it maid-servant of the sciences. It is neither the one nor the other. But if it is necessary to resort to that comparison, then it should rather be both at the same time. We should be near the truth saying that philosophy is like a large family's mistress, who, when necessary, willingly acts like a maid-servant for her family and acquires the charm of a queen, and if she behaves like a queen to her house that looks like a royal castle, she is willing to act, at every moment, like a servant for her children. Of course, one should not forget the conditional nature of every comparison, nor the extremely relative value of truth contained therein. Philosophy is not the science of sciences. But being a general method of sciences, a methodology, its task is, as Spencer thought, to co-ordinate the most important general notions and fundamental principles of various sciences.

It is wrong to say that concrete sciences inquire definite fragments of reality while philosophy inquires the universe as a whole. If each science studies a definite part of the universe then there is not place for philosophy to study. Philosophy does not study the universe as a whole. It studies the most general laws of the development of reality. The relationship between concrete sciences and philosophy is not a relationship between singularity, particularity, and generality.

The relationship between philosophy and special sciences cannot be seen only on one level. The nature of philosophy is polyhedral, multiplying, multiform. Hence, relationship between philosophy and special sciences will be exposed if we analyse the different sides of this relationship and sum up the results with the help of the principle of complementarity in its methodical sense.

Philosophy is not only a science. It is also an outlook. But its being an outlook is not a mere specificity of philosophy. Some kinds of knowledge also have the function of outlook (for example, esthetics, religion, etc.). The specificity of philosophy in this context is the specificity of philosophical outlook. The philosophical outlook is the basis of any outlook.

Being an outlook, philosophy obtains some other functions, among them: a) the function of value, b) the function of criticism. Philosophy criticises society, evaluates it and shows the way of reconstruction of human society. That is why many philosophers think that philosophy is, first of all, the science of man.

Philosophy deals with categories. Every science has its own categories. But philosophical categories are the most extensive, for they have a universal character. This character of philosophical concepts determines one of the main specific signs of philosophy: the relation between philosophy and metaphilosophy which essentially differs from the relations between any other science (logic, mathematics, biology, etc.) and its metascience (metalogic, metamathematics, metabiol-

ogy, etc.).

Knowledge in general, particularly philosophical knowledge is heterogeneous. Manylayer or manystratum character, first of all, distinguishes philosophical knowledge. It is because of the unity of multifunctions (methodological, gnoseological, axiological, critical, etc.) of philosophical.

When we discuss the character of philosophical knowledge we must differenciate between philosophy and philosophising. It is well-known that everybody likes to philosophise. Man is a Homo philosophicus by birth. We can characterise philosophising as a philosophical reasoning or reflection on the level of common sense.

The transformation of philosophising into philosophy is a very hard and complicated process. To elucidate this process it is necessary to analyse the sources and the origin of philosophy. Generally speaking we can talk of a philosophical picture of the world. In other words, we can say that philosophical knowledge is a result of generalisation of the universal laws of nature, human society and activity and consciousness. So we can say that the main sources of philosophical knowledge are men's individual and social activities, scientific results of discovery of the laws of nature, man's ability of knowledge of the realities surrounding us as well as our inner world, art and literature as essential phenomena which we must understand and at the same time a specific means or tools of knowledge of other's mind and other phenomena.

It is possible to mention some other sources on the basis of which we construct the philosophical picture of reality but even the mentioned sources can direct our understanding of the nature of philosophical knowledge in a right way.

Let us consider, first of all, science as one of the sources of philosophical knowledge. There are two main reasons why we begin our consideration of science as the source of philosophical knowledge. First, the influences of the intensive growth of scientific knowledge on philosophy. It is symptomatic that many concepts of different sciences now are included in dictionaries, encyclopaedias or textbooks of philosophy. If we compare the new dictionaries, with the previous ones we can find such concepts as algorithm, axiomatic method, entropy, formalisation, idealisation, isomorphism, metalanguage, metamathematics, metatheory, operationalism, structuralism, etc. All these concepts and many others like them are reflections of the new development of science and spontaneously entered the dictionaries and encyclopaedias of philosophy. Second, the concepts of science are much more exact than the concepts of other kinds of knowledge.

The question is whether we use in philosophy the concepts of science in the same meaning in which they are used in science? it is a very important question as there are many concepts which we use in philosophy as well as in science.

The same situation is with man's social activity. Social changes have reflections in philosophy. We even use "social philosophy" which indicates the part of philosophical knowledge which sciences too which studies some features of life of humanity (for example, history, economics and so forth) and again the question is if the concepts of social character which we use in philosophy and, for example, in the science of history, are identical.

The concrete sciences (regardless science of nature or social sciences) have their own apparatus of categories. But usually they use also philosophical concepts and terms. When we regard the intervention of concepts of sciences into philosophy we mean, of course, not philosophical concepts which they use but their own, typical, specific concepts.

The transformation of non-philosophical concepts into philosophical ones I call the conceptualisation of philosophical theory.

The preliminary condition of including non-philosophical concepts in the system of philosophical concepts is their transformation from the viewpoint of the universal character of philosophical concepts. This demand is conditioned by the very character of philosophical knowledge: philosophy investigates the universal laws of being.

The universal character of the concepts of philosophical knowledge conditions some other specificities of the philosophical concepts, the highest level of abstraction and generalisation.

But it does not mean that all the concepts of philosophical knowledge are on the same level of university and hence on the same level of abstraction and generalisation. We can consider the concepts of philosophical knowledge as *many-sided* composition.

The simple way of consideration of semantics

of philosophy can be the consideration of all the words which can be used in philosophical knowledge as a set. This set may be considered from the viewpoint of the first approximation as a construction of three subsets. One of them consists of the words by the help of which we usually illustrate philosophical assertions, assumptions, arguments, inferences and so on. With such a picture we consider other fields of knowledge too. The difference is that the subset of such words in philosophy includes many more words and many more different words than in other fields of knowledge.

It is also conditioned by the specificity of philosophical knowledge which is much more universal than any other field of knowledge.

The second subset of the vocabulary of philosophical knowledge includes those words which express the concepts of philosophical character though they are not on the level of abstraction and generalisation of the categories of philosophy.

The third subset includes those words which express a category of philosophy.

The differences between philosophical concepts and categories of philosophy are conditional.

The answer to the question "which philosophical concepts must be included in the categorical apparatus of philosophy" depends on the context of the development of philosophy.

The very division of the set of the words used in philosophical knowledge is also conditional. It can always be defined by the character of the concrete task of the problem under consideration. The category of philosophy, for example, can be considered as a subset of the set which includes philosophical concepts.

When we consider all the words which we use in the field of philosophical knowledge as a set, we can call it word composition or vocabulary. This set is the open set. Every language sign can be included in this set as well as it can be excluded from it during the growth of philosophical knowledge.

It is necessary that the concepts taken from sciences, literature and art, from everyday experience, etc. be transformed and replaced on the same level of generalisation and abstraction on which the actual concepts of the given philosophical system are. It is obvious that concepts which we use during our philosophising cannot be included in the systems of philosophical knowledge without a special explication. We usually identify, e.g., truthfulness, rightness, correctness, adequateness, etc. and not only in our everyday life but even sometimes in different branches of science. Meanwhile they are quite different concepts from the viewpoint of philosophical and logical sciences.

That is why the task of explication is the first job of any philosopher in his research work. We shall try to do it concerning the key concepts of this book.

2. Philosophy and Metaphilosophy

The fate of concepts which comprise the philosophical knowledge of our epoch, an epoch in which the information explosion, including scientific information, has become a universal conditioning factor, unfolds in various ways. Some of these concepts are inscribed in a basic way in the categorical apparatus of philosophy. Others, having failed the tests of time and philosophical and methodological practice, lose their significance for philosophy and drop out of the conceptual apparatus as easily as they entered it. Among the various new concepts in contemporary philosophy, that of "metaphilosophy" occupies a special place.

This importance is determined by the tasks that some philosophers assign to "metaphilosophy" in the historical role of philosophical knowledge. However, no consensus exists among authors who have intensively turned to the concept of metaphilosophy. This is despite the fact that a special journal bearing the title of "Metaphilosophy" has been published in the United States now for some decades. In addition a number of books can be enumerated in which the word "metaphilosophy" figures in the title or in which the preface specifies that the book deals with the problems of metaphilosophy.[2]

What essentially do these publications, which claim to be studied in metaphilosophy, deal with? In a book entitled *Studies in Metaphilosophy*, M. Lazerowitz writes that his own metaphilosophical research develops a hypothesis about the nature of metaphysical theories examined by him in a previous book, *The Structure of Metaphysics*. Each study of his book, in the opinion of the author, is a new attempt to improve

our understanding of what philosophical theory is and to explain the arguments confirming this understanding (Lazerowitz 1964: IX).

In the first chapter, entitled "Metaphilosophy", of Lazerowitz's book, *The Language of Philosophy*, the author's understanding of the nature and essence of metaphilosophy is revealed to an even greater extent. He characterises metaphilosophy as a new realm of research whose roots can be found in "a number of revolutionary ideas of Ludwig Wittgenstein" (Lazerowitz 1977: 1). According to Lazesowitz's conception, "metaphilosophy is the investigation of philosophical utterances with the special aim of reaching a satisfactory understanding of what in their nature permits the intractable disagreements which invariably attach to them (Ibid). Referring to Wittgensteins's words to the effect that philosophical problems have no solutions but only dissolutions, Lazerowitz underlines the idea that "metaphilosophy dissolves philosophy" (Lazerowitz 1977: 2).

In his book *Metaphilosophy*, J. Gill asserts that the term "metaphilosophy" has come to mean the activity wherein philosophers explain the nature of philosophy itself. He suggests that this question has become central today. He characterises metaphilosophy as a self-referential activity, since the consideration of the nature of philosophy is itself a philosophical enterprise. He comes to the conclusion that to be concerned with metaphilosophy (or in his words, "to do metaphilosophy") means to be concerned with philosophy ("to do philosophy") (Gill 1982: 1-2).

Despite the differences in the understanding of the nature of metaphilosophy found among its interpreters, who usually follow the traditions of Anglo-American analytic philosophy, there is a common thread: metaphilosophy studies the nature of philosophical knowledge, the structures of philosophical knowledge, the structure of philosophical theories, the methods and means of their substantiation, appearing thus as the philosophy of philosophy. In such an interpretation there is a great deal in common between "metaphilosophy" and "metamathematics". For a critical analysis of the proposed interpretation of metaphilosophy, and also for the resolution of the problems of metaphilosophy, it is expedient to turn to the conceptions of metamathematics. By virtue of its high degree of elaboration, metamathematics can serve as an analogue for understanding the characteristic features of metatheory, including metaphilosophy, which claims to be one of the varieties of metatheory.

Let us cover briefly the genesis and characteristic features of metamathematics.

The conception of metamathematics arose in connection with David Hilbert's research on the foundation of Mathematics. He formulated the aim of reconsidering all of mathematics in terms of formalised consistent theory. (In this case, as Hilbert correctly suggested, there would not arise paradoxes similar to those of the set theory). Such formalised mathematics is the object of the analysis of the theory that is called "metamathematics". Metamathematics itself appears as an informal theory, but it is not another level in comparison with the original theory. It is called upon to investigate the properties of the axioms and theorems of formalised mathematics. Special attention is devoted to the investigation of the consistency of the system of axioms. It is obvious that as much as the object of the analysis of metamathematics is a formalised theory, metamathematics itself does not and cannot undertake the task of explaining the meaning and content of object theory as such (Hilberd & Bernays 1939).

Mathematical object theory is considered as some form of logical calculus, built on the basis of a formal language (an object language) with all its specifically conceptual syntax and semantics.[3]

S. Kleene notes that metamathematics considers a great diversity of problems of foundation of mathematics and logic (the author has in mind mathematical logic as a mathematical science), and the problem of consistency is only one of these problems (Kleene 1952: §14).

In the book by N. Raisova and R. Sicorski, alongside "mathematics" and "metamathematics" appear such terms as "arithmetic" and "metaarithmetic". Metaarithmetic investigates arithmetic as some new object (Raisova & Sikorski 1963: Ch. V, §1). Moreover, in their work theory and metatheory are also discussed. What Rasiova and Sikorski say should be understood to mean that one can present scientific theory as in principle a definite formal calculation, in the language of the given science[4], and create for this calculation an informal conception in the form of a concrete metatheory. The latter is called upon to investigate the structure, the models of foundation, and other analogous properties of object theory.

In this way, also, linguistics has laid claim to metalinguistics, biology – to metabiology, and the like. It is obvious that in such an approach the question suggests itself as to whether metaphilosophy is possible for philosophy. We have already seen that certain philosophers respond affirmatively and unequivocally to this question.

Undoubtedly, one may consider philosophy as a definite theory. However can one consider it as an object language for the purposes of the corresponding metatheory, which in the given context appears as metaphilosophy? Philosophy as a theory studies definite regularities of the surrounding reality and in this sense philosophy, like any other theory, needs a conception that embraces the conditions and realm of its application, the specificity of its foundation, and other analogous properties. In this sense philosophy, like any other theory, claims to have metatheory. But with this the common ground between philosophy and other theories ends, and the divergence between them begins.

This divergence manifests itself above all in the fact unlike many other theories, it is impossible to present philosophy as a formalised system, or the language of philosophy as a formalised language. It is true that certain philosophers attempt to formalise philosophy, even dialects, but it is questionable whether one can take such efforts seriously. In philosophical knowledge the informal, formal, and formalised levels are so closely interwoven that it is impossible in principle to present this knowledge in the form of the calculation. And it is questionable whether it is expedient to attempt to present even its individual, more or less independent fragments as a formalised system.

And when the issue concerns the normalisation of an entire theory in other realms of knowledge, then the enthusiasm of such aspirations should not exceed the real possibilities. With his theorem about incompleteness K. Gödel proved the impossibility in principle of a complete normalisation of more or less informal scientific theories (Gödel 1990, see also Nagel and Newman 1964).

It should be noted that when the discussion concerns the possibility of metaphilosophy, the very philosophical theory is meant above all, and not such disciplines as logic, ethics, aesthetics, and the like – whose degree of detachment from philosophy as such continues to be a subject of discussions.

We must use a strictly differentiating approach to this problem, something that the objects themselves require of our analysis. It is quite natural that within the framework of this problem, the question which logic we have in mind, has primary significance. Thus, for dialectical logic, which appears as the logical function of dialectics, it is impossible in principle to construct a metatheory in the form of a metalogic. The considerations here are the same as those expressed in connection with philosophy, dialectics from the standpoint of the possibility of creating metatheories for them. Neither dialectical logic, nor dialectics is subject to normalisation. (Modern formal logic is another matter. Many of its parts now are presented or can be presented as formalised systems. The concept of metalogic is precisely applied to them. No one has any doubt that the object theory of metalogic is a logical calculation.

As far as ethics and aesthetics are concerned, their substantive and social determinateness and their close connection with philosophy testify to the impossibility in principle of formalising these theories. The path to the creation of metaethics is seen by some philosophers in the complete isolation of ethics from philosophy and the construction of so-called deeply normative ethics. Attempts are made to create a "nonphilosophical ethics", evidence for which is the title of the most recent book – *Ethics without Philosophy* (Ethics without Philosophy 1982). But do these attempts mean the possibility of representing ethics as a formalised theory? Can one really give an affirmative answer to this question?

However, the fact that philosophical theory cannot become a formalised theory does not mean that philosophy is not in need of a foundation of its positions or an analysis from the standpoint of its method and structure, i.e., of those issues which metatheory deals with, or in this case metaphilosophy – if it were to exist.

Such questions as those enumerated, which have significance for philosophical theory, appear in a unique way and are interpreted in the light of the specificity of philosophical knowledge. Thus, if the impossibility of constructing metaphilosophy is maintained as a matter of principle, this does not mean that in respect to philosophical theory we cannot demand the requirement of consistence. But here this require-

ment is not defined by the same criteria that are proposed in relation to the consistency of formalised theories. As is well known in the latter theories the consistency has syntactical and semantic aspects. In this connection are theories consistent with the syntactical point of view providing there cannot be derived from its foundations any assertion together with its negation. A theory is consistent from a semantic point of view providing there is at least one model which would satisfy this theory. These requirements themselves have simply a formal character, although they are considered within the framework of an informal theory – a metatheory. (Of course, metatheory can become, in turn, an object theory for metatheory, and in such a case it is converted from an informal to a formalised theory).

As regards philosophy, like any other informal theory, there exists the widely accepted requirement that there should not be any logical contradictions in it. Only misunderstanding the true nature of dialectics can lead to the unfounded conclusion: "Appealing to the fruitfulness of contradictions, dialecticions claim that this law of traditional logic (that is to say: the law of contradiction. G. B.) must be discarded" (Popper 1969: 316).

It should be also noted that for concrete scientific theories the proof of their consistency (and even completeness) does not always exhaust the epistemological problems linked with them. It may seem at first that the establishment of the consistency and completeness of a formalised calculation, which describes the certain theory, signifies proof of the complete adequacy of this theory: if the calculation is consistent (in the semantic sense of this term), then only true expressions may be derived from it; if the calculation is complete (in the broad sense), then all the true assertions of the corresponding theory may be derived from it. Hence, the following conclusion suggests itself: in a consistent and completely formalised system all and only true assertions about the realm being studied are provable. This would be the ideal foundation of the theory under consideration, and moreover, it would mean that the fundamental and final (absolute) criterion of the truth of scientific assertions is a criterion that is completely independent of the test of practice. This could give rise to the illusion of metaphilosophical proof of the truthfulness of philosophical theories, independent of the criteria of socio-historical practice.

But in reality the situation is essentially different. First of all, in the course of proving metatheoretically the consistency of some formalised calculation, we proceed from the belief in the complete adequacy of metamathematically informal reasoning; at the basis of this belief lies the socio-historical experience of humanity. Secondly the proof of the completeness of the calculation is by its nature relative. The completeness of the given calculation involves the unprovability in it of all the truth about the realm of reality under study, and the probability only of all the semantically true assertions of the given formal theory, whose adequacy to reality can be established only on the basis of the criterion of practice. Thus the consistency and completeness of the classical logic of propositions is strictly proven. But B. Russell has already noted the unusual properties of material implication (Russell 1903, 1919) and after the work of C. I. Lewis (Lewis 1912, 1917, 1918. See also Lewis 1913, Lewis & Langford 1932) the incongruity of the material implication of classical logic of propositions to the intuitive idea of the relation of logical consequence was revealed very clearly.

In the contemporary methodology of science, a number of criteria have been formulated (the principles of verifiability, falsifiability, correspondence, simplicity, and the like) that can be understood as forms of generalising the conclusions of the metatheoretical analysis of scientific theories. But in this case the metatheoretical analysis and foundation merely provide a preliminary appraisal of the theory being considered (the hypothesis), leaving a question of the final choice between alternate theories to the practice of scientific knowledge itself.

It is clear that in regard to the world view function that is immanently characteristic of philosophical knowledge, the possibility of so-called metaphilosophical foundation is even more limited.

Besides the question of the consistency of theory, metatheory investigates other aspects of object theory too. If concerning the aspect of consistency, philosophical theory should be considered in some other foreshortened aspect, then what is the status of the other properties of this same theory? In a general way one may assert that those problems that metatheory is called upon to study have a logico-methodological charac-

ter (the methods of proof, the modes of foundation of the object theory).

The sources of such an understanding of metatheory are found in D. Hilbert's mathematical conception. He uses the concepts "theory of proof" and "metamathematics" as synonyms[5]. In this sense, the creation of a metatheory for any theory that allows for complete normalisation is correct in principle. Any such science of realm of knowledge finds a general method, a general logic, a logic of proof and foundation from "without".

But in other spheres of knowledge guided by a method and logic that are beyond the bounds of the given realm of knowledge, philosophy itself creates its own logic and method as a self-reflecting system. We can speak about the philosophy of any science: the philosophy of mathematics, the philosophy of biology, the philosophy of linguistics, and the like – in the direct sense of this words. But we can speak about the philosophy of philosophy only in metaphorical sense. The philosophy of mathematics is not mathematics. The philosophy of linguistics is not linguistics, and so on. But we cannot say that the philosophy of the philosophy is not philosophy. Many modern philosophers agree with the opinion of F. Schelling that philosophy as a science is simultaneously a science about itself (Schelling 1927: 65). In Schelling's example it is obvious: the classical figures of philosophy understood well that if it is possible to create a certain theory about other theories, this cannot be said of philosophy, which studies its own nature. This fact finds its theoretical explanation with Hegel, for whom dialectics is not only a theory, but also a method and logic.

This position provides a key to understanding the nature of philosophy and its relationship to metatheoretical constructions. Philosophical theory, if it is not eclectic and is built consistently, must be based on the unity of the initial ontological, methodological, epistemological, and logical principles. In this case theory and metatheory coincide. More precisely, philosophy is not in need of another theory as a metatheory, for logic and method (=methodology) in a philosophical system are essential forms of its self-assertion.

It is well known, however, that in presenting philosophy as a discipline, particularly for the purpose of teaching, we simplify its nature, separate its aspects, which exist in unity, and for the purpose of didactics, expound them in distinct sections of a course. Those problems of other theories, which are investigated in metatheory, are usually considered in philosophical theory in the section devoted to the subject matter and nature of philosophy, of philosophical knowledge. The question can arise, why not call this section of philosophy, which considers the nature of philosophy, its method and methodological functions, means, structure and models of substaining philosophical theories, a "metaphilosophy"? Here we must turn to the question of the role and meaning of the selection of scientific terms.

Could Andronicus of Rhodes have imagined that, in having proposed the term "metaphysics" for designating those works of Aristotle that in his classification followed the works of physics (natural science) of the Stagirite, he not only sums up the reading of the conceptions designated by this term, but also gives a striking example of the formation of terms by means of the prefix "meta"! In fact, "metaphysics" in history of philosophy often was understood as philosophy (and this does not apply merely to the past; today many philosophers identify philosophy with metaphysics). For many philosophers, "metaphysics" is the name of doctrine about the supersensible and the origins of existence. In Marxist philosophy metaphysics is considered a general philosophical method that has lost its cognitive value for contemporary science and is opposed to another general philosophical method – the dialectical method. Besides this basic meaning of the term "metaphysics", one can point to other meanings that emphasise the polisemantic nature of this word and require its contextual application to an even greater extent.

But all the terminological difficulties linked with the introduction of the prefix "meta" do not end with this. The Greek civilisation left us other examples, among which are: metalepsis, metathesis, metabasis, and the like. (The latter term was designated a logical mistake, which is known now as "substitute thesis"). In distinction to our galaxy (the star system to which the sun belongs), the observable part of the stellar world, consisting of billions of galaxies, in the history of cosmogony was called "the great Universe". The American astronomer H. Shapley decided to rename the "great Universe", using in this connection the good old Greek prefix "meta". Thus a new, now widely used term - "metagalaxy" has arisen.

The new explosion of the terms constructed by means of the prefix "meta" occurred after the application by D.Hilbert of "metamathematics". In this connection H. Curry's remarks that in reading the works of formalists on contemporary mathematical logic, a large number of words beginning with the prefix "meta" is striking: "metalanguage", "metasystem", "metatheorem", "metalogic", "metacalculation", "metasemiosis",... All those terms are ascribed to Hilbert. In fact Hilbert only utilised the term "metamathematics". The other terms were introduced by analogy by his successors. There is a danger the student will lose sight of what metamathematics actually represents and the principle upon which these analogies are based (Curry 1963: Ch. 2, 5).

In connection with the above cited remark we should note that the terms created by analogy with Hilbert's "metamathematics" are not limited to what Curry has enumerated. In logical and methodological literature such terms as metavariable, metaexpression, meta-information, and the like, are used. In one of the issues of Indiana University philosophical journal an article with the symptomatic title of "metaquestions" was published (Driver 1984). However, there is another fact that is even more important. Curry is quite correct in his assertion that terms with the prefix "meta" can cause one to overlook the principle upon which analogy or similarity with "metatheory" is based. We have noted above that the supporters of "metaphilosophy" in reality have overlooked this principle.

But the followings type of objection is possible. It may be argued that "metaphilosophy" need not be created in complete analogy with "metamathematics". It is not necessary that this must be a definite extrapolation of the metatheory of formalised calculations. Metaphilosophy should not possess the characteristic features of metatheory, in particular metamathematics. Let it be called that section of philosophy that considers the nature and specifics of philosophical knowledge, the subject matter of philosophy, the character of the proof and substantiation of philosophical assertions, the logic and methodology of philosophy.

In response to this one may say the following. In the creation of a new term we are obliged to take into account many of its parameters. In particular, we should determine whether it creates terminological confusion by associating on the basis of an external similarity the contents of concepts that are in the essence extremely distinct from the concept that appears as the new term.

Undoubtedly, the choice of the term has significance in scientific theory, in particular when this term designates a whole theory. This circumstance should also be taken into account, in particular in considering whether "metaphilosophy" should or should not exist.

3. The Language of Philosophy

The use of the notion "the language of philosophy" is right or legal in the sense in which we use the notions "the language of mathematics", "the language of chemistry", etc.

The language of each science has its own peculiarities. The language of chemistry, for example, has some differences from the language of mathematics, and the latter from the language of biology. But it will be wrong to look for the peculiarities of the language of philosophy on the same level on which we often analyse the peculiarities of the language of other sciences.

By "the language of philosophy" I mean: (a) a definite conceptual formation, specific for that kind of knowledge, which is known as "philosophy"; (b) a combination of methods, with the help of which it is possible to manipulate philosophical concepts.

We may conditionally call the aspect (a) "The semantics of the language of philosophy", the aspect (b) "The syntax of the language of philosophy".

The specificity of both aspects of the language of philosophy may be cleared on the basis of some understanding of the nature of philosophy itself. It may be determined by the specificity of philosophical knowledge itself.

One of the specificities of philosophical knowledge – its methodological function – explains the fact that no science has such an extensive admittance into the exit from other sciences as philosophy has.

If we compare the conceptual apparatus of philosophical investigations of past periods, we may easily notice that the language of philosophy has been enriched very much from the point of view of semantics by revaluing the achievements of natural and humanitarian sciences.

At the same time the definite exchange is taking place not only in the extension of the conceptual apparatus of the language of philosophy. It is important to remark that concepts taken from other sciences do not merely coexist with ready concepts, in the system of philosophical knowledge in the form in which they are taken. As soon as philosophy and other sciences conceptually reflect the same phenomena on different levels of abstraction and generalisation, the concepts from other sciences should be put into correspondence with the level of abstraction and generalisation of concepts specific for philosophical knowledge.

When we put into use concepts from other sciences in philosophy we must take into consideration the important fact that the representatives of special sciences use words expressing philosophical categories in a special sense under the influence of their own speciality, as some kind of stereotypes. It often happens, when the representatives of special sciences make philosophical generalisation themselves. This factor also lays its specific shade on the semantics of definite concepts. Moreover, we must have in consideration the remark of the author of the book "A Path to Modern Mathematics "W. W. Sawyer, that specialists differ one from another not only in knowledge, but also in their life philosophy (Sawyer 1969).

One of the main important functions of philosophical knowledge is its outlook function.

During his philosophising the Homo philosophicus uses many words of a philosophical character. But those words, in fact, impress apprehensions which correspond to everyday experiences of the Homo philosophicus. And at the same time the content of such words essentially differs from corresponding philosophical correlates. John Locke differentiated the ordinary use of words from their philosophical one. Hegel appealed to be careful in choosing words from common language for the purpose of philosophical constructions.

The outlook character of philosophy determines the problem of interrelation between "philosophising" (reasoning on the outlook problems on the level of philosophical apprehensions, not quite exact concepts used in everyday life (Carnap), on the level of philosophical stereotypes) and philosophy (as a system of definite scientific knowledge). This interrelation manifests itself in the fields of discussing problems in the form of influence of everyday language on the language of philosophy as a science.

There is an influence on the semantics of the language of philosophy not only by "outside factors" (mentioned above). During the complicated process of the development of philosophical thought there takes place some inner change in the conceptual content of the categories of philosophy. In that case there is a danger of polysemantics of concepts which may disturb the development of philosophy as well as of any science. An inner collision between the new contents and their old language expressions takes place. Sometimes, as Engels writes, the old name stands in the way of understanding.

The factors mentioned above determine the most important specificity of formation of the semantics of the language of philosophy. The concepts which we use in philosophy from other sciences and everyday life as well as the concepts which reflect an earlier stage of the development of philosophy, we consider as explicandums (as not exact, vague concepts, rather apprehensions of common sense that exact concepts, as kind of stereotypes) and explicate them. As a result of such transformation we reach more exact concepts which Carnap calls explicatum (the terms explicandum and explication here are used also in Carnap's interpretation (Carnap 1956: 7-8).

Only with the help of such explication can we reach in philosophy that exactness and clearness of concepts by which the language of science, in general, differs, in Einstein's opinion, from language in the common sense of that word.

The explication of the meaning of words is very important in philosophy. It is because the categories of philosophy and, first of all, its primary points, the concepts of departure are on the high level of abstraction and generalisation. But, as Einstein, remarks in his article The Common Language of Science, only on his high developed level, where we usually use abstract concepts, the language becomes a tool of thought in the true sense of that word. But at the same time thanks to such development the language becomes a dangerous source of mistakes and function.

The preliminary analysis of concepts, terms in philosophical investigation is well known from the history of philosophy. From ancient times to nowadays many famous philosophers (among

them Aristotle, Locke, Hegel, etc.) not only analyse the main philosophical concepts which they like to use, but also stress the necessity of such analyses or explication.

The explication of concepts, by which we operate in philosophy, can lead to their clearness and exactness, but not to their uniqueness or single-valuedness in the absolute sense of those words. If the single-valuedness of words is one of the most important demands in other sciences, without any exception, that demand does not work if we mean philosophy in general. The single-valuedness in the language of philosophy is possible only if we mean the given, concrete philosophical system. It is because the conceptual formation and the ways of operating with concepts of any philosophical systems are determined by primary ontological, methodological, gnoseological and logical points, which are variable for different philosophical systems.

So far as different philosophical systems can use some philosophical concepts in their own way, the hermeneutics obtain some role in philosophical investigations. In that case I mean the hermeneutics which studies the principles of analysis and interpretation of authoritative texts.

As a subsidiary form of verification of the validity of explicatums we can use the translation of transformation of the language of one of the main parts of philosophy to the language of another part (i.e. from the language of ontology to the language of gnoseology).

As it consists of different semantical layers, it seems useful to transform from one logical system to another during the explication of concepts in philosophical systems. Such transformations may help us to discover new and new properties of thought in the different layers of language reality.

The syntax of language must be modified when we mean the language of philosophy.

Meanwhile the syntax of the language of some sciences expresses in some formal rules and with their help in the operations by the symbols of a given language, the syntax of the language of philosophy we can consider as some class of logical-methodological methods and operations, by which we argue and prove the statements of a given philosophical system as a whole. Meanwhile we can reduce the function of the language in the formal deductive systems of science to its syntax, the same situation is impossible in philosophy. Nondifferentiation of the theoretical and empirical levels of investigation, as well as contental, formal and formalised components of philosophical theory determine the necessity of unity of semantical and syntactical functions of the language of philosophy.[6]

Ch. II. THE NATURE OF LOGIC[1]

1. Language and Levels of Abstraction as Criteria for Determining the Status of Systems of Logic.

"*The map of logic*". Comparatively recently, Kant's words to the effect that in the two thousand years since Aristotle Logic had made not a single step forward and, all things considered, it seems to be a fully finished and completed discipline (Kant 1787: Introduction) used to be quoted widely and not unsympathetically. Today, however, there are works about logic in which the listing of logical disciplines runs into the dozens. In this regard the attempt by the American logician N. Rescher to compile a diagram or "map of logic" in which the list of the branches of logic takes up several pages, is noteworthy (Rescher 1968: 6-9). Also characteristic is the following statement by one of the major modern representatives of mathematical logic, S. Kleene, that since the discovery of non-Euclidean geometries by Lobachevsky (1829) and Bolyai (1833), it has become clear that different systems of geometries are equally possible in one's thought. Identically, there are different logics (Kleene 1967: §2).

Coexistence or conflict? When there are a great number of sciences, the natural desire to classify these sciences always arises. An effort on the part of logicians to demonstrate the place of one or another logic in the system of logical disciplines is entirely justified. However, a retrospective glance at the history of logic as a whole shows that logicians have engaged to a larger degree in counterposing each new logical discipline to the logic that existed before it came into being. In this regard it is symptomatic that after twenty years of pondering this work, on logic, in the course of which it was rewritten twelve times, Francis Bacon entitled it *Ovum Organum Scientiarum*, thus counterpoising his *New Organon* to the *Organon* of Aristotle. The further development of logic as a science showed that in defining the relation of a new stage in the development on logic to the proceeding one, some logicians at best sought to apply the principle of con`espondence. In synchronic examination of the status of the logical sciences, conflict usually triumphed over the idea of coexistence. How justified is this? To answer this question let us continue our diachronic analysis of logic.

Criteria for distinguishing transcendental logic from formal logic. Aristotle did his job: he created a science of logic. But, not having given a name to this discipline, he thus opened the broadest opportunities for naming it in different ways, and each name (with the exception perhaps, of the neutral term "logic", proposed by the Stoics) certainly assumes a particular attitude towards the science created by the great Stagirite. In this sense particular interest attaches, for our purposes as well, to Kant's division of logic into formal and transcendental. Before touching on the very foundation of this division, we should note that in his principle opus on logic, *A Critique of Pure Reason*, Kant used the term "formal logic" only once. He more often turned to the terms "general logic" or "elementary logic". But in all these cases he had in mind traditional logic, created primarily by the efforts of Aristotle.

What are the criteria in Kant that distinguish formal (general) and transcendental logic? In Kant's opinion, formal logic disregards, abstracts itself from any content of knowledge whatever and concerns itself with forms of thought in general (Kant 1787). Furthermore, Kant points out that, in speaking of knowledge he has in mind both "pure knowledge" and "empirical knowledge", and in speaking of thought, he has in mind "discursive knowledge".

From Kant's explanations it also follows that disregarding, abstracting from all content of knowledge signifies disregarding every sort of relationship towards the object, while examination of forms of thought in general signifies examination of logical form in terms of the relations of knowledge to each other.

Unlike formal or general logic, transcendental logic, as it studies the forms of thought and takes its point of departure from the nature of the object being cognised, approaches the object a priori. This is explained by the fact that Kant admits the possibility of notions pertaining a priori to things not as pure or sensory contemplation but only as the action of pure thought. This hypothe

sis makes it possible for Kant to advance the idea of a science of pure reason and of knowledge based on reason. Such a science, Kant concludes, defining the origin, scope, and objective significance of similar bodies of knowledge, should be called *transcendental logic* (Ibid).

Transcendental logic is characterised by the fact that it studies forms of thought in their dependence on the material or content of knowledge and on the origin of our knowledge of things. It is precisely in transcendental logic, according to Kant, that a synthesis of the form and content of knowledge is achieved. It is no accident that, unlike formal logic, which Kant treats as customary or general logic, transcendental logic emerges as philosophical or, to be more precise, *epistemological* logic.

One of the important differences between dialectical logic and formal logic in Hegel. The concept of dialectical logic in Hegel is an important landmark in the history of logic. In the present book we have no opportunity to provide a detailed characterisation of this conception or to present Hegel's attitude, complicated and in many respects contradictory, towards formal logic. For our purpose one thing is important – to clarify the principle difference between dialectical and formal logic. Hegel believes that difference lies in the fact that formal logic studies forms of thought disregarding their content. It studies the definiteness of thought primarily as a form. This relation, as Hegel put it, of natural, school, or formal logic to the forms of thought does not satisfy him. That is why, from Hegel's point of view, this examination of the forms of thought appears as an inadequate attitude toward truth. For, when one takes them as more forms, as different from content, one accepts them as finite and renders them incapable of encompassing truth which is infinite in itself, concludes Hegel in the *Introduction* of the second edition of *The Science of Logic* (Hegel 1929).

Although Hegel recognises that the forms of thought studied by formal logic pertain not to the truth of knowledge but to its conformity to a set of rules and sees in knowledge a region in which these forms have to possess significance (Ibid), nonetheless, he holds that the emptiness of the forms of formal logic is worthy of "contempt" and "ridicule".

It is precisely the formal logic forms, divested of their relation to matter, "indifferent forms existing above a certain content", that Hegel contrasts to the content-filled forms of dialectical logic, of thought "itself, comprising substantial *content*".

It is also not difficult to conserve the genetic connection of Hegel's concept of the interrelation between formal (natural, school logic) and dialectical logic with the views of Kant on the interrelation between general (formal) and transcendental logic. In both cases the difference between the indicated logics is based primarily on recognition of the fact of disregarding, of abstraction from the content of knowledge.

However, in differentiating two logics, one can either demonstrate their interconnection, pointing out the spheres of their functioning, or contrast them, resulting in the conclusion that one of them is necessary. And Hegel does incline to the latter conclusion. However, concrete analysis of the classification of the forms of thought in formal and dialectical logic demonstrates the difference in their *objective* grounds, which does not testify in favour of the abandonment of one of these logics. To prove this statement let us examine certain characteristic features of the classification of judgements in dialectical and formal logic.

The Hegelian judgements respecting immediate being, reflection, necessity, and concepts, which correspond to the levels of being, essence, and concept, demonstrate the levels of development of human knowledge. Hegel classifies them on the basis of the degree to which the form of a judgement corresponds to its matter or, to be more exact, to its epistemological content. The highest form of judgement, according to Hegel, is that type in which the form entirely corresponds to content and in which the Kantian synthesis of form and content exists. This also follows from Engel's interpretation of the classification of judgements in Hegel. In speaking of the judgement of universality, which corresponds to the judgement of a concept in Hegel, Engels observes that it is the final expression of a law. And he adds that in its universality, within which form and content are equally universal, it is incapable of any further expansion (Engels 1946).

Concrete analysis of the examples presented by Hegel and Engels shows that in examining forms of thought, in this case judgements, dialectical and formal logic examine their different properties and study various regularities of this

area of subject matter that may conditionally be termed the logic of judgements or the logic of the cognitive act.

Let us turn to Engels's classification of judgements, which is essentially a materialistically understood version of Hegel's classification. The judgement of singularity (of immediate being): "Friction is a source of heat" (1); the judgement of particularity (of reflection, of necessity): "All mechanical motions are capable of being connected into heat by means of friction" (2); the judgement of universality (of the concept): "Any form of motion, under cognition fixed for each case, is both able and compelled to undergo transformation, directly or indirectly, into any other form of motion"(3).

As it has already been observed, this classification demonstrates the levels of development of our knowledge, and in the given concrete case our knowledge of the forms of motion. According to the Engels's illustration, generalising from his historical experience during many millions of years, man came to a theoretical conclusion that friction is a source of heat. Still further thousands of years passed before, in 1892, Meyer, Joule and Golding formulated the statement (2), which gives us much more information about the sources of heat. But the statement formulated later by Meyer in judgement (3) is an apodeictic for it embraces the complete region of things studied.

This kind of classification is based on the principle of coincidence between the logical and the historical. The judgement of particularity expands our knowledge compared to that provided by the judgement of singularity and is therefore a higher form than the former.

The judgement of universality, however, is the highest form of judgement and serves as the final expression of a law, as the manifestation of a regularity. It is natural that this classification should be based on the principle of subordination and should develop higher from lower forms.

The same judgement can be of singularity in the one context, and of particularity or of universality in another; it depends on the relative cognitive role of those judgements and it may be discovered not by formal means, but by using the contental, informal approach to logical forms.

If we examine judgements (1), (2), and (3) in the system of formal logic, the question of their classification disappears, for all three of these judgements emerge as one and the same logical type of judgement – i.e., the universal affirmative type. This occurs because, in studying forms of ideation, formal logic, as Kant and Hegel justly observed, completely disregards the content of the knowledge or, to be more precise, the cognitive content of forms of thought. In this case formal logic defines judgements (1), (2), and (3), presented above, as type A judgements, for it analyses them in terms of the interrelationship of the spheres of the concepts (subject and predicate) composing the judgement.

Do formal and dialectical logic negate each other? Engels sees an opposition between the principles of classification of judgements in dialectical and formal logic. Whereas the former is guided by the principle of subordination, the latter is characterised by the principle of co-ordination, not only in the classification of judgements but in the classification of all forms of thought. However, the opposing character of the principles of subordination and co-ordination certainly does not mean that one of them is "unnecessary" or that the principle of subordination is superior to that of co-ordination. Try to classify the world's languages according to the subordination principle. It is not difficult to conclude that nothing will come of it, and in this situation general linguistics quite justly turns to the principle of co-ordination. It is possible to cite a number of such examples from the history and the theory of the various sciences. The question as to what principle to use to classify various phenomena is determined by the nature of the thing being studied, its specific and characteristic features. In the given case the object studied by formal logic is subject to scientific analyses and classification primarily, as a rule on the basis of the co-ordination principle. An object as studied by dialectical logic, however, yields to scientific analysis and classification on the subordination principle. It does not follow from any of this that one of these classifications of forms of thought is unnecessary.

The question may be posed in a more general form: Does not recognition of the exceptional value of one of them – dialectical logic – signify that formal logic is unnecessary? This is not an idle question, although it is not an especially pressing one. Today there are few even among dialectical logicians who deny the validity of the existence of formal logic as a discipline. Howev-

er, the question is not whether or not one asserts recognition to non-recognition of its existence. Of greater importance is the question of justifying or not justifying it; and even more important – if it is justified – there is the question of deciding its status in the system of logical science.

If one assumes that the region of entities being investigated is the same for both formal and dialectical logic, it becomes obvious that one of them is unnecessary. A certain lack of clarity in this instance is caused by the fact that the objects studied by both formal and dialectical logic are, in a first approximation, called forms of thought. But only in a first approximation. Forms of thought in themselves are multifaceted phenomenon, not limited to any single science. The properties of forms of thought (or, to be more precise, some of them) that are revealed when one disregards cognitive content are the object of study in formal logic. The properties of forms of thought revealed when they are examined in terms of their epistemological content are the object of study in dialectical logic.

The very fact that the things studied by formal and dialectical logic are different shows that these branches of logic do not exclude each other.

The logical discipline existing prior to Kant was called simply "logic". It was not because this science studied forms of thought that Kant and Hegel characterised as formal. Dialectical logic also studies forms of thoughts. However it was the logic which, in accordance with the concept of Kant and Hegel, disregards the content of knowledge and studies forms of thought as such that came to be named formal. By analogy, the logic which studies forms of thought in their relationship to specific content – dialectical logic – may be characterised as contentual logic or non-formal logic.

A legitimate question arises: In what sense is dialectical logic contentual? Kant, and to a greater degree Hegel and Engels, when speaking of the dependence of forms of thought on their content and on the synthesis of the form and content of thought, were thinking not of all possible content of thought but that which reveals a certain level in the development of our knowledge of a given fragment of reality.

Dialectical logic refers above all to the category content of knowledge. Hegel remarks, that the highest task of logic is to purify categories that initially function only instinctively, as attractions, of which the spirit becomes aware in their isolation from one another, consequently, as betraying and confusing one another, so that they give the spirit an isolated and dubious reality, the purification of which elevates the spirit in them, raises it to freedom and truth (Hegel 1929).

Let us disregard Hegel's cloudy form of presentation and direct attention to the essence of the matter. The "purification" of categories of knowledge is essentially the path along which the epistemological content of thought comes into being. Dialectical logic has to do precisely with the categorical content of thought with the content that is identified as the transition from phenomenon to essence and from essence of lower orders to essence of higher orders. It is precisely for this reason that dialectical logic can also be called epistemological logic. Therein a definite similarity lies between dialectical logic and transcendental logic.

Formal and formalised logic. The origin and tempestuous flourishing of symbolic (mathematical) logic faced logicians and philosophers with new tasks, among them clarification of the relation of symbolic logic to formal logic, which more and more often came to be termed traditional logic. The most intriguing solution of this problem was regarded to be that of declaring that symbolic logic is the latest stage in the development of formal logic. That symbolic logic is the most recent stage in the history of logic is a fact. But is the term "formal" applicable to it in the strict sense of the word? Next, holding symbolic logic to be the latest stage in formal logic, the authors of this conception declared all prior formal logic to be traditional and, in the best case, incorporated it as a fragment within the system of symbolic logic, in accordance with Niels Bohr's principle of conformity. In fact, however, the relationship between formal and symbolic logic is more complicated, and the solution of this problem should be sought on a different plane of examination. The key to its solution can be found in formalistic logic offered by the Polish logician Jan Lukasewicz. From his concept one derives the following.

The form of thought consists of logical constants and variables. Whereas variables in Aristotle's works were symbolised by letters the logical constants are expressed in words from ordinary language. Moreover, as Lukasewicz characteris-

es it, Aristotle constantly uses different phrases to express identical thoughts. Further, as Lukasewicz mentions in Aristotle all this is not accidental and would seem to derive from some prejudice. "Aristotle says occasionally that we ought to exchange equivalent terms, words for words and phrases for phrases. Commenting on this passage, Alexander declares that the essence of the syllogism depends not on words but on their meanings. This statement, which is manifestly directed against the Stoics, can be understood thus: the syllogism does not change its essence, i.e. it remains a syllogism, if some of its expressions e.g. if the expression "to be predicated of all" is replaced by the equivalent expression "to belong to all" (Lukasiewicz 1957: 18).

Lukasewicz calls Aristotle's logic formal and underlines, that formal logic and formalistic logic are two different things. Aristotelian logic is formal but not formalistic. To describe formalised logic, Lukasewicz writes, "Formalism requires that the same thought should always be expressed by means of exactly the same series of words ordered in exactly the same manner. When a proof is formed according to this principle, we are able to control its validity on the basis of its external form only, without referring to the meaning of the terms used in the proof" (Ibid: 16).

It is not difficult to see that formal and formalised logic differ by levels of abstraction. Formal logic disregards any specific content of thought. Concrete terms are replaced by letters, but this process of abstracting is not absolute. Within the confines of formal logic it is possible for words and phrases of equivalent meaning to be substituted for each other, and the examination of logical constants by their content is possible. This provides for the assertion that on formal logic we are abstracting from concrete and particular content but not from all content, not from content in general.

Formalised logic, however, ignores any content whatever and examines pure forms as such. Kleene directed attention to this important circumstance saying that as much as we have entirely disregarded or essence, retaining form alone, we will say that a given theory is *formalised* (Kleene 1952, §15). It is pertinent to note that when Kant and Hegel respectively counterpoised transcendental and dialectical logic to formal logic, they were not entirely correct in their identification of the features characterising formal logic, to which they ascribed the study of "pure form", "external form" without content of any kind, and so forth. This characterisation is true with respect to formalised but nor formal logic.

In a certain sense formalised, in Lukasewicz's interpretation, is the logic of the Stoics. Many systems of contemporary symbolic or mathematical logic either take the form of formalised logic or display a tendency to become such. The interrelationship of symbolic (mathematical) and formal (traditional) logics, in our view, has to be resolved by examination between the formal and the formalised logic. Here it is necessary to take two aspects into consideration: (a) Do formal and not formalised systems exist within the framework of symbolic (mathematical) logic? If so, then this formal system may justifiably be called the modern stage of formal logic, and the problem of the relationship of the modern stage in the development of formal logic to traditional formal logic is decided by using the well-known conformity principle, (b) A different approach is necessary in solving interrelationship among those systems of symbolic (mathematical) logic that appear as formalised logic and traditional formal logic. Let us examine this side of the question.

In a first approximation it may be asserted that both formal (traditional) and symbolic (mathematical) logic study definite properties of forms of thought. However, as we know, forms of thought are multifaced. Formal logic studies those properties of forms of thought that appear when one disregards their concrete and special content. Formalised logic, however, studies those properties of forms of thought that are revealed upon complete disregarding of any content or of content as such.

This circumstance demonstrates that the objects of study and examination by formal and formalised logics, respectively, are different, just as the Subject of formal logic differs from that of contentual logic. This circumstance shows, at the same time, that there is not, nor can there be, any conflict between formal and formalised logic and that the point must not be that one of them is superfluous and may be replaced by the other but that they coexist, in a specific sense of the word.

Here it is necessary to emphasise the circumstance of no small importance. When it is assert-

ed that formal logic retains an independent value in addition to the existence of formalised logic, one should not create the impression that the matter at issue is preservation, within the system of the modern logical sciences, of traditional formal logic in the form in which it came down to us. Traditional formal logic has to be examined from the standpoint of the modern achievements of logic. Its conceptual apparatus has to be explicated by the methods of modern logical systems and its value to modern formal logic has to be defined, as has already been remarked, in the light of the conformity of principle.

Logic and language. Among some neo-Positivists the notion is prevalent that Aristotelian logic is determined by the structure of the Greek language, and although this conception is finding a constantly increasing number of adherents, as not evidenced by certain propositions in the theory of linguistic relativity, no scientific proofs in its support have been made. The truth lies in the fact that there is a certain mutual influence in the unity of thought and language. The proponents of the notion under examination direct their attention to one facet of the complex interrelationship of thought and language, i.e. to a certain influence exercised by language of thought, and by exaggerating that influence they come to the unjustified conclusion that there is a causal conditioning of logic by the character and structure of one or another concrete language.

In the context of our examination it is important to know that the notion "language" has taken on a broad meaning. It includes both natural and artificial languages. The problem of the logical is associated primarily with the question of what language we are dealing with, a natural or artificial one. Therefore, let us isolate an aspect of the multifaceted relation between language and logic, one that here is quite significant – the language of logic.

The language of logic. The fact that contentual logic is built on the foundation of natural language requires no special proof. It is specifically natural language that makes it possible to examine forms of thought in relation to their epistemological content. It goes without saying that at any level of use of natural language we are in a position to turn to the services of symbol, of artificial language; but this does not change the essence of the matter in this case.

As much as a formal logic turns to the meaning of words and to substitution of words (phrases) of equivalent meaning, to that degree the use of the symbolism to denote logical variables cannot mask the fact that formal logic is built also on the basis of natural language. The language of formal logic is ordinary, spoken, natural language. In other words, formal logic, like contentual logic, is a logic of natural language. In formal logic, of course, symbolism and artificial language are used much more that in contentual logic. This also reflects the fact that formal and contentual logics are at different levels of abstraction from the content of thought.

The picture changes when we deal with a formalised system. In Kleene's words, rigorous normalisation makes it a practical necessity to construct the theory under examination from scratch in a special symbolic language, i.e., to *symbolise it* (Kleene 1952: §15). In this case, symbols and the like are final objects by themselves and must not be used to designate anything other than themselves. The metamathematicians look at them and not through them, nor at that which is behind them; thus they are things without interpretation or meaning (Ibid).

What Kleene says about mathematics is entirely applicable to formalised logic. Symbolic (mathematical) logic, which appeared in its "pure form" as formalised logic, is entirely constructed in symbolic, artificial language. It gains this possibility from the character of the abstraction it performs, from its capacity to disregard content in the forms it examines. Symbolic (mathematical) logic as a formalised theory is the logic of artificial language.

Is it possible to replace formal logic by formalised logic? The factor of normalisation. In discussing the significance of the language of symbols for logic, Hans Reichenbach observes: "It is true that simple logical operations can be performed without the help of symbolic representation; but the structure of complication relations cannot be seen without the aid of symbolism. The reason is that symbolism aliminates the specific meanings of words and expresses the general structure which controls these words allotting them to their places within comprehensive relations. The great advantage of modern logic over older forms of science results from the fact that this logic is able to analyse structures that traditional logic has never understood, and that it is able to solve problems of whose existence the

older logic has never been aware" (Reichenbach 1966: 3).

One has to agree with this. But does the conclusion follow that formal logic may and must be replaced by formalised logic? This is not an idle question. The enormous achievements of symbolic (mathematical) logic, like its striking applied successes, have had the consequence that in many universities throughout the world only one logic was, and is to this day, recognised. Although it is usually called "formal logic", what is really conceived of under this name is symbolic logic as a formalised logic. Often the designation "modern formal logic" is used to term the same symbolic (mathematical) logic as formalised system.

The question is whether formal logic has two aspects that one can conditionally call subjective and objective. The former aspect resolves to the fact that although not all the problems of a logical phenomenon are subject to normalisation, this is explained by the limitations of our knowledge of the techniques and means of normalisation at the present time. That which is not subject to normalisation in the logical sphere today may be formalised by the means available to science tomorrow. This can hardly be doubted. And if the entire problem of the possibility of normalisation of a logical phenomenon is reduced to this aspect, we would have to come to the conclusion that normalisation is possible in principle within the sphere of the logical.

However, the problem has the second aspect, consisting of the fact that logical reasoning by its very objective nature cannot be totally formalised. The very nature of the thing being studied means that some degree of logical content will remain, within certain limits. Here it is pertinent to draw an analogy to knowledge of certain laws in the microworld. In the words of academician I.Tamm, the statistical character of the laws of the microworld are not at all due to the limitations of our knowledge of that world, as some researchers assumed at one time, but lie in the very nature of things.

This question may also be approached from the standpoint of more fundamental scientific generalisations. Reference is to Gödel's well-known concept set forth in his work "On Formally Undecidable Propositions of *Principia Mathematica* and Related Systems", from which derives the epistemological conclusion that complete normalisation of thought and intellect are impossible, inasmuch as problems exist that are decided not by formal but informal methods (Gödel 1970, see also Nagel & Newman 1964, Lycan 1984).

Today many logicians and philosophers have come to the conclusion that symbolic (mathematical) logic cannot embrace the entire region of things covered by logical reasoning, and they divide logic into formal (actually meaning formalised) and philosophical (Strawson 1968: 1-2), (Rescher 1968: 1-5, etc.).

Is it possible to replace formal logic by formalised? The factor of language. It has already been observed that contentual and formal logic are logics of natural language, while formalised logic is the logic of artificial language. In defining the status of logic the factor of language has very great significance. It is no accidental that in logical literature the term "logic of ordinary language" is appearing more and more often (e.g. Purtill 1971: Ch. 9) to distinguish formal logic for symbolic as the logic of artificial language.

Now let us examine the problem of the possible substitution of formalised for formal logic from the standpoint of the linguistic grounds of these disciplines. And in doing so let us assume that the normalisation of forms of thought knows no objective limits. It is not difficult to imagine that when formal logic is replaced by formalised logic it is also necessary to replace natural language, as the basis of formalised logic, with artificial language in which formalised logic is constructed which is called formalised language by some authors[2].

Thus if it were possible to replace formal logic by formalised logic, this would mean abandonment of the logic of "ordinary language". Here the use of the term "logic of ordinary language" is most appropriate, for when this term is used it is possible to assume that the status of the other logic of natural language – contentual logic – is not automatically destroyed. However, it must be borne in mind that contentual logic has a common base with formal logic only in language and differs from it in the fact that, as has already been demonstrated above, it exposes other strata of forms of thought.

Is it necessary to replace formal logic by formalised logic? Even if it were possible to replace formal logic by formalised logic, it would be undesirable, for two reasons. In the first place, let us

remember that formal logic investigates those properties of thought that are disclosed when one disregards the concrete and particular content of the ideas being studied, but not all content. Formalised logic, however, studies those properties of thought that are revealed when one disregards all content of thought. If one approaches forms of thought solely from the standpoint of their normalisation one can leave outside examination those properties of forms of thought that are revealed when one concretely and specifically disregards only certain content. Freudental closes his book *The Language of Logic* with the following conclusion, instructive in the given context: "The moral of all of this is: If we formalise "all" by "we try to seize the infiniteness in a finite grasp. But we are only moderately successful" (Frendental 1966: 101).

In the second place, substitution of formalised logic for formal logic is equivalent to replacing natural by artificial language and has certain advantages over the natural language for solution of some scientific tasks. But just as it is impossible to replace the human eye by microscope, by Frege's apt remark, so it is impossible to replace natural language, with its extensive functions, by an artificial language having narrow functions. Analogously, symbolic (mathematical) logic, as formalised logic, performs scientific tasks that formal logic cannot. However, being a logic of ordinary, conversational language, formal logic performs particular tasks in the sphere of human communication and dialogue, in which the use of formalised logic would be equivalent to the use of the microscope for aesthetic viewing of the Mona Lisa or to Sienkiewicz's use of symbolic language to express the emotions of his heroes in the novel *Without Dogma*.

Logic and the complementarity principle. At the present stage of development of logic, we are dealing with various logical systems. It would be mistaken to examine the relationship among them only on the diachronic level to be satisfied by applying to them only the conformity principle. The character of these systems presumes above all that they have to be examined on the synchronic level. In this case it would be desirable to apply to them the methodological aspect of Niel Bohr's idea of complementarity. As we know, in applying the idea of complementarity we are dealing with a situation that is characterised primarily by the following three criteria: that the data obtained about a thing is mutually exclusive; that this data is equivalent; and that consideration be given to the factor of interaction between measuring instruments and the thing being measured in reproducing the procedure of it.

In a certain sense one can extrapolate this idea, without modifications or further generalisation, to the region of examination of the interrelationship of the logical sciences when analysing them on the level of synchrony. Let us use a concrete example to demonstrate this. Classification of judgements in dialectical logic is carried out on the principle of subordination, while in formal logic it is done by means of the principle of coordination. Engels sees this opposition as representing two approaches, but the results of these classifications might also be characterised as equivalent, for each of them reveals certain properties of a form of thought and communicates true information to us. Finally, the manifestation of particular properties of forms of thought depends on the content we are disregarding, from which we are abstracting.

However, a more fruitful approach is generalisation of Bohr's idea of complementarity to the level of its methodological application as the complementarity principle is not limited by the three characteristic features indicated above, as much as we are already dealing with certain subsets of statements (information), and it is necessary to take all these subsets into consideration if we are to reproduce an integrated picture of the thing being investigated.

As applied to the subject of our investigation, this means only combined consideration of the findings of all the logical disciplines together, capable of being examined in the synchronic aspect, can reproduce the real picture of that phenomenon characterised as logical in the spheres of thought. The author has called this conception "polylogical" (Brutian 1968).

Let us return to the "map of logic". The presence of a number of logical systems necessitates the drawing of a "map of logic", or to be more precise, the creation of a classification system for it. This question is naturally quite complex and, what is equally important, can be subject for special investigation. Here let us confine ourselves to certain general thoughts about it.

If we take as a basis the character of our abstraction from the content of forms of thought, we find ourselves dealing with the following log-

ic's: (1) contextual, (2) formal, and (3) formalised.

Group (1) includes Kant's transcendental logic, Hegel's dialectical logic, Marxist dialectical logic, philosophical logic, informal logic, and so forth. Group (2) includes Aristotelian logic, traditional formal logic, and those systems of symbolic (mathematical) logic that fall into the characterisation of formal logic presented above. Group (3) includes those branches of symbolic (mathematical) logic that are built as formalised systems.

Taking as the basis "the language of logic", that is, the language on which a given logical system is constructed, we obtain two principle classes: the logic of natural language (I) and the logic of artificial language (II). The logical systems listed in groups (1) and (2) make up class (I). Logical systems (3) are class (II).

The division into groups (1), (2), and (3) and also into classes (I) and (II), was on the plane of synchrony. In the analysis of the interrelations of (1), (2), and (3), as of (I) and (II), one can use the complementarity principle in its methodological (generalising) sense. In groups (1), (2), and (3) logical systems can be classified on the level of diachrony, and application of the conformity principle is theoretically possible, with due consideration of their concrete character, to these systems, or to be more precise, to some of them.

2. Transformational Logic.

2.1. The Basic Concepts of Transformational Logic

To elucidate the essential nature of transformational logic let us first describe its basic concepts. These are explicit and implicit forms (structures) of thought, the subtextual and contextual forms of thought, the rules of transformation, subtextual logic, contextual logic, etc. We call the "explicit" (abbreviation: EXP) form (structure) of thought that form (structure) of thought which is fixed in a given logical system by means of the given language.

We call the "implicit" (abbreviation: EMP) form (structure) of thought that form (structure) of thought which is (or can be) derived from EXP form (structure) of thought by the interpretation of the given logical system and its language expressions.

Let us take a look at the following sentence: "Only some sets are finite" (l). This sentence expresses in direct form an exclusive particular-affirmative proposition. This proposition *contains* implicitly more information than a simple affirmation of a fact. This proposition at least gives grounds for asserting that "Some sets are not finite" (1^a). This means that the examining linguistic expression directly fixes a particular-affirmative proposition of a definite type and, at the same time, presupposes some particular-negative proposition. The first of these is an explicit form, and the second, an implicit form of thought.

"The Slavic languages, like the Indo-European, are inflected languages" (2). This sentence expresses in direct, explicit form from a universal-affirmative proposition. This form may be easily transformed into the following syllogism: "All Indo-European languages belong to the class of inflected languages; the Slavic languages are Indo-European languages; therefore, the Slavic languages belong to the class of inflected languages" (2^a). Clearly, this is already another form of thought, another structure. But this form is already contained in the proceeding form, is implicitly understood in it, so that we may characterise this syllogism as an IMP form (structure) of the starting, original form of thought. This means that one and the same linguistic unit (in this case, a compound sentence) expresses at the explicit level one form (structure) of thought (in this case, a universal – affirmative proposition), while at the implicit level it expresses another form (structure) of thought (a syllogism).

The examples given above of the IMP forms and structures of thought may be referred to as subtextual or presupposing. The given logical (as well as linguistic) unit to be analysed provides grounds for deriving from it, by means of our interpretation, i.e. by exposing the subtext, a form (structure) of thought distinct from the expressed logical form (structure).

The part of transformational logic that studies implicit forms and structures of thought generated by the subtext may be called subtextual logic. However, the IMP forms and structures of thought are not exhausted by subtextual logic. There are a number of IMP forms (structures) of

thought that are generated by the context rather than by the subtext.

"What could there be more purely bright in Truth's daystar" (3)? This interrogative sentence, seen as such, does not express a proposition directly in explicit form; it expresses what is the same thing, an explicitly zero proposition (EXPo). Meanwhile in the context of E.A.Poe's poem *A Dream* the same sentence presupposes the categorical proposition "Nothing could there be more purely bright in Truth's day-star" (3^a). This is an IMP proposition of contextual origin.

The part of transformational logic that studies implicit forms and structures of thought generated from the context may be called contextual logic.

However, transformational logic not only studies subtextual and contextual forms and structures of thought: it also examines the nature of those logical rules by means of which IMP forms and structures of thought are derived, generated from EXP forms and structures of thought by means of interpretation of the subtext, the context being taken into account. We may call these logical rules transformational rules; we examine them somewhat later in the section "Transformational rules".

From what has been said, we may now define transformational logic as a science studying the relationship between EXP and IMP forms and structures of thought, the essence of subtextual and contextual forms and structures of thought, the means and rules by which IMP forms and structures of thought are generated from the EXP forms and structures, as well as forms and structures of thought made precise.

2.2. Transformational Analysis of the Forms and Structures of Thought

Careful analysis of the forms and structures of thought will show IMP forms and structures in all layers of thought. A precondition for uncovering the IMP forms and structures of thought is accurate fixation of the EXP form (structure). This, in turn, requires a correct notion of logical form, based on proper interpretation of the science of logic. It is no accident that many books and textbooks on logic include an analysis of the very notion of logical form.

R. J. Kreyche, the author of the textbook of logic for undergraduates, underlines: "Because of the possibility that the *meaning* of a proposition may be confused with an *implication* (correct or incorrect) that is derivable from it, it is of prime importance to attend first to the exact, literal and explicit meaning of any given statement before making any attempt at implication" (Kreyche 1961: 101). "Since it is the business of logic not only to teach the student to make implications and inference that are correct, but-even more fundamentally than that – to help him get at the explicit meaning of a proposition, the discipline of placing propositions in their logical form should be considerably stressed" (Ibid).

But before the attempt to show some types of transformational analysis of the concrete forms, let us say that the very notion of logical form cannot be understood as something absolute and independent. We must agree with S. Doss "that the search for universal *forms* is both misleading and futile" (Doss 1985: 133).

The logical form first of all depends on the systems of logic. As Professor D. Davidson writes, logical form is "relative to the choice of a metalanguage (with its logic) and a theory of truth" (Davidson 1984: 71).[3]

It is possible to understand the real nature of IMP forms (structures) of thought only on the basis of adequate fixation and interpretation of the EXP logical forms (structures) of thought. The differential and concrete approach to the fixation of the logical form seems more useful. So does R. Kreyche in his textbook, for example, according with the analysis of the kinds of proposition: "In general, to put a proposition into its logical form is to reconstruct it so that it conforms to one of the typical patterns: "Every S is P"; "No S is P"; and so on. Or, if no sign of quantity is required, as, for example, in singular propositions, it simply takes the form: "S is (or is not) P" (Kreyche 1961: 101).

There are a number of cases in which to ascertain the precise sense of a proposition, it is transformed into another proposition, at the same time altering the very form of the proposition. Actually this means that the authors of logical literature in these cases are doing a transformational analysis of a proposition as a result of which IMP propositions are derived from EXP propositions. This is true, for example, from the assertions of many logicians that exclusive and exceptive propositions may be represented in the form of two propositions.

Let us turn to the example of an exclusive proposition presented in the textbook by V. F. Asmus: "The Bulgarian language, the only one of all Slavic languages, has not retained inflected forms" (4) (Asmus 1947:116). The author of the example points out the following two propositions that are supposed by the proposition given:" (4^a) "The Bulgarian language has not retained inflected forms" and (4^b) "All the Slavic languages except the Bulgarian have retained inflected forms". It is obvious, that the original proposition (4) is an EXP exclusive one, but proposition (4^a) and (4^b) are IMP propositions that differ in form from the original EXP proposition. In this particular case it is also important that the transformational analysis should not stop here. We can derive other IMP propositions from the IMP proposition (4^b), in particular: "The Polish language has retained inflected forms" (4^c).

This brings us to the fundamentally important conclusion, namely, that the transformational analysis of the forms of thoughts should be considered as a multistage process rather than one that takes place in a single operation: not only do EXP forms of thought generate IMP forms but the latter, in turn, may presuppose other IMP forms that are more concealed and deeper lying.

The distinction between IMP and EXP forms of thought often assumes the fundamental importance in dealing with many of the vexed questions of logic, particularly that of the distributions of terms in propositions.

The authors of the textbooks of logic J. Brennan (1961), M. Cohen and E. Nagel (1966), I. M. Copi (1962), R. M. Eaton (1959), R. J. Kreyche (1961), McCall (1957), J. R. Sharvy (1962), W. A. Sinclair (1965), L. S. Stebbing (1960) are of the same opinion on the problem of the distribution of terms in proposition. According to their (and many others) view, the subject of proposition is distributed in universal affirmative and universal negative propositions and the predicate of proposition is distributed in universal negative and particular negative propositions; the subject of particular affirmative and particular negative as well as the predicate of universal affirmative and particular affirmative propositions are undistributed.

This problem is not clear even for some of the mentioned authors. As R. G. McCall writes, "the law regarding the *distribution* or *extension* of the predicate-term is one of the most important and most persistently misunderstood principles in logic. Upon it hinges the very important operation of *conversion*, and much of the theory of the categorical syllogism" (McCall 1957: 104).

R. J. Kreyche does not see any difficulties of the interpretation of the distribution of predicate of universal-affirmative proposition, when extension of the term of subject may be wholly included in the extension of the term of predicate without coinciding with it. He illustrates such situation by the following example:

"Every textbook is intended for purposes of study (5).

The intent of this statement is that "All textbooks" belong to the class of "things to be studied" (Kreyche 1961: 98) (5^a).

It is well known that there can be another situation with universal affirmative proposition. It is when extensions of the term of subject and predicate completely coincide. It occurs particularly when a universal affirmative proposition expresses a definition. R. J. Kreyche does not deny such cases and explains them in the following way: "The most obvious exception ... is the A proposition in which the predicate *defines* its subject: for example, "Every man is a rational animal" (6). In a proposition of its sort the extension of S and P would coincide perfectly. For purposes of formal inference, however, even the predicate of this type of proposition is considered as particular (undistributed)" (Ibid).

We can conclude that according to R. J. Kreyche's interpretation, the predicate of the universal affirmative proposition is undistributed in any case from the viewpoint of *formal inference*. In other words, the criteria of distribution of terms are formal.

The similar interpretation of subject and predicate-term of the A proposition we can find in W. A. Sinclair's textbook, an interpretation that underlines a new nuance of the question. He regards two examples of the A proposition: "All Canadians are British subjects" (7), "All equilateral triangles are equiangular triangles" (8). How does the author prove that P is not distributed in the first proposition? The answer is: "We speak not of the whole of the denotation of P, but only of that part of it that coincides with the denotation of S. About the remainder of the denotation of P, if there is any remainder, the proposition gives us no information" (Sinclair 1965: 27).

W.A.Sinclair understands the difference between the first and second propositions from the point of view of distribution of predicate-term. "It happens that in the second example quoted we know that the whole of the denotation of P does coincide with the denotation of S, but that comes from our knowledge of geometry and not from our knowledge of the form of the proposition. That is, the predicate of the proposition is undistributed, the P of SaP is undistributed" (Sinclair 1965: 27-28).

Such interpretation means factually that the predicate term is undistributed in the A proposition when we regard the A proposition from the point of view of our knowledge of its *form*, and is distributed from the point of view of our knowledge of its *content* (in this case: of geometry). The question is – which of those knowledge may be as a criteria of determining the distribution of the terms in proposition? The answer will follow after some consideration.

The difficulties of the interpretation of distribution of predicate-term also arise when we consider the particular-affirmative proposition. W. A. Sinclair analyses the possibility of the relation between S and P in the I proposition: intersection of S and P, inclusion of S in P, inclusion of P in S and coextension of S and P. He comes to the following conclusion: "We speak not of the whole of the denotation of P, but only of that part of it that is also S. About the remainder of the denotation of P, if any, the proposition gives no information, as is shown by there being four possible alternatives, any one of which may be the case *Some* S *are* P. In other words, the predicate of the proposition is undistributed..." (Sinclair 1965: 29-30).

Again the question of the distribution of the predicate-term is determined by the information. But what kind of information: information of the form or of the content of the proposition? We can only conclude in this case according to the author's view that P is undistributed in I proposition.

So, we can conclude on the basis of the analysis of the above-mentioned English textbooks of logic that all their authors think that the predicate-terms in the A and I propositions are undistributed, though some of these authors express their doubts about a clear understanding of the principle or criterion of the distribution of the predicate-term in logic.

The contrast of understanding of distribution of the predicate-term in the A and I propositions is more obvious in Russian logical textbooks.

I should like to analyse here some details of this question in Russian authors' explanation as Russian literature is not always accessible for English readers.

According to D. P. Gorski, neither subject nor predicate is distributed in particular- affirmative proposition (Gorski 1963: 110). Authors of the textbook *Logic*, edited by G. A. Levin, are of the same opinion (Lewin 1974: 102). V. F. Asmus and the authors of *Formal Logic*, edited by I. I. Chupakhin and I. N. Brodski, hold another view. As Asmus writes, "the predicate is not distributed in I proposition in which the subject and predicate partially include and partially exclude each other, but is distributed in those I in which the predicate is subordinate to the subject" (Asmus 1947: 106, see also Chupakhin & Brodski 1977: 60).

To evaluate this difference in approach to the distribution of terms in a proposition, we must first ascertain how an author understands the concept of distribution. A term is considered to be distributed if it refers to all members of the class designed by the term. Otherwise, it is not distributed (Asmus 1947: 102). But what does it mean to say "it refers to the members designated by the term?" In the particular cases, there is no clear criterion for determining the distribution of terms in a proposition.

It would be useful, therefore, to look at the arguments upon which the authors try to base their understanding of distribution.

According to V. F. Asmus, to resolve the question of the distribution of terms in a proposition we should first ascertain the relationship between the subject and predicate in a proposition. This can be done only on the basis of concrete examples of propositions, by revealing the mutual relationship between the subject and predicates on the basis of *previous knowledge of the content* of the concepts being analysed.

This is what V. F. Asmus does. In the proposition "Some guardsmen are order-bearers" (9) he considers the predicate to be undistributed since "although guardsmen who have been awarded orders are all order-bearers, this proposition refers only to order bearing guardsmen among the total number of order-bearers". On the other hand, in the proposition "Some weap-

ons are missiles" (10), the predicate is distributed, according to Asmus, since in this proposition all missiles, not some missiles, are referred to: the "some weapons" that are included in the extension of the concept "missiles" *exhaust* the entire extension of this concept" (Asmus 1947: 106).

From the very nature of formal logic, when we define or clarify the essence of some logical category, we should not resort to a concrete substantive analysis (unless this is only an illustration) and should not operate on the basis of our knowledge of the content. In these or similar cases we should proceed from an analysis of the form used in the given language of logic. We may assert that a term in a proposition is distributed if, from the *very form* of the proposition, it is evident that it embraces the entire extension of the concept. If this is not evident, the term is not distributed. It is evident from the formula for a particular-affirmative proposition "Some S is P" that the subject in it is not distributed. It does not follow from the formula that it is the full extension of the predicate that is in question here. Consequently, we can only affirm that the predicate is also not distributed. These are the kind of data we obtain in an explicit analysis of the distribution of terms in a proposition.

Another question arises when we continue our analysis and try to determine the implicit structure of proposition. At the implicit level we can undertake a content analysis and speak of the distribution of the predicate in a particular-affirmative proposition under certain conditions.

Concerning the distribution of terms in a proposition in generalised form, it may be said that at the explicit level we observe the following picture:

In proposition (A) S is distributed, and P is not distributed.

In proposition (I) S is not distributed, and P is not distributed.

In proposition (E) S is distributed, and P is distributed. (11)

In proposition (O) S is not distributed, and P is distributed.

At the implicit level, taking into consideration a content analysis of subtextual and contextual information, the following picture may be observed:

In proposition (A) S is distributed, and P is not distributed when S is wholly included in P without coinciding with it, and P is distributed when S and P completely coincide, for example, in definitions. (12)

In proposition (I) S is not distributed, P is not distributed in propositions in which S and P partially include and partially exclude each other, and P is distributed in those in which P is wholly included in S.

In proposition (E) S is distributed, and P is distributed.

In proposition (O) S is not distributed, and P is distributed.

A clear distinction between the explicit and the implicit level of analysis of the distribution of terms in a proposition enables us to: (a) eliminate any inconsistency (which is especially inadmissible in logical literature) in the interpretation of the problem of the distribution of terms in a proposition; (b) create a consistence logically correct, conceptually sound theory for other areas of logic, such as immediate inferences, syllogisms and the like.

As M. Cohen and E. Hegel write, "the concept of distribution of terms plays an important part in traditional logic, and is the fundamental idea of the theory of syllogism" (Cohen & Nagel 1966: 38).

Different theories of immediate inference, for example, the conversion may be created, depending on the interpretation of the distribution of terms in a proposition. And if there is some misunderstanding of the explanation of the concrete forms of conversion, sometimes it is because of inconsistency of the explanation of the distribution of terms in propositions as well as of inconsistency in the relation between the theory of the distribution of terms and the theory of the conversion of propositions.

According to R. Sharvey, "an "A" proposition can always be converted by reducing the proposition to an "I" proposition" (Sharvy 1962: 34). But seeing the difficulties in connection with such proposition where S and P completely coincide, as in a definition, R. Sharvey writes: "A definition can be converted because the subject and predicate apply to the same objects. To say a triangle is a three-sided plane figure is to say all three-sided plane figures are triangles" (Ibid). It is very important that, as the author remarks, "this sort of conversion requires special knowledge of the subject matter dealt with by the orig-

inal proposition" (Ibid). Such explanation shows that the author's approach to the conversion of a definition is determined not by the knowledge of logical form, as in other cases, but by the knowledge of the content, of the subject matter regarding proposition.

Sharvy's attempt to declare the predicate-term in the A proposition as not distributed and at the same time a definition convertible simply shows a contradiction in his theory. He tries to solve that contradiction saying that the definition mentioned above is not "A" proposition, it is a statement that looks like "A" (Ibid).

Such interpretation of a definition as a form of thought is not logically founded. The main mistake of such interpretation is nondifferential approach to EXP and IMP forms (structures) of thought.

Sharvey's example is not unique.

L. S. Stebbing tries to find another way to explain the simple conversion of A proposition when S and P completely coincide. He converts the proposition "All equilateral triangles are equiangular" (13) into "All equiangular triangles are equilateral" (14). According to his interpretation the conversion of the proposition (13) leads to the proposition (14), but we cannot regard it as immediate inference. He writes: "...*All equilateral triangles are equiangular and All equiangular triangles are equilateral* would be regarded as converses. But neither can be said to be immediately inferred from the other since such an inference would violate the rule that no term may be distributed in the inferred proposition unless it was distributed in the original proposition. These are both A propositions, in which the subject-term is distributed but the predicate-term is undistributed" (Stebbing 1960: 37).

So it is not difficult to say that ignorance of differences of EXP and IMP forms (structures) of thought leads in this case to the non-correct conclusion according to which there is a conversion that is not immediate inference.

There are, of course, some logicians who interpret the predicate-term in the A proposition as indistributed and on the basis of such understanding conclude that the conversion of the A proposition may be only per accidents (by limitation), even when S and P completely coincide, if we are led by criterion which is adequate to the logical form. R. Eaton is right, when he writes: "We are sometimes tempted to convert A propositions *simpliciter*. It is natural but fallacious (called a fallacy of *illicit simple conversion*) to infer from "All triangles are plane figures having their angles equal to two right angles" (15) that "All plane figures having their angles equal to two right angles are triangles" (16). This conclusion[4] is, of course, true but the proposition All S is P does not tell us on logical grounds that All P is S, though in the present case we know this as a truth of geometry" (Eaton 1959: 204).

In search of a right solution of the problem of conversion of proposition R. McCall sees logical differences between the notions *conversion* and reciprocal. He writes: "If occasionally the reciprocal of a true A proposition is itself true – as when the P of the original is the definition or a specific property of the S – this is only by reason of the *matter*, or content, of the proposition. *Formally*, the reciprocal of a true A proposition is *doubtful*" (McCall 1957: 116). But really this semantic attitude to the conversion shows that the author sees the problem and he is in search of this solution. He is right, of course, when he differs two approaches to the conversion of A proposition: *formal* and *material*. This is one more step to understand the role of EXP and IMP forms (structures) in conversion.

R. J. Kreyche thinks that "any attempt to convert an A proposition to another A, instead of to an I, is simply based on the assumption that the convertend is an *exclusive* proposition (only S is P)" (Kreyche 1961: 156). Such interpretation factually recognises the possibility of implicit and explicit forms of the conversion of A proposition, though this recognition itself is also implicit.

V. F. Asmus sees the direct logical connection between his conceptions of distributions of S and P in propositions and conversion as immediate inference. According to his opinion, if S is wholly included in P in the A proposition then we can infer from such proposition the I proposition. In other words, such A proposition may be converted per accidens. If S and P completely coincide in the A proposition then we can infer from such A proposition the A proposition. In other words, such A proposition may be converted simply.

So, we must differ two levels: the level of EXP and the level of IMP forms (structures) in conversion as well as in studies of other logical forms and structures.

On the level of EXP form (structure) when the only criterion is the criterion of *logical form*, the conversion of the A, E, I propositions has the following picture:

Original proposition	*Type of conversion*	*Convers*
A All S is P All poets are writers. All men are rational beings.	by limitation	Some P is S I Some writers are poets. Some rational beings are men. (17)
E No S is P No doll is a rational.	simply	No P is S E No rational being is a doll.
I Some S is P Some writers are professors. Some writers are poets.	simply	Some P is S I Some professors are writers. Some poets are writers.

At the level of IMP form (structure) when the criterion is our knowledge of *content*, of subject matter of considering propositions, the conversion of A, E, I propositions has the following picture:

Original proposition	*Type of conversion*	*Convers*
A All S is P When S is wholly included in P without coinciding with it. All poets are writers.	by limitation	Some P is S I Some writers are poets.
A All S is P When S and P completely coincide in the A proposition. All men are rational beings.	simply	All P is S A No rational being is a doll. (18) All rational beings are men.

(cont)

Original proposition	*Type of conversion*	*Convers* (cont)
E No S is P No doll is rational being.	simply	No P is S E No rational being is doll.
I Some S is P When S and P partially include and partially exclude each other. Some writers are professors.	simply	Some P is S I Some professors are writers.
I Some S is P When S is wholly in P without coinciding with it. Some writers are poets.	with extension	All poets are writers.

Transformational logic deals not only with the forms (structures) studied by traditional formal logic but also by modern formal logic, symbolic logic. Here are only some illustrations of that.

Suppose we want to know if the following two propositional formulas are equivalent:

$((P\vee\neg Q)\wedge P)\rightarrow R$ (I) $((\neg P\rightarrow\neg Q)\wedge\neg R)\rightarrow Q$ (20)

Let us reduce them to the conjunctive normal forms which can answer our question:

$\neg(P\vee\neg Q)\wedge P)\vee R$
$\neg\ (P\vee\neg Q)\vee\neg P\vee R$
$(\neg P\wedge Q)\vee\neg PR$
$\neg PR\wedge\neg PQR$ (19^a)
$\neg PR\ (Q\ \wedge\neg Q)\wedge\neg PQR$
$\neg PQR\wedge\neg P\neg\ QR\wedge\neg PQR$
$\neg PQR\wedge\neg P\neg QR$

$((\neg\ \neg P\vee\neg Q)\wedge\neg R)\rightarrow Q$
$\neg((P\vee\neg Q)\wedge\neg R)\vee R$
$\neg(P\vee\neg Q)\vee R\vee Q$
$(\neg P\wedge Q)\vee QR$ (20^a)
$\neg PQR\wedge QR$
$\neg PQR\wedge QR\ (P\wedge\neg P)$
$\neg PQR\wedge PQR\wedge\neg PQR$
$\neg PQR\wedge PQR$

The comparison of the (19^a) and (20^a) shows that the (19) and (20) propositions are not equivalent.

We solve the problem that was fixed above. We can say at the same time that the (19) and (20) propositions as well as (19^a) and (20^b) propositions are EXP forms. They are fixed according to the definite system of logic and its language. But we can also reduce from that EXP forms new IMP forms. We can regard particularly the (19) proposition as a formula which consists of premises ($P\vee\neg Q$) and P and of possible R consequence which is joined with premises with the help of implication. As the proposition (19^a) is not tautological, we can come to the implicit conclusion that the proposition R is not deduced from the premises ($P\vee\neg Q$) and P.

Another illustration. Let us clear up whether the propositions (21) and (22) are equivalent.

$(P\rightarrow Q)\wedge\neg Q$ (21) $(P\sim Q)\wedge\neg P$ (22)

Their conjunctive normal forms are:

$\neg PQ\wedge P\neg Q\wedge\neg P\neg Q$ (21^a) $P\neg Q\wedge\neg PQ\wedge\neg P\neg Q$ (22^a)

show that the propositions (21a) and (22a) are equivalent.

The propositions (21) and (22) as well as their conjunctive normal forms: (21^a) and (22^a) are EXP forms. They presuppose at the same time some IMP forms. So we can consider the proposition (21) as a conjunction of the premises ($P\rightarrow Q$) and $\neg Q$ as well as the proposition (22) as a conjunction of the premises of ($P\sim Q$) and $\neg P$: it means that they are all IMP forms. The proposition (21^a) and (22^a) allow us to consider the following formulas:

$\neg PQ\wedge P\neg Q\wedge\neg P\neg Q$, $\neg PQ\wedge P\neg Q$, $P\neg Q\wedge\neg P\neg Q$, $\neg PQ\wedge\neg P\neg Q$, $\neg PQ$, $P\neg Q$,

$\neg P\neg Q$ (23) as consequences from the premises $P\rightarrow Q$ and $\neg Q$ as well as from the premises $P\sim Q$ and $\neg P$. All these formulas are also IMP forms. There can be also other possible IMP consequences from the above mentioned IMP premises. The above transformational analysis of the forms of thought concerns only particular cases. They are only illustrations. Among the most important tasks of transformational logic are: (a) strict determination of the EXP forms (structures) of thought on the basis of an appropriate understanding of logical form, and (b) description and systematisation of possible IMP forms[5] (structures) of thought contained in the corresponding EXP forms (structures).

2.3. Transformational Rules

Transformational rules are rules that enable IMP forms (structures) of thought to be derived from

EXP forms (structures) of thought, rules that fulfil the foundation of making precise the nature of EXP forms of thought, or rules for both functions. Let us state a few transformational rules for determining the quantity of a proposition.

First Rule. In a proposition that lacks the words that indicate universal or existential quantifiers, "each" or "every" should be placed before the subject of the proposition; if a true proposition is thus obtained, the given proposition is a universal one; on the other hand, if a false proposition is obtained, the given proposition is a singular-collective one.

Let us take a look at the following propositions:

"Triolets consist of eight lines". (24)

"The triolets of writer N won a literary prize". (25)

Let us place the word *each* before the subjects of these propositions.

"Each triolet consists of eight lines". (24^a)

"Each triolet of writer N won a literary prize". (25^a)

It is obvious, that proposition (24^a) is true; therefore, proposition (24) is a universal proposition. It is also clear that proposition (25^a) is false, and thus that proposition (25) is not a universal proposition, but a singular collective one.

Since the quantity of the EXP proposition 24 and 25 is indeterminate, let us call them EXPind. Propositions (24^a) and (25^a) on the other hand, are IMP propositions. This also means that the transformational rule mentioned above enables us to derive quite certainly (from the standpoint of quantification of the proposition) IMP propositions from the EXPind ones. It also makes precise the quantification of the indicated EXP proposition.

Second rule. If a proposition has the word all before the subject, it should be replaced by the words each or every; if this yields a true proposition in question will be considered universal; but if a false proposition is obtained, that proposition will be considered a singular collective one. Here are the examples given by V. F. Asmus to illustrate this rule (Asmus 1947: 114-115).

"All aeroplanes are heavier than air". (26)

"All the projectiles weighed ten tons". (27)

Let us replace the word *all* by the word *every* in each case:

"Every aeroplane is heavier than air". (26^a)

"Every projectile weighed ten tons". (27^a)

Proposition (26^a) is true, and hence proposition (26) is a universal proposition. Proposition (27^a) is a false proposition, and hence proposition (27) is a singular collective one.

In the case of (26) the transformational rule confirmed the information that was given in the proposition by the word *all*. The transformation of the proposition (26) into proposition (26^a) tells us that the word *all* in proposition (26) is a universal quantifier. This means that this transformational rule enables us not only to generate an IMP proposition (26^a) from an EXP proposition (26) but also that the form of the EXP proposition (26) is verified in terms of quantity by this transformation.

In case (27) the analysis shows, that although the given EXP proposition (27) contained the word *all* as a typical expression for the universal quantifier, *actually* the EXP proposition (27) is a singular one in terms of quantity. This transformational rule enables us to derive an IMP singular collective proposition (27^a) from the EXPind proposition (27), and this also makes precise the form of the EXP proposition (27) in terms of quantity.

Other similar rules may also be formulated.

In examining the certain concept it is not always clear whether it expresses a property or a relationship. Such concepts may be fixed as EXPind concepts. The following transformational rule makes it possible to establish the precise sense of the subject, matter of thought. If a proposition (true or false) is thus obtained, the given concept expresses a property; if nonsense is obtained, the given concept expresses a relationship.

Let us look at the concept "good" and the concept "better". If we say "John is a good man" (28) we obtain a true or false proposition (depending on the actual state of affairs). This means that "good" expresses a property. If, on the other hand, we say "John is better" (29) we obtain nonsense; this will indicate that "better" expresses a relationship ("John is better than Jack") (30). In this particular case, we have been able to make precise the form of explicitly stated concepts by means of this transformational rule.

We have mentioned only a few of the transformational rules to familiarise ourselves with their nature and their characteristics. A detailed description of transformational rules, their analysis, and their classification are among the most

important tasks of transformational logic.

We should point out, especially in connection with the above, that many transformational rules will be found in the literature on logic, in some formulation or other, but with a different purpose. For instance, Aristotle actually described the transformational rules for deriving the figures of a syllogism from the first figure. In textbooks in traditional formal logic concrete techniques for reducing the figures of a syllogism to its first figure are usually also explicated. To reduce *Camestres's* mode of the second figure to the *Celarent* mode of the first figure the following transformational rules may be employed: (a) converse the negative premise, (b) rearrange the premises (since, according to the special rules of the first figure of a syllogism, the minor premise must be an affirmative proposition, (c) since in the end the conclusion takes the form "P is not S", the conclusion must be conversed.

Many transformational rules are described de facto in different textbooks of logic (see, for example, Asmus 1947, Gorski 1963, Kreyche 1961, etc).

It is necessary not only to comprehend their very essence and to reformulate them from the standpoint of transformational logic but they must be substantially developed by reducing them to a rigorous system.

Here we shall make only a few general comments.

Transformational rules have various functions. The principal function of transformational rules is to derive IMP propositions from the EXP proposition.

This does not mean that all transformational rules are meant to fulfil this function. In the analysis of the concepts (5) and (6) we noticed that transformational rules do not generate IMP forms of thought. Transformational rules that do serve to generate IMP forms of thought from EXP forms are called *generative* transformational rules, or rules of *derivation*.

Some transformational rules perform the function of making precise the form. The given EXP forms (structures) of thought may sometimes be the subject of that function, as we say in the example of the analysis of propositions (1), (2), (3), and (4).There are also cases in which generative transformational rules are used to generate some form (structure) of thought, but the specific type of form (structure) generated still remains unclear. Applying transformational rules of making the form precise, we fix their adequate form (structure).

The same transformational rule may in some cases fulfil both the function of generation and the function of making precise the form. These rules we call *complex rules*. Let us also note a property inherent to all transformational rules: they all are of an *operational* nature.

2.4. Relationship Between EXP and IMP Forms of Thought

EXP forms (structures) of thought are clearly fixed in the corresponding linguistic units. They need not to be sought or discovered. They themselves "propose" to us, and therein lies one of their merits, since IMP forms (structures) are to some extent hidden from us: they are at various depths within the thought process. They must be sought, discovered, and brought to light. This is not a shortcoming, perhaps one of the delights of knowledge is discovering this "secret".

It would be wrong to assume that EXP and IMP forms of thought exist by themselves or coexist. IMP forms are the creations of EXP forms, even when we are dealing with EXPo forms.

EXP forms of thought may also be called generative, and IMP forms of thought may be called presuppositional. Because IMP forms of thought derive from EXP forms and are generated by them, EXP forms of thought are primary relative to IMP forms. This, of course, is at the genetic level.

EXP forms of thought are of a unified character, while many IMP forms of thought are pluralistic, in the same sense that every thought which has one explicit form may generate several IMP forms of thought.

EXP forms may be characterised as normal forms, but not in the sense in which we use this term in the calculus of propositions when we operate with the concepts "conjunctive normal form" and "disjunctive normal form". By "normal form" we here mean that which is standard for a definite form of thought.

EXP forms of thought may be described as "correspondent" forms. This term underscores the feature that EXP forms match their linguistic expression to a maximum degree and that their logical structure corresponds to the grammatical structure of these linguistic expressions in which

they are fixed.

This brings up the question whether cognitive preference must be given to EXP or IMP forms (structures) of thought. The answer must be that neither of them must be given the preference. EXP and IMP forms (structures) of thought embrace different aspects of thought; and by taking them jointly into account, one may reproduce that real picture of the forms of thought. This question may also be posed as follows. Do we lose much if we do not take into account the difference between EXP and IMP forms (structures) of thought? This question requires somewhat more involved explication. The founder of general semantics, A. Korzybski, has suggested that Aristotle systematised the modes of speech for the Greek language, and that this systematisation was called logic (Korzybski 1948: 371). It became a popular saying among Korzybski's followers that if Aristotle had written in Chinese, he would have created a completely different logic. One of the most eminent representatives of "general semantics" S. Hayakawa wrote that a person speaking a language of a structure entirely different from that of English, such as Japanese, Chinese, or Turkish, may not even think the same thoughts as an English-speaking person (Hayakawa 1964:17).

Professor N. Nakamura, of Tokyo University, has published, in Japanese and in English, a book entitled *Ways of Thinking of Eastern Peoples,* in which he claims that the forms of expression in Japanese are more sensitive and emotional and less adapted to the reproduction of logical precision, and the Japanese language is unable to express logical concepts or abstract concepts in general, that it has an illogical character. The author makes an even more general statement about the illogical character of the Japanese people, who, as Professor Nakamura thinks, since the earliest times have not argued (Nakamura 1960: 462, 465, 471, 487, etc.). Another representative of Japanese philosophical thought, Oyde Akiwa, in his book *Japanese Language and Logic*, published in Japanese, asserts that although the Japanese cannot be considered illogical, their mode of logical thinking differs from the European mode.

To clarify the factual side of this question, the author of this book complied the list of statements in the English language with specific logical parameters that were translated into Japanese by Japanese logicians. This translation was then distributed in Ritsumeiken University (Japan) and at the Tokyo University of Sciences among a heterogeneous group whose members were then asked to retranslate it back from Japanese into English.

An analysis of the test showed some divergence among the forms of propositions as a result of the second translation. If we were to remain at this stage of the analysis, it would be clearly possible to agree with the thesis that the Japanese have the logic specific to themselves. The analysis continued in the sense of clarifying what exactly was intended by the twice-translated form of a thought if this form differed from the original form. The answers to the question "What was intended?" made it necessary to formulate the implicit forms of thought which were generated. This added the precision to the results of the double translation, which in all cases were brought into accord with the original form of the given proposition. Thus, the role of implicit forms of thought was discovered in the answer to the question "What was intended?".[6]

From the test carried out in the Japanese University we may conclude that the explicit forms of thought that were used will vary according to the specific features of a language. However, these do not exhaust all possible forms of thought, and one cannot assert that Japanese thought has a logic specific to it on the basis of these forms. If we examine the entire totality of explicit and implicit forms of thought, we shall notice that there are no differences between the logical tools of people speaking different languages, even sometimes strongly differing from each other. This conclusion was verified by our logical tests in the universities of Helsinki, Turku (Finland) and Budapest (Hungary). Of course, this conclusion requires a further experimental study on extensive tests among audiences speaking the most varied languages. The findings, however, indicate that the notion of transformational logic does have practical value, too.

2.5. Transformational Logic and Transformational Grammar

If transformational logic is possible, then the conclusion arises that transformational grammar is also possible. That conclusion has its roots in the unity of language and thought. As a matter of

fact, during recent decades, a definite model of transformation grammar has been created (Chomsky 1957, 1965), known as Chomskian revolution in linguistics (Lyons 1977: 9-10).

Transformational logic and transformational grammar may have some common initial positions, definite resemblances in their instrument sets of concepts. However, the certain differences have to be ascertained both in methodological positions as well as in the interpretation of the most important categories of the above-proposed transformational logic and that of transformational grammar of N. Chomsky.

The notion "surface structure" and "deep structure" occupy an important place in the conception of Chomsky's transformational grammar. In particular he proceeds from the assumption that any sentence possesses surface structure as well as a deep one. It may seem, that there is an analogue of those forms (structures) in transformational logic as notions *EXP* and *IMP forms (structures)* of thought and also accordingly: *normal, standard, correspondent forms* of thought, on the one hand, and *non-normal, non-standard, non-correspondent*, on the other. To the former there might also be added *surface form (structure) of thought*, and to the latter - *deep form (structure) of thought*, if those phrases did not also possess some definite gnoseological sense. From Chomsky's point of view, the deep structure of a sentence, rather than the surface structure, shows its more essential properties. Moreover, according to Chomsky the surface structure is often deceptive and non-informative. In general form, it may be said that according to Chomsky's conception, the surface structure corresponds to the level of description, and the deep structure to the level of explanation.

One may observe in the matter some gnoseological, theoretic-cognitive differences between the notions of *surface structure* and *deep structure* of Chomsky's transformational grammar and *explicit form (structure)* and *implicit form (structure)* of transformational logic. Applying the notions of EXP and IMP forms (structures) of thought, we do not ascribe gnoseological primacy to any of them, we do not consider either one to play a more important role in disclosing the form of thought, but we think, that each of them clears up formal properties of definite sections of thought and only their combined results may lead to a correct understanding of forms (structures) of thought. Just for those reasons we dissociate ourselves terminologically from Chomsky and do not consider it possible to apply the terms *surface structure, deep structure* as possible equivalents of EXP and IMP forms in transformational logic.

Chomsky proceeds from the supposition that transformation of deep structure into surface structure takes place and that will be derived from deep structure by transformational rules, (and such transitions, transformations are governed by innate grammar, set in human mind). That means that for Chomsky the deep structure appears as primary, and the surface structure as secondary, derives from the deep structure. While there is an exactly opposite correlation between EXP and IMP forms (structures) of thought in transformational logic Here we deal with evidently expressed, explicit forms (structures) and in that sense they are primary. First we have to do with forms (structures) of thought given by the text, and only then from the text we come to the subtext and context discovering IMP forms (structures) of thought. In Chomsky's transformational grammar the deep structure generates the surface structures, while in transformational logic EXP forms (structures) generate IMP forms (structures), (thus, as it was said above, the mechanisms of generation in the two systems are also different).

There are terms (first of all, "transformation", "generative structure", etc.), which may equally be used in transformational logic as well as in transformational grammar and which has been in use in logical and linguistic studies long before the appearance of those systems.

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Transformational logic is one of the possible logical sciences (systems) revealing a vast wealth of human thought, its forms and structural variety.

3. Kurt Gödel's Letter: Logical Text and Philosophical Subtext

An Austrian logician and mathematician K. Gödel (1906-1978) at the age of 25 published an article "On Formally Undecidable Propositions

of Principia Mathematica and Related Systems", the ideas and the results of which played an important role in the development of logic and mathematics of our time. The works of Gödel exceeded the bounds of proper logical and mathematical ideas and acquired common methodological significance. Gödel succeeds in proving the principle impossibility of full formalisation of more or less rich in content fields of knowledge and of scientific knowledge as a whole. Besides the above mentioned article Gödel wrote some other works, in which there were important results, particularly in the fields of constructive logic and the theory of models, etc.

The undeniable common methodological significance of Gödel's logico-mathematical achievements is admitted by philosophers representing different schools. In one of the works of the American philosophers devoted to Gödel's it is noted "the conclusions Gödel established are now widely recognised as being revolutionary in their broad philosophical import" (Nagel & Newman 1964: 4).

In the given case we shall dwell in detail on one of Gödel's letters received by the author of this book which arouses into a few philosophical thought though the very text of the letter is especially logical.

Some words on the pre-history of that letter.

In 1969 I had the occasion to be in Princeton, where Gödel since 1938 was a permanent member of the Institute for Advanced Study at Princeton. In the program of my stay in Princeton there was a talk with Gödel. The future meeting aroused a lively interest among Gödel's colleagues of Princeton University. Besides, the question was meeting with an outstanding contemporary scientist who was the pride of Princeton University, the meeting excited curiosity because Gödel lived in solitude and seldom met people. One of the Professors of the University told me that he would be very glad to accompany me to Gödel as it would give him an opportunity to see the professor who, so he said, was paid a huge sum of money, and whom, alas, he had never seen for his almost 30 years stay in Princeton.

The appointed day (19 November, 1969) I went to the School of Mathematics for Advanced Study at Princeton to Gödel, accompanied by the professor of Princeton University. Gödel's secretary informed us that the professor could receive only me.

The talk with Gödel took place in quite a large study where I noticed a lot of books devoted to Gödel himself, to analysis of his logico-mathematical achievements. While talking Gödel took a special interest in Hegel's dialectics, to the question of how Hegel's logic is understood by Soviet philosophers. Motives of such interest of Gödel to Hegel's dialectics, as may be supposed from the content of our talk, were connected with the question of interrelation of dialectical and logical contradictions, in other words, if it was possible to combine the demand of dialectics – to consider the entire reality of environment and our thought as unity of opposites – with the law of contradiction of formal logic. That question acquired a peculiar actuality under the light of Karl Popper's article What is Dialectic? which was read at a philosophy seminar at Centerbury University College, Christchurch, New Zealand in 1937 and then published in "Mind", as well as in Popper's collection Conjectures and Refutations. In the article Popper tries to prove incompatibility of the demand of dialectics on universality of contradictions and demands of formal logic on inadmissibility (inaccessibility) of logical contradictions in our thoughts (Popper 1969).

Our talk lasted about an hour. Gödel seemed unhealthy. He took pills now and then. I was eager to know his opinion on philosophical significance of his logico-mathematical achievements. With that question I had time to address him factually at the end of our talk. He told me that because of tiredness he would not answer my question immediately; later he would answer by letter. For that purpose he asked my address in New York where I had to return approximately in a month. Gödel also added that some philosophical interpretations of his logical conception can be found in his article "What is Cantor's Continuum Problem?" (Gödel 1990: 254-270), (Gödel 1964: 258-273).

The day after the talk with Gödel the content of our talk became the subject of lively discussions with philosophers of Princeton University. Gödel's colleagues were surprised by his interest in Hegel's philosophy. G. Hempel and S. Hampshire told me that Gödel was usually interested in Leibnitz. When I informed them about Gödel's promise to write me on methodological significance of his contribution in logic, a shadow of doubt appeared on the faces on my interlocutors.

During the talk G. Pitcher - the Dean of Philosophical faculty told me that Gödel had rung him up and expressed a wish that we should meet again. Our talk was still going on when I was called to the telephone. It was Gödel. He said that his call had two aims: first, he was worried as to how I had returned to my hotel, and second, that David Hawking working in their Institute had written a book entitled "The language of Nature". Wouldn't I have a talk with him? Unfortunately, according to the program of my stay in the USA I had soon to go to Washington. That is why I would have no opportunity for new meetings in Princeton.

During my further visits within the month to the universities of San-Francisco, Los Angeles, Chicago, Boston and other cities, where I had very interesting meetings with such famous philosophers as Carnap, Tarsky, Quine, Goodman, and others I didn't forget Gödel's promise and the unexpressed doubt of the Princeton philosophers.

Arriving at the New York I rang up the International Research and Exchange Board the address of which I had left to Gödel for possible correspondence. The following letter of Gödel was already waiting for me there.

THE INSTITUTE FOR ADVANCED STUDY
Princeton, New Jersey 08540 School of Mathematics

December 10, 1969

Professor George A. Brutian
International Research and Exchange
Board 110 East 59th Street
New York, N.Y. 10022

Dear Professor Brutian:

Here is *one* formulation of the philosophical meaning of my result, which I have given once in answer to an inquiry:

The few immediately evident axioms from which *all* of contemporary mathematics can be derived do not suffice for answering all Diohpantine yes or no questions of a certain well-defined simple kind*. Rather, for answering all these questions, infinitely many new axioms are necessary, whose truth can (if at all) be apprehended only by constantly renewed appeals to a mathematical institution, which is actualised in the course of the development of mathematics. Such an intuition appears, e.g., in the axioms of infinity of set theory. There are other formulations, which ought to be added, in order to make the situation completely clear. Perhaps I can send them to you at some later date through the International Research and Exchange Board.

Yours sincerely,
Kurt Gödel

* See: m. Davis, The Undecidable, New York 1965, p. 73, last but one paragraph.

A short logical text! But it hides too much philosophical presuppositions of great interest. Returning to the Soviet Union I have shown the letter to some of my colleagues, particularly to Professor I. Zaslavski, with whom I usually discuss the philosophical problems of mathematical logic and metamathematics. As a result of such discussion I answered Gödel's letter on 26th December 1970. I tried to formulate in my letter some questions with a few interpretations. I hoped to know Gödel's opinion on those questions having in mind the last sentence of his letter.

Here is a paraphrase of my questions:

1. The principal question concerns the extension of concrete mathematical theories by the introduction of new axioms the truth of which, as Gödel writes in his letter, can be apprehended only by constantly renewed appeals to mathematical institution. May we believe that "Yes" or "No" answers to the mathematical questions (for example, to the Diophantine question) are completely definite (though, probably, not known to us at present), and new axioms in corresponding theories (e.g. in arithmetic) must only formalise these ready answers? Or, probably, these answers must essentially depend on the results of "appeals to a mathematical intuition" by means of which we create new axioms.

The other formulation of the same problem can be given in the following terms. What conclusions can we arrive at from Gödel's theorem about the non-completeness of arithmetic in the aspect of the subsequent development of arithmetic? Does that theorem denote only that arithmetic cannot be completely described by means of some apparatus of constructive generation of arithmetical statement? Or does it denote, that arithmetic is not single as mathematical theory and the content of this branch of knowledge could be described by means of a quantity of mathematical theories essentially different from one another?

The answer to the Diophantine questions of a simple kind, which is described in Gödel's letter, seems to be single, but it is not so clear for more complicated questions. Most mathematicians, it seems to me, believe that the concepts, for example, are well-defined mathematically, and the difficulty in studying corresponding problem consists only in finding "Yes" or "No" answers to the corresponding questions; these answers are defined independently of our activity and are single. I wanted to know if Gödel is of the same opinion? Or if he accepts that this belief of the majority of the mathematicians is little by little disturbed by the results of, for example, Gödel's theorem about the non-completeness of arithmetic or of the theorems belonging to Gödel and P. Cohen about the relative independence of the Continuum Hypothesis of the axioms of the set theory?

2. In what sense does Gödel understand the "mathematical intuition", the "renewed appeals" to which, as he writes, must clear up the truth of additional axioms by which we extend our mathematical theories? Is it the intuition in the same sense that permits him to characterise "the few axioms from which all of contemporary mathematics can be derived" as immediately evident? (They are, apparently, the axioms of the set theory?). If it is so, Gödel's understanding of "intuition" and "evidence" is apparently quite different from the understanding of analogous terms in the concepts of the intuitionistic school. It would be, of course, very interesting to know Gödel's interpretation of these concepts. Particularly, if Gödel's treatment of intuitive clearness in mathematics includes some elements of constructively.

3. My last question to Professor Gödel was: if he accepted that the appeal to mathematical intuition is the basic method to establish the truth of mathematical axioms?

It seems to me that the truth of basic statements in mathematical theories cannot be established only by means of mathematical intuition, without digressions outside of mathematics. In my opinion, the establishment of the truth of such statements is a complicated and difficult process which includes in general the appeals to the results of practical human activity, to concepts in science and technics and also to logical and philosophical concepts.

Unfortunately I haven't received the answer to my letter. So there was no chance to transform the presuppositions of Gödel's letter into explicit text. The subtext of Gödel's letter lives independently from its text and gives endless opportunity for logical and philosophical imagination and implications.[7]

4. From Philosophy to Logic and Argumentation: The Historical Significance of David the Invincible's Theoretical Heritage.

In 1980 the official UNESCO calendar "Anniversaries of Great Personalities and Important Historical Events" featured the 1500th anniversary of the birth of an outstanding Armenian philosopher, David the Invincible (Anhaght).

In the capacity of the author he is mentioned on his manuscripts as Thrice Great and Invincible philosopher David. Later on his writings were published under that name. It is true, he was also often named David the Armenian, nevertheless, the name of "David the Invincible" obtained the right of citizenship securing the thinker an appraisal in such an exceptionally difficult sphere of intellectual activity as philosophy. But who is he who was called "Thrice Great" and in addition "Invincible", and of whom that nickname became a proper name?

David was born fifteen centuries ago, in the 70's of the 5th century, in the village of Nergin, province of Taron, West Armenia.

It is not known when the youth got interested in philosophy, and in science in general, but it is certain that he travelled in different countries, studied and taught philosophy, developing his broad philosophical activity in world famous philosophical centres of his time – Athens and Alexandria. David also visited Constantinople. And wherever he went he actively participated in philosophical discussions, disputes, defeated everybody by the force of his logical argumentation and many a time proved himself victor in very significant debates of philosophical nature, and his nickname is evidence of it. Apparently the thinker distinguished himself in the knowledge of languages. It is at least known that three of his works have reached us both in Armenian and in Greek and one work only in Armenian. But David knew not only how to make use of languages, even brilliantly for that matter. He even engaged in language creative work. Thanks to his works an exclusively rich and great supply of terminology of philosophy and logic was created in Armenian based on the Armenian philosophical tradition and with due regard to achievements in that domain by other peoples, particularly the Greeks.

Boundless is David's love for philosophy, which was both profession and vocation for him. His main work "Definitions of Philosophy" begins with the following words entirely characteristic of the author: "Those who have once been fired with love for philosophical discourse, even if they have savored its sweet delights with but the tip of a finger, are impelled towards them by a same ecstasy and bid farewell to all earthly cares. And then through knowledge of that which exists, they rapidly turn their desires to this. Now, as we shall show below, knowledge of that which exists is philosophy" (David 1983: 3).

Wisdom, for David, begins with philosophy, and all kinds of sciences and arts originate from philosophy. Creating his own system of definitions of philosophy, he includes in it the definitions of the classics of philosophy – Pythagoras, Plato, Aristotle, and with the help of each of the definitions he tries to disclose one or some other aspect of philosophy. In essence, David values, in the Platonian definition of philosophy, such an ideal of philosophy as becoming divine in the views of those whose eyes are turned to the sky: philosophy is becoming like God within human possibilities. In the above context, the loftiness which David the Invincible, following Plato, imparts to philosophy is important.

The disclosure of the etymology of the term "philosophy" – philosophy is love for wisdom linked with the name of Pythagoras – serves as evidence for David that of all the spheres of intellectual activity no other but philosophy has the most intimate connection with wisdom. And certainly David maintains, with peculiar pride, the Aristotelian definition of philosophy as the art of arts and science of sciences, seeing in it the superiority of such an activity to which he devoted himself with all his soul, with all his consciousness.

David perceived the sense of the existence of philosophy in its vocation to ennoble and beautify the human soul. Again, it is not important as to how he understands the realisation of that task. In that case, David's words once again testify to his being in love with philosophy.

He was a philosopher first and foremost. But he did not confine himself to the bounds of philosophy. Apparently not all of David's writings have come down to us. Nevertheless, what has reached us testifies to the exclusively wide scope of the Armenian thinker's scientific interests. Besides problems of ontology and gnoseology,

logic, ethics and aesthetics, his works contain interesting ideas about problems cosmology, mathematics, biology, psychology, theory of literature, musicology and so on. Did he exhaust all the branches of knowledge, did he reach the climax of knowledge? The most emphatic "No" on the lips of David himself rings: how can knowledge reach bounds where nature has no bounds (David 1980: 148). That is admiring the power of reason, a hymn to the boundless possibility of human cognitive activity, skepticism, limiting man's ability to inquire into the mystery of life, is emphatically refuted by the Armenian thinker.

If it is possible to know the reality surrounding us and ourselves, then we must have logic as a guiding star to move over by its help from non-knowledge into knowledge. David seems to make use of even a simple syllogism in the fact that "by the help of one thing some other things are perceived, for nature has not concealed everything from us, since, in such a case, nobody would be able to perceive anything obvious, for then nobody would investigate anything. However, it has concealed something from us and has made obvious some other things; and thanks to that there exists investigation, which means to search and find. And precisely that became the essence of syllogism, so that with the help of what nature shows us we might discover what it has concealed from us..." (David 1980: 305).

And he begins a detailed investigation of logical forms of thought and with the same aim a word for word analysis of some of Aristotle's texts, in which his key positions regarding investigated problems are expounded. And what David has done in that domain cannot today not rouse that admiration, and more important, the gratitude of those for whom the scientific understanding of the problems of Aristotelian logic in the basis content of their creative biography. It is common knowledge that Aristotle's works on logic have undergone such changes, supplementations, editing, that their contemporary texts raise many problems before the investigator, first of all, in the essence of adequacy to the author's original intention and ideas (Edel 1967: 15-18). In that respect all the specialists of Aristotle are unanimous. At the same time, as the English scholar F. Conybeare notes, examining Aristotle's "Categories" and "On Interpretation" in comparison with the Armenian texts, it is possible to determine the exact character of the text, as clearly and accurately as if the manuscript of the same age lay before us. Some similar thing may also be said about those parts of Aristotle's" Analytics" that became an object of word for word analysis for David (Conybeare 1892: XXVII).[8]

Treating the subject of logic David the Invincible agrees neither with the opinion of the Stoics, who maintain that logic is a part of philosophy, nor with the opinion of the Aristotelians, who maintain that logic is a tool of philosophy. At the same time he indicated in what respect logic serves as part of philosophy and in what as its tool: when logic serves to prove the existence of real objects, then it is a part of philosophy, and when it acts as rules of thought, then it serves philosophy as a tool (David 1980: 313).

In essence, Aristotle's attitude as to the main thing in logic, i.e. demonstration, is fully supported by the Armenian logician. Although David the Invincible closely links logic with philosophy, consequently it mainly bears a gnoseological nature, none the less, the Armenian thinker never doubts that the forms of thought, operations of the mind are studied by means of a special science, by logic. Regarding the task of the latter, the investigation of division, definition, demonstration and analysis, David scrutinises the question in respect of the sequence of these logical means. In doing so, one feels his tendencies to explain the place and role of logical categories in knowledge with respective analogues in the everyday working activity of people[9], tendencies towards a materialistic interpretation of logical categories (David 1980: 45).

On the other hand, scrutinising the sequence of the investigation of logical categories, David the Invincible states that investigations must be realised from the simple into the complicated (Ibid: 114, etc.).

David the Invincible has an idea about the nature of much a relation between the general theory and the particular, thus, speaking in today's language, the former is the metatheory of the latter. Such, first of all, is philosophy with regard to other sciences, and in particular to logic (Ibid: 73, l16), (Matenadaran, Manuscript No.1747: 74b),

In the works of David the Invincible logic comes into play also as a theory of argumentation. One of the characteristic peculiarities of all the works of the Armenian thinker is revealed in the statement of his views in the form of argu-

mentation, and while arguing he displays some or some other feature of argumentation. He examines, in particular, the rule of the refutation of the opponent's thesis (in method) of opposition and the method of equality in disputation), the nature of the antithesis of the thesis to be proved, and also of all the possible arguments in favor of the antithesis, the conditions in which they resort to an authoritative opinion and so on.

A number of problems referring to the logical theory of concepts is examined in the works of David the Invincible. Such as types of concepts, specificity of such concepts which are investigated by philosophy, interconnection and interconditionality of the categories "genus", "species", "difference", "proper sign", "accidental sign".

In that case some treatments of the problem of the theory of concept by David the Invincible have a relative character. The one and the same concept may appear in some relations as a species, in others as a genus. Such a connection, according to his interpretation, conditions their joint study (David 1980: 186).

The problem of property takes up much space in the works of David the Invincible. However, the most interesting thing in the theory of concept, in our opinion, is David the Invincible's study on definition, and also division. Not accidentally did the Armenian philosopher entitle his chief work otherwise than "Definitions and Divisions of Philosophy...".

Setting himself the aim of analysing nature, the essence of philosophy, David the Invincible resorts to an all-sided examination of the definition and division of the concept of "philosophy". And to accomplish the projected task the Armenian thinker makes the very logical means of definition and division an object of investigation.

David the Invincible subjects the analysis of the following problem referring to definition; what is definition; the distinction of definition from means resembling definition; genesis of definition; structure of definition; perfect and imperfect definitions; number of definition of philosophy; validity of given number of definitions of philosophy; sequence of definitions of philosophy; whom those definitions are established by.

The indicated problems are not of the same order. The first five of them refer to definition itself as logical operation and hence it has an all-logical nature. The remaining four questions refer to the definition of a definite phenomenon, namely philosophy. However, in order to solve the second task, David the Invincible undertook to create his own system of definitions on the basis of trying to understand anew all that had been created by the science of logic in the domain of the theory of definition.

While examining the problem of definition David does not avoid possible objections which he evaluates as "very strong and hard to solve" (David 1980: 137). To them belongs the "self-reflectiveness" as definition, both as a logical operation in general and also as definition of categories. From David's interpretation of a given problem it ensures that while defining, in essence, we have to do with a set, which contains itself as an element of that set. He also remarks that a logical situation with definition is by far not a unique case in the theoretical-cognitive difficulties of knowledge. David the Invincible sees the solution of a problem in the formulation of the logical rule that everything said regarding the conjunction of two objects (or the object and its property) may be confirmed about each of those objects (Ibid: 76, etc.).

David the Invincible made up his mind to work out formal rules, which might make it possible to distinguish correct definitions from incorrect one. Relevant here is the rule that in definitions words and the defined are in reverse dependence. When the quantity of words in a definition is increased, the defined are decreased, and vice versa, when the quantity of words is decreased, the defined are increased (Ibid: 45-46).

By that rule, David the Invincible, in essence, spreads the property of the reverse dependence between the extent and content of concepts on definition, or in other words, tries to understand anew the nature of the structure of definition through the view of the interrelation of extent and content of the defined and defining concepts, and that also means that he indicates the connection between the structures of concept and definition, which enriches our knowledge in relation to both the former and the latter.

The examination by David the Invincible of the rule forbidding the negative definition creates the possibility not only to ascertain the relative action of that rule but also to outline precisely the boundaries of its applications (Ibid: 182-185). It is possible to formulate as follows: if all the species of given except one are defined, then it is

possible to give it a negative definition pointing out that it does not possess the properties of the other species of the given genus.

David considers the reversibility of a defining concept in relation to a defined concept an important condition of perfect definition (David 1980: 50). That is the rule, which, later in the history of logic, was called the rule of proportionality.

Describing the types of definition (as to genus and distinctive sign, as to subject and aim, as to both, at all), David the Invincible starts from the idea that the cognitive meaning of every type of definition and their applicability depends on the concrete tasks of definition, on the sphere of its application, on the character of the object the concept about which is defined.

Highly interesting are those considerations which David the Invincible expresses about the question regarding the interrelation between the name of an object and the definition of the concept about the object, about the genesis of definition, about the basis on which definition is built, about requirements regarding the plenitude of definition, about the interrelation between definition and means replacing definition, about the cognitive significance of definition, and so on (Ibid: 40-45, 140-166, etc.).

David the Invincible analyses six definitions of philosophy. However, David the Invincible's contribution to the history of scientific thought consists not in the fact that he suggested new definitions (or a definition) of philosophy, but in the fact that (a) relying on the definitions of philosophy given by Pythagoras, Plato and Aristotle (Ibid: 51-52), he creates a system of definitions of philosophy demonstrating that not only one definition, taken separately, could display the essence of philosophy; (b) he reached the idea of definition through contrariety. According to David the Invincible the singular and the particular "anti-define each other" (Matenadaran, Manuscript No. 1716: 116b) he characterises the particular as the undefined singular, and the singular as the definite particular. In another connection the Armenian thinker observes that species and genus mutually correlate, and when defining the genus it is necessary to define also the species, for the study on genus and species is the same thing. Summing up his system of definitions of philosophy, David the Invincible emphasises that on the whole the beginning and the end are linked. For the Armenian thinker the question is not only about the requirements of interconnection of concepts in the system of definitions, but also that interconnection is the unity of contrarieties; (c) David the Invincible proceeded, in particular, from the position that in order to know an object it is necessary to study it from all sides, in its connections and interlacing with other objects, and that implies the necessity of different definitions of the one and the same object; (d) he also stated that different definitions of the one and the same object may have different cognitive significance, and consequently, when creating a system of a definitions they must be classified beginning with the more important and moving towards the less important, which acts as a peculiar manifestation of the principle of subordination; (e) while creating his system of definitions of philosophy, he constantly had; (f) David considered definition in close connection with division; (g) David explained the origin of the indicated categories by the working activity of people, their real relations, considering the former (categories as mental reflection of the latter); (h) he thought over, in his own way, all the main things which had been created by logical thought by the domain of investigated categories the studies on logic, on definition and division of concept.

From his study of proposition those fragments of David the Invincible's theoretical heritage have come down to us which refer to the theory of inference. In spite of the fragmentariness of the Armenian thinker's considerations reaching us, it is still possible to conclude David's creative approach regarding the logical theory of proposition. A number of his ideas have preserved their freshness even for our times. The problem of the interrelation between the logical and its linguistic expression pertains to those ideas. As a particular manifestation of the given problem, David the Invincible analyses the definite article and shows that it plays one role in grammar and another in logic. With the help of the latter David the Invincible distinguished the propositions according to their quantity. According to his interpretation propositions without the definite article are tantamount to particular while with the definite article they are tantamount to general propositions.

From the viewpoint of development of ideas of the history of logic, the interpretation of some logical connectives by David the Invincible is not devoid of interest. First, some of his expres-

sions leave no doubt that the Armenian logician accurately realised the role of the logical connective "conjunction" in the process of reasoning, argumentation. More important, in some cases of his interpretation of common linguistic expressions the conjunction (in Armenian "yev", in English "and") does not always fulfil its standard function. So, in one case David joins two simple statements by means of "and", the first expression authentic knowledge, the second inauthentic (Matenadaran, Manuscript No. 1716: 101b). That means also that the indicated statements are at different levels in cognitive thought, and from that viewpoint the communicativeness regarding their relation in the structure of a compound statement is uncertain. Since communicativeness is one of the characteristic peculiarities of conjunctive proposition, then it may be supposed that the case of the conjunctive "and", examined by David the Invincible, is not a usual content of conjunction.

The idea that the property attributed to the totality of objects (object and property) is not always possible to attribute to the object (to the property) each taken separately, and vice versa, the property attributes to objects taken separately, is not always possible to attribute to the totality of those very objects, is in the essence used by David the Invincible to elucidate the question about conjunctive proposition and also to solve the procedure of obtaining conjunctive proposition from simple ones or from the decomposition of conjunctive proposition into simple ones.

Neither did the Armenian logician leave out of his field of vision the examination of the cognitive role of connectives expressing variety of disjunction's, negations as well (Matenadaran, Manuscript No. 8132: 213b).

David the Invincible regards the essence and tasks in inference in close link with cognition and its forms. The correct understanding of its nature, according to the Armenian scholar, serves as a means to refute skepticism and agnosticism. He reveals the meaning of syllogism both for knowledge of the surrounding reality and for self-knowledge.

David notes five types of inference-demonstrative, logical (=dialectical, in the ancient Greek sense), rhetorical, sophistic, poetical (=mystical). The basis of that classification to the relation of propositions in the structure of inference to truth. He investigates the nature of syllogism, its premises and terms.

The analysis of the Aristotelian syllogism, realised by David the Invincible in the 5^{th}-6^{th} centuries, is not only interesting as it is from the viewpoint of David the Invincible's logical conception in the aspect of those new logical ideas which we notice in the Armenian logician, but also as an answer to some yet unsolved questions in the history of formal logic. We mean in particular the so-called true form of the Aristotelian syllogism. Jan Lukasevich distinguished the latter from the traditional syllogism, for Aristotelian syllogism has the form of implication, and as such it is a proposition. And a proposition must be either true or false. While traditional syllogism represents a number of statements, which are linked with conclusion by means of the word "consequently". According to that interpretation, traditional syllogism is not a proposition by its form.

It should specially be noted that Jan Lukasevich has in view the contemporary text of the "Analytics". However, it is known that those texts as well as the other writings of Aristotle have undergone different changes and additions. The texts which are the subject of David's interpretation are doubtless much nearer to the Aristotelian original ones.

The Armenian thinker stresses, first of all, that the Aristotelian definition of syllogism spreads over all kinds of syllogisms, and that Aristotle gave the definition of syllogism in general. The examples produced by David as illustrations of Aristotle's understanding of syllogism do not correspond to Jan Lukasevich's interpretation of Aristotelian syllogism. From Jan Lukasevich's viewpoint they must be characterised as traditional syllogisms. As for Jan Lukasevich's supposition that Aristotelian syllogism from the form of implication into the form of inference is probably conditioned by the influence of the Stoics; there is no ground to extend it also over David the Invincible. First, David the Invincible's view regarding that question, by the statement of David himself, differs from that of Alexandre. Maintaining the thesis that Aristotle defined every syllogism, syllogism in general, David the Invincible especially notes that the interpreter of the "Analytics" Alexandre wrongly interpreted the Aristotelian understanding of syllogism. Second David the Invincible expresses his negative attitude still sharper towards the conception of

the Stoics in general and towards the interpretation of syllogism by the Stoics in particular. He mercilessly criticised the "Stoics' clumsy construction of syllogisms". Finally, and this circumstance should necessarily be underlined clearly, David the Invincible's analysis of the Aristotelian definition of syllogism is textual: he moves from word to word commenting on every one of them separately and all the consequences resulting from the given word and its position in the definition. By such an approach and by the indicated attitude towards Alexander and the Stoics, David the Invincible could not deviate, to any extent, from the form of the Aristotelian syllogism either. Hence there is all the required ground to regard the forms of syllogism in David the Invincible's interpretation, most adequate to the "true form of the Aristotelian syllogism".

While criticising the Stoics' conception of the nature of syllogism, David the Invincible expresses a number of ideas which certainly represent interest to understand the development of ideas in the history of formal logic. The Armenian logician analysis the inference of the relations of equality and inequality. David perceives the deficiencies in the Stoics' conceptions in the fact that they take the minor premise twice and drop out the major one. In David the Invincible's opinion, the indicated inferences can assume a correct form if the corresponding rule of inference, in the form of a general premise, is introduced into their structure - (things that are equal to one and the major, will be significantly greater than the minor). Thus, David imparts a more strict form to the Stoics' inferences. However, David does not suggest any similar demand for the Aristotelian syllogism, he does not consider that the axiom of syllogism in the form of a general premise should appear in it. It is possible to suppose that the difference in David's approach to Aristotle and to the Stoics is conditioned by his fine understanding of the specific peculiarities of Aristotle's logical system, on the one hand, and the Stoics', on the other, from the viewpoint of the normalisation of their logical systems. David's assumption of the possibility of replacement in the expression of the universal quantifier by equivalence in meaning by other expressions while analysing the Stagirite's conceptions is evidence of his weaker demand from the viewpoint of normalisation concerning Aristotelian syllogistic rather than his demand suggested while analysing the Stoics' logical constructions.

The validity of the inference "aRb and bRc, therefore of aRc", according to the interpretation of the Armenian logician, depends on the nature of the relation (R); the inference in one case must be valid /in the event of transitiveness of the relation (R)/, in the other case invalid /in the event of intransitiveness of R/.

David the Invincible has also a number of interesting and fruitful ideas which include: the problem of consequence (if Aristotle's conclusion of syllogism contains new knowledge in comparison with premises, so in distinction from that, according to David's interpretation, the Stoics have identity of conclusion and premises in some syllogisms); conditions of validity of inference; cognitive meaning of concrete varieties of inference; question about perfect and important syllogisms; direct inferences (in that connection David's attempt to distinguish a concrete-object peculiarity from an abstract one in predication is of particular interest, for the purpose of differentiation, in some cases, between a valid reversibility of statement and an invalid one); conversion of syllogism, and so on.

In his writings David the Invincible investigates also the problem of demonstration, its types, and following Aristotle, he prefers deductive demonstration, placing it, because of its cognitive significance and certainly of inferential knowledge, higher than demonstrative, and also analogy.

The Aristotelian laws of thought are not subjected to special analysis by David the Invincible. However, the whole context of his investigations shows what an important significance he imparts to the demands originating from the laws of identity, of contradiction and of the excluded middle. For all that the demands of the laws of identity in David's interpretations, in essence, are directed against the relativism of Cratylus; he combines the logical content of the laws of contradiction and of the excluded middle with the gnoseological tasks of the discovery of truth.

On the whole, David the Invincible's study on the subject of logic, on the forms of thought, is one of the important pages of the ancient period of the history of logic, and the world history of logical studies would have suffered without due regard for all that has come down to us from the Armenian thinker's theoretical heritage.

Ch. III. ARGUMENTATION[1]

1. The Architectonic of Argumentation

An adequate theory of argumentation can be created if we first describe the real process of argumentation. This implies simultaneously answering the question - what is argumentation? The more or less complete picture of argumentation can be obtained if we delve further to reveal its structure, main components, the relation and comparative role of the component of argumentation in its real process.

Argumentation is reasoning. But not any reasoning is argumentation. It means that argumentation is a special kind of reasoning. As an answer to the question about the nature of reasoning in argumentation we must know what reasoning is. But it is difficult because both words "argumentation" and "reasoning" are ambiguous. So let us try to explicate these terms. In order to know what argumentation is we must, first of all, know what reasoning is.

There are different explanations of reasoning in encyclopedia and dictionaries of philosophy. In the authoritative Encyclopedia of Philosophy (edited by Paul Edwards) there is no special article on "reasoning". Instead of explaining reasoning it refers to the article on "thinking". I think that this is not the best way of explaining reasoning because the concept of thinking has a much wider content than the concept of reasoning. The popular Dictionary of Philosophy (edited by Dagobert D. Runes) distinguishes between three main meanings of reasoning: the general meaning, the psychological meaning, and the logical meaning. The first and the third ones are important for our purpose. According to them reasoning is a kind of discursive thought; thinking is logical form; drawing of inferences; a process of passing from given premises to legitimate conclusions; power, manifestation and result of valid argumentation, the process of inference; the process of passing from certain propositions already known or assumed to be true, to another truth distinct from them but following from them; a discourse of argument which infers one proposition from another or from another or from a group of others having some common elements between them, etc. (Runes 1960: 264-265).

These explanations of reasoning differ, of course, from each other. Some definitions seem to be narrow, others broad. But common and characteristic for all of them is that reasoning is a discursive thought, thinking in the form of logic. And though according to these explanations reasoning manifests itself as a result of valid argumentation, it does not explain argumentation nor offer a definition of argumentation.

Argumentation is a kind of reasoning which means a kind of discursive of logical thought where the arguer tries to realise his main aim by means of logical, psychological, rhetorical, axiological, and other component, that is, he tries to convince the recipient to become a co-participant of the realisation of his project.

Like reasoning, argumentation is one of our main abilities. People argue in every sphere of life. Homo Sapiens is homo argumenticus. This means that (a) argumentation has a universal character; (b) there can be different interpretations of argumentation, but argumentation itself is the same for all people and differs only according to peoples' intellectual or logical abilities. The universal character of argumentation does not mean that it is absolutely the same in each sphere of peoples' intellectual contacts. Argumentation can be modified under the influence of the main characteristics of any particular field in which we argue.

The modification of argumentation according to the specificity of the area in which contacts can be realised in different ways. Certain specific means that political (or philosophical) argumentation is a special kind of argumentation whereas the features of genus and also the differences of species. This may be a simple method of modifying argumentation. Another method may be considered when a particular component of the abstract scheme of argumentation loses its "normal power" in the concrete case or becomes more powerful than its normal condition.

What do we in fact do when we argue in general, or what is actually argumentation? I believe that we argue when we formulate a proposition (the thesis of argumentation), consider all the necessary arguments for and against the thesis, demonstrate the truth of the thesis and the falseness of the antithesis, value the thesis as being the most acceptable among the other true propo-

sitions, convince the recipient of all our decisions with the intention of making him think in a similar manner in order to be able to participate in the realisation of the aim of argumentation. This is an abstract scheme of argumentation. The difference between this model of argumentation and its real process is somewhat akin to the difference between language and speech. This description of the process of argumentation shows that the argumentative fields include such concepts as reasoning, thesis, antithesis, argument, conterargument, conviction, evaluation foundation, action, and so on. It contains at least the following four components: logical, psychological, rhetorical, and pragmatical.

The logical component of argumentation is determined by the necessity to test the argumentation thesis, to refute its antithesis, to demonstrate the truth of all the propositions which lead to the aim of the arguer. Some experts of argumentation assert that there is no need to use logic in argumentation. The appearance (surrogate) of logic is enough to convince the recipient. Such argumentation cannot be characterised as valid. It is, in fact, pseudo-argumentation.

Other experts of argumentation neglect the role of logic in argumentation, especially in the field of social sciences. According to their point of view, argumentation begins when logic ends its mission. I think that the gnoseological roots of that inadequate explanation of logic and argumentation are determined by a restricted understanding of the notion of logic, by reducing all kinds of logic to symbolic logic, to logic based on artificial language. As a rule, we do not use the symbolic logic when we argue about social topics but argumentation deals not only with reasoning in social spheres. Argumentation is universal mode of reasoning and logic is, in principle, one of the main components of argumentation, its very essence. The kind of logic we use, logic of common, natural language or logic of artificial language, formal or informal logic, formalised or contentual, etc. or the combination of two or more kinds of logic depends on the concrete field, sphere of application of argumentation.

The logical component is a highly effective tool in argumentation, it can achieve positive results only as a unit together with the psychological one. The test itself can achieve nothing without conviction in addition to acceptance of the truth of the argumentation thesis. To convince the addressee, the argumentator himself must be certain that his approach is right, that the thesis under discussion is true, and that it is expedient to carry out the devised programme of action. Socrates in his times underscored the importance of convincing, in the process of arguing, not only the interlocutor but himself, which is notably demonstrated in Phaedo by Plato (77 B, 91 A-B). In advising such a conception, Aristotle infers that you cannot convince another person by using arguments that can be refuted by yourself. It has become a commonly accepted fundamental law of psychology that it makes no sense to try and convince another person with arguments which you yourself do not find convincing.

The psychological component is no less significant than the logical component in argumentation. That is why these experts of argumentation who factually neglect the important role of logic in argumentation and concrete on the psychological factor arrive at the incorrect conclusion that the theory of argumentation is a branch of psychology (Perelman & Olbrechts-Tyteca 1971: 9).

The psychological factor prepares the recipient so that he may believe the arguer, to convince him of the truth of what he is saying, to accept his programming, and finally to become the coparticipant in realising his project. If the logical factor deals with the mind of recipient, the psychological factor deals with his emotions and his will. The rational and emotional component consist of the unity in the real process of argumentation. From the viewpoint of dialectics, they are on opposite sides of the same unity.

The creation of a sufficient psychological atmosphere requires certain means and tools. Rhetoric provides us with these. I am referring to the effective use of speech.

Rhetoric in the above-mentioned sense has no role in the logical theory of proof but its role is important in argumentation. The way we can use rhetoric and the kind of results we can achieve depends on ourselves. If we use the art of effective means of speech, the flexibility of notions in a flexible way, as Hegel frequently said, there will be a conflict between logic and rhetoric. However, the conflict can destroy the argumentation itself, transforming it into pseudo-argumentation. Valid and effective argumentation presupposes the alliance of logic and rhetoric.

The logical, psychological and rhetoric components in argumentation are not isolated steps which appear one after another, they constitute the unity of the different sides of the same phenomena whose final aim accompanies those components and at the same time, includes them. In addition to the final aim of argumentation-e.g. to make the recipient the co-participant of the realisation of the arguer's intention, argumentation can have certain intermediate aims. The component of the aim of argumentation reveals its pragmatic aspect. The final aim of argumentation shows the unity of saying and doing, the unity of thought and action in argumentation. The intermediate aims of argumentation can be convincing the recipient of the truth in the arguer's thesis in addition to other propositions which he uses during argumentation, e.g. the acceptance by the recipient of the arguer's intentions, etc.

A question arises in connection with convincing the recipient of the truth of the arguer's thesis: should we seek the truth in the process of argumentation? Or, to put it differently, what is the target pursued by the argumentor. What is he trying to convince his addressee of? Is the truth of the thesis under discussion or simply in the acceptability of the advanced proposition as a thesis of argumentation? This question revives divers replies from modern theoreticians of argumentation. One of them, Ch. Perelman, thinks "that argumentation like all persuasive discourses is directed towards increasing the intensity of adherence to certain theses, that this intensity can always be increased, and that because of this feature, arguments aiming at adherence are different from proofs directed towards truth..." (Natanson & Johnstone 1965: 136). In his book *The Art of Argumentation*, G. Aubin comments John Milton as saying that "truth never comes into the world but like a bastard, to the ignominy of him that brought her birth" (Aubin 1966: 24). The point of view that in the process of argumentation the truth can be avoided and that the main purpose of argumentation consists in convincing the addressee to accept the thesis put forward by the argumentator is hardly acceptable. The latter must convince his interlocutor that the thesis under discussion is true, and presents valid arguments.

There is a supposition that the argumentator should do nothing more than to convince the addressee to accept his thesis and that there is no need to prove the truth of that thesis. This supposition draws largely on a pluralistic understanding of the truth. If every man has his own truth and if the concept of truth is replaced by the idea of usefulness, as in the case of the pragmatists, then one can certainly do without proving the truth of the given thesis and be content with the process of convincing the addressee to accept the thesis. In reality, we suppose, the truth of each statement is single – this depending on specific conditions of the statement.

So argument should be made in favor of a true proposition rather than in favor of any proposition with dismissing the question of whether it is true. With this in mind, in the process of arguing one should prove the truth of the proposition and demonstrate it. Otherwise it will be nothing more than pseudo-argumentation.

To achieve the final and principal goal of argumentation the argumentator passes several stages, each possessing a definite aim and bringing him closer to the final target. Among the attendant or intermediate aims, we should single out the need to prove the truth of the thesis under discussion and create the impression that, since it is true, it should be chosen as a programme of action.

Certain argumentation experts believe that the main aim of argumentation is to convince the recipient to hold a similar opinion and that is all. I think, this can be a special or partial case but not a general rule. The reduction of all the possible aims of argumentation to those means order to reduce argumentation to a passive role. However, the practice of argumentation shows that the arguer prefers to achieve a particular goal in life, to transform thought into action.

The components of argumentation and their relations construct the structure of argumentation. Argumentation has also a form. I think, it is necessary to distinguish between the internal and the external forms. The internal form of argumentation is a combination of different kinds of influences. The typical external form of argumentation is a dialogue. There are different opinions on the problem of the form of argumentation among theoreticians of argumentation. This problem was discussed at the XVIII World Congress on Philosophy in Brighton. From D.Ph. Verene's point of view, argumentation has narrative character, especially in philosophy, because "arguments are not interesting in themselves;

they are only interesting for the role they play in some narrative. If an argument is examined by itself, it is ultimately interesting only when it is brought back into some narrative of which it is a part (Verene 1989: 143).

Another view on the problem was presented by Jaakko Hintikka in his paper *The Role of Logic in Argumentation*. He considers reasoning and argumentation as an interrogative model, as a process of questioning, as a question-answer sequence (Hintikka 1989b).

I think, there is no necessity to oppose a narration and dialogue as well as a narration and question-answer process as forms of argumentation. The typical form of argumentation from my point of view is a dialogue. The thinkers of the Ancient World were masters of dialogue-conversation, the best representative of which was Socrates. It is not necessary for dialogue to be expressed in the explicit form. A narrative can be considered as hidden, implicit form of a dialogue.

The correlation of the components of argumentation and their relative value in the system of argumentation should be viewed, in the final analysis, in the context of human activity and definite social conditions. It is exactly by taking into account specific social conditions that one can grasp the dynamics of relationships between the components of argumentation – in particular the role and importance of self-conviction, of convincing the addressee, and of confirming the truth of the advanced thesis – as attendant goals of argumentation. It is exactly with due regard for the specific social context that one can better perceive and assess the ethical position of the argumentator. This position involves a wide range of ethical aspects, the major of them being the relationship between the goal and the means which help the argumentator realise his intention, the problem of choosing arguments and reasons, the use of admissible and inadmissible method in the process of psychological influence over the addressee, and drawing distinction between means that are good and no good in dealing with controversial issues.

It is symptomatic that some exports of argumentation underline the ethical responsibility of the arguer (Miller & Nilsen 1966: 180-182). In our opinion, it is necessary to extend the boundaries of this responsibility and stress the arguer's social responsibility. If it is true that through convincing arguments we pave the way for our programmes, urge this addressee to take definite actions, and seek to make the audience an ally of our actions, then we should recognise that all this may have certain social implications. In our complex world of today when the destiny of civilisation depends on human actions, the question influencing people's minds and outlooks, and the contact of minds has acquired a curtail significance.

2. An Explication of the Main Concepts of Argumentation

Although the argumentative act is as old as mankind, we need a theory of argumentation which will be adequate to the act of argumentation. Any theory of argumentation needs some explication. The main reason of such a procedure lies in the very specificity of the theory of argumentation. If we consider any theory of argumentation we may notice that there is no concept not used in other fields of knowledge – in logic, psychology, rhetoric, theory of communication, methodology, gnoseology as well as in everyday life, in common sense, etc. Although the theory of argumentation should be created by those philosophers who are called methodologists, such a theory can be effective if it is based on the cross-roads of different fields of knowledge, especially the knowledge mentioned above. So using Rudolf Carnap's terminology we must consider the concepts of the theory of argumentation as explicandum which we must explicate transforming then into explicatum. Such an explication is possible not only towards the concepts which we introduce in any theory of argumentation but also towards those concepts which we use in the modern theory of argumentation but they are taken from former steps of the development of the theory of argumentation. In other words the explication of the main concepts of the theory of argumentation must be realised not only as a synchronic analysis but also as diachronic analysis.

Both synchronic and diachronic explications of the above-mentioned concepts may be of semantic, functional, relational, methodological, ontological, etc. character.

The semantic explication of the concepts of argumentation takes place when the concepts taken from the other branches of knowledge as

well as from the former steps of development of the theory of argumentation change their contents in a considered new theory. The functional explication takes place when the mentioned concepts do some other functions than in the fields from which they are taken. In other words, the explication in this case concerns the function of considering concepts. When the explicated concepts have the same semantic content as in the field from which they are taken but attain new nuances in the relations with other concepts of the context of a new theory such an explication may be characterised as relational.

All semantic, functional and relational explications can be realised together with other or others.

The methodological explication deals with these demands which can be done towards the system of arguments. The specificity of such an explication is that it does not deal with concepts of argumentation but with some rules regulating the very basis of argumentation, the set of arguments as a system.

One of the main concepts of any theory of argumentation is the argument. That concept is taken from logic, particularly from the part of logic which is known in traditional logic as the *Theory of Proof and Refutation*. The concept of argument in argumentation we use wider than in logic from the point of view of its essence was well its role.

Argumentation as a kind of reasoning in a mental process, an intellectual action like reasoning itself. It is quite natural that if argumentation is a mental process, all of its components also are of mental character. There are some difficulties in this connection to explain the nature of an argument. Arguments from the viewpoint of the theory of argumentation are premises by means of which we prove the thesis of argumentation, refute the antithesis, motivate the validity of any thesis, etc. When we analyse the nature of arguments, we can, first of all, conclude that they are judgements or propositions like in logic and, therefore, they have a mental character. Sometimes there can be arguments in argumentation which are not propositions, but merely indications of the facts. Sometimes we can see that somebody uses force or a weapon or any kind of objects as an argument. Professor Henry Johnstone writes that threat is a form of an argument and adds that it is a degenerate form of an argument (Natanson & Johnstone 1965: 2).

Of course, we can say that it is much better to use the force of an argument than the argument of force. But we cannot abstract from all those situations where an object is used as an argument. And not only in a negative sense. Let us consider such a situation in life. Spouses discuss the problem of adopting a child. The wife tries to convince her husband by saying, for example, that it is sad to live without a child. That a child can make their empty life more interesting, that even a single smile of a child can make their life happier, that the adoption of a child has a high, humanistic importance, etc. Let us imagine that the husband is not convinced but does not want to argue with his wife. Suddenly the door opens and their friend comes in with a child in his arms. The child smiles charmingly and stretches out his arms to the husband. The husband solves the problem of adoption without words. We can say that the sudden appearance of the child was the best argument in the argumentation between the spouses. But this action has no mental character.[2] How can we explain the nature of this phenomenon from the viewpoint of the mental character of argumentation and its components?

It is possible, from my point of view, to give an explanation of this phenomenon. First, when we deal with certain objects during argumentation (for example, with guns), the object itself does not become an argument. As an argument we use the thought about the object which we immediately fix in our consciousness without having enough time to express it by words. That is the reason why one may think that the object itself becomes an argument instead of its mental image. Second, to understand the nature of such arguments we can refer to an analogous situation in logic. The case of ostensible definition is quite different in its nature from other kinds of definitions. The main difference is that we do not express either definiendum or defines. We can call such phenomena as force or appearance of a child as ostensive arguments. They can also be called non-expressed arguments or shortened arguments. They really become full arguments when we describe them, and thereby they obtain a mental character.

If this is true, we can come to the conclusion that there are situations where arguments are not fully expressed. We can go further and point out that in describing the components of argumenta-

tion we do not mean that they must take place in every act of argumentation. It means that some elements of argumentation are fully expressed, others are implicit, and the rest of them are missed. There is an analogue between syllogisms and enthymems in the situation. We can say that we have not only incompletely expressed an argumentation but also shortened it. I would like to call it an enthymematic argumentation. But if it is necessary to convince the recipient, we have to transform all the implicit components of argumentation into explicit ones.

On the other hand, if the role of arguments in logic besides that role has other functions too: to convince a recipient, an auditorium; to found an expediency, reason, choice of the thesis of argumentation among other equivalent true propositions, etc.

One can easily notice that the explication of argument here has both a semantic and functional character. It must be considered at the same time that explication is a contextual procedure. The explication of one of the main concepts of argumentation necessarily leads to the explication of other connected concepts.

Such an understanding of the nature of argument and its function in argumentation leads us to the explication of the nature of fallacies in connection with arguments.

Let us consider, for example, *argumentum ad populum* and *argumentum ad hominem*. When they are analysed in a textbook of logic (and they are in most textbooks) they are described as fallacies. I want to underline that from the viewpoint of logic *argumentum ad populum* and *argumentum ad hominem* are not normal, valid arguments but only fallacies among possible arguments. Here are only two illustrations from modern textbooks of traditional formal logic. Robert J. Kreeche describes *argumentum ad populum* in the following words: "This is a familiar type of rhetorical appeal. It is based on an attempt by the speaker to "self" his cause to the people by addressing himself to their prejudices, their emotions, their own characteristic local interests, and by similar appeals. It is most often in dictatorial countries that one finds a rabble-rousing leader playing up to the instincts of the mob by the employment of the "principles" of mass psychology. This type of appeal, however, is not altogether absent in democratic countries, especially at election time" (Kreyche 1961: 279-290).

One can easily notice that such a characteristic of *argumentum ad populum* is quite negative, although it is mentioned one appeals to it even in "democratic countries".

We find in J. G. Brennan's "A Handbook of Logic" a similar characteristic of *argumentum ad populum*. "This variety of irrelevant conclusion is committed by anyone who addresses a mass audience and endeavours to sway the judgement of those present by appeal to matter close to their prejudices and emotions but separate from the point at issue" (Brennan 1961: 217).

If we compare the evaluation of *argumentum ad populum* with *argumentum ad hominem* by the same authors we can see again the negative characteristic of the latter too. At the same time both authors (and not only they) underline the possibility of the use of *argumentum ad hominem* in "certain circumstances". R. J. Kreyche writes on *argumentum ad hominem*: "This line of attack is based on appeal to the person and is an attempt to discredit an opponent's argument by discrediting the opponent himself. Frequently it takes the form of mere name-calling. Sometimes, too, it involves a pernicious attempt to destroy an opponent's reputation" (Kreyche 1961: 279). And adds: "There are circumstances, of course, in which it is perfectly legitimate to attack the person, as for example, in disqualifying an unsuitable court witness or exposing a mere pretender. In circumstances of this sort it is very much to the point to "consider the source" (Ibid), J. G. Brennan's (and not only his) position towards *argumentum ad hominem* is the same: "We argue ad hominem when we try to refute an argument by arguing against the character of the man who brings it forward or his dubious motives in so doing" (Brennan 1961: 217). And he adds: "However, like many of the so-called fallacies in argument, ad hominem may under certain circumstances be both effective and legitimate" (Ibid).

It is very important from the viewpoint of the context of our analysis to notice that the "circumstances" which are mentioned by the authors have no connection with logic. They play a definite role in argumentation.

It is interesting in this connection to consider that some authors see the legitimacy of *argumentum ad hominem* in Aristotle's works (Hintikka 1987a). Indeed, Aristotle has some passages

where he speaks on such possibility. He writes, particularly, that sometimes it becomes necessary to attack the speaker and not his thesis (Aristotle: VIII, 11, 161a 20). But what is very important are such passages we can find, first of all, in "Topica" and in "De Sophistic Elenchis" in which Aristotle factually paid attention to the different aspects of argumentation rather than the logical forms of thought.

So we are coming to the conclusion that *argumentum ad populum* and *argumentum ad hominem* are fallacies from the viewpoint of logical theory of proof and refutation, but when they are analysed from the viewpoint of theory of argumentation as components of arguing they become normal, not false argument. When we include these arguments in the system of argumentation we must explicate them, explain them in another way, than, first of all, they are explained in the formal, traditional logic. In the real process of argumentation we must appeal to a person and to the masses and auditorium. We do it even when we write our speeches or papers, even books. We always have, in mind a recipient – actual or potential. So if it is argumentation our arguments must be *ad hominem* or *ad populum* and usually of both characters. But they must play here a role different from that explained in logical theories. In our case (in argumentation) the appeal to the recipient is based on true premises and has its aim: to come to the true conclusion with the recipient. So such an appeal is argumentum as an ally to logic but not an opponent to logic.

The *argumentum ad populum* and *argumentum ad hominem* in the system of argumentation need further explication. It can be the task of a special paper. I should like to say in this connection that such explication, except the transformation of these irrelevant arguments in logic into quite adequate ones in argumentation, has another task too: to analyse these arguments in the former theory of argumentation at least since Aristotle and to make it exact from the viewpoint of the modern stage of the development of the theories of argumentation. Such a task is being realised by some experts of argumentation, especially by J. Hintikka, D. Walton and others (Hintikka 1987), (Walton 1987).

The concept of *thesis* in argumentation is also taken from logic where the thesis of the proof has its exact meaning: we must prove the thesis, derive its truth from some other propositions by logical means. The thesis which we defend in argumentation must also be true, and we must demonstrate its truth, otherwise it will be pseudo-argumentation. But if the truthfulness is the single characteristic of the thesis in logical theory of proof, the thesis of argumentation attains new characteristics as a result of explication in a new theory – theory of argumentation. Here we speak not only on truthfulness of the thesis but also of its expediency, reason, use, etc.

We can speak not only on the necessity of the explication of this or that element of logic in the theory of argumentation but also on the necessity of explication of the very notion of *logic*, its role in argumentation as well as other aspects of argumentation. Such an explication is done in different theories of argumentation and the results are different (Our explication of the logical aspects of argumentation is made in the next part of the Ch. III).

We can say that the explication of logic in argumentation has both a semantical and functional character.

The explication of the notion of *rhetoric* in argumentation is done in many investigations by experts of argumentation, especially in the well-known book *La Nouvelle Rhétorique: Traité de l'Argumentation* by Ch. Perelman and L. Olbrechts-Tyteca (Perelman 1958). The very title of that book indicates that from the viewpoint of the authors we must identify argumentation with rhetoric. There are some other and similar interpretations of this problem which often appear in the journal *Philosophy and Rhetoric* edited by H. Johnstone.

I should like to say in this connection that from my viewpoint the rhetorical component is very important in argumentation but it is not adequate explanation of its role done in the works of Perelman and his followers. The notion of rhetoric I understand in the sense which is explained in Aristotle's works. Such an understanding of rhetoric in argumentation shows that there is no necessity to transform *every* concept which we introduce in the theory of argumentation from other fields of knowledge into another concept. Sometimes the task of explication shows that we can use the concepts taken from other spheres of knowledge in its original sense but in other relations with the components of the new theory.

The explication of rhetoric in argumentation

is an illustration of the relation explication.

Among the explications of the concepts introduced in the theory of argumentation methodological explication has a specific character. I mean the explication of methodological rules by which we regulate functioning of arguments. One can ask, for example, is it possible to extrapolate such methodological demands to deductive axiomatic theories as *consistency, completeness, independence* to the systems of arguments?

It is possible to extrapolate the rules of consistency, completeness and independence to the systems of argumentum only after their radical explications. It is because we use these rules as demands to the axiomatic-deductive systems meanwhile argumentation is not a formal or formalised system par excellence. (When we argue in formal or formalised systems of knowledge we must also explicit the above-mentioned methodological rules but then they do not need radial explication as in other fields).

Let us consider each of those rules having in mind their radical explication.

The consistency may be applied to the systems of argument in its syntactical interpretation after some explication. If the deductive-axiomatic theory is consistent when we cannot deduce any proposition together with its negation the system of argumentation is consistent if there is not any assertion with its negation, there is not any contribution in arguer's conclusion.

The *consistency* cannot be used in its semantical interpretation in the systems of arguments because that interpretation supposes a notion of model which is characteristic of deductive-axiomatic systems.

The *completeness* in its syntactical interpretation in a weak sense may be explicated in such a way: the system of arguments is complete if we add a new proposition as an argument which is not proved by other propositions of that system, the letter becomes contraditional.

There are some new aspects of completeness of any system of arguments. The system of arguments is complete if the arguments are enough (a) to prove the thesis of argumentation, (b) to establish the choice of the thesis of argumentation, (c) to convince the recipient of the truthfulness, best choice of the conclusion based on the considering systems of arguments.

The *independence* in connection with the systems of arguments may be explicated in the following way. The system of arguments is independent if no argument of that system is proved by other arguments of that system.

The analysis of different types of explication of the main concepts of argumentation shows the very act of explication is not a simple, one-sided operation. It has many hidden layers which are possible to discover during the concrete work in the concrete field of argumentation. In any case the explication of the main concepts of any theory of argumentation is very important to understand the real meaning of argumentation and its components.

3. Logic of Argumentation

The history of human thought shows that men argue always and anywhere if there are enough conditions for argumentation.

The history of human thought shows also that there are not always enough conditions for argumentation. The relation between the *argument of force* and *force of argument* changes constantly and that relation has been and is always determined, first of all, by social factors. Totalitarianism uses the argument of force, democracy needs the force of argument. I think that the thinkers who study and construct the theory of argumentation are the defenders of democracy.

The contact of mind (le contact des esprits) (Perelman 1963a: 107) - this was one of the main points of Ch. Perelman's approach to the human relations on our times. Really, the contact of minds is possible on the basis of argumentation.

The role of logic in argumentation is both a strong and a weak point in Perelman's theory of argumentation. It gives rise to criticism by some experts and enthusiasm by others.

Perelman's theory of the relation of logic and argumentation is based on some premises.

a) Perelman neglects the identification of argumentation with logic. He characterises such view as an illusion (Perelman & Olbrechts-Tyteca 1971: 37). We must consider this premise as a true premise independently of the sense we give to the very term "logic".

b) Perelman considers logic, particularly the theory of demonstration and the theory of argumentation as two different mental constructions. Indeed, these are different theories when we con-

sider them in different contexts. But when we construct the general theory of argumentation there must be some reconstruction of logic, of the logical theory of demonstration, within the framework of the system of argumentation.

Different solutions to that problem are possible. Perelman himself proposed some.

c) One of them is that "logicians should complete their theory of demonstration by a theory of argumentation" (Perelman 1963b, 142; Perelman & Olbrechts-Tyteca 1971: 10). This is a quotation from the chapter VIII of Perelman's book *The Idea of Justice and the Problem of Argument*, published in 1963.

Perelman comes to another conclusion in his "Reply to Henry W. Johnstone, Jr.", published in *Philosophy, Rhetoric, and Argumentation* in 1965, where we read: "Fundamentally, our thesis stresses the opposition between (formal) demonstration and argumentation" (Natanson & Johnstone 1965: 135).

It is not difficult to notice a contradiction between these two statements. If the first proposition shows the alliance between logical demonstration and argumentation, the second underlines an opposition between them. Maybe we must consider a nuance which, I think, has an essential significance. Perelman speaks of the theory of demonstration in general in his first statement, and of formal demonstration in his second statement.

Perelman considers the opposition not only between formal demonstration and argumentation but also between logic and argumentation. In other words, he extends the notion of logical demonstration and transforms it into logic in general, but not always into general logic (in Kantian sense). He criticises the role of logic in argumentation in different ways – from the point of view of psychology, juridical reasoning, dialectical arguments, etc.

"Is a strong argument an *effective* argument which gains the adherence of the audience, or is it a *valid* argument, which ought to gain it? Is the strength of an argument a descriptive or normative quality? Does its study come under the heading of individual and social psychology, or rather under that of logic?" (Ibid: 463) - asks Perelman. He chooses the first members of these disjunctions. Perelman conies to the conclusion in his *The New Rhetoric* that argumentation must be based on psychology, not on logic (Ibid: 464). This is one of the main theses in his famous book – *The New Rhetoric* declared in his *Introduction* that "the theory of argumentation... might have been treated as a branch of psychology" (Ibid: 9).

The real meaning of Perelman's conception of the relations of logic and argumentation can only be adequately understood if it is considered in the context of the development of the science of logic in the period when the theory of argumentation was created at the Brussels school. That was the period when logic was considered as symbolic or mathematical logic. Some parts of logic were formalised. The tendency of the progress of many sciences demanded the use of computers, which required the normalisation of scientific theory. So formalised logic became the ideal of logic. Being not only one of the creators of the new theory of argumentation but also a logician, Perelman understood that such logic cannot be used in argumentation in many fields of human life.

"...Under the influence of mathematical logicians, logic has been limited to formal logic, that is the study of the methods of proof used in the mathematical sciences" (Ibid: 2). He repeats this thesis in his different works and even in the same book. Logic, Pereman, "has development into purely formal science which the conditions of correct deduction; it appears that a great many of the proofs utilised in law, ethics, philosophy, political debate life cannot be considered relevant to logic in the strict sense" (Natanson & Johnstone 1965: 102). That quotation is from the Ch. 6 of *Philosophy, Rhetoric, and Argumentation*. The same thesis is given in his, *"Reply to Henry W. Johnstone, Jr."*: "Logic is nowadays reduced to the study of formal reasoning, and, in so far as the Aristotelian distinction between analytical and dialectical proofs is concerned, the whole field of dialectical reasoning has been neglected" (Ibid: 135-136).

Such a tendency of the development of logic (reduction of all the kinds of logic to mathematical, formalised logic) lost its force during the past decades. Many logicians understood that mathematical logic is only one kind of logical sciences and it is impossible to formalise the whole logical thinking. But as Professor Else M. Barth, from the University of Gronigen writes, "in wide circles logic has been, and still is, identified with mathematical proof theory..." (Barth 1989: 305). I should like to add: more or less.

The negation of the role of logic in argumentation has its defending among experts of argumentation. But it is symptomatic that some of them understand that it is difficult to convince in public speech on the basis of negation of the role of logic in argumentation. Ervin P. Bettinghaus, from the Michigan State University, sees the solution of this problem in proposing the *appearance* of logic instead of logic. "... It doesn't seem to make much difference in public speech whether we have a logical model or not. As we have seen, this *appearance* as logic is important in persuasion, but actual use of logic is much less so (Miller & Nilsen 1966: 147). And again: "On the other hand, it is important to give the speech the appearance of being logical even when the speech may not, in fact, be so" (Ibid: 154).

Such solution does not indeed solve any problem, it can only discredit the very notion of argumentation.

Perelman is right that logic, if we have in mind mathematical logic cannot be logic of argumentation in law, political debate, philosophy, in everyday life. But he did not see the possibility of using other logical systems in different fields of human communication. This is the reason of his inadequate view on logic in argumentation. We must understand his position. As Francis Bacon said once truth is the daughter of its time.

Some experts of argumentation call Perelman the founder of informal logic (together with L. Olbrechts-Tyteca, St. Toulmin and M. Scriven) (Blair & Johnson 1987: 147). But even Perelman's new ideas have not solved the contradiction between logic and argumentation in his theoretical heritage. Meanwhile the very practice of argumentation shows that there is no conflict between logic argumentation, that logic is a powerful tool in argumentation. The question is how we understand the very nature of logic.

We must note that there is not only one logical science in the present stage of the development of the theory of logical thinking. There are many of them. Each of them discovers and describes certain layers of logical thinking which has multicomponent structures.

I think that the universal character of argumentation and its realisation in every sphere of our life demands its differentiation according to the tools of reasoning which are, first of all, nothing but different kinds of logic: material, formal and formalised logics or logic based on natural, spoken, everyday language and logic based on artificial, symbolic language.

The bounds of the abovementioned logics are relative. It is possible and sometimes obligatory to transform one kind of logic into another during the real process of argumentation, of knowledge in general. This transformation depends on our aim.

What kind of logic must we use in argumentation? To answer the question, which is central in the context of our examination, we need a preliminary premise about the working ability of argumentation. As I have underlined above, argumentation has a universal character – we argue in all fields of our life (social, political, scientific spheres, and everyday relationships). The character of logic which we can and must use in argumentation depends on the character of field in which argumentation is going on. If the sphere of our argumentation is political, social, juridical, we use in argumentation *first of all* informal as well as formal logic, the logic based on everyday language. Meanwhile arguing in the field of formalistic system of mathematics, we must use, *first of all*, the means of formalised logic. The logical means of argumentation must correspond to the character of the field in which we argue. It is impossible for the logic of argumentation to smile when the sphere in which we argue is crying.

I should like to describe my understanding of the specificity of informal logic as it was mentioned in the chapter devoted to the nature of logic.

There are different interpretations of the very nature of informal logic. Anthony Blair and Ralph H. Johnson write in the article "The Current State of Informal Logic": "We believe that informal logic is best understood as the normative study of argument. It is the area of logic which seeks to develop standards, criteria and procedures for the interpretation, evaluation and construction of arguments and argumentation used in natural language" (Blair & Johnson 1987: 148). I am afraid that there is no concreteness. In search of a criterion for evaluation of the arguments studied in informal logic, I should like to quote two experts of informal logic: James B. Freeman and Moris Finocchiaro. According to Professor Freeman "the "it must be that" and "we may expect that" serve to make a claim about how strongly the premises support the

conclusion. They are modalities. Their introduction into an argument can be easily motivated with a dialectical question:

How sure do your reasons make you of this claim?" (Freeman 1994: 43).

According to Professor Finoschiaro such criteria in informal logic are the use of some logical – linguistic particles. He writes in this connection in his article Informal Logic and the Theory of Reasoning: "I think that the essential feature of all reasoning is the interrelating of individual thoughts in such a way that some follow from others, and the normal linguistic expression of such interrelated thinking involves the use of particles like "because", "therefore", etc." (Finocchiaro 1984: 4).

I understand that some logical-linguistic particles can be criteria for logical reasoning in informal logic. But what are criteria for the validity of using such or other logical-linguistic particles in concrete cases? If there are no such logical, objective criteria, subjectivity becomes the criterion and then everything can follow from everything. One of the illustrations of such a situation can be the following poem by J. G. Vivian which is taken as an epigraph of the chapter *Fallacies in Argument* of J. G. Brennan's *A Handbook of Logic*:

I love you
Therefore I am a lover;
All the world loves a lover,
You are all the world to me -
Consequently
You love me.

These thoughts of mine do not mean that I neglect informal logic. It means only that I want to understand the real meaning of that kind of reasoning which is now known as informal logic and which I am sure has an important role in argumentation.

I should like to choose two points which can characterise informal logic as logic and show its place in logic. First of all I mean Gilbert Ryle's description of the differences between formal and informal logic. Informal logic analyses concepts like *pleasure, memory, responsibility, chance*, etc., while formal logic studies concepts such as *all, some, not,* etc. (Ryle 1954: Chapter "Formal and Informal Logic"). We can say on the basis of such a statement that formal logic works by means of the analysis of logical constants, whereas informal logic does the same by means of replacing possible logical variables with the names of the concrete objects and contextual examination of their connection with the another.

Bertrand Russel proposed a criterion to which we can determine whether a given proposition belongs to logic or not. It belongs to logic if we are sure that it is true (or false) even in those cases when we do not know the meaning of its words except those words which show the structure of a proposition (Russel 1948: part IV, Ch. III). We can say on the basis of Russell's statement that if we do not know the meaning of the words in propositions except of its logical constants in formal logic, we ought to know the meaning of all the words in the propositions of informal logic.

The Russelian criterion shows the differences between formal and informal logic and at the same time indicates what kind of propositions studied in informal logic do not belong to logic. But it is possible to modify the Russellian criterion and say that they do not belong to *formal logic* and expand the notion of logic, including in it informal logic too. This can be regarded as a matter of a semantic convention.

James Freeman stressed in his above-mentioned paper the dialectical character (in Hegelian sense) of informal logic, he uses the term "dialectical informal logic" (Freeman 1994). This thesis can be a matter of special examination. But what I should like to say in this connection is that dialectical logic proposed by Hegel and his followers is also some kind of material logic and has many characteristics common with informal logic. The main among them is that dialectical logic analyses the forms of thought in connection with their *materia*, their content.

We underline the phrase "first of all", in our answer to the question "what kind of logic do we use in argumentation?" because we practically combine means of different logics if it is necessary for our purpose. We must agree with Perelman that mathematical logic is not the logic of argumentation in jurisprudence. We must use in this area, first of all, the means of informal logic. But if we consider jurisprudence, law in the broad context nowadays, we see that even the means of formalised logic, the elements of computer logic as based on mathematical logic, can

be useful here too.

We can conclude that each of the specific spheres of argumentation can and must use the suitable kind of logic for the aim of argumentation but, the combination of the means of different kinds of logic sometimes gives more useful results. It can be explained by the integrated character of our knowledge nowadays.

4. The Language of Argumentation

The combination of the words "the language of argumentation" expresses different concepts. We must differentiate between, at least, two main concepts: "the language of argumentation" in a linguistic sense and in a conceptual sense.

Linguistically speaking, "the language of argumentation" includes any word from everyday language combined with the syntactical rules of that language by which we express our thoughts. It is similar to the combination of words "the language of Shakespeare", "the language of Edgar Allan Poe", etc. In its linguistic sense "the language of argumentation" has its base where certain other language-layers are placed. In its linguistic sense the basis of argumentation language is everyday language with which men communicate in their everyday life on the level of thought. It is necessary to bear in mind that the limits of everyday language are relative. In any case when we speak of "the language of everyday life", we differentiate it from "office language", "the language of poetry", "the language of international commerce", etc. When we add certain specific "language-layers to commerce", etc. When we add certain specific language layers to the base of everyday language, which we may call "the argumentative language- -layers", we transform the everyday language into the language of argumentation in its linguistic point of view, argumentation in its linguistic sense. From a linguistic point of view, argumentation language has its semantics and syntax just as any other language.

The semantics of argumentation language consists of two sublayers. One indicates the sum of words which is characteristic for argumentation (argument, foundation, proof, refutation, conviction, etc.). The other sublayer indicates words of rhetorical language, its stylistic characteristics.

The rhetorical component is one of the characteristic features of the language of argumentation. It is necessary, however, to stress the fact that this component varies in different fields of argumentation. For example, we consider the strongest expression of the rhetorical components to be in the language of political, juridical argumentation. The language of scientific argumentation and especially of the language of mathematical argumentation does not need such strong expression of rhetorical component as does the language of social argumentation.

Language argumentation syntax consists of the rules dealing with the combination of the rhetoric of the words of the rhetorical language from the syntactic structure of everyday language as well as from its style. This factor alone is enough to distinguish the syntax of argumentation language from the syntax of other language. Nonetheless, there must be other specific features in the syntax of argumentation language. Such characteristics of argumentation as foundation, conviction, refutation, etc. determine certain features of the syntax of the language of argumentation.

Argumentation language can also include certain functions of artificial languages. It can take place when formal or formalised structures are the object of our dispute (debate, discussion, etc.). It cannot however change the characteristics of argumentation language, because the dominant component of argumentation language is everyday, even in the above maintained cases, and the elements of the artificial language themselves are constructed on the basis of everyday language.

Linguistically speaking "the language of argumentation" has a nationalistic coloring, it depends on the specificities of the concrete national languages (English, Armenian, Dutch, Russian, etc.). Conceptually, "the language of argumentation" indicates the set of the characteristic concepts of argumentation and the set of logical and methodological rules, with which we realise an argumentative act.

The concept of argumentation language is similar to "the language of mathematics", "the language of biology", "the language of politics", and so on. In a conceptual sense "the language of argumentation "has an all-human character as does logical thinking itself. It does not depend on the specificities of everyday language. "The lan-

guage of argumentation" has inherent semantics and syntax both linguistical and conceptual.

The semantics of the language of argumentation consists of all the concepts which are characteristic for argumentation. We cannot consider the concepts of the argumentation language semantics on the same level from the viewpoint of their nature, significance and the role in argumentation. If we demonstrate the series of concepts of argumentation language in the form of concentric circles, we observe the following picture. The center of this series includes the categories of argumentation. The second circle contains the other concepts which are typical for an argumentative act. The next circle of argumentation language semantics may include the concepts which are typical for that field of knowledge which the argumentative act is dealing with. Finally, the circle which may contain certain concepts taken from common sense and necessary for the concrete field of argumentation.

Three comments are necessary in connection with his description of argumentation language semantics. First, the description above of the series of concepts of argumentation language is schematic and reflects the real situation in a very abstract manner; second, the difference between the circles of the above-mentioned series is highly relative and it is sometimes particularly difficult or even impossible to define to which circle this or that concept of argumentation language belongs. We must distinguish between the explicit and implicit levels of argumentation language semantics. All the above-mentioned explanations apply to the explicit level of the series of concepts of the language of argumentation. But its implicit level is nevertheless no less valuable from the point of view of understanding the real argumentative act. For example, life-outlook concepts of the arguer are not always obvious but their being understood is very necessary in order to be able to evaluate the attitude of the arguer. There are, of course, many other hidden premises of argumentation which are included in the implicit level of argumentation language and it is necessary to transfer every implicit element into an explicit one in argumentation if we wish to obtain an adequate picture of an argumentative act.

We must consider all the concepts which we include in the semantics of the language of argumentation as explicandum (using the terminology of Carnap) and explicit how they transform into explicatum. This procedure must be made both synchronistically and diachronically. The necessity of the direct way of explication may be explained by the factor that an argumentative act is based on the semantics of different fields of knowledge.

When we argue, we use not only specific argumentative terms, categories (the core of the series argumentation language semantics) but also other concepts of philosophical, methodological character, the concepts from the concrete fields, which become the arena of our dispute, discussion, etc. All these concepts must be used on the level of abstraction and generalisations and performing this is one of the tasks of explication.

But we cannot use even the categorical apparatus of argumentation continually in the same manner. Generally speaking, every new generation finds new meaning in existing words, finds new words and new concepts which can enrich the argumentative act. Words and concepts also have their rise and demise and we may observe this not only after the generation has been superseded but also during the life of the same generation.

We cannot state that the procedure of explication is a simple one and that we can transform explicandum in any given case.

The success of explication depends on the character of the participants in the dispute (debate, etc.) between whom argumentation occurs.

There are different levels of the explication of argumentation language semantics. The simplest case is when debate (dispute, discussion, etc.) occurs between people of a similar intellectual disposition, for example, between representatives of the same philosophical school or political party. We can consider another level of explication when dispute, etc. occurs between representatives of different or opposite schools of philosophical, political and so on thoughts, parties, etc. We may often encounter such words as reality, consciousness, mind, truth, etc. in philosophical books, democracy, justice, property, etc. in the theory and practice of political parties. But each such words expresses different concepts and no explication can bring different concepts expressed by such words to one and the same concept. The solution is quite different when debate, discussion, etc. occurs between representa-

tives of different fields of knowledge, for example, between philosophers and non-philosophers. We encounter the words *cause* and *consequence* in the books and articles of both philosophers and physicists, the word *consciousness* in the works of philosophers, physiologists but, of course, in different contexts. No explication can succeed in limiting the differences in meaning of words which possess such character.

There must be some other levels or cases of explication of argumentation language semantics. Such difficulties in explication of argumentation language semantics do not mean that argumentation is, in certain cases, impossible. The contact of minds through argumentation is possible and necessary in every sphere of the intellectual life of men. How it is achieved differs. Representatives of different fields of knowledge, physicists and physiologists, or philosophers and non-philosophers, for example, can meet on the common ground of methodology and effectively carry on their debate or discussion and so on. Here, the realisation of argumentation in this case as well as in other cases is possible by means of interpretation, explanation, hermeneutics and other various means.

Argumentation language syntax in the conceptual sense consists of the all possible logical and methodological means with the help of which we realise our argumentation on the basis of the semantics of the language of argumentation. All everyday language has its specific syntax which we normally use during our argumentation when we employ it in this or that language (English, Dutch, etc.).We can even sometimes observe contradictions between linguistic and conceptual syntaxes in an argumentative act. It happens particularly when we change the standard arrangement of words in the sentence for the purpose of emphasising a particular concept. The logical construction of inferences sometimes appears to be artificial but it helps us to transform implicit, hidden premises into explicit ones which is very important in an argumentative act. Argumentation, in a certain sense is the art of transformation of implicit thought into explicit one. We emphasise here in a certain sense as there are situations where the power of argumentation is to keep some premises as sub-contextual means and demonstrate them in necessary and suitable cases.

There are some descriptions of argumentation rules which indicate argumentation language syntax in a conceptual sense but the investigation of this problem as a whole is still one of the most important problems of argumentation theory.

5. The Problem of Translatability in Argumentation[3]

The necessity of translation in the process of argumentation arises in different cases and different senses. First, when during argumentation people use different languages, for example, English and Russian, French and English or at the same time even more than two languages. Of course, in this situation we need an interpreter. In such a case for successful argumentation it is necessary to transform the conceptual content in a very exact way. The conceptual exactness of translation is necessary but insufficient condition of translation in the process of argumentation. If we use translation in argumentation we need also expression of emotional nuances of conceptual content of our thought. Without expression of emotionality of our thesis, arguments, sometimes, if not always, it is possible to convince the recipient, listener, auditorium. This factor shows that there are some difficulties for interpreters as it is not easy to find equivalent means to express emotional factors which are used in original languages.

The exact understanding of the very sense, meaning of the words, sentences, conceptual constructions of an arguer can be reached in different ways during oral argumentation. We should like to underline the way which is as old as a human dialogue. We mean the following. The recipient repeats the main content of the thesis of the arguer and asks him: “May I hope that I understand you in exact way saying so”... And only after positive answer of the arguer is it possible to continue argumentation in a useful way.

It is quite natural that this way is possible in oral argumentation meanwhile we usually argue not only orally, but also in the written form. And this is the second kind of the problem of translatability in argumentation. Indeed, there are many books, article, pamphlets etc. which are the best examples of written argumentation. In such cases the authors of these works have in their minds the real recipient as a concrete person or a large auditorium which consists of similar persons. Of

course, it is a simple case. It is quite possible to have an auditorium as a recipient which consists of not similar but quite different persons. This adds new difficulties in translation of argumentative text.

But we shall consider the simple case. We shall analyse the problem of translatability in the process of argumentation when the recipient is a concrete person, or an auditorium which consists of similar persons.

In spite of oral argumentation here the recipient cannot repeat what is said by the arguer. But it gives another chance to understand the exact sense of the arguer's conceptual constructions. The recipient in written argumentation has more time to analyse word for word everything in argumentative text and not only once.

There are some difficulties in translation which are common in oral or written argumentation. For example, the translation of phraseologisms.

It is trivial to say that it is impossible to translate phraseologisms. The practice of translations shows that usually instead of phraseologisms of the given language the interpreter uses other equivalent phraseologisms of the language into which he translates. There are different reasons for such transformation. I should like to mention some of them. First, there are language difficulties. Sometimes phraseologism is based on the play of words, on artificial ambiguities and there are no ways to translate such phraseologisms. The other reason is that phraseologism depends on life situation, life context of the people who use the given phraseologism. And when we translate it into the language of the people who live in different life context, have different habits, we must choose other phraseologism which will correspond to the second situation.

The phraseologism КАШУ МАСЛОМ НЕ ИСПОРТИШЬ is very popular in Russian. The literal translation of that phraseologism is: *Butter doesn't spoil porridge* and that is understandable from the point of view of Russian food. But it is not understandable from the point of view of Chinese, Japanese and so on. The best porridge for them is porridge without butter. So the difficulty is to find the equivalent phraseologism during translation and if it is oral, the difficulties, of course, are more because translation demands fast reaction. In any case we shall have in mind that each phraseologism is an argument in argumentation and conviction of the recipient or auditorium depends also from the power of such arguments.

But even if we can easily find an equivalent phraseologism in other language sometimes other difficulties arise showing that the transformation of phraseologisms of original languages and equivalent phraseologism of other language is not the solution of the problem. In "Twelfth-Night" Shakespeare uses the phraseologism "to have fools in hand". The word translation of this phraseologism into Russian cannot practically help us as well as the translation of the name of very popular food in the USA "Hot dog". That is why some of well-known interpreters of Shakespeare transform Shakespearean phraseologism into the equivalent Russian phraseologism ЗА НОС ВОДИТЬ (Russian phraseologism consists of two words НОС-nose and ВОДИТЬ-to lead, to conduct). If we consider this English phraseologism itself, without context, then it is possible to transform it into other phraseologism in Russian as well as into other languages. I think, the best Russian equivalent is ЗА НОС ВОДИТЬ.

But in this concrete case such translation is not sufficient. We can even say that it is wrong and is the source of misunderstanding. It's because of the words used in this phraseologism.

They are the necessary elements of the original text. I mean, first of all, the word *hand*. It has definite relations with the other words of its context. It can be easily understood if we consider the following text from Shakespeare's "Twelfth-Night".

Sir Andrew. And you part so, mistress, I would I might never draw sword again. Fair lady, do you think you have fools in hand?

Maria. Sir, I have not you by the hand.

Sir Andrew. Marry, but you shall have; and here's my hand.

Maria. "Sir. thought is free": I pray you, bring your hand to the buttery-bar and let it drink.

Sir Andrew. Wherefore, sweet-hand? What's your metaphor?

Maria. It's dry, sir.

Sir Andrew. Why, I think so: I am not such an ass but I can keep my hand dry. But what's your fest?

Maria. A dry jest, sir.

Sir Andrew. Are you full of them?

Maria. Ay, sir, I have them at my fingers'

ends: marry, now I let go your hand, I am barren.

That is why the translation of this extract causes many problems for interpreters and some of them give some explanation in footnotes which are not so usual in the translations of fiction.

The translation of phraseologism has some other difficulties too. Sometimes phraseologisms are every subjective.

It's content and form depend not only on social condition, habitual context in which the phraseologisms are used but also it depends on the authors of the phraseologism. That is why the phraseologisms used in Shakespeare's plays are known as Shakespeareanisms. They are under the very influence of Shakespearean manner of expression. At the same time they are spread in English literature.

All these factors show that when we translate phraseologisms in argumentation, in oral or written, we must do contextual and subtextual analysis of phraseologism and transform everything which is implicit into explicit. It is quite natural that one of the main tasks of an arguer is transformation of implicit into explicit.

The third problem which arises in the practice of translation in connection with argumentation is the translation from the language of one science (sometimes from the language of one part of science) into the other language of another science (into the language of another part of science). It takes place when there is a discussion or debate between the representatives of different sciences or even between the representatives of different branches of the same science. For example, the representatives of algebra and geometry take part in discussion and each of them wants to convince the other. Practically, each of them is the owner of his language, or the language of his science, though they all express their thought in the same English, Russian, French, etc. "The language of science" we use here in the sense of Carnap. The language of science is the system of special concepts and some logical methodological ways with the help of which we come to definite conclusions proceeding from their conceptual basis. So it must be much easier in the process of argumentation between the representatives of algebra and geometry to translate the language of algebra into the language of geometry and vice versa. Such translations as the English mathematician William Sawer showed (Sawer 1969) gave an opportunity to have a visual understanding of the discussed problem. The factor of visuality is very important in the process of argumentation. The factor of obviousness is very powerful from the viewpoint of the recipient.

One can say that if we translate from the language of algebra into the language of geometry it will be a visual demonstration, graphical explanation and obvious understanding of the phenomena of algebra. It means that the translation from the language of algebra into the language of geometry transforms implicitness into explicitness, but if we do the opposite: translate from the language of geometry into the language of algebra in some sense we lose the visuality of demonstration, the clearness and obviousness of the arguments. What is the use of such translation? I am sure that such translations are very useful in argumentation as with their help we can discover some new sense may be deeper which was under the obviousness and which was impossible to demonstrate by visual means and graphical methods.

The translation from the language of one science into the language of other science has another function too – the function of explication. Let's consider such a situation. If we want to understand, for example, philosophy of pragmatism and to evaluate it from the viewpoint of dialectical materialism, it will be useful, first of all, to transform the language of pragmatism into the language of dialectical materialism. If we do so, we shall notice that many concepts which are used in the system of philosophy of pragmatism are used in quite a different sense from the same in philosophy of dialectical materialism. As a demonstration we can mention such concepts as *reality*, *truth*, *experience*, *consciousness* and so on. Discussions between representatives of dialectical materialism and pragmatism, argumentation during such discussions can be useful if we translate from the language of dialectical materialism into the language of pragmatism and vice versa. The same we can say on argumentation between representatives of existentionalism and neopositivism and other philosophical schools.

Such translations may also be useful when we analyse from the viewpoint of argumentation different stages or levels of the same philosophical development, for example, positivist, neo-

positivism, postpositivism.

It may also be useful when we consider the different part of philosophy. The translation from the language of ontology into the language of gnoseology as well as from the language of logic into the language of aesthetics and vice versa gives arguers many privileges and becomes the powerful tool of argumentation.

The fourth kind of translation is the translation from the language of one kind of art into the language of another. It is possible, though it is not easy, to construct the model of sculpture in music and vice versa. If it is done it means that there is the translation from the language of a sculpture into the language of music and vice versa. If we regard art as the language of some kind symbols and differ them according to their specificity of different arts, we can say that it is quite possible to transform from one kind of symbols into other.

The next kind of translation is possible to realise from the language of art and vice versa. The interpretation of the specificity of science by means and method of art and vice versa is practically a special kind of translation.

Argumentation between the representatives of different kinds of art as well as the representatives of science and art can be useful on the basis of the translation from one language into other.

The next kind of translation may be during argumentation, dialogue, between man and machine, computer. That field of argumentation is comparatively new and perspective. The methods of discovering the optimal solution of the problems in the man-machine dialogue need the foundation of definite inferences. There can be different ways for the realisation of the dialogue between man and machine (Mkrtchian 1987). The best system of modern level of dialogue is when we transform thought of man into machine by means of formalisation. In other words, the common language of man we translate into the formalised language. There are also intermediate means with the help of which we transform these or those elements of the natural language. The natural language in this case we combine with the formal language for the purpose of giving some information to machine to realise the dialogue in the "man-machine" system. It is impossible in our time if we mean the business prose. It is known that the business prose is also a game with different rules. In this case we use in our dialogue with machine some stereotype expressions which operate within relations of production. Business prose is a definite language, it is the means with the help of which men express their business relation in all spheres of their productive activity. It means that the business prose has a very large implication and includes not only the sphere of production of the material goods but also the social and political activity, different business correspondence and so on.

There are other activities, other relations which differ from the activities mentioned above. For example, the relations of love, hate, friendship, the specific emotional relation to the reality surrounding us, etc. If we compare these two different spheres – the sphere of the language of business prose and so called sphere of lyrics then we can notice that the words we use in the second sphere have a deep emotional content. These words are the most subjective in the sense, in their use comparing with the words which we operate with in business prose. The language of the sphere of lyrics has a contental character, meanwhile the language of the business prose is known among specialists of computer as inner formalised language. The latter is known as an office dialogue.

There must be some conditions for argumentation during the business dialogue between man and machine. I should like to mention some of them:

1. There must be some common reserve of the language means of communication between the arguer and recipient. As the arguer I mean here a man, as a recipient I mean a computer.
2. There is a very important monosense, monomeaning exactness of the means of communication of the office dialogue. The exactness, of course, is very important in science as well as in all the spheres of intellectual communication between men. But if the context can help us in other spheres of communication, our hope in the office dialogue is only monomeaning of the language means. I should like to underline that argumentation in the dialogue between man and machine is practically useless if the language means are polysense, polymeaning.
3. The next preliminary condition of such office dialogue and useful argumentation in such dialogue is clearness, accuracy, precision of the functions of each element of the language,

unity of semantics as well as syntax of the language of the business prose.

4. It is necessary to keep order in relations of the length of pauses and reports, answers and interpretations.
5. It is necessary as another preliminary condition of the realisation of necessary argumentation in the dialogue between man and machine to transform the implicit meaning into explicit one. This process is one of characteristic features of any productive argumentation and to realise that aim by the preliminary contextual and subtextual analysis of the business prose is necessary. The results of transformational logic can help us as it differs in the implicit and explicit forms of thought and the conditions of deriving explicit forms from implicit forms, to make clear the character of each of them. The translation of all the implicit forms of thought into explicit forms is one of the necessary conditions of the productive argumentation in the dialogue between man and machine.

The machine thesaurus may be constructed only on the basis of the mentioned conditions and there may be some others too. The fuzzy logic which analyses the nuance of the meaning which is very difficult to formalise may also be used in constructing such thesaurus.

The next kind of translatability in the process of argumentation is translation from the language of science into the usual common language and vice versa. It is necessary to mention that when we use words of the natural language and science we consider them as explicands, and we must explicate them and transform them into explicants. We realise that task with the help of the methodological and logical means of science.

The next kind of translatability is transformation of the language of one group of specialists into the language of another group. (The translation from so called one "bird language" into other "bird language", for example, from the language of tailor into the language of silversmith and vice versa).

And as the last kind of translatability I should like to mention the translation from one slang of the given natural language (for example, Russian, English), into other, from one dialect of the natural language into another.

There may be, of course, other kinds and possibilities of translatability in argumentation but even those which are mentioned here show that argumentation has among different and interesting problems the problem of translatability too.

6. Philosophical Argumentation

Philosophical argumentation is not the only variety of argumentation. The very problem of the typology of argumentation is one of the important questions in the theory of argumentation. This question does not enter into our investigation, although it could be the subject of a special investigation.

Philosophical argumentation is a system of methods, devices and means of which philosophical systems are based, philosophical assertions are demonstrated and their proof becomes evident for an audience; these statements become a conviction inherent to the formation of an active vital position for these with whom an appropriate dialogue is being conducted.

The characteristic of philosophical argumentation cited here is approximate and requires further specifications and explanations which will be given to some degree below.

Philosophical argumentation is conditioned by the specificity of philosophical knowledge, and its characteristic traits originate from the peculiarities of the latter.[4]

The method of foundation of this or that philosophical system is defined by the starting ontological premises of the system and can be means of creation of a definite theory, if it is an organic unity with the theory. The philosophy of Hegel, for example, is founded by its dialectical method. At the same time a number of inconsistencies of Hegelian dialectics are easily explained by the starting ontological premises of the philosophical system of the German thinker. A completely different argumentation apparatus is used, let us say, in linguistic philosophy, which originates from the thesis that the main subject of the research of philosophy is the analysis of language.

In the process of argumentation we naturally encounter the problem of the univocal usage of concepts in general, including philosophical concepts. For the resolution of this problem we consider the concepts introduced into philosophy as "explicanda" and, explicating them, turn them into "explicata". This process is not isolated from argumentation. It is realised in the very process

of argumentation. As a result of the stipulated explication we have to do with the completely defined content of concepts on which we rely in the given state of philosophical knowledge in the limits of a *given* philosophical system.

But philosophical argumentation does not take place merely within the limits of a given system, as when the goal of argumentation is the foundation of this system or the derivation of new theses from the principles proven in it for the development of new theses of a given system, etc. This kind of philosophical argumentation we conditionally call intraphilosophical argumentation" (IPA). In addition to it we often have to do with argumentation applied in polemics between the representatives of various, sometimes opposite, philosophical systems. The latter we conditionally name "interphilosophical argumentation" (IPA).

For IPA[1] among the very diverse conditions for the correct conduct of argumentation, univocal usage of the entire conceptual apparatus is of great importance, and is achieved by a repeated explication of the guiding concepts.

Considering the presence of a number of philosophical systems, we often resort to IPA[2], in the process of which explication of the concepts employed in a given philosophical system is necessary, but is insufficient condition for the realisation of IPA[2]. So far as we cannot achieve univocal usage of concepts of various philosophical systems, an explication becomes the important condition of the polemic between them – an explanation of precisely the sense in which this or that concept is used in a given system, and an accurate interpretation of the content of ideas of the philosophical; the system within which the philosophical argument is being conducted. The fact that for philosophy as a whole it is impossible to achieve univocal usage of concepts does not mean at all that a dialogue is impossible between philosophers of various schools or an adequate interpretation of philosophical texts of the past. The process of argumentation offers the possibility of an adequate understanding of any philosophical reasoning, the judgement of a like-minded thinker as well as the judgement of the representative of a different school.

One cannot accept the observation of Professor H. Johnstone that when we are removed from all argumentative contexts, a philosophical statement becomes "radically ambiguous" and gives rise to intellectual giddiness or disorientation on the part of the reader or hearer (Johnstone 1969: 25). In the first place, this concerns not those who think alike in philosophy, but the representatives of various philosophical schools. Strictly speaking, from H. Johnstone's point of view, as long as every argument in philosophy has its counterargument, we always have to do with various philosophical conceptions and conformity of ideas is excluded.

But if one agrees with this statement then at that time one can observe the absolutisation of the "radical ambiguity" of ideas of a philosophical character. In the process of argumentation the conceptual content of words employed is becoming more defined and fixed at every phrase, which is making possible mutual understanding, even if only relative.

Among certain theories of argumentation the opinion is met, according to which the specificity of philosophical argumentation is based on the fact that the philosopher who substantiates his conception has to do with alternative views and seemingly must consider them true in no less a degree than his own. In the opinion of H. Johnstone, in such a "heterodox age" as ours, for every philosophical outlook there is another, placing the first under doubt and the ingenuous thinker can understand that only the reality of controversy itself is ultimately undeniable (Natanson & Johnstone 1965: 126). This independently of the author's desire leads in the first place to the fact that the basic principles of philosophy can be neither proven nor disproven, they simply are postulated; in the second place it leads to the assertion of the implicit assumption of the pluralistic character of truth, at least in the area of philosophy. Out of the existence of a number of philosophical systems, the pluralism of truth in philosophy, which is unfounded, is derived in a given case.

Obviously, the assumption of the "equality" of various philosophical concepts leads certain theorists of argumentation to the idea that one of the peculiarities of argumentation is included in its dialogical character. And this in turn limits the instruments of debate. From this point of view not a single conscientious philosopher will be satisfied with such an agreement which is achieved by means of methods hidden from the audience. Since "philosophical controversy is essentially a bilateral affair it is genuine only

when each party to it makes available to the other all the argumentative devices that he uses" (Ibid: 133).

The question of the exposure of the methods of philosophical debates is an important question in itself. However, one can hardly agree with the opinion that the clarity or vagueness of the methods of philosophical conclusions is conditioned by the ethical platform of the discussing sides (that is, depends on conscientious philosophers). The philosopher's method appears in his argumentation independently only of his desire, and this is explained by the specificity of philosophical knowledge itself. If a philosopher is consistent in his ideas, then the unity of the ontological, the methodological, the gnoseological and logical is reflected in them. If he is not consistent, then in this or that degree he falls into eclectics, which also is an indicator of his method of reasoning (in the given case that of the eclectics). As Natanson says, "the total philosophical machinery is involved, then, in philosophical argumentation" (Ibid: 151).

H. Johnstone supposes that any philosophical statement must be a source of disagreement between those who accept it and those who do not accept it. Such disagreement he considers radical in the sense that it cannot be overcome by means of a compromise.

From this hypothesis he reaches a more general conclusion: "...philosophical discussion is, in effect, a collaborative effort to maintain the conditions under which disagreement is possible" (Ibid: 146). According to the words of H. Johnstone, one does not remember a single case from the history of philosophy when a philosopher would have achieved the general agreement with the help of arguments, whence it supposedly follows that for every philosophical argument there is a contreargument. If the disagreement is possible, then from the original disagreement on the basis of the rules of argument we arrive at incompatible conclusions. Subsequently he adds that disagreements can develop in the future with the help of the rules of arguments applied by the participants of the argument. "This account may suggest a kind of monadism of philosophical positions - a plurality of positions, each obeying its own inner law of development but wholly incapable of interacting with the others" (Ibid). It specifically follows from this that philosophical criticism is not an act completed at a given moment. Debates can always be continued.

Various interpretations of the statement being investigated are possible. But in all cases here the absolutisation the meaning of disagreements between the representatives of various philosophical concepts occurs, which leads to the evaluation of the use of philosophical dialogues or dialogues between philosophers with positions too narrow.

Of course, the materialists and the idealists cannot arrive at common conclusions in the course of debates, although that is not the case that H. Johnstone has in mind. But even the practice of international philosophical congresses of recent decades shows that in the area of philosophical comprehension of the contemporary world there are problems demanding not only the mutual understanding of philosophers of various schools, but a unification of their intellectual efforts as well. Particularly relating to these problems are the relationships of philosophers to the preservation of peace in contemporary conditions, to thermo-nuclear war, to genocide, to apartheid, the question of co-existence of various-social systems, etc. Nor is this dialogue restricted to the social problems of philosophy. The possibility is *not* excluded of a fruitful dialogue between philosophers of various schools on the question, let us say, "Do the principles of complementarity and correspondence of N. Bohr have a methodological character?" One can also indicate a number of other analogical questions.

The close contiguity of philosophy with other sciences is distinctively perceived in the philosophical argumentation.

Argumentation can be fruitful: (a) if the reasoning is conducted on one and the same level of abstraction and generalisation. In the given instance this means that if we have to do with argumentation within the limits of philosophical ideas, then the concepts borrowed from other areas of science, from literature and art, must be cited in conformity with the conceptual apparatus of the philosophical system on the level of abstraction and generalisation of the latter; (b) if the argument is being conducted between a philosopher and a non-philosopher, an exact realisation is necessary of the difference in the level of generalisation and abstraction of the concepts used and it is of crucial importance to discern these levels. Otherwise, by the use of one and the same word expressing different ideas (let us say in the

philosophical and in the natural science sense) we will have to do with the violation of the demands of the law of identity.

In the interaction of philosophy with other sciences a complex inter-relation comes from the methods of philosophy and particular sciences. The important thing in the given case is that in the development of science, the universal method of philosophy enriches itself with the achievements of the devices and methods of the particular sciences. But this does not mean that an automatic extrapolation of the methods of the particular sciences, in a natural science theory, is accompanied by a clarification of those methods which in the corresponding explication organically flow into the methodological set of instruments of philosophy. The cases are also frequent when, as a result of analogous discoveries, new methods devices arise in this or that particular scientific theory which go beyond the narrow limits of that theory but do not rise to the methodological level of philosophical generalisations. Therefore, in the process of philosophical argumentation a precise knowledge is needed of the levels of methodological devices, of the ability to distinguish the methods of investigation being conducted on the level of uniqueness, peculiarity and universality, without which it is impossible really to achieve scientific results in philosophy.

According to G. Ryle, the specific nature of philosophical knowledge is allegedly in the fact that the latter goes beyond the boundaries of scientific knowledge. The basic method of the philosopher's reasoning is *reductio ad absurdum*, which comes from Ryle's understanding of the nature of philosophical knowledge. In his opinion, if in sciences we distinguish true judgements from false ones, then in philosophy one can distinguish only meaningful utterance from senseless ones. By the application of this method philosophy supposedly fulfils its basic task-it achieves "clarification of ideas" and defines their precise usage. It is not accidental that according to the views of Ryle, philosophical arguments cannot be proven and themselves do not follow from premises (Ryle 1959: 327-344).

In the given case, what is important is not that Ryle deprives philosophy of the status of a science; in this he is not original. He is not original even in the question of the distinction of the truth and falsity of a proposition on one hand, from meaningful and senseless sentences on the other. (This distinction comes from B. Russell). But Ryle consequently develops this conception, and, applying it with regards to philosophy, concludes from it the corresponding devices of philosophical argumentation, having demonstrated the truth of the thesis that the method of argumentation is dependent on the original ontological and methodological principles of a given philosophical system.

As long as we resort to practice in its most diverse manifesting for the truth of philosophical assertions, there can be no codification of the means of establishment of truth in the area being investigated. The theory according to which specific nature of philosophical argumentation is perceived as "equal to" arguments and conterarguments and in the infinity of debates, actually disclaims the goals of obtaining truth through philosophy.

Asserting that philosophy is distinguished from science (natural and exact sciences), H. Johnstone perceives the following difference between the truth in science and in philosophy. In the sciences, in his opinion, the truth does not depend on arguments (the forms of argumentation) but depends on only factual bases. Mistakenness of statements in the case of the presence of foundations in the facts does not derive the foundations of science of truth. In philosophy, truth of its assertions depends on arguments (the form of argumentation), leading to their confirmation (Johnstone 1969: 21-41).

He assumes the presence of absolute truth in science as an ideal goal of scientific investigations; however, he asserts that "absolute truth in philosophy cannot even operate as an ideal goal" (Ibid: 25).

Finally, H. Johnstone arrives to the radical conclusion about the exclusion of truth from the competence of philosophical thought. In his opinion, in philosophy we have to do not with propositions but with statements. Truth is the property of propositions and does not extend on to statements. Along with the property of truth he also excludes the law of contradiction from the sphere of philosophy (Ibid: 40). The disclaiming of the truthful characteristics of philosophical assertions practically means the disclaiming of their cognitive meaning. Actually, this is just how H.Johnstone sees it (Natanson & Johnstone 1965: 138).

In philosophical argumentation the question

of the nature of arguments themselves proposed for or against this or that thesis acquires an important meaning. In a definite sense one can agree with Ch. Pereman that "the development of every philosophical system depends upon the use of social forms of argument" (Perelman 1963b: 197).

M. Natanson considers the first characteristic peculiarity of philosophical arguments their apriority in the sense that they do not concern the facts. M. Natanson illustrates the distinction of philosophical arguments from other aspects by the following example cited by the English philosopher I. Berlin: if you have a factual question you go to a scientist for the answer; if you have a formal question you go to a mathematician for the answer; but if your question is neither factual nor formal, you go to a philosopher for help (Natanson & Johnstone 1965: 149).

The comparison, cited by Berlin and after him by M. Natanson, does not just deny the right of philosophy to resort to facts in the use of arguments. It leads even further: philosophical arguments can be considered correct in form, even if the rules of logic are violated. M. Natanson considers precisely this property the second characteristic peculiarity of philosophical arguments. In his words, "philosophic content appears to transcend its formal vestment" (Ibid: 150). It appears that H. Johnstone is correct, when analysing the ideas of "cogency" and "formal validity", he emphasised that "cogent philosophical arguments are formally valid, and no formally invalid philosophical argument could be cogent" (Johnstone 1963: 96).

Certain philosophers in this or that form ignore the meaning of proof and of arguments in philosophy. F. Waismann unreservedly asserts that there are no proofs in philosophy (Waismann 1959: 345).

They often try to deprecate or even basically deny the relevance of arguments in philosophical argumentation with the help of logical arguments. In similar instances we have to do with a rather comical situation: logic comes out against the logic of the supporters of the irrational interpreters of argumentation. Here is an example which H. Johnsone cites in one of his articles as a generalisation of the views of a certain group of theorises of argumentation" since all sound arguments are either inductive or deductive and philosophical arguments are neither, no philosophical arguments are sound" (Johnstone 1964: 467). Referring to one of J. Passmore's books (Passmore 1961), H. Johnstone indicates that the latter tries to show the possibility of valid philosophical arguments. H. Johnstone criticises J. Passmore because "although Passmore holds that all valid philosophical arguments must be deductive in formal structure, he scarcely makes any attempt to exhibit the formal structure of the arguments he considers in the book" (Johnstone 1964: 468).

Johnstone is right so far as he criticises Passmore's absolutisation of one of the forms of inference used in philosophical argumentation. But he does not indicate the correct ways of solution of the problem discussed. Meanwhile it is precisely a dialectical understanding of cognitive knowledge of forms of thought which can give the key to the exposure of the role of logical arguments in philosophical argumentation. The attempts of J. Passmore are strikingly reminiscent of the analogous efforts of the German naturalist E. Naeckel, justifiably criticised by F. Engels. According to his words, the Naekels come forward with their induction and trumpet it as a great fact – against Hegel – that progression must be from the individual to the particular and then to the universal, from the individual to the species, and then to the genus and then permit deductive conclusions which are supposed to lead further. These people have got into such a deadlock over the opposition between induction and deduction that they reduce all logical forms of conclusion to these two, and in so doing do not notice that they (I) unconsciously employ quite different forms of conclusion under those names, (2) deprive themselves of the whole wealth of forms of conclusion insofar as it cannot be forced into these two, and (3) thereby convert both forms – induction and deduction¸ into sheer nonsense (Engels 1946). Developing this idea, F. Engels generalises saying that induction and deduction belong together as necessarily as synthesis and analysis. Instead of one-sidedly lauding one to the skies at the expense of the other, we should seek to apply each of them in its place, and that can only be done by bearing in mind that they belong together, that they supplement each other (Ibid).

In search of the specific nature of philosophical argumentation on the path of discovery of one of the possible forms of a conclusion, certain

theorists of argumentation finally arrive at the denial of the role of any logical arguments in philosophical argumentation or criteria for establishing such arguments. The conclusion of one of H. Johnstone's articles on the question being investigated sounds pessimistic: "There is no effective criterion for the validity of a philosophical argument" (Johnstone 1964: 485).

T. I. Oizerman justifiably notes that ideological conflict acquires in philosophy a specific form of a theoretical discussion of a question in which every participant in an argument considers the authority of logic, argues, proves, and does not simply declare his conviction. Even the followers of antilogicism must be subjected to this imperative" they try to prove the gnoseological groundlessness of logical thought by logical arguments" (Oizerman 1969: 351).

Philosophical argumentation makes the implicit explicit (Zaner 1968: 74). This idea of R. Zaner deserves attention. It relates not only to philosophical argumentation. What has been said extends to argumentation in general. In the sphere of philosophical argumentation the transformation of the implicit into the explicit comes from the practical-reorganisation function of philosophy and from the fact that philosophy has a social content and social direction.

Finally, one should note that the questions explicated here are considered by the author from the point of view of their being posed, not necessarily answered. At best, some beginning study has been done here. The entire totality of the problems of philosophical argumentation, awaits a fundamental investigation and thorough enlightenment.

In the light of what has been said, a further analysis of the following aspects of argumentation is especially important, each of which can become the subject of an independent examination: the history of argumentation, particularly of philosophical argumentation, typology of argumentation, dialectics as argumentation, argumentation and rhetoric, etc.

For the philosopher, a fundamental analysis of the nature of philosophical argumentation itself has special meaning.

Among its most important aspects, one should above all separate methodological, gnoseological, logical, ethical, social, and others.

From a methodological point of view, the most important questions are put forth such as the interrelations of the methodological, of the method and theory of philosophical argumentation, the methods of receiving philosophical knowledge, and philosophical nature of methodology and philosophical argumentation, the method of extrapolation in philosophical argumentation, etc.

A wide field of investigation stands out in the gnoseological aspect, where one can notice such problems: the gnoseological roots of philosophical argumentation, philosophical argumentation and the criterion of truth in philosophy, truth and faith in philosophical argumentation, the problem of philosophical model construction, the interrelationship of the continual and formal in philosophical argumentation, the interrelationship of the exact and non-exact, of the logical and psychological in philosophical argumentation, the problem of implication and context in philosophical argumentation, methods of affirmation in philosophical knowledge, aspects of the basis of philosophical theories and systems, system analysis of philosophical knowledge, ideas of a scientific character in philosophy and social knowledge, explanatory and precisitive functions of philosophical argumentation, understanding and interpretation in the sense of philosophical argumentation, hermeneutics and philosophical argumentation, the interrelationship of the proof and the assertion, of the rational and emotional in philosophical argumentation, the problem of participation in philosophical argumentation, stereotypes in philosophical argumentation, the role of language in philosophical argumentation, the language of philosophical argumentation, etc.

The logical problematics of philosophical argumentation especially grasps such a questions: the logical structure of philosophical argumentation, the specificity of proof in the sphere of philosophical knowledge, the problem of the plurality of logic and philosophical argumentation, the interrelationship of logic and rhetoric in philosophical argumentation, etc.

From the point of view of ethical aspects one can indicate such problems the assumed and the unacceptable in philosophical argumentation, the interrelationship of the goal and the means of philosophical argumentation, the value aspect of philosophical argumentation, etc.

Social aspects of philosophical argumentation can include such questions: the social roots of philosophical argumentation, the social meaning

of philosophical argumentation, the character of its social aim, philosophical argumentation and action, the role of philosophical argumentation in the reorganisation of social reality, etc.

Even this, a far from complete list of problems of philosophical argumentation, shows how wide the spectrum of investigation is. This is explained by the fact that philosophical argumentation is essentially a projection of philosophical knowledge in its complex and uncommon view of philosophical theory and philosophical activity.

Ch. IV. LANGUAGE AND THE PICTURE OF THE WORLD[1]

1. Linguistic Relativity

Dealing with the whole complex of questions concerning human nature, no small role is played by the problem of language – the role of language in man's life – both personal and social. During the various periods of human history different representatives of social thought saw in different perspectives the role of language in human life and its influence on social development. Among the more native views on the importance of language in human affairs there is the one according to which language, speech and words themselves decide the fate of people.

However, that view of the ancient Hellenians led to the definite theory of the ancient Greece sophists during the epoch of Perikles and might be considered to have been deluded to such an extent as to be forgotten in the annals of history if it had not taken on new forms and been revived in the works of many modern positivists. This conception is characteristic in particular of the followers of the philosophy of general semantics, of some positivist-minded linguists, and, in one of its clearest forms, is found in the Sapir-Whorf hypothesis or in the theory of linguistic relativity. According to it, people's thinking and behaviour are determined in the long run by the character of the language they speak, or in Sapir's words, "the real word is to a large extent unconsciously built up on the language habits of the group" (Whorf 1966: 134).

Let us examine the fundamental tenets of the theory of linguistic relativity: a) thought is determined by language; b) human behaviour is determined by language. It should be noted here that "language", "thought", and other fundamental notions of the theory are used by Whorf quite ambiguously. This has led different investigators of this problem to different interpretations of Whorf's conceptions.

In Whorf's view human thought is determined by the character of a given language: the linguistic system to a definite extent predetermines the thought system. Our conceptions of our environment are determined not by reality itself, but by the nature of the linguistic system we use. In Whorf's words, we are thus introduced to a new principle of relativity, which holds that all observers are not led by the same physical evidence to the same picture of the universe, unless their linguistic backgrounds are similar or can in some way be calibrated (Ibid: 214).

According to Whorf, formulation of ideas is not an independent process, strictly rational in the old sense of the word but is rather a part of grammar of a given language and differs from slightly to greater different grammars (Ibid: 212-213).

To confirm his thesis Whorf presents several arguments. For instance, he points out that in English two main groups of words exist -noun and verbs. In the Nutka language all words are verbs. According to Whorf, while English just as the language SAE (Standard Average European) in general divides the world into two spheres, the language of the Nutka is based on a monistic conception of nature. Comparing and contrasting SAE with the Semitic, Chinese, Tibetan and other languages Whorf concludes the relativity of all conceptual systems, ours included, and their dependence upon language stand revealed (Ibid: 214-215).

However, Whorfs conclusion does not follow from his argument. He states that the expression of one and the same – and this is very important – relativity differs in various languages depending upon the grammatical structure and other peculiarities of the given language. He finds the essential difference between English and Nutka in the fact that in the latter the same word which is a noun in English has inflexions conveying various aspects of duration and time. According to Whorf, the Suffixes of the word "house" give it such meanings as: "house occurs" or "it houses", "temporary house", "future house", "house that used to be", and so on (Ibid: 215-216).

But the fact that a phenomenon expressed in Nutka by one language pattern is adequately expressed by another completely different language pattern in SAE serves to show further that in all words and word combinations we are confronted with the same *logical content*. Consequently, it is hardly possible to prove that our concepts of reality depend upon the character and specificity of language used.

Comparing language having different grammatical structures, Whorf points out only that it is not always possible to discern parallel elements in different languages. That does not signify, however, that a given concept expressed by a given word or phrase in one of these languages cannot be conveyed in one way or another in the other. When Whorf explains, in English, that the Hopi and Nutka language and other similar languages express objects and phenomena in completely different ways from SAE, insofar as grammar is concerned, he unconsciously refutes that which he set out to confirm - the dependence of conceptual categories upon the nature of the language. And the method of descriptive translation itself to which Whorf was obliged to resort, serves to confirm that any concept, any thought, in one way or other, can be translated into another language. Consequently, it is only the linguistic devices used to express the *same* logical category and concepts which change.

The fundamental error of the proponents of the they of linguistic relativity, in the given instances, lies in that they misinterpret the role of language in the process of cognition; they misconstrue the specific character of the relative independence of the "language picture" of our environment.

The extremely great significance of language lies in the fact that by means of it we express the highest form of the reflection of reality – logical cognition or abstract thinking. All our thoughts logical categories occur and exist in language forms. However, these concepts, categories are interpreted into language forms in accordance with the grammatical and other peculiarities of a given language. That is one of the reasons for varying "language pictures" of the world. Although "language pictures" vary for different peoples, their lexical-object content, stipulated in relation to a single objective reality, in general and as a whole are the same for all people.

The specificity of "language pictures" is influenced also by the fact that different people live in different social, cultural, geographic and other conditions, which will have to effect the lexical content of the given language. Whorf also turned his attention to this fact. He points out that the Hopi language has one noun denoting any flying object or creature except birds. The class of the latter is denoted by another noun. Here he draws the analogy with SAE and Eskimo languages, while for the Eskimo "snow on the ground" is expresses as distinct from "falling snow" and the latter from "wind-driven flying snow", such differentiation does not occur in SAE. In Aztec, on the other hand, "cold", "ice" and "snow" are expressed by the same basic word.

However, such facts do not at all indicate that people's concepts about reality are different depending on the character of language. They indicate only that the people's way of life is reflected in their lexicons. In other words, the specific words used by a given people do not determine his views, his concepts of life; it is rather the specific conditions of life which determine the emigrance in language, of concepts appropriate to these conditions.

However the followers of the theory of linguistic relativity in their inferences do even further by judging as local and dependent upon the nature of language even such categories as time, space, etc., which unquestionably, under all conditions of life are universal in their nature.

Following Whorf, the American philosopher Philip Frank maintains that Einstein's concept of the relativity of time is a reform in semantics, not in metaphysics. At the 12th International Philosophical Congress in Venice Frank made the following statement concerning the problem: "The new physics does not teach us anything about "matter" and "spirit", but much about semantics" (Frank 1958: 8). This thesis of Frank found no support in the reports of the delegates at the Venice Congress. Frank himself did nor present a convincing argument in favor of his writings. On the other hand, the direct refutation of Frank's theory can be seen in the research work of leading modern physicists, for example, Niels Bohr. According to him the development of atomic physics has taught us how to create, without departing from the norms of our customary language, a system of concepts which are general enough for a comprehensive description of new experimental facts. Further on N. Bohr notes in this connection that it is an imperative to understand that the conditions as well as the results of the researches in question must be described with the same words and language patterns used in classical physics.

Not only the evidence of modern scientists but the practical experience of human intercourse in general and the exchange of views among representatives of the most varied nationalities con-

firms the universal nature of substantive concepts, concepts of time, space, and other logical categories. If those concepts, categories had been called forth by the structural specificities of a given language, and if relativity had applied in that sense as the followers of the theory of linguistic relativity hold, then an exchange of views and a sustained intellectual intercourse between people belonging to different language groups would have been impossible. But events have shown this to be possible.

The proponents of the theory under discussion, as pointed out above, have come in their expositions to the radical conclusion that world outlook, philosophical views of people are determined by the nature of the language they use in their thinking. A. Korzybski, the founder of general semantics, takes into view that every language uses as a basis its own definite metaphysics through which either consciously or unconsciously, it describes certain aspects of world structure (Korzybski 1948: 89).

To the same category belongs Whorf s statement that those who use different grammars must come to different world views.

However, that principle of the theory of linguistic relativity is fundamentally incorrect. It results from the misunderstanding, misrepresentation of the "language picture of the world" (or the world picture in terms of meanings conveyed by language) and the relation of this to the real world of things.

As we have already had an occasion to note the lexicon of a people reflected the social and material conditions of its existence. It contains this or that concrete differentiation of phenomena in accordance with the conditions of the environment, thus giving rise to different 'language pictures of the world".

At a certain abstract level the supporters of the theory of linguistic relativity divorce those pictures from their causes, and convert them into independent forces linguistically determining people's views of the environment. This distorted notion of the nature of language, as it related to the point under discussion, is promoted by the exaggeration of specific structural peculiarities found in different languages.

At the same time this procedure indicates the exaggeration of a single feature in the complex process of cognition, and its isolation from operative causes can lead to a distorted explanation of the phenomena under study. In this case it leads to an erroneous interpretation of the role which language plays in the formation of people's views of reality.

The supporters of the theory of linguistic relativity contradict "the languages of Standard Average Middle European" other languages and at the same time the surrounding reality. According to them, the "conflict" between SAE and reality lies in the fact that our environment is a continually changing process, whereas language of the SAE type artificially isolates objects and their properties. Some of them maintain that the Aristotelian structure of language is elementaristic and propose a language with a non-elementaristic structure for a new orientation.

The supporters of this conception, first of all, ignore the important circumstance that our environment is not only a continuous process; it is also a process of *qualitatively distinct* things and events. Second, continuity, as one of the properties of development, is contrasted with the non-continuity of developing things. This theory fails to comprehend unity of non-continuity and continuity in the process of development.

On the other hand, the adherents of the theory of linguistic relativity assume erroneously that the perceived picture of reality depends mainly upon the nature of language, and, that the "segmentation of the continuum", the distorted representation of motion are properties of certain languages, in particular of SAE.

And, therefore, from is standpoint, languages of a different type can and do introduce us to other forms of thought. Actually, however, it is the very specific nature of thinking (and cognition as a whole) and not one or another language that is responsible for distorting and making courses the suitable and complex process of reality.

The history of philosophy, the history of origin and the development of scientific outlook, fundamentally repudiates this principle of the theory of linguistic relativity, the dependence of philosophical views upon the specificities of the language. It is worth recalling that the materialistic philosophy of Bacon and the subjective idealism of Berekeley appeared in the same language – English. Even more significant is the appearance in the same language of philosophers as far apart as those of Marx-Engels, of Hegel and of Kant, of all who express their thoughts in

German.

According to the hypothesis under discussion, it is the nature of language which determines not only human thought and philosophical outlook, but behaviour as well. In Whorfs opinion, the behaviour of people speaking SAE and the behaviour of people speaking the Hopi language evidently in many ways is correlative with the linguistically conditioned microcosm (Whorf 1966: 148).

Let us consider Whorf s argument in support of this thesis. Working for a fire insurance company, he noted that not only physical conditions (as he says), but also how they are designated, sometimes become a factor in outbreaks of fires. While people are very careful in the vicinity of gasoline storage systems, labelled "gasoline drums", they are not sufficiently careful in the vicinity of objects, empty gasoline drums"; they smoke and even throw lighted cigarette butts. However, he continues, those "empty" drums can be more dangerous because of the explosive vapour they contain. In the presence of real danger, linguistic analysis orients itself to the word "empty", assuming the absence of risk. There are two linguistic patterns of "empty": (I) null, void, negative, inert and (2) "applied in analysis of physical situations without regard to, e.g. vapour, liquid vestiges, or stray rubbish in the container". The situation is named "empty" in its second meaning, but people have the first in mind. Here is a general formula for carelessness derived from linguistic factors (Ibid: 135).

However, the example given does not really prove that language determines behaviour, but only that people who are careless in the presence of empty gasoline drums have not sufficient knowledge of the properties of gasoline. If they know about the vapours, they would behave as carefully as they do near full drums, or more carefully. For someone who does not know about the explosive properties of gasoline, in general, even the term "gasoline drums" carries no inducement to be careful (any more than "empty drums").

Whorf is correct in noting that the expression "empty gasoline drums" conveyed two different concepts. People's incorrect behaviour as appears from Whorf s explanation, derives from the fact that they overlook the differences and behave as if the expression conveyed one concept, the first of those indicated by Whorf. But every language has instances of quite different concepts expressed by the same word. If a speaker confuses the different concepts, this does not necessarily mean that his behaviour is determined by the nature of the language, but only that he does not sufficiently master the language.

Undoubtedly language plays an important role in people's behaviour and activities. However, that role is not the chief determiner of their behaviour, their activities. Language cannot be considered to determine behaviour, especially since a language does not contain a regulator capable of stimulating people's activities of others not speaking the given language. The role of language is to help us expressing our attitude towards properties or objects and by that is the basis on which we influence the behaviour of others. In other words, language is a weapon in our hands, and depending upon how it is wielded, we may influence the standard of behaviour of our listeners. However, language is a demurrage of those standards.

Language, with its exceptionally vast possibilities, is a means and can be used in many ways and for many purposes, but cannot itself condition either people's standards of thinking or of behaviour.

From the linguistic relativity of behaviour being determined by the nature of language some supporters of this conception have deduced incorrect sociological thesis to the effect that social differences in societies are caused by imperfection in colloquial speech as a means of intercourse. St. Chase tries to persuade that endless political and economic difficulties in America have their origin in and are propagated by bad language (Chase 1938: 22).

Some others wish to explain discord in international relations by tracing it mainly to language difficulties, and a way out of that situation is soon by the unification of international terminology, effected through the *Encyclopedia of International Relations*.

Of course, the Sapir-Whorf hypothesis did not spring up in a vacuum. In spite of its weak point the hypothesis does rest on certain foundations. The problems raised in it, namely those concerned with the relations between language and thought, language and behaviour, the limits and degree of influence of language factors on people's thinking and action, are undoubtedly of scientific interest.

The bond between language and thought is undeniable. Language above all is a condition of origin and existence, formulation, transmission of thoughts – and this has a tremendous importance.

This circumstance indicates the great cognitive role which language plays in people's lives and in the history of human society. As the means of creating, expressing and communicating thoughts, language is of inestimable significance in the transmission of human knowledge from one person to another and from one generation to another.

However, these functions do not exhaust the significance of language. It has other functions, the absolutisation of which at the epistemological level also plays a definite role in promoting such incorrect interpretations about its nature as the theory under discussion.

Language expresses not only thoughts, but human feelings and emotions as well. And the language patterns of expressing emotions vary. The important thing is that some words in every language, besides possessing its lexical-objective content, combine emotional colouring, the use of such words doubtlessly influences human behaviour as well as their cognition as such.

Of course, other influences of language on thought and behaviour are possible. However, one must not exaggerate the range of that influence. Language has an immediate and emotional influence upon thought and human behaviour. It does not touch the essence of thought; it cannot alter the nature of conceptual thinking; it cannot itself determine the world outlook of people, their philosophical views, their behaviour.

That point is exemplified in the instances presented above. They indicate the definite influence of language on thought and human behaviour; at the same time they also indicate the process of absolutisation by which the theory of linguistic relativity has originated, as a theory which ascribes to language the determining role in the formulation of outlook, thought or behaviour. The isolation of the world picture in terms of linguistic meaning from causative socio-material conditions, the exaggeration of absolutisation of specific structural peculiarities of different languages, of the emotional functions of language, of the concrete attributes serving as a basis for the meaning of a word, and making them absolute, the misunderstanding of the dialectics of non-continuity and continuity in development – these are the gnoseological roots of error in the claims made for the determining role of language in the process of cognition and human behaviour – the gnoseological basis of the theory of linguistic relativity.

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The essence of the theory of linguistic relativity, or the Sapir-Whorf hypothesis, consists of the claim that the language which people speak exercises a determining influence on thought and behaviour, that logical categories, forms and laws of thought, and various substantial concepts acquire national qualities depending upon language and, in that sense, are relative.

The followers of the philosophy of "general semantics" put particular stress on the linguistic relativity thesis concerning world outlook as determined by the nature of language. From that the proponents of this theory have drawn misleading conclusions of a sociological nature that social conflicts and the contradictions in international relations arise from the incorrect use of language as a means of intercourse.

These conclusions are refuted by the history of the development of social thought, by the cultural and social history of the most diverse peoples, by the international relations of past and present eras.

From the gnoseological standpoint, the theory of linguistic relativity represents an exaggeration of the role of language factor in the process of cognition. This is concretely reflected in the fact that the adherents of the theory of linguistic relativity:

a) isolate the world picture in terms of linguistic meanings from the causative socio-material conditions, absolutise it, contrast it to objective reality, and, thereby explain linguistically people's views of their world;
b) absolutise the specific structural peculiarities of languages and from them infer logical categories, forms and rules of thinking;
c) misconstrue the dialectics of continuity and non-continuity in the process of development, interpreting the situation in terms of a conflict between the so-called elementaristic structure of SAE and the non-elementaristic structures of our environment;

d) exaggerate the emotional functions of language, the role of the concrete attributes which serve as a basis of the meaning of word, the role of the metaphorical meaning of a word, and the concrete linguistic formation of words.

But the disclosure of the unsoundness of the basic principles of the Sapir-Whorf hypothesis, above all, its philosophical premises does not involve any underestimation of the influence of language on human thought and behaviour. However, the important point is that this influence is of an immediate and emotional nature, not affecting what is the essence of thought, and that it cannot alter the nature of conceptual thinking, nor could it itself determine the world outlook, philosophical views or general behaviour of people.

The main problem is to determine the spheres and degree of the influence which language has upon thought and behaviour.

Only by the positive investigation of this problem the theory of linguistic relativity can be dialectically perceived rather than rejected.

As a result of the dialectical negation (in Hegelian sense) of the principle of linguistic relativity we come to the conclusion of the necessity of the foundation of the principle of linguistic complementarity.

2. Linguistic Complementarity

As often happens in the history of science, an idea, put forward for the solution of a certain concrete task, having embraced a broader circle of phenomena, undergoes evolution. Sometimes it attains such a degree of generalisation that acquires methodological functions. Reasonably enough, in that case, the range of signs, by which the given idea had been characterised at the moment of its conception, also changes. That is what happened also with the idea of complementarity originated by one of the greatest physicists of our century, Niels Bohr (1885-1962). He advanced it originally (in 1927) to overcome difficulties in establishing the quantum theory.

Niels Bohr perceived the sense of the new approach to quantum phenomena in his attempt to remove the alternative between corpuscular and wave pictures while describing the microworld. He proceeded from the idea that space continuity of light diffusion and atomicity of light effects are complementarity aspects of one and the same phenomenon.

He understood complementarity in the sense that both aspects reflect equally important properties of light phenomena.

However, according to N. Bohr's conception, the idea of complementarity is applicable not only to the given concrete case – the investigation of the nature of light. He formulated his conception with regard to atomic physics as a whole. According to his interpretation the term "complementarity" is used in atomic physics with the purpose of characterising the link between data which has been obtained from tests in various conditions and may be visually construed only on the basis of representations, mutually excluding one another. Yet that is by no means the end of the matter. The author of the idea of complementarity regarded it as a general methodological principle of knowledge. Addressing an International Congress on Anthropology and Ethnology in 1938, Bohr emphasised the thesis that different human cultures complement one another and the idea of complementarity, with some reservations, might be applied to the study of that phenomenon as well. In Bohr's opinion a complementary correlation exists between such mental phenomena as "thought" and "feeling", similar to the one existing among data about the behaviour of atoms at tests in different conditions. He also indicated the typically complementary link among the types of behaviour of living beings that are defined by the terms "instinct" and "reason".

Bohr makes a generalising inference about that problem in his article Quantum Physics and Philosophy, first published in Moscow in 1959. He asserts that in a general-philosophical aspect it is remarkable that as regards analysing and synthesis in different fields of knowledge, we come across situations recalling that in quantum physics and requiring a complementary way of description.

Actually many distinguished contemporary scientists apprehend N. Bohr's idea of complementarity as a methodological principle. Let us refer to Max Born, according to whom the principle of complementarity is a completely new method of thinking. It is applicable not only in physics. That method leads to the future liberation from traditional methodological limitations of thinking, and promises important results (Born

1968).

The first impression of the interpretation by Bohr himself of the idea of complementarity in the methodological aspect suggests the idea that its author is fighting for the possible all-sided consideration of the object under study. If the sense of the idea of complementarity, at the present time known as the principle of complementarity, is to be understood in this way, then such an approach is one of the important demands of dialectics. The idea of all sided consideration of phenomena under study occupies one of the central places in the philosophy of Hegel.

There arises a natural question: is the content of the concept of the "principle of complementarity" (connected with the name of N. Bohr) identical with that of the principle of all-sided consideration of phenomena" (put forth by the representatives of Hegelian dialecticians, long before the idea of Bohr)? The appropriateness of posing the question thus is explained by the fact that if the contents of the indicated concepts coincide, apparently we have a new use of words ("principle of complimentarity"), which hardly introduces anything new into our knowledge about the principle of all-sided consideration of phenomena under study. And if the contents under analysis are not identical, then it is necessary to disclose the new and distinctive trait, which characterises the principle of complementarity.

To answer that question a differentiating approach is necessary to the concept of the "idea of complementarity". That idea gives grounds to the author of the idea himself, as well as to both adherents and opponents of the principle of complementarity for adopting different treatments. From this viewpoint it is necessary, first of all, for N. Bohr to distinguish broad and narrow comprehensions of the idea of complementarity.

Expounding the idea of complementarity N. Bohr proceeded from the fact that the data about the nature of light – the corpuscular and wave pictures – contradict (mutually exclude) each other. However, he does not infer from the primacy of one picture over the other. On the contrary, he arrived at the conclusion of the equivalence of those pictures.

Further, in order to understand Bohr's idea of complementarity it is quite important to consider the circumstance that on obtaining mutually excluding pictures about the object under study he took into account the fact, that the obtained pictures were affected by the means of observation, the interrelation between the measuring instruments and the object under investigation. Thus, three features distinguish N. Bohr's initial comprehension of the idea of complementarity: 1) mutual exclusion of data obtained about the object; 2) its equivalence; 3) consideration of the factor of interaction between measuring instruments and object at the time of reproducing its feature.

All these features characterise the idea of complementarity in its application by Bohr both in connection with the nature of light and with atomic physics as a whole. At the same time it is not possible to say that the enumerated features characterise the idea of complementarity in its methodological interpretation. It is true that N. Bohr asserts situation in various manifestations of human nature with mutual exclusion of obtained data. As an illustration he pointed out "split personality" equilibrium between earnestness and jest. Fie asserts that if we attempt to speak always very seriously, we risk seeming very soon ridiculously boring, both to our listeners and to ourselves and if we try to joke all the time, we shall soon discover (and so will our listeners) that we are in the despondent mood of jesters in Shakespeare's dramas (Bohr 1961).

Niels Bohr looked in the sphere of human history for parallels to mutually excluding situations of atomic physics, and in one of his speeches in 1937 he referred to Buddha and Laotse, who attempt to harmonise our position as spectators and as acting people in the great drama of existence. That thought so attracted Bohr, that he returned to it in 1954 in another of his speeches, introducing it as some wise advice from ancient eastern philosophy: attaining harmony of human life, never forget that we ourselves are actors as well as spectators on the stage of existence. However, Bohr himself especially emphasises that on examining different human cultures as complements to one another, absolute mutually-excluding interrelations, such as exist among complementary data about the behaviour of atomic objects, are out of the question.

It is noteworthy, that one more specification is made which shows, that none of the signs of the idea of complementarity, advanced for the investigation of atomic physics, covers, in its strict form, the idea when it is applied as a methodological principle. Evidence is his assertion that

while comparing different cultures the link among them was sometimes characterised as complementary. But it is not possible in this case to use that comprehension in its strict sense, as it is used in atomic physics.

Thus, for the application of the idea of complementarity, as a general principle, such a sign as mutual exclusion of obtained data is irrelevant. Neither are there obligatory conditions of equivalence of data, nor is there regard for the factor of interaction of observer and observed. What, then, characterises the idea of complementarity in its general application? The answer to that question is given in Academician V. A. Fok's interpretation, expressed in the preface of the Russian edition of N. Bohr's book: the philosophical idea which preoccupies Bohr most is an idea about complementarity among different aspects of phenomena (Ibid).

A retrospective analysis of the idea of complementarity shows the following distinctions between its narrow and broad interpretations. In the first case its application is limited by some special parameters: we are dealing with two subsets of expressions, which mutually exclude one another, are equivalent on their significance and the results of the consideration for the factor of interrelation of observer and observed. In the broad interpretation, on the other hand, we are dealing with two sub-sets of expressions and for the integral picture of the investigated object both sub-sets are to be taken into consideration neither being affected by the above-mentioned specific characteristics.

It is true, some interpreters of the principle of complementarity digress somewhat from Bohr's understanding of it. This is observable, in particular, in Heisenberg.

Heisenberg's interpretation refers to the narrow understanding of the principle of complementarity. However, digressing from the abovementioned limiting parameters, it is possible to assert the possibility of various treatments of that principle on a broad comprehension of it. In that case the digression may be reduced to our having to do with Bohr's two sub-sets (A and B), which complement each other, while we have to do with Heisenberg's three sub-sets, where the third – C – complements the other two sub-sets, A and B. However, in some cases the nature of sub-sets A and B may not particularly interest us, but we may have to do with their sum total, to join them in a new sub-set D (D= A U B). In that case Heisenberg's comprehension gets reduced to Bohr's interpretation, for we again have to do with two sub-sets. (So far as the question is about the broad comprehension of the principle of complementarity, then in the given case it does not matter whether those sub-sets, according to their contents, exclude one another or not. What is important is that they complement one another).

In other cases, however, the characters of each of the three sub-sets A, B and C are of particular interest and it is necessary to emphasise, say, the circumstance, that sub-sets A and B are mutually exclusive and sub-set C complements them; then we are dealing with concretisation of Bohr's idea, or with limitation of that idea by some new parameters.

The principle of complementarity, even put free from the parameters already and any similar ones and from the comprehension in the broad sense, will not be reduced to the principle of dialectical logic about the all-sided consideration of phenomena under study. The essential difference between them is that the principle of complementarity, a methodological principle, is founded on some formal bases (we have to do with data which are worked out in the form of sub-sets and, completing one another, re-create a sub-set as a model of the object under study), while the principle of all-sided consideration is a pith demand, philosophical by its nature and for that very reason universal in its application. In the latter case the question is about the most general demand of studying an object from all its sides, connections and mediations And that live link is so many – sided and all-embracing, that any attempt at a formal working-out and further strict formulation will lead to schematisation, and finally to distortion of the real picture of phenomena under study.

The demand of all-sided consideration is a broad demand and it is applied everywhere by the force of the scope. But at the same time it does not indicate concrete conditions of its manifestation. Therein lies the characteristic trait of the philosophical nature of the given principle, as well as any philosophical category in general, any philosophical law.

But if the principle of complementarity cannot be reduced to the principle of dialectics above an all-sided consideration of objects under

study, it does not mean, that the principle of complementarity has no methodological significance.

The principle of complementarity may successfully be applied in many branches of knowledge just as well as, let us say, formalisation, mathematisation, modelling are realised in different spheres of knowledge. But as formalisation, mathematisation, modelling and similar apprehensible phenomena do not become universal methods of dialectics, so also the principle of complementarity cannot be generalised at the level of laws and categories of dialectics, cannot be considered on the same plane, let us say, the principal of "dialectical logic" about the necessity of all-sided consideration of phenomena. If, however, an attempt must be made to find a place for the principle of complementarity in the conceptual system of dialectics, then it may be in class or set where modelling, formalisation, etc., enter. That is where the methodological function of the principle of complementarity lies.

It is impossible to assert that between the narrow comprehension of the idea of complementarity, the principle of complementarity (let us give this name to the broad interpretation of the idea of complementarity) and the principle of dialectics about the all-sided approach to phenomena under study, there exists the same type of subordination as between singularity, peculiarity and universality, as ascending forms of knowledge by the embrace of generalisation and level of abstraction.

As has already been mentioned, the principle of complementarity is applicable not only to the explanation of the nature of light, the phenomenon of quantum physics, but also to a wide variety of spheres, which proves its methodological significance for knowledge but, depending on the concrete objective province, in which the principle of complementarity is applied, it may appear in a specific form. Let us disclose the content of that thesis by analysing the application of the principle of complementarity to the logical nature of reasoning.

The arguments among logicians in favor of one logic-dialectical against formal or the other way round, traditional – formal against symbolic (mathematical) or the other way round, did not lead and could not, in my opinion, lead to any positive results. Each of those logical sciences, as it was underlined above, has its specific subject, it studies definite properties of the logic of reasoning.

For a comparatively full picture of logical structure it is, apparently, necessary to resort to the principle of complementarity. In that case various interpretations of that principle are possible. It is possible to present the results of investigations in dialectical, formal and symbolic logic in the form of three subsets, the total of which, at this stage of the development of our knowledge about it. Although that is a rather general characteristic, nevertheless the generality of this approach does not reach the universal demand of all-sided consideration of the object of investigation. That is so, because, first of all, in this case we have to do with a definite formal approach – by the presentation of knowledge about the logical in the form of three sub-sets. While the demand of dialectics and of all-sidedness of the study of objects, as has already been mentioned, are by their spirit pithy.

In the second place this approach, in a certain sense, manifests one of the signs of N. Bohr's idea of complementarity – the design of mutual-exclusion of data of analysis. Witness to that, in particular, is Engel's thesis, that in opposition to formal logic, which classifies the forms of thought by the principle of co-ordination, dialectical logic in the classification of these forms proceeds from the principle of subordination (Engels 1946).

The principle of complementarity may in connection with the analysis of the logic of reasoning, also be interpreted otherwise, using, in particular, Fleisenberg's interpretation of the principle.

Hiels Bohr's principle of complementarity helps us to understand the real role of the world's language picture in the knowledge of reality, Bohr's theory of complementarity in the methodological ground of the principle of linguistic complementarity.

Let us analyse some aspects of the world's language picture which is necessary to understand the very nature of the principle of linguistic relativity.

In the process whereby the representation of reality comes to approximate that reality or, in Hegel's words, a coincidence between concept and objectivity comes about, language plays an exceptional and distinct role.

The role of language does not resolve merely

to the fact that language serves as the means whereby thoughts arise, exist, and are transformed to others. Also of no small importance is the fact that, in the process by which the representation of reality in thought arises, there also comes into being, parallel to or interwoven in, a verbal picture of the world and linguistic reproduction of the reflected. The linguistic picture of the world supplements the logical reproduction of real actuality and renders it most complete and all-sided reflection in the minds of man.

The picture of the world arising in our consciousness, in concepts, and in systems of concepts contends definite information about that world. Conceptual ideation occurs via language and presents itself as verbalised thought. The information contained in concepts, however, does not entirely exhaust all the content present in the meaning of a word.

When we speak of the meaning of a word, we have in mind the information it contains. It may be considered that in the given case the meaning of the word is employed by us as explicand to be explicated through the following consideration. The distinction between sense and meaning drawn in Frege's theory of logical semantics, by the way, is not important in understanding the principle of linguistic complementarity. Since our concern is with the general cognitive aspect of the problem, we content ourselves with characterising the meaning of the word in its most general aspects, calling it the information that created the opportunity to understand a word. In other words, by the meaning of the word we have in mind capacity to be understood, or the comprehensibility of the content of the verbal symbol. This interpretation follows, in a certain sense, from the position taken by R. Carnap (Carnap 1956) and A. Church (Church 1956). In the given context, of greater importance is the fact that different meanings exist: lexical, grammatical, phonetic, etc.

Making use in this connection of the advantages of dichotomous division, we are able to distinguish between central and noncentral meanings of words.

The central meaning of a word is its lexical meaning. It transmits to us knowledge, information about the object of thought. Often this meaning is called the material, tangible, palpable content of the word, its referability to a thing. This is the word meaning in the sense referred to in linguistic literature as "sememe". Everything that remains "outside" the central meaning, i.e., the noncentral meaning of the word, we shall call its peripheral.

If we were to proceed from the standpoint that holds that the lexical meaning is itself the concept expressed by the given word, it would be possible to go on a discussion of the problem of the interpretation between the central and peripheral meanings of the word, or conceptual and extraconceptual meanings, in constructing a picture of the world in our minds. However, we regard as scientifically more fruitful the view that holds that the concept and the lexical meaning of the word are not identical at all; the latter is broader in scope than the former. Guided by this view, we extract the conceptual core, the logical meaning from the lexical meaning of the word. Everything that remains outside the conceptual content in the lexical meaning of the word we shall call the extraconceptual (strictly linguistic) meaning.

A characteristic feature of lexical meaning as a whole lies in the fact that it is fundamentally determined by the very object of thought. This applies, first of all, and unconditionally to its conceptual nucleus, which presents itself as a mental image, a copy of an object, a logical plaster cast taken of it. But, having arisen in the form of a word, the concept is subjected to linguistic transformation, loses the integrity of its abstract logical form, and emerges as a simultaneously semantic and lexical category. In its linguistic realisation, the concept presents itself in unity with the lexical meaning of the word. As noted above, the lexical meaning of the word is defined fundamentally through its referability to a thing – but not by this alone, the nature of lexical meaning, as distinct from conceptual is also determined by certain factors of a linguistic order, by the structure of the language and its system.

In a certain sense and within sense certain limits, the lexical meaning of the word bears upon itself the imprint of the character, nature system, and structure of spoken language and the ethnic uniqueness of each. One cannot fail to see that while the lexical meanings of words are uniformly towards reality, semantically they diverge. Viewed from a certain aspect, the lexical meaning of a word varies from language to language. It is the conceptual nucleus of the word, what is understood by it, that does not vary. This

invariant in meaning is that which is principal and determining in the word, while its lexical variations are collateral, supplemental information. We find ourselves in complete agreement with J. Vendryes's statement that everything that can be said in any given language can doubtless also be said in any other language... The differences will only be in the structure of the forms and their supplemental meanings (Vendryes 1945: 16-17). But it would be false to discard this supplemental meaning. From the standpoint of cognition, this would distort the real picture of the reality.

It has already been noted that the meaning of a word is not exhausted purely by its lexical meaning. If the meaning of word were considered in its entirely, we would observe that all the other forms of its meaning are conditioned by linguistic factors and, in the epistemological plane, do not differ fundamentally from the meaning remaining in the lexical significance of the word when its conceptual content or "innards: are emptied out of it. Therefore it is desirable, in the given instance, to extract the logical meaning of the word (the conceptual content of the word = its conceptual nucleus) from its entire content, and to designate it as a class or set, A. All the rest of the meaning in the word emerges as its nonlogical meaning. Let us denote as I, representing a supplemental class to class A. It is the logical meaning (A) plus its supplement – the extralogical meaning (¬A) – that precisely exhaust the entire domain of meaning of the word. By its content, class A is the carrier of the strictly linguistic meaning.

In the sense of reconstruction of a real picture of the reality around us, the decisive meaning, in our view, is precisely the logical meaning, the logical model of the world. Therefore, the conceptual meaning of the word is its principal meaning. The extralogical or strictly linguistic meaning is derivate and supplemental in character. But nonetheless the synthesised picture of the real world would be incomplete and, in a certain sense, false without allowing for the strict meaning in all aspects.

But, therefore, one can speak of the concrete epistemological role of the strictly linguistic meaning in reconstructing the architectonics of the reality around us, special emphasis must be placed on the following circumstance. While the logical meaning of the word is common to all mankind and determined by one and the same tangible reality, the strictly linguistic meaning of the word presents itself as national, determined by the character and system of the actual languages as they exist.

Inasmuch as a special role in understanding the epistemological nature of the principle of linguistic complementarity is played by components that provide the ethically distinctive aspects of the linguistic meaning per se, let us list the most important of those with the briefest possible explanation.

When one analyses the verbal reproduction of the picture of the world, one's attention is attracted by the linguistic formulation of thought and particularly of concepts.

Comparing such ordinary words as the English *whale* and the German *Walfisch* you can see a great difference between the verbal formation of this concept even in two kindred languages. In English, in the given case, there is no divergency between the concept of "whale" and the meaning of its verbal formation. The German word *Walfisch* means *whale* plus *ftsch*, that is, additional information about the object of thought is communicated by means of language.

One need only compare the verbal denotations of colour in the English language to that in the China language of Rhodesia or the Basa language of Liberia to detect striking differences.

When we describe the spectrum in the English language, we encounter such denotations of colour as red, orange, yellow, green, blue, violet, etc. In the Shona language three majors colours are seen in the spectrum, and in the Basa language, two. Citing these and analogous data widely known in the linguistic literature, Gleason notes that in nature a continuos gamut of colours exists that is denoted, in different languages, by diverse series of individual names. Neither in the spectrum nor in its perception by man is anything that could have predetermined this kind of differentiation of the spectrum. A distant mode of classification is a part of the structure of any given language (Gleason 1955: Ch. I)

If we compare the linguistic expression for parts of the day even within the languages of the Indo-European group, we will observe denotation communicating *different* information about one and the same fragment of reality. The segment of time denoted by the Russian word *sutki* (a day and a night) is denoted in English by di-

viding it into day and night, without any joint term denoting. Nor is there correspondence between the more detailed differentiation within this time segment (compare morning /utro/, midday /polden'/, evening /vecher/, midnight /polnoch'/) in Russian to the division of the twenty-four hours in English: morning, forenoon, noon, afternoon, evening, night.

While the Russian, Ukrainian, Slovak, Lithuanian, Lettish, Kazakh, Kirgiz languages employ some single word to denote the arm and all its parts (the latter being denoted by a process of description), certain other languages employ two independent words for the same purpose. One word denotes the hand, while the other denotes the portion of the arm from the wrist to the shoulders. The latter group of languages includes French, Spanish, Romaine, German, Albanian, Finnish, Estonian, Hungarian, Azerbaijan, Chinese, and Japanese. This group also includes English, with its corresponding words: hand and arm. But there are languages, such as Czech and Indian, employing three names for this, in which the arm and all its components, the hand and the arm from wrist to shoulders, are denoted by three independent words (Lukasiewicz 1957).

Naturally, both the notion of the arm and hand as a unit and the differentiated concept of its various parts coincide in the final analysis among all peoples. But at the same time one cannot fail to note both the quantitative difference in the information transmitted by words in the listed groups of languages and the fact that different languages differentiate the parts of the arm in different ways, directing attention to one or another aspect of the thing under consideration by means of linguistic information.

One could also cite different, and sometimes unique, denotations of other parts of body, of numbers, different kinds of temperature scales, and the like, in different languages, even in languages having the very closest relation to each other.

Such facts provide the fullest foundation for the conclusion that "the translation from one language to another is not a simple, mechanical "pasting-on" of one set of "labels" instead of others, i.e., into identical given thoughts clearly defined in themselves. On the contrary, in a very large number of cases one encounters not only different formulations of what is obviously identical, but such diverse data for the shaping of a thought as to suggest the formation of thoughts that are not entirely identical, and not only to compel "emphasis" upon different aspects of things, phenomena, and relationships, but to lead to different classifications, different "ranking" of the corresponding elements of reality" (Smirnitski & Akhmanova 1954: 47).

It is quite remarkable that sometimes one may see quantitative and qualitative differences in the information transmitted by the grammatical meanings and the structural features of languages.

It may be contended that logical apprehension of the world (which is the decisive factor in the representation of reality in our minds) has a linguistic meaning between the lines, subtext suggesting disjunctive ways of viewing the world and some forms of linguistic knowledge of it. These modes and forms vary from language to language, and the difference between these variations is greater, the sharper the differences between the character, system, and structure of languages are.

What is specific to a language leaves long-lasting residues in the semantic field of utilisation of words. It would be wrong to estimate this fact in the cognitive aspect.

In considering the "linguistic meaning between the lines", subtext of mental representation of reality, it is necessary to pay attention to the image elements in the meaning of words, often termed, in the linguistic literature, the inherent form of a word, the instinct linguistic motivation, etc. Needless to say, the cases are common in which the words of different languages contain identical images. But the differences between them are even more striking. Whereas the concept "feast" in Old Slavonic is transmitted by a word /pir/ that emphasises drinking /pit'e/, in Polish the word rendering this concept is based on the notion of honour, while in Latin it is life together, and in French it is celebration (Bulakhovski 1954: 10). Of course, independent of the difference among the listed criteria, the concept "feast" among all these peoples reflects an identical reality corresponding to one and the same referent. But it is obvious that the inherent form of the word, its aspect as image, may call forth different associations in one or another degree. And these latter in turn may facilitate a unique perception of one and the same object.

Naturally, it is necessary to bear in mind the

fact that the inherent form of the word is often erased in the process of its historical development. Frequently the initial image loses its connection with the latter meaning of the word. The criterion on which the content of the word has been based for many centuries is forgotten. This process sometimes even leads to catachreses, illogical word combinations in which their strict meanings contradict each other (for example, red ink, in Russian the word for ink means black) or an old boy /*un vieux garçon*/ in French, etc). But on this basis one cannot avoid considering the inherent form of the word in analysis of the origin of the linguistic picture of the world. In fact, in many cases, the image aspect of the word preserves its freshness and in the light precisely of it plays an important role in giving meaning to the picture of the world. Also to be borne in mind is the circumstance that revival of the forgotten inherent form of the word may occur in the complex process of development of the word and its derivation in the system of concrete languages.

As far as catachreses themselves are concerned, in various languages they serve to hint at different association with the things represented, and in their own way facilitate the appearance of various "linguistic perceptions of the world". The realm of the peripheral meaning of the word and its linguistic sense as such expanse to polysemy and synonymy. It is well known that most words in spoken languages are polysemantic, which is a consequent not of their referability to object but to the very character of the language. At the same time, it is hardly possible to find cases of completely adequate translation of words having multiple meanings. Here linguistic differences, ethnic distinction in lexical meaning enter the arena. Leo Weisberger has observed that the French word *les herbes* expresses different concepts in view of its polysemantic nature: greenery, vegetables, weeds, etc. There is obviously no doubt about the fact the Frenchman does not identify these things with each other either in scientific interpretation or in everyday life.

But at the same time it marks a distinctive feature of the mental attitude of Frenchmen of these objects as a consequence of the polysemantic nature of the given word, the linguistic factor.

Polysemanticity results in various additional meanings and, consequently, in supplemental information in various languages. The same thing may be said with respect to synonyms. This is clearly to be seen in the comparison of series of synonyms in different languages, where no exact correlation is evident. And how many new, distinctive, meanings, often unique to the language in question, are to be seen in the figurative uses of words and word combinations1. Sometimes translation from one language to another results in curiosities because of the meaning distinct to each given language.

In ever greater degree, languages manifest their "alienation" from each other when one examines idioms and "phraseologisms".

Translatability of these from one language to another is virtually out of the question. Yet idioms and "phraseologisms" provide distinctive "projections" of the world in our minds. Consequently, we see a certain distinction in the linguistic perceptions of one and the same actual reality, depending upon the specific features of the language.

To this it is necessary also to add such components of linguistic meaning as the phenomenon of enantiosemia /enantiosemia/, loanwords and semiforeign forms, sensory-visual factors, expressive and stylistic prosperities of languages, with the result that peripheral region of meaning of the class of linguistic *co*-meaning expands even farther.

For comparatively complete characterisation of linguistic co-meaning it is necessary also to give special attention to those specific nuances of meaning that arise as the result of word-forming processes and morphological devices. Of special interest is the circumstance that, sometimes, the new meaning of a word is, in a certain sense, determined by the outward appearance of a word, its external form, it arises as the result of similarity of sound with other words. It is clear that in these cases the distinctly linguistic origin of the new meanings is unchallengable, and these meanings are incorporated in the linguistic co-meaning.

Thus, we have taken note of a number of components of that multiplicity of meanings determined by linguistic factors, with the result that they vary from language.

If one disregards the fundamentally important circumstance that concepts do not exist outside of words, and that the information contained in a concept is part (and, moreover, the principal and

significant part) of the meaning of the word, it may seem that there are two models of the reality around us: the conceptual or logical model, and the verbal or linguistic. Of course, their origin in our minds, does not occur in so "crystal pure a form". There is much more justification for speaking of a complex interweaving of these models, and of the extreme diversity of the picture of the world in our consciousness, in which logical or mental images determined by things either coincide with the lexical plaster casts taken from those things or acquire various overlays in accordance with linguistic components.

It should also be specially emphasised that whereas an adult, in cognising the world, may often disregard linguistic factors, not approach actual reality from the standpoint of the linguist, and even not be aware of the linguistic substrate of logical meaning, the situation is different for a child, "for the child at home, assimilation is method of learning about life, a means of getting what he wants, a device for satisfying his insatiable curiosity. He is hardly aware that he is learning a language, and this does constitute his principal (major) conscious goal". The child becomes aware of life as he becomes aware of words (Pemfield & Roberts 1964: 221, 234).

However, despite the immense complexity of the process of cognition and the interweaving of linguistic and logical factors in that process (particularly in the period of formation of the very first and most necessary information about the world), it is possible even physiologically to discriminate between the spheres of conceptual thought and the linguistic shaping of thought in consciousness. Bearing this aspect of the matter in mind, Penfield comments that with the passage of time, a ganglionic equivalent of words and ganglionic equivalent of concepts takes shape in the brain. Over a period of years, experience continues to reinforce the bilateral interneuronal connections between concept and word (Ibid: 211).

It is no accident that Penfield speaks of a distinctive "verbal memory" as one of the three principal aspects of memory, to wit: (1) the memory of experience, (2) the memory of concepts, and (3) the memory of words. And this, from the standpoint of the problem that interests us, means that when the picture of reality is reconstructed in our memory, the verbal and conceptual models of the world occupy relative positions, depending upon the activity of the verbal or conceptual memory.

The fact that the unity of concepts and word does not rule out a special and yet completely autonomous influence upon our minds of a given aspect of that unity is testified to by the following fact, of which Penfield takes special note: A man listening to a speaker may follow his words, ignoring concepts, or may pay attention only to the concepts, the symbols of which are words, ignoring words themselves. If this listener knows two languages, he may not even notice in which language he is being addressed (Ibid: 214).

We have thus attempted to show that in the complex process of cognition of reality, two models of it appear in our minds: the conceptual (logical) and the verbal (linguistic). It is also possible, as E. Wellander puts it, to speak of object and verbal notions of the world. It must also be emphasised that the verbal notion, linguistic images, and, speaking in generalised terms, the linguistic model of reality vary from language to language. The conceptual or logical model is invariant, common to all people, independent of the language in which they think and express their thoughts.

Sapir, Whorf, their followers, and the spokesmen for general semantic have taken note of the exceptional role of language in the process of cognition. However, a one-sided approach to the problem led Whorf to formulate the principle of linguistic relativity.

In our evaluation of the tendency to emphasise that language plays an exceptional epistemological role, we are compelled to express disagreement with the categorical nature of Whorf s principle (and with the Sapir-Whorf hypothesis in the broad sense, our reference being to its generalising propositions of principle). The failure of Whorf and his supporters consists in an exaggeration of the role of language versus the role of thought in cognition, which is denigrated.

In reality, as has already been noted above, the principal meaning in a word is its conceptual core. Everything else is of peripheral significance, and this is what determines the role of the latter in reproducing the picture of the world. The strictly linguistic concept of the world, or the linguistic model, communicates to us only supplementary, concomitant information, co-meaning. But it is the conceptual or logical model that is the carrier of the principal and most significant

information; the concomitant world of linguistic concepts plays a role of importance in the process of cognition. This co-conception often serves to correct the conceptual picture of the world and to enlarge our knowledge of it. Nor is it impossible for divergences and contradictions to exist between the conceptual and linguistic models, which is testified to, particularly, by such phenomena as catachreses. But all distortions of the picture of the world in linguistic co-conceptions are corrected through the medium of control by logic, and thanks to the fact that the conceptual model is dominant.

As a result, the conceptual and linguistic interpretations of the world are combined in a single model of reality, a single picture.

It is precisely all this that causes us to found the principle of linguistic complementarity, which in a certain sense is a positive overreaching of the principle of linguistic relativity and is based on the rational meaning within the latter.

The content of the principle of linguistic complementarity is not understood identically by the authors, operating with the given concept. Some authors think that the principle of linguistic complementarity must not be associated with the principle of complementarity of N.Bohr. From this point of view the content of the principle of linguistic complementarity is not the interaction of object and instrument, but the idea of mutual complementarity and mutual conditioning of linguistic phenomena within the system of a concrete language. But with such an approach the principle of linguistic complementarity merely put forth the demand of dialectics for the all-sided study of phenomena, applied to the facts of language. Here there is nothing specific for the idea of complementarity.

Other authors accept the application of the principle of complementarity in the shape of extrapolation of the narrow understanding of the idea of complementarity.

Other authors accept the application of the principle of complementarity in the shape of exploration of the narrow understanding of the idea of complementarity in the sphere of linguistic apprehension of the world. Thus they interpret the influence of Whorf and Weisgerber on considering a language in cognition of the world. Such an approach to the principle of complementarity has its justification. The history of science shows how many regularities have successfully been investigated by means of the extrapolation of the ideas of one science in the range of the phenomena of the objective province beyond the limits of the study of the given science. And in the concrete case it is possible to quote numerous instances which prove the fruitfulness of the extrapolation of the narrow understanding of the idea of Bohr's complementarity while studying the role of language in the process of knowledge.

However, to insist that the idea of complementarity preserves, at any application, its original characteristic signs would mean to make extremely narrow its range of action and thus to limit, in a certain sense, its possibilities of acquiring methodological functions. It is remarkable that already for the relativistic quantum theory, in Professor B. G. Kuznetsov's opinion, we need to set forth the principle of complementarity in a more general form, discarding some specific characteristic of non-relativistic quantum mechanics (Kuznetsov 1966: 143).

It occurs to us that the application of just the broad interpretation of Bohr's idea of complementarity is more fruitful in the methodological aspect, a comprehension, which is limited neither by the demands of the combination of mutually excluding concepts, conceptual re-understanding of facts under study, nor by the demand of considering those cases, where we have to do with one or another manifestation of interrelation of objects and measuring instruments. In that case it is important to pay attention also to the fact, that the application of the principle of complementarity in the study of the cognitive role of language has its specificity, peculiarities of its manifestation. It is no accident that the principle of complementarity, applied in the field of study of the role of language in the production of the picture of the world in our consciousness, is called the principle of linguistic complementarity.

The author of these lines proceeds from the following interpretation of the principle of linguistic complementarity as one of the possible applications of the principle of complementarity for the study of the role of language in the production of the picture of the world in our consciousness. It is possible to represent all the information about reality, surrounding us in the form of set A and its complement ¬A. All the logical content of linguistic media are considered to be under set A. Under set ¬A is implied the knowledge about the world surrounding us. That

knowledge is contained in every language apart from and besides their logical content and thanks especially to the specific traits of the given language. The knowledge in the form of set A is constant, common to all people, independently from the concrete form of its linguistic expression. The knowledge in the form of set ¬A *varies* from language to language. We obtain a relatively complete picture about reality by the combined account of A and ¬A.

Such an interpretation of the ways of the rise of the picture of world in human consciousness fully agrees with the demand of Hegelian dialects on the all-sidedness of the study of phenomena under consideration. At the same time, as concretisation of this general methodological demand, it manifests itself in the form of a partial case of the principle of complementarity – in the form of the principle of linguistic complementarity.

For this interpretation of the principle of linguistic complementarity it is characteristic that A and ¬A are considered not as equivalent sets which complement each other; but set A put forth as basic, and ¬A as its complement. That circumstance is not accidental. The author proceeds from the fact that in general and as a whole the information of set A gives a general picture of reality, surrounding us, while the information of set ¬A is not the main, but the complementarity source of knowledge about reality. As complementary knowledge bears linguistic character, hence the origin of the name "principle of linguistic complementarity". In contrast to the interpretation of the principle of complementarity where A and B are considered as two sub-sets of a set, the volume of which evidently is not always known, in this case set A and its complement ¬A cover all the given objective province (A U ¬A = 1).

So, we can summarise: the principle of linguistic complementarity holds that the reality around us, the real world, is reproduced in our consciousness by a conceptual (logical) model and a linguistic *co*-model. The principal and most significant information about the world is communicated to us by the logical or conceptual model, while the verbal or linguistic model supplements this information and sometimes corrects it with new data and concepts. The class of information constituting the linguistic model presents itself as supplemental to the class of information in the logical model, while two together permit us to create the most complete and exact possible picture of the reality around us. The logical model presents itself not only as carrier of significant information about the world but as an invariant form of our conception and knowledge. The model provided by language proper, the linguistic model, is not only a source of additional information but varies from language to language, creating a similar accompanying universe of concepts, as Whorf puts it, only if the linguistic backgrounds are similar or, at least, can in some way be calibrated (Whorf 1966: 214).

NOTES

Chapter I

1. Chapter I summarises the author's articles published in Armenian, Russian, Polish, English, etc. The following articles in English are particularly used: "Philosophy and Metaphilosophy". In: *Soviet Studies in Philosophy*, 1986, vol. XXV, No. l, pp. 73-86; "The Specificity of Philosophical Knowledge and the Language of Philosophy". In: *Wissenschaftliche Zeitschrift der Ernst-Moritz-Arndt-Universitat Greifswald*. Fragen der Sprachphilosophie und Kommunikationsforshung. Gesellschaftswissenschaftliche Reihe. XXXVI, 1987. 1-2, pp 32-36. "The Language of Philosophy". In: *Philosophy and Methodological Problems of Social Sciences*. Ed. by V. Lektorsky. Moscow, 1978, pp. 45-49.
2. We refer, for example, to the books of the American philosopher M. Lazerowicz: *Studies in Metaphilosophy*, London, New York, 1964; The Language of Philosophy, Dodrecht, Boston, 1977; J. H. Gill. *Metaphilosophy: An Introduction*. Washington, 1982. It is possible to enumerate a number of articles published not only in the journal *Metaphilosophy*, but also in others, in particular, such as *Cultural Hermeneutics*, *American Philosophical Quarterly*, and the like.
3. Based on the analysis of the conceptions of S. Piannot, A. Whitehead, B. Russell, and A. Church, I. Lakatos writes that the object of metamathematics is the abstraction of mathematics when the mathematical theories are replaced by formal systems, proofs – by certain consistent well-known formulas, and definitions – by abbreviated expressions which are theoretically unsound, but topographically convenient (Lakatos 1970).
4. As A. Church notes, it is often necessary for us to use one language in order to speak about another language; furthermore, not only in the process of building formalised languages, but also to formulate theoretical expressions about the possibilities of such formalised language (Church 1956: 07).
5. According to O. Hilbert and P. Bernais, the formalisation of logical derivation was formed in a systematic theory of proofs, which in the most general way discussed the problem of the sphere of operation of logical modes of inference, a problem which traditional logic poses resolves only in a very special way. By virtue of methods of the theory of proofs a direct interconnection between the problem of foundation of mathematics and logical problems was also discovered.

   This theory of proofs the authors also named metamathematics (Hilbert & Bemays 1934).
6. On the language of philosophy from different points of view see also (Alexander 1972), (Chatterjee 1981), (Israel 1979), (Lazerowicz 1977).

Chapter II

1. The Chapter II is written on the basis of the author's articles published in different languages. The following articles in English are particularly used: "Language and Levels of Abstraction as Criteria for Determining the Status of Systems of Logic". In: *Soviet Studies in Philosophy*. New York, Winter 1975-76, vol. XIV, No. 3, pp. 3-23; The Study of Logic is the Main Content of the Theoretical Heritage of David the Invincible (Anhakht). Yerevan, 1980; "Transformational Logic". In: *Formal Approaches to Natural Language. Proceeding of the Second Colloquium of Montague Grammar and Related Topics.* Tokyo, March, 1982, pp. x-l-x-8; Transformatory Logic: Essential Nature and Basic Concepts. In: *Soviet Studies in Philosophy*. New York, Winter, 1983-84, vol. XXII, No. 3, pp. 3-22. (This article is the translation of the Russian version published in Moscow magazine *Voprosy fdisofii* (1983, No. 8) and includes many essential errors in translation. *Some* of them are mentioned in *Erratum* published in *Soviet Studies in Philosophy*, New York, Fall 1986, Vol. XXV, No. 2, p. 88). Those errors are corrected in the booklet *Transformational Logic* (Yerevan, 1995) which is also included in the publishing book.
2. In speaking of the linguistic needs of formalised logic, Church observes that there is a practical need to use a specially created language, *formalised language*, for logical pur-

poses. Contrary to ordinary language, it will follow logical form and reproduce it even if this means loss of conciseness and ease of communication, when that is necessary. The introduction of a special formalised language consequently means also the use of a special theory or system of logical analysis (Church 1956: 00).

3. According to J. M. Moraviczik, logical form depends not only on a choice of logic, a choice of the logical vocabulary, but is also "one's choice of ontology" (Moraviczik 1983: 231).
4. It is not correct in this case to use *conclusion*. Indeed, it is a true statement, which is known from the science of geometry, but it does not follow from the proposition: "All triangles are plane figures having their angles equal to two right angles".
5. Many philosophers and logicians as well as linguists – independendy of the schools which they represent – came to the conclusion of the important role of logical form. According to P.Suppes, "a correct piece of reasoning, whether in mathematics, physics, or causal conversation, is valid by virtue of its logical form" (Suppes 1986: XVI). Some authors' opinions on logical form are quite negative. J. Etchemendy declares: "So far I have seen little reason to think that form has much to do with logic at all" (Etchemendy 1983: 334). It seems to me that the transformational analysis of the forms of thought is one of refutations of Etchemendy's conclusion.

   (On logical form see also (Aoun 1983), (Bosque & Moreno 1984), (Carlson 1983), (Gueron 1984), (Higginbotham 1983), (Kielkorf 1984), (Ladusaw 1983), (Lycan 1984), (May 1986), (Neale 1988), (Pesetsky 1985), (Woods & Walton 1988), etc.).
6. The following fact indicates the importance of such a question. "What did Shakespeare intend? – that was the title of an article in an American journal in which it is stated that as early as 1960, the Shakespeare scholar Horace Howard Fernes began an extremely detailed analysis of the texts of all thirty-seven of Shakespeare's plays. Each play was interpreted in a special volume, and each volume took thirty years' work to prepare. All this work is being done to answer the above mentioned question.
7. Solomon Feferman, Professor of Mathematics and Philosophy, Chairman of the Department of Mathematics at Standford University and past President of the Association for Symbolic Logic, wrote to me (January 18, 1984) that copies of Professor Gögel's correspondence with me were found in Gödel's files. Gödel's letter to me will be published in his unpublished MSS, notes, and correspondence. The short history of the mentioned letter and its translation in Russian with an epilogue were published in the Moscow journal *The Questions of Philosophy* (in Russian), 1984, No. 12, 123-127.
8. I shall describe some problems of Aristotelian and Stoics logic in David the Invincible's interpretation more or less in detail, as Western logicians are not much familiar with logical traditions in Armenian reality. It is characteristic, that the well-known expert of the history of logic I. M. Boochenski notes, that "western logic having conquered the Arabian world in the high Middle Age... penetrated Armenian culture through missionaries" (Bochenski 1961: 11). And adds: "I am grateful to Prof. M. van den Oudenrijn for having drawn my attention to this fact" /Ibid/.
9. "It is important to realise that definition originated as a metaphor for the boundaries of villages and forms; for our forebears determined boundaries so that they would profit from their own without touching what belonged to others and thus avoid the two extremes of excess and of want" (David 1983: 37).

Chapter III

1. The author's following articles in English and German are used in this chapter: "On Philosophical Argumentation". In: Philosophy and Rhetoric. The Pennsylvania State University, 1979, No. 2, pp. 77-90; "Allgemeine Argumentationstheorie". In: Wissenschaftliche zeitschrift der Ernst - Moritz - Arndt - Univcrsitat Greifswald. Gesellschaftswissenschaftliche Reine, XXXVI, 1987, No. 1-2, pp. 32-36; Argumentation in Man's Activity. In: The Problem of Man in Philosophy. Moscow, 1988, pp. 1983-189; The Architectonics of Argumentation. In: Proceedings of the Second International Conference on Argumenta-

tion. Edc.: F. H. van Eemeren, R. Grootendorst, J. A. Blair, Ch. A. Willard. Amsterdam: SICSAT. 1991, pp. 61-63; The Language of Argumentation (in collaboration with H. Margarian). In: Ibid, pp. 546-550; The Theory of Argumentation, its main Problems and Investigative Perspectives. In: Problems of Philosophical Argumentation. I. General Problems. University of Turku: Turan Iliopisto, pp. 5-17.

2. One of the students of the contemporary well-known American philosopher W. V. Quine-W. Shebar, describing the lectures of his Professor, writes that even his round, bald head added power to his arguments (Harvard Magazine, 1987).
3. The Problem of Translatability in Argumentation is written by Narine Brutian in collaboration with the author of this book.
4. One must recognise as correct the assertion of Professor N. Rotenstreich that "philosophical argumentation proper, i.e. ways of presenting a philosophical statement, point of view, or a system, as well as ways of arguing and demonstrating the validity of statements - cannot be dealt with separately or independently from the view of what is philosophy itself about or what are the problems, in terms of contents, that philosophy is concerned with" (Rotenstreich 1963: 19).
5. Many interesting results in philosophical argumentation, as well as argumentation are published in the proceedings of the first and second international conferences on argumentation organised by the International Society for the Study of Argumentation (ISSA) at the University of Amsterdam (Eemeren & Grootendorst & Blair & Willard 1987a, 1987b, 1987c, 1991). See also (Eemeren & Grootendorst 1984), (Eemeren & Grootendorst & Kruiger 1987).

Chapter IV

1. The author's following works published in English are used in this chapter: The Philosophical Essence of the Theory of Linguistic Relativity. Moscow, 1963; "The Philosophical Essence of the Theory of Linguistic Relativity". *Memories del XIII congrese de filosofia. Communication libres, vol. V*. Universidad nacional autónoma de Mexico, 1964; *The Philosophical Bearings of the Theory of Linguistic Relativity*. ETC.: *A Review of General Semantics* 2(1965); "On Some Aspects of Language as an Object of Philosophical Investigation". *Akten ds XIV. Internationalen Kongresses für Philosophie*, Band 3. Universität Wien, 1969; "The Principle of Linguistic Complementarity". *Soviet Studies in Philosophy* 2(1969); *Methodological Aspects of the Principle of Complementarity*. Yerevan, 1974.

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